

ENGINEERING
TOMORROW

Danfoss

EMEA

Fluid Conveyance Application Guide

We put the world in motion





What should you know about fluid conveyance?

We put the world in motion

Whether your products move, turn, shape, mold, lift, dig, or haul, you can depend on Danfoss' fluid conveyance products to deliver the performance you need to stay competitive. Danfoss' unwavering dedication to leadership in mobile and industrial applications has made Danfoss one of the world's preferred suppliers of fluid conveyance systems, parts, controls and engineered solutions. This Fluid Conveyance Field Guide was created as a quick reference tool for identifying and selling Danfoss' fluid conveyance products. The Field Guide is the ideal tool for those new to Danfoss' products or those having responsibility for a broad range of products. This Field Guide provides the "core of the core" products that Danfoss Fluid Conveyance has to offer. For further or more detailed information on the fluid conveyance product lines go to:

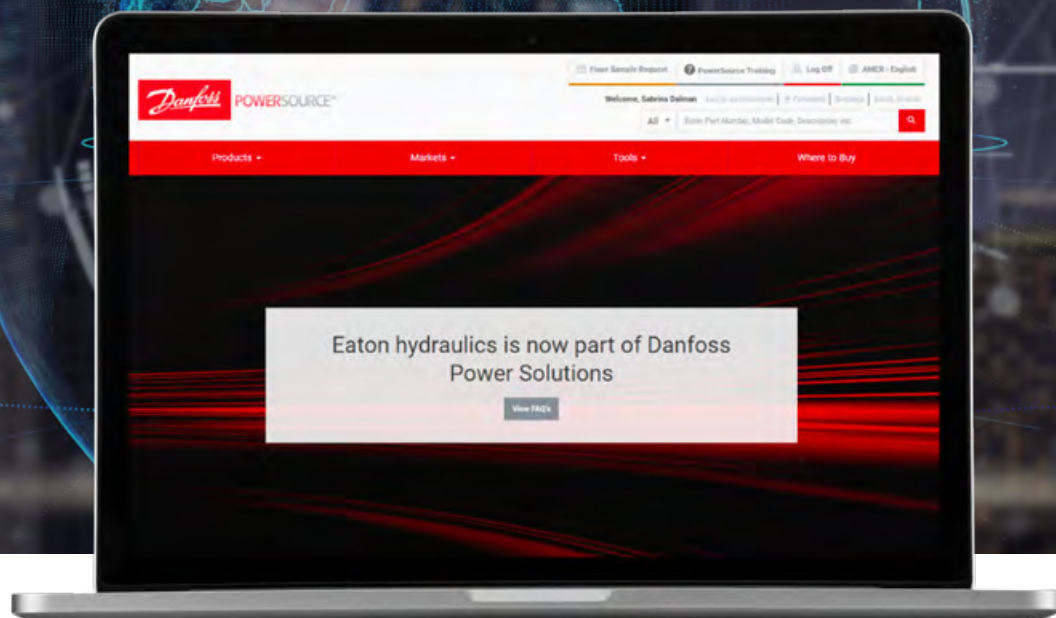
www.danfosspowersource.com

PowerSource

Tools

PowerSource

Your information headquarters



Putting fluid conveyance information **at your fingertips**

Danfoss PowerSource™ is the hub for all of Fluid Conveyance. This informational site houses Danfoss' product, market and technical information including:

1. Searchable fluid conveyance product information:
 - Part numbers
 - Sizes
 - Performance and specifications
 - Branding information
2. Literature and videos
3. Product value propositions
4. Crimp specifications
5. Coupling cross reference tool
6. Custom bin label tool
7. 2D/3D CAD models
8. Hose assembly configurator
9. Marketplace (authenticated PowerSource only)
10. List prices and lead times (authenticated PowerSource only)

To access these tools and more, visit and log in to PowerSource from my.Danfoss.com and then select tools.

PowerSource Tools

PowerSource information

Beyond the features highlighted on the previous pages, PowerSource also offers:

Literature

Access the complete Danfoss Product Literature library, which includes product catalogs, brochures and sell sheets, operators manuals, repair documents, and technical and installation documents.

Videos

View Danfoss' promotional, training, and help videos.

On demand presentations

Access training videos in the On Demand Presentations section to learn about the latest products from Danfoss.

Sales kits

Your one-stop-shop for selling tools on the benefits of Danfoss' products and services.

Hydraulic guide selector tool

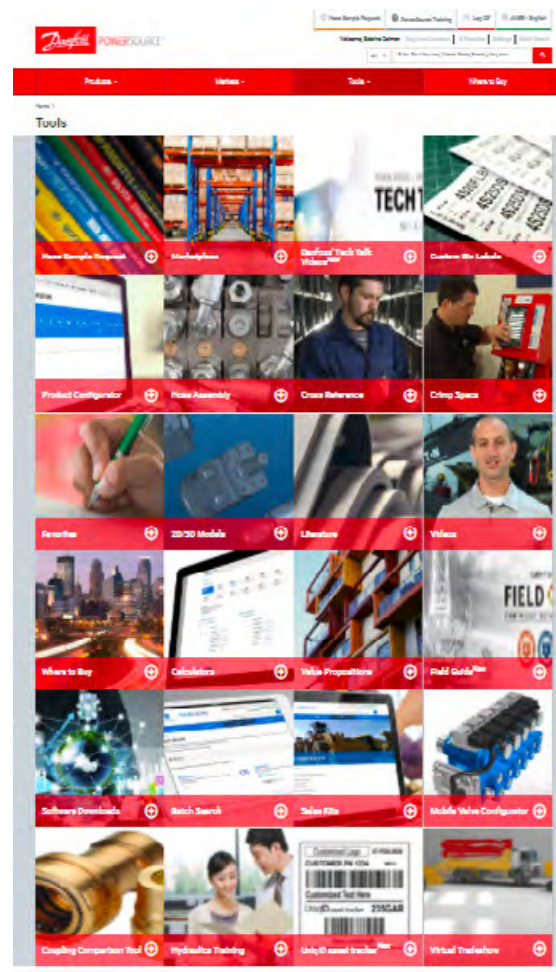
Need help selecting the best hydraulic hose and fittings for the job? Let Danfoss help by stepping you through the process of building a hose while showing you which performance characteristics are tied to each hose feature, including inner tube, reinforcement, and cover.

Hose assembly tool

To build a hose assembly and then create a bill of materials, start by selecting a hose, hose endings, and specify the length.

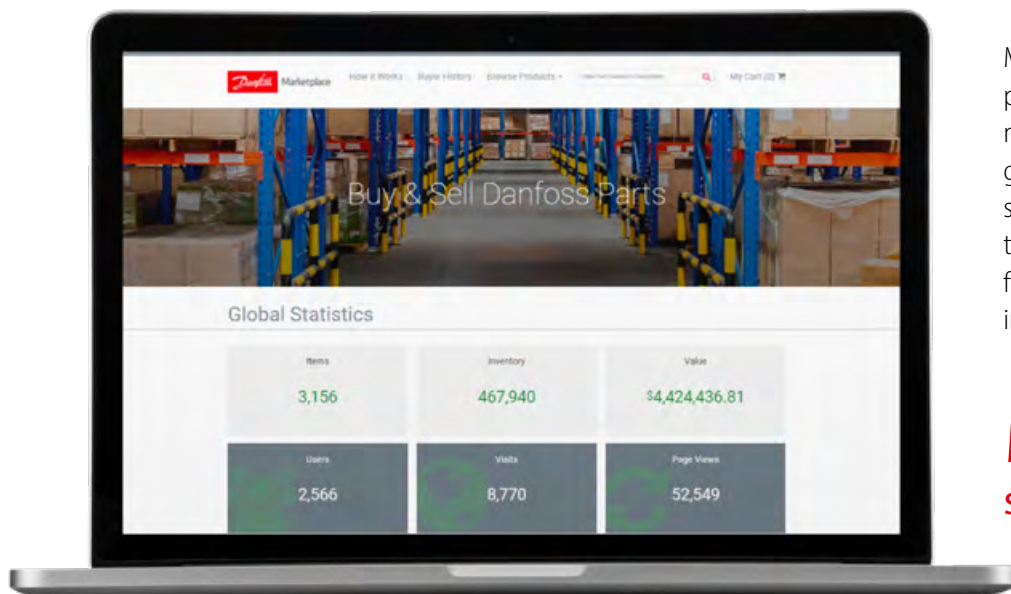
Calculators

Danfoss' Hydraulic Calculators are designed to get you the right parts to suit your needs.



Marketplace

Don't miss out, become part of the Marketplace community today!



Marketplace is the only site that provides access to fluid conveyance non-core products. Whether your goal is buying or selling, Marketplace should be your first stop. Check it out today and don't miss your chance to find that rare part or sell your surplus inventory.

Marketplace
search • buy • post • sell

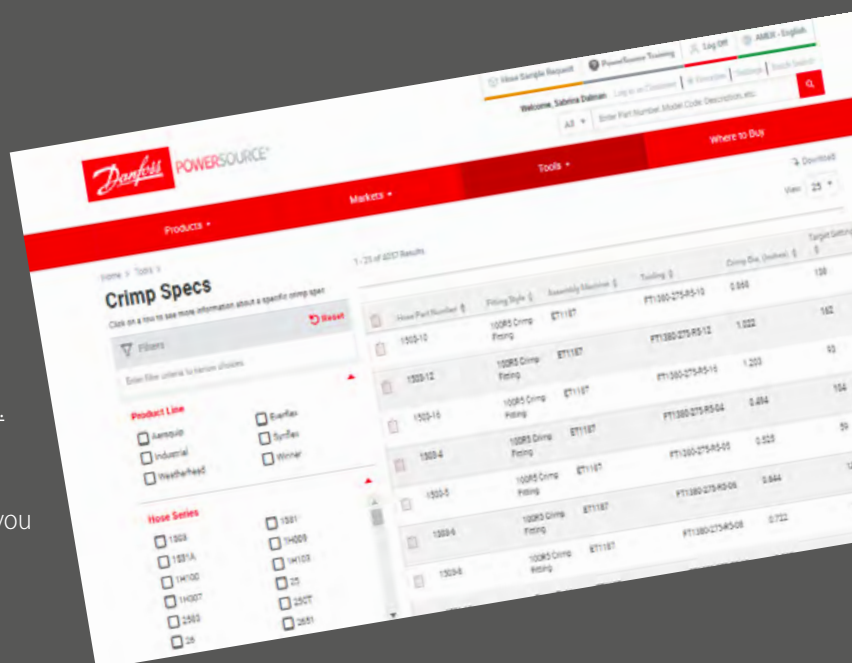
PowerSource

Tools

Crimp Specs

Danfoss has simplified the crimping process.

Just use Danfoss' resource website, danfosspowersource.com, to find up to date crimp spec information. To find your crimp specs, select your assembly machine group, hose series, hose size, and fitting style. When logged in you can then download the results to Excel or PDF to see all relevant details, including all tooling needed for the job.



Key service benefits

- Simplify product supply and ordering processes
- Improve assembly configurations
- Optimize production engineering processes
- Bring down total cost
- Achieve complete solutions with a single code and from a single supplier

Value that goes beyond the hose

As one of the world's preferred suppliers of fluid conveyance products, we're relentlessly dedicated to helping our customers gain competitive advantage in a wide array of demanding industries. Whether our customers rely on machines that move, turn, shape, mold, lift, dig, or haul, Danfoss products are there to deliver the performance they need to stay ahead.

To help our customers go further and faster, we've developed a broad portfolio of value-added services. Working hand-in-hand on tailored solutions, we use our expertise to help customers harness theirs—freeing them to focus on what they do best.

By streamlining and simplifying component supply and installation processes, we can help customers rationalize spending, accelerate productivity, flex with new demands, and outmaneuver competitors. We carefully evaluate each customer's processes and workflow to tell them how they could be optimized, helping to ensure their operations are adding value every day.

Service overview

On-site assembly



Through on-site hose assembly, we can make a customer's production system faster, more efficient, and more predictable, as well as simplifying their ordering and inventory processes.

Key benefits:

- Enables short lead times and a rapid response to new demands
- Optimizes costs due to reduced logistics and packaging

Rapid prototyping



We can help customers quickly create even high complexity hose assembly prototypes—enabling them to leverage the value of a physical specimen to create more optimized and competitive solutions.

Key benefits:

- Rapidly enables design verification, testing and optimization
- Maximizes product lifetime and performance

Kit building



We use kit building to optimize the customer production process, helping them work faster and more efficiently—making better use of space, simplifying assembly, reducing training demands, and more.

Key benefits:

- Reduces inventory space and costs
- Enables faster assembly and optional direct delivery to line

Expedited shipping



Our expedited manufacturing and shipping service helps clients cope with challenges like inventory errors, breakdowns, or short-term production changes—avoiding delays, higher costs, and unhappy end customers.

Key benefits:

- Enables rapid delivery of urgently needed parts
- Prevents line stops or ramp up issues

Kanban/consignment



Developed to improve production efficiency, Kanban offers a clear advantage for lean and on-time manufacturing. We can create a bespoke logistics solution to meet any customer requirements

Key benefits:

- Increases productivity
- Reduces inventory demands
- Ensures streamlined and reliable on-time delivery

UniqID asset tracking



UniqID™ asset tracking is our cloud-based tool designed to label, manage, and track hose assemblies. It enables customers to manage their assets like never before—anywhere, anytime—while also meeting OEM compliance requirements

Key benefits:

- Enables complete asset lifecycle management
- Reduces downtime with fast and accurate maintenance and replacement
- Streamlines record-keeping

On-site application engineering



With on-site support from our experienced engineers at their manufacturing location, customers can reduce the time and cost for new application development and select the most suitable components during prototyping to guarantee an efficient, cost-effective, and competitive solution.

Key benefits:

- Makes application development faster and less expensive
- Expert support ensures an efficient, cost-effective, and competitive solution
- Ideal routing upfront reduces design iterations and later issues

Stronger than ever

Brands that move the industry forward

		Winner by Danfoss	Boston by Danfoss	Synflex by Danfoss
Danfoss Waltech Offering excellent tube fitting performance: no leakages, high-bending stress and high impulse resistance since 1958.	Raising the bar since 1940 in critical applications with unsurpassed purpose-built performance.	Cost-effective solutions that meet industry standards since 1963.	A pioneer in industrial hoses, with 150 years of excellence in innovation.	Reinventing performance with thermoplastics innovation since 1940.

Danfoss Hansen®
Setting new industry standards in fluid conveyance with the invention of the quick-release coupling since 1915.



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The Telehandler platform



A telescopic handler – also known as a telehandler, teleporter, or reach forklift – is a multifunctional piece of equipment used in agriculture. Telehandlers are also becoming more widely used in the construction and manufacturing sectors. These vehicles can undertake a variety of tasks, including site clean-up, material handling as well as unloading heavy weights from trucks.

Telehandlers are similar to forklifts, except they have a boom (or telescopic cylinder), in common with cranes. These types

of vehicles offer the increased versatility of a single telescopic boom that can extend forwards and upwards. Operators can fit a range of attachments to the end of the boom, like buckets, pallet forks, muck grabs or winches. Unlike some other machinery telehandlers can also be deployed on rough terrain. In addition to lifting, telehandlers can also be used to hoist materials. Instead of picking up goods on its forks and lifting them, a telehandler can hoist heavy loads by means of a crane job with a hook or a winch.

Work Cycle



Winner EC115 and EC215 one and two wire braided hose



Synflex 3TB0 thermoplastic hydraulic hose



Aeroquip EC881 Dynamax® two-wire braided hose

Engine



Danfoss FC699 elevated temperature engine hose

Pilot line



Winner WH006 textile hydraulic hose

Stabilizer



Winner EC215 two-wire braided hose

Hydrostatic drive



Aeroquip EC850 Dynamax® four/six wire spiral hose



Aeroquip hydraulic high pressure special multi bended tube assembly



Aeroquip EC600 X-Flex® four/six wire spiral hose

Air conditioning



Danfoss EC007 Type C EverCool



Danfoss Hansen Flat Face (FF) quick disconnect couplings



Synflex Optimum 43GW thermoplastic grease line hose



Waltech tube fittings



Waltech Walform tube connector

Work cycle



Winner WH004 hydraulic suction hose

Aeroquip EC850 Dynamax four/ six wire spiral hose



Overview

Aeroquip EC850 Dynamax four/ six wire spiral hose is a four spiral layer (six spiral layers for size -20) hydraulic hose with a working pressure up to 500 bar.

The challenge

Hydrostatic drive hose lines are one of the most critical hydraulic applications in mobile machines like telehandlers.

Depending on the machine type, pressure ratings of up to 500 bar can be achieved. The connectivity between hydraulic components is very complex in this application, requiring flexible hoses in combination with multi-bent fittings. This is essential on at least one end of the hose assembly to optimize routing.

All the components used in this application need to be reliable and safe. There must be no leakage of hydraulic fluid between hoses and fittings.

Solution benefits

- EC850 hoses are the best choice for high-pressure hydrostatic drive applications up to 500 bar
- Thanks to a four-wire layer design in sizes -10, -12 and -16, these hoses provide outstanding flexibility at high pressures
- Improved flexibility and a tight bend radius enhance installation and routing capabilities
- Offers 8X better abrasion resistance than standard rubber hoses, due to Dura-Tuff® cover
- Can be combined with customized multi-bent fittings without brazing or welding points, eliminating the risk of leaks

Aeroquip EC600 X-Flex four/six wire spiral hose



Overview

Aeroquip EC600 X-Flex four/six wire spiral hose provide excellent flexibility at a working pressure of 420 bar and exceed both SAE 100R15 and ISO 18752 standards.

The challenge

Hydrostatic drive hose lines are one of the most critical hydraulic applications on mobile machines like telehandlers.

Compact installation space demands hoses with very tight bend radii, even at this high-pressure rating. The connectivity between hydraulic components is very complex in this application, requiring flexible hoses in combination with multi-bent fittings. This is essential on at least one end of the hose assembly to optimize routing.

All the components used in this application need to be reliable and safe. There must be no leakage of hydraulic fluid between hoses and fittings.

Solution benefits

- EC600 hoses offer a very tight bend radius (1/2 of SAE) that can reduce the hose length required through shorter routing. Improved flexibility (force-to-bend) also enables easier installation in tight spaces
- By making the hose assembly smaller and lighter, these hoses enable a more compact installation space
- Weight reduction in the hose assembly increases machine efficiency and reduces total cost of ownership
- Can be combined with customized multi-bent fittings without brazing or welding points, eliminating the risk of leaks

Aeroquip EC881 Dynamax two-wire braided hose



Overview

Aeroquip EC881 Dynamax two-wire braided hose is a high-performing two-wire braided hose qualified to one million impulse cycles. Using a next-generation inner tube and "hybrid plies" reinforcement, the EC881 enables higher working pressure and an improved bending radius, as well as a long operational lifetime. The EC881 can even challenge spiral hoses in some applications, helping customers to decrease machine weight and to improve routing.

The challenge

A telehandler's arm is always dynamically moving, as are the hose assemblies connecting the hydraulic system between the machine chassis and the arm.

To minimize machine downtime and operational costs, it's essential to have a hose assembly with superior flexibility, as well as the ability to withstand demanding and dynamic applications.

The hydraulic hoses and fittings selected need to support a long lifetime in-application by featuring high corrosion resistance and the ability to maintain leak-free operations for many years.

Solution benefits

- A higher pressure rating than standard two-wire braided hoses. Thanks to its higher working pressure, the EC881 can also be used instead of a spiral hose to reduce machine weight and operational costs
- EC881 provides excellent flexibility (1/3 SAE 100R2 bending radius at 100°C). This enables easier installation in compact spaces and decreases failures caused by tight bends
- A next-generation inner tube enables slow aging and a low compression set, providing better sealing and leak-free performance in even dynamic applications
- Reduces downtime, with an operational life up to 5X longer than standard EN857 Type 2SC hoses, supporting as many as one million impulse cycles
- Offers 8X better abrasion resistance than standard rubber hoses, due to Dura-Tuff cover
- Aeroquip 1A type TTC fittings are qualified for zero leakage and can provide up to 1000 hours red rust protection thanks to their enhanced Dura-Kote plating

Winner EC115 one-wire braided hose, Winner EC215 two-wire braided hose



Overview

Winner EC115 one-wire braided hose (1SC) and Winner EC215 two-wire braided hose (2SC) are one and two-wire braided hydraulic hoses which provide a competitive solution for all kinds of standard hydraulic applications in combination with Winner two-piece hose fittings.

The challenge

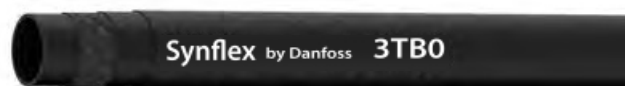
A competitive hose assembly solution is needed for all kinds of standard hydraulic applications, such as front attachments or mobile machine legs.

Even in standard applications, leak-free connections are essential. Any hoses and fittings must be technically qualified and approved by the supplier.

Solution benefits

- Winner 1SC and 2SC braided hoses EC115 and EC215 both meet industry standards and are very cost-effective, as are their optional fittings
- Winner two-piece crimp fittings are non-skive for easier and quicker assembly, as well as safe and leak-free connections. One nipple part number can also be used for both EC115 and EC215 standard hoses just by utilizing a different socket
- With stock available locally in Europe, short lead-times are possible for a wide variety of fitting terminal ends

Synflex 3TB0 thermoplastic hydraulic hoses



Overview

Synflex 3TB0 thermoplastic hydraulic hose is an ideal solution for telehandler boom applications thanks to its great abrasion resistance, lightweight, and bonding capabilities. The most used sizes are -6, -8 and -10.

The challenge

To create more compact, efficient, and cost-effective telehandlers, the size and weight of hoses is critical.

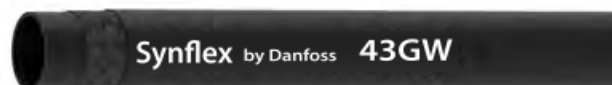
Greater weight directly translates into higher fuel consumption.

In demanding applications with high dynamic pressure and vibration, robust hoses are also essential to ensure long-term reliability and leak-free operations.

Solution benefits

- Low-weight Synflex 3TB0 hoses make telehandler booms lighter and reduce power demands—increasing efficiency and decreasing fuel consumption
- A highly abrasion resistant polyurethane cover increases operational lifetime. Hoses can move on pulleys for long periods without jacket degradation
- Supports working pressures of 270 bar up to size -12. Low hose expansion also enables smooth, precise steering
- Offers a tight bending radius and can form multi-lines of up to eight hoses for easier and more compact routing

Synflex 43GW thermoplastic grease line hose



Overview

Synflex 43GW thermoplastic grease line hose is the perfect solution for lubrication systems thanks to its flexibility and long impulse life. The most common size in use is DN4.

The challenge

Thanks to its thermoplastic construction, the Synflex 43GW hose is lighter and more flexible compared to rigid steel or nylon pipes. This hose reduces machine weight and enables easier routing with a bending radius of just 20mm, while its polyurethane cover guarantees high abrasion and UV resistance.

Solution benefits

- Long life for impulse cycling and flexing
- Replace rigid nylon and/or steel pipes
- Very flexible
- Weather rugged design
- Thermoplastic hose construction reduces machine weight

Winner WH004 Hydraulic suction and return hose, Winner WH006 textile reinforced hydraulic hose



Overview

Winner WH004 Hydraulic suction and return hose (R4) and Winner WH006 textile reinforced hydraulic hose (2TE) are textile reinforced hydraulic hoses that provide a competitive solution for all kinds of low-pressure hydraulic applications in combination with Winner two-piece hose fittings. As a suction hose, Winner WH004 also includes an additional helical steel wire to prevent collapse.

The challenge

Low-pressure hydraulic applications, such as fuel, return, and suction lines, increasingly require competitive, standard performance hose assembly solutions.

Even in these standard applications, leak-free connections are essential. Hoses and fittings must be technically qualified and approved by the supplier.

To maximize equipment efficiency, these lines must also be very flexible and low weight.

Solution benefits

- The Winner R4 suction hose, WH004, and 2TE textile braided hose, WH006, both meet industry standards and are very cost-effective, as are their optional fittings
- Winner two-piece crimp fittings are non-skive for easier and quicker assembly, as well as safe and leak-free connections. The same nipple part number for wire braided standard hoses can also be used for these hoses, just by utilizing a different socket
- With stock available locally in Europe, short lead-times are possible for a wide variety of fitting terminal ends

Danfoss EC007 Type C EverCool air conditioning hose



Overview

Danfoss EverCool EC007 Type C air conditioning hose is designed for air conditioning systems, enabling enhanced performance at a competitive price.

The challenge

With customers requiring easy installation in tight spaces, air conditioning hoses must offer high flexibility, a low bending radius, and excellent kink resistance to avoid hose damage and to keep on performing.

Low permeation is another must-have feature to minimize refrigeration loss and its environmental impact, as well as the downtime and servicing costs associated with system "top offs". At the same time, this also protects the system from catastrophic failure by minimizing moisture ingress.

Air conditioning hoses also need to be very robust, offering high temperature, UV, and ozone resistance to ensure reliability and a long operational lifetime. Additionally, they should support easy crimping to accelerate field servicing.

Solution benefits

- Robust construction improves safety and reliability
- The hose offers high flexibility, kink resistance, and low bending radii to guarantee easy installation in tight compartments
- Barrier design with a rubber inner tube means the EC007 is qualified with various fittings
- Very low permeation reduces greenhouse gas emissions and protects the environment
- Qualified with a wide range of refrigerants or oils, and available in sizes -4 to -14, the EC007 hose can meet the requirements of most mobile AC systems
- Qualified with Danfoss crimp fittings and exceeds SAE J3062 and SAE J2064 standards
- Production facilities in the USA and Turkey ensure a smooth supply chain and reliable delivery times

Danfoss Hansen Flat Face (FF) quick disconnect couplings



Overview

Danfoss Hansen Flat Face (FF) quick disconnect couplings provide greater performance at higher pressures along with higher flow rates.

The challenge

With growing demand for more powerful and compact machines, system pressure is rising while engine compartments shrink. To enable machines with lower energy loss and optimized fuel consumption, couplings must be able to support higher pressures and flow rates. To improve telehandler efficiency, it's vital to reduce the pressure drop between the boom and any attachments through an optimized flow.

Solution benefits

- Flat Face (FF) quick disconnect couplings are designed to connect top-performing hydraulic lines. As well as leak-free operations, they support increased pressures to help meet demand for high-pressure and high-impulse-pressure solutions
- Exceeds ISO 16028 standards, with 60% higher working pressures up to 400 bar and up to 74% higher flow rates that reduce energy loss
- Exceptional corrosion resistance of up to 1000 hours due to an eco-friendly and nickel-free coating
- Can connect under (residual) pressure up to 350 bar
- Multiple direct porting solutions are available, including integrated elbows for compact and lean fluid conveyance lines

Aeroquip hydraulic high pressure special multi bended tube assembly



Overview

Danfoss custom tubes are ideal for applications featuring higher pressures or extreme heat, as well as for those where flex line geometry cannot be designed into the system. For ease of assembly and installation, tube assemblies can be bundled with mechanical bracketing. Formed tube ends also include couplings and have been qualified for various hose applications, including air conditioning, transmission oil coolers, steering, and more.

The challenge

Tubes are required for various applications where non-flexible installation is acceptable. They are commonly installed on chassis, frames, or booms where shaped and multi-bent solutions with low bend radii are needed.

Solution benefits

- Dedicated product application team to help customers design and develop the best solution for each application.
- Danfoss' custom tube assemblies are available in a wide range of sizes and end connections.
- Solderless design and shaped or roll-formed termination ends provides a one-piece character that optimizes volume flow rates.
- Multi-3D bent tubing and hose-tube assemblies can be supplemented by STC couplings or Danfoss' Walform connections, offering a high-tech solution for many applications with an almost unlimited service life.

Waltech WalformPlus



Overview

Waltech WalformPlus is a robust, reliable, and easy to assemble tube fitting system. It enables safe tube end forming, with a primary elastomeric seal and secondary metal-to-metal sealing. For thin wall tubing, WalformPlus®-SR is also available, which includes an additional support ring to enable greater reliability and ease of assembly.

The reshaped tube in WalformPlus® eliminates the only possible leak path and prevents the tube from pulling free under excessive pressure or high impulse applications.

The challenge

In demanding applications like tractors and front loaders, tube fitting systems face both high working pressures and high vibration environments. To ensure reliable, safe, and leak-free operations, the fitting must offer exceptional sealing and the tube must be unable to pull free. Also, since assembly errors are a leading cause of leaks, tube fitting systems must be designed to enable correct assembly.

Solution benefits

- Primary elastomeric sealing and secondary metal-to-metal sealing ensures leak-free performance.
- Eliminates the only possible leak path and prevents the tube from pulling free by ensuring resistance at the connection point that exceeds the strength of the tube material.
- Enables easy, safe and repeatable assembly. Positive locking between stud and tube guarantees absolute reliability under extreme dynamic loads and eliminates the risk of disconnection.
- Approved for safety-critical applications where cutting rings cannot be used.
- Meets and exceeds DIN EN ISO 8431-1 requirements.
- Where thick wall tubing is traditionally required, WalformPlus-SR enables higher strength tube materials in thin wall thickness to be used. Thin wall tubing can enable lighter, more compact machine designs that reduce fuel consumption.

Waltech tube connector family



Overview

Danfoss Waltech tube fittings provide a complete solution for a wide range of application challenges. With a 24° cone according to ISO 8434-1 standards, these fittings also support the highest operating pressures up to 800 bar. Guardian Seal plating adds high corrosion resistance too, for a long lifetime in demanding applications.

The challenge

To maximize machine uptime in the most demanding applications, tube fittings need to both withstand high dynamic pressure and offer excellent corrosion resistance. Assembly errors can also cause tube fitting leaks during operation, due to the wrong torque being used, over/under-assembly, and more. Additionally, slower cycle times for tube assemblies increase manufacturing costs.

Solution benefits

- Waltech tube fittings support the highest operating pressures up to 800 bar with a 4:1 safety factor.
- Allows easy dry assembly (i.e., without lubrication) and has defined torque values for all systems, as well as reduced torque variance.
- Guardian Seal coating offers more than 1000 hours resistance to red rust corrosion, confirmed by salt spray testing per ISO 9227.
- Bespoke assembly and forming machines reduce cycle times and complexity in the assembly process to ensure leak-free performance.
- Our broad portfolio is also supplemented by customized fittings (e.g., special jump sizes).

The Tractor Platform

Tractors are types of heavy-duty, powerful vehicles, with large rear wheels, used in agriculture or construction. They are designed to deliver a high level of torque at slow speeds, in order to haul a trailer or machinery. They can undertake a range of agricultural tasks, including pulling farm implements for plowing, planting, cultivating, fertilising and harvesting crops. Tractors can also be used for hauling materials and for personal transportation.

Tractors comprise several components: internal combustion engine, clutch, transmission gears, differential unit, final drive, rear wheels, front wheels, steering mechanism, hydraulic

control and hitch system, brakes, power take-off unit, pulley and control panel. Modern tractors are powered by internal combustion engines that run on either gasoline, kerosene (paraffin), liquefied petroleum gas (LPG), or diesel/biodiesel fuel. Power is transmitted through a propeller shaft to a gear-box, with eight or 10 speeds, as well as through the differential gear to the two large rear wheels. Tractor engines typically range from 50 to 300 horsepower or even higher.



Work Cycle

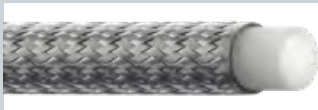


Winner EC115 one-wire braided hose, Winner EC215 two-wire braided hose



Waltech Walform and Walpro tube connectors & steel adaptors

Engine



Winner PTFE high performance Teflon hoses

Return Line



WH006 textile-reinforced hydraulic hose

Front Loader



Danfoss Hansen Multi-FF Quick Disconnect Multiplate Coupling

Power Steering



Aeroquip GH681 one-wire braided hydraulic hose

Diesel & Fuel lines



Aeroquip GH100 braided textile biodiesel hose
Aeroquip FC699 elevated temperature engine hose

Work Cycle



Aeroquip hydraulic high pressure special multi bended tube assembly

Suction line



Winner WH004 textile reinforced hydraulic suction hose

Air conditioning



Danfoss EC007 Type C EverCool air conditioning hose

Trailer Brake



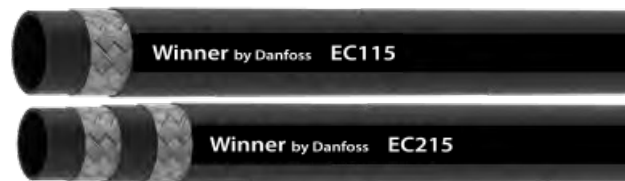
Danfoss Hansen Q9000 Flat Face series

Attachment



12IARS series push-pull coupling

Winner® EC115 one-wire braided hose, Winner® EC215 two-wire braided hose



Overview

Winner EC115 one-wire braided hose (1SC) and Winner EC215 two-wire braided hose (2SC) are one and two-wire braided hydraulic hoses which provide a competitive solution for all kinds of standard hydraulic applications in combination with Winner two-piece hose fittings.

The challenge

Tractor manufacturers require a cost-effective hose assembly solution for all kinds of standard hydraulic applications, such as front attachments or mobile machine legs.

Even in standard applications, leak-free connections are essential. Any hoses and fittings must be technically qualified and approved by the supplier.

Solution benefits

- Winner 1SC and 2SC braided hoses EC115 and EC215 both meet industry standards and are very cost-effective, as are their optional fittings
- Winner two-piece crimp fittings are non-skive for easier and quicker assembly, as well as safe and leak-free connections. One nipple part number can also be used for both EC115 and EC215 standard hoses just by utilizing a different socket
- With stock available locally in Europe, short lead-times are possible for a wide variety of fitting terminal ends

Winner WH004 Hydraulic suction and return hose, Winner WH006 textile reinforced hydraulic hose



Overview

Winner WH004 Hydraulic suction and return hose (R4) and Winner WH006 textile reinforced hydraulic hoses (2TE) are textile reinforced hydraulic hoses that provide a competitive solution for all kinds of low-pressure hydraulic applications in combination with Winner two-piece hose fittings. As a suction hose, Winner WH004 also includes an additional helical steel wire to prevent collapse.

The challenge

Tractor manufacturers require a cost-effective hose assembly solution for various low-pressure hydraulic applications, including fuel, return, pilot and suction lines.

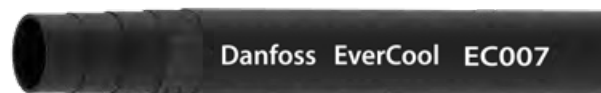
Even in these standard applications, leak-free connections are essential. Hoses and fittings must be technically qualified and approved by the supplier.

To maximize equipment efficiency, these lines must also be very flexible and lightweight.

Solution benefits

- The Winner R4 suction hose, WH004, and 2TE textile braided hose, WH006, both meet industry standards and are very cost-effective, as are their optional fittings
- Winner two-piece crimp fittings are non-skive for easier and quicker assembly, as well as safe and leak-free connections. The same nipple part number for wire braided standard hoses can also be used for these hoses, just by utilizing a different socket
- With stock available locally in Europe, short lead-times are possible for a wide variety of fitting terminal ends

Danfoss EC007 Type C EverCool air conditioning hose



Overview

Danfoss EC007 Type C EverCool air conditioning hose is designed for air conditioning systems, enabling performance at a competitive price.

The challenge

With customers requiring easy installation in tight spaces, air conditioning hoses must offer high flexibility, a low bending radius, and excellent kink resistance to avoid hose damage and to keep on performing.

Low permeation is another must-have feature to minimize refrigeration loss and its environmental impact, as well as the downtime and servicing costs associated with system 'top offs'. At the same time, this also protects the system from catastrophic failure by minimizing moisture ingress.

Air conditioning hoses also need to be very robust, offering high temperature, UV, and ozone resistance to ensure reliability and a long operational lifetime. Additionally, they should support easy crimping to accelerate field servicing.

Solution benefits

- Robust construction improves safety and reliability.
- The hose offers high flexibility, kink resistance, and low bending radii to guarantee easy installation in tight compartments
- Barrier design with a rubber inner tube means the EC007 is qualified with various fittings
- Very low permeation reduces greenhouse gas emissions and protects the environment
- Qualified with a wide range of refrigerants or oils, and available in sizes -4 to -14, the EC007 hose can meet the requirements of most mobile AC systems
- Qualified with Danfoss crimp fittings and exceeds SAE J3062 and SAE J2064 standards
- Production facilities in the USA and Turkey ensure a smooth supply chain and reliable delivery times

Danfoss GH001 Type E EverCool air conditioning veneer hose



Overview

Danfoss GH001 Type E EverCool air conditioning veneer hose delivers high-performance air conditioning, exceeding SAE J2064 standards.

The challenge

With customers requiring easy installation in tight spaces, air conditioning hoses must offer high flexibility, a low bend radius, and excellent kink resistance to avoid hose damage and to keep on performing.

Low permeation is another must-have feature to minimize refrigeration loss and its environmental impact, as well as the downtime and servicing costs associated with system 'top offs'. At the same time, this also protects the system from catastrophic failure by minimizing moisture ingress.

Air conditioning hoses also need to be very robust, offering high temperature, UV, and ozone resistance. Additionally, they should support easy crimping for quicker field servicing and more.

Solution benefits

- The GH001 hose combines durable construction with industry-leading features
- A custom-designed dual-extruded inner tube guarantees extremely low permeation and optimal adhesion to the rubber layer
- High temperature resistance up to 140 °C ensures a long life in hot engine compartments
- As an alternative to crimped hose assemblies, Danfoss' EZ Clip can be used for small series, for sampling, or for field servicing
- The GH001 is qualified with all common refrigerants, including R1234yf. Its EPDM cover is also UV and ozone resistant
- Production facilities in the USA and Turkey ensure a smooth supply chain and reliable delivery times

Danfoss Hansen Q9000 series quick disconnect coupling



Overview

Danfoss Hansen Q9000 series quick disconnect coupling is a dry brake coupling designed for tractors and vehicles used in the agricultural and forestry industries.

The challenge

The manufacturers of tractors and other vehicles used in agriculture and forestry require robust and reliable couplings for trailer brake circuits.

To maintain high system performance and efficiency, these couplings must provide a secure seal to prevent air ingress when making or breaking connections. to ensure reliability and a long operational lifetime. Additionally, they should support easy crimping to accelerate field servicing.

Solution benefits

- Pull-to-connect double shut-off
- Minimal air intrusion and fluid loss
- Developed in accordance with ISO 5676 and NFU 16-006 standards
- Standard construction in zinc trivalent plated steel with NBR seals helps to ensure robust performance

Danfoss Hansen 12IARS series push-pull coupling



Overview

Danfoss Hansen 12IARS series is a push-pull coupling, developed to meet ISO7241-1 standards. It can be assembled directly on rigid pipes or on tractor valves.

The challenge

Tractor manufacturers for the agriculture sector require an IARS coupling that can cope with the possibility of accidental disconnection if the tractor moves without the trailer attached. The coupling must ensure that the trailer's hydraulic lines are safely disconnected.

The coupling must also enable connectivity when the hydraulic line has heated up (such as in direct sunlight) which creates higher internal pressure.

Solution benefits

- The 12IARS series is specifically rated for agricultural tractors and other machinery with an operating pressure up to 250 bar
- Pull-push design provides a breakaway function for safe disconnection when simply pulling the attachment plug or hose
- The coupling enables connections at full working pressure on the plug side

Danfoss Hansen Multi-FF Quick Disconnect Multiplate Coupling

Overview

Danfoss Hansen Multi-FF quick disconnect multiplate coupling is designed for any application that requires multiple hydraulic fluid connections for power transmission and further extends the benefits of flat face couplings.



The challenge

Tractor manufacturers require a robust multiplate coupling to connect the front loader's hydraulic lines to the tractor in a flexible and adaptable way. They need a system that can support two to six FF couplings simultaneously and enable simple manual connection up to 350 bar. Ideally, the system will also support electrical connectors or other specialized couplings.

Solution benefits

- Robust internal mechanism and linear connection for long service life
- Simple design enables use by untrained operators, using optimum force-to-connect
- Sealing band and dust caps offer integrated contamination protection
- Improved servicing due to easy-to-replace couplings, dust cap, and safety pin mechanism
- Modular design allows for customized solutions with electrical connectors or specialized couplings
- Able to integrate Danfoss Snap-To-Connect system
- Enables connection under (residual) pressure up to 350 bar

Danfoss Hansen Flat Face (FF) quick disconnect couplings

Overview

Danfoss Hansen Flat Face (FF) quick disconnect couplings provide greater performance at higher pressures along with higher flow rates.



The challenge

With growing demand for more powerful and compact machines, system pressure is rising while engine compartments shrink. To enable machines with lower energy loss and optimized fuel consumption, couplings must be able to support higher pressures and flow rates. To improve tractor efficiency, it's vital to reduce the pressure drop in the work cycle through an optimized flow.

Solution benefits

- Flat Face (FF) quick disconnect couplings are designed to connect top-performing hydraulic lines. As well as leak-free operations, they support increased pressures to help meet demand for high-pressure and high-impulse-pressure solutions
- Exceeds ISO 16028 standards, with 60% higher working pressures up to 400 bar and up to 74% higher flow rates that reduce energy loss
- Exceptional corrosion resistance of up to 1000 hours due to an eco-friendly and nickel-free coating
- Can connect under (residual) pressure up to 350 bar

ISO 8434-1 compliant customized fittings



Overview

To support bespoke machine designs making the most of available space, enabling unusual hydraulic functions, or using components not compliant with ISO 8434-1, customers need customized fittings. Additionally, special jump sizes are required in some applications to reduce the number of fittings and potential leak paths.

The challenge

In some specific situations, non-typical installation requirements mean that standard ISO 8434-1 fittings cannot be used. In these cases, customers need bespoke fittings built to their specifications to securely connect hydraulic hoses without the need to redesign their machine.

Solution benefits

- One source for all connection components in carbon and stainless steel
- Specialized hydraulic fittings custom-built for specific applications or customer needs
- Fittings qualified according to ISO 19879
- Guardian Seal coating offers more than 1000 hours resistance to red rust corrosion, confirmed by salt spray testing per ISO 9227

Waltech WalformPlus



Overview

Waltech WalformPlus is a robust, reliable, and easy to assemble tube fitting system. It enables safe tube end forming, with a primary elastomeric seal and secondary metal-to-metal sealing. For thin wall tubing, WalformPlus®-SR is also available, which includes an additional support ring to enable greater reliability and ease of assembly.

The reshaped tube in WalformPlus® eliminates the only possible leak path and prevents the tube from pulling free under excessive pressure or high impulse applications.

The challenge

In demanding applications like tractors and front loaders, tube fitting systems face both high working pressures and high vibration environments. To ensure reliable, safe, and leak-free operations, the fitting must offer exceptional sealing and the tube must be unable to pull free. Also, since assembly errors are a leading cause of leaks, tube fitting systems must be designed to enable correct assembly.

Solution benefits

- Primary elastomeric sealing and secondary metal-to-metal sealing ensures leak-free performance.
- Eliminates the only possible leak path and prevents the tube from pulling free by ensuring resistance at the connection point that exceeds the strength of the tube material.
- Enables easy, safe and repeatable assembly Positive locking between stud and tube guarantees absolute reliability under extreme dynamic loads and eliminates the risk of disconnection.
- Approved for safety-critical applications where cutting rings cannot be used.
- Meets and exceeds DIN EN ISO 8431-1 requirements.
- Where thick wall tubing is traditionally required, WalformPlus-SR enables higher strength tube materials in thin wall thickness to be used. Thin wall tubing can enable lighter, more compact machine designs that reduce fuel consumption.

Waltech Walpro



Overview

Waltech Walpro redefines the standard for cutting ring technology. The Walpro® system is a metric flareless tube fitting that consists of a body, a profile ring (cutting ring), and a nut. During assembly, the two cutting edges of the profile ring penetrate the tube, creating a safe and reliable hold function and seal. The top area of the profile ring seals along the 24° surface of the tube fitting's body. With controlled final cutting ring assembly via the proprietary M-R7 machine, Danfoss Waltech offers an optimized assembly process that reduces cycle times to a minimum and enables high-quality, leak-free results. It can also process tubes with the tightest 180° bending radii.

The challenge

In demanding applications, tube fitting systems must be able to tolerate high vibration and dynamic loads to deliver both top performance and a long service life. Errors in assembly can also result in leakages or a critical failure in application.

Solution benefits

- Meets and exceeds DIN 2353 and ISO 8431-1 requirements.
- High axial strength and the radial flexibility of the profile ring ensure excellent tube holding, clamping, and sealing.
- Increased resistance to high dynamic loads and vibration through axial ribs, inner area clamping along the complete tube length, and cutting edges that equally share the holding force.
- High quality and performance confirmed by neutral agencies, with type approvals according to IACS specifications.
- Enables easy and safe assembly due to a significant torque increase at the end of the assembly process. Operators 'feel' when assembly is complete, and overtightening is unmistakable.
- Danfoss' M-R7 cutting ring assembly machine enables easy, accurate, and safe assembly in a short cycle time.
- No uncontrolled deformation during excess tightening.
- Leading pressure performance.
- Available in carbon and stainless steel.

Danfoss steel adapters



Overview

Designed for applications with very high operating pressures, Danfoss' steel adapter range features excellent corrosion resistance and offers a wide variety of different terminal ends and configurations.

The challenge

Many tractor manufacturers need ORFS, BSP, and JIC terminal ends that meet the ISO8434-1 standard for tube fittings. For demanding applications in the agricultural sector, steel adapters must also be designed to withstand high dynamic pressure and provide excellent corrosion resistance.

Solution benefits

- Danfoss offers a wide range of steel adapters with ORFS, BSP, JIC, and other terminal ends.
- Rated to withstand up to 125% higher operating pressures than SAE standards.
- All of Danfoss' steel adapters range provides high corrosion resistance of 720+ hours in red rust environments.

Aeroquip FC699 elevated temperature engine hose



Overview

Aeroquip FC699 elevated temperature engine hose is an affordable, lightweight, and flexible solution for the conveyance of fuel and oil in demanding conditions.

The challenge

With high temperatures and little space, engine compartments are a tough environment for hoses. To convey gasoline and diesel with up to 10% biofuel (B10) content, vehicle manufacturers need robust, flexible, and cost-competitive hoses.

Solution benefits

- The Aeroquip FC699 fuel hose is suitable for gasoline, diesel, and biodiesel up to 15% (B15)
- Very robust, with abrasion-resistant construction and a high temperature operating range from -40 °C to 150 °C for a long in-service lifetime
- Extremely flexible to enable installation in tight spaces
- Lightweight design reduces total vehicle weight for improved fuel efficiency

Danfoss GH100 braided textile biodiesel hose



Overview

Danfoss GH100 braided textile biodiesel hose for diesel/biodiesel fuel systems supports a wide temperature range and is suitable for up to 100% biodiesel fuels, as well as Rapeseed Methyl Ester (RME) and Soy Methyl Ester (SME) mixtures.

The challenge

Diesel/biodiesel engine fuel systems must operate using different fuel mixtures, including ultra-low-sulfur diesel (ULSD), blends of biodiesel up to B100, and synthetic oils. While offering a long life in application, fuel hoses must support these different regional norms and standards. They must also tolerate hot engine compartments and high vibration environments.

Solution benefits

- With an aramid poly-braid reinforcement that's durable, yet lightweight and flexible, GH100 and GH101 hoses are easier to install compared to wire-braided hoses
- The hydrogenated nitrile rubber inner tube consists of a polymer that's resistant to bio-fuels up to B100, qualified with SME and RME blends of B5, B20, and B100, plus ULSD and synthetic oils
- The hose cover consists of a highly abrasion-resistant textile braid that offers reliable protection from external factors. Alternatively, the GH101 hose is available with a smooth rubber cover
- Due to high temperature resistance from -40 °C to 150 °C, these hoses are ideally suited for installation in hot engine compartments
- Both hose types meet all common standards (e.g., ASTM D380, ASTM D6751, EN412 and EN2240) as well as many customer specifications

Aeroquip GH681 one-wire braided hose



Overview

Aeroquip GH681 high performing one-wire braided hose is qualified to one million impulse cycles and exceeds 1SC pressure ratings, making it useful for a wide variety of mobile machinery applications.

The challenge

Heat, vibration, and other challenging conditions inside mobile machine engine compartments can shorten hose life. In power steering applications, hydraulic hoses also need to be able to reduce the noise and vibration generated by the oil pump.

Solution benefits

- Aeroquip GH681 has an operating temperature rating up to 126 °C (260 °F) making it ideal for hot engine compartments
- Suited to a broad range of hydraulic systems, as well as demanding applications such as power steering
- 1 million impulse cycle performance
- Flexible and easy to route in tight spaces
- High abrasion resistance minimizes hose failures
- Both crimp and reusable fittings are offered with Dura-Kote plating for superior corrosion protection

Winner PTFE high performance Teflon hose



Overview

Winner PTFE high performance Teflon hoses are designed for demanding applications where excellent temperature and vibration resistance is essential. The range consists of the:

- 2807 series premium product
- S- and SC- series
- EN-TW and EC-TW value series products

The challenge

Customers require seamless, high-performance oil system connections and components that can deliver in the high temperature and high vibration environment inside engine compartments. In addition, the oil supply to turbo chargers must be guaranteed, or a complete engine failure is possible. Oil lines also require effective protection against dirt and flying particles.

Solution benefits

- Extended operating temperature range from -73 °C to 260 °C for heavy duty applications.
- Broad fluid compatibility.
- Highly flexible and shock resistant.
- Able to withstand continuous vibration.
- Supports a wide range of applications and fluids: hydraulics, high-pressure refrigerant, grease lubrication, compressor discharge, engine return lines, oil cooler lines, and fuel lines.

Teflon is a trademark of The Chemours Company FC, LLC used under license by Danfoss.

Aeroquip hydraulic high pressure special multi bended tube assembly



Overview

Danfoss custom tubes are ideal for applications featuring higher pressures or extreme heat, as well as for those where flex line geometry cannot be designed into the system. For ease of assembly and installation, tube assemblies can be bundled with mechanical bracketing. Formed tube ends also include couplings and have been qualified for various hose applications, including air conditioning, transmission oil coolers, steering, and more.

The challenge

Tubes are required for various applications where non-flexible installation is acceptable. They are commonly installed on chassis, frames, or booms where shaped and multi-bent solutions with low bend radii are needed.

Solution benefits

- Dedicated product application team to help customers design and develop the best solution for each application.
- Danfoss' custom tube assemblies are available in a wide range of sizes and end connections.
- Solderless design and shaped or roll-formed termination ends provides a one-piece character that optimizes volume flow rates.
- Multi-3D bent tubing and hose-tube assemblies can be supplemented by STC couplings or Danfoss' Walform connections, offering a high-tech solution for many applications with an almost unlimited service life.

The Concrete Pump Platform

Concrete pump trucks are an important part of any construction project. These specialised vehicles are indispensable for large construction and building projects, which is reflected in steady demand growth. Concrete pumps are used to transfer liquid concrete by pumping this material directly into the construction site prior to setting. There are three key types of concrete pumps: boom or truck-mounted pumps, trailer, line, or stationary pumps and specialised usage pumps. Typically, manufacturers of concrete pumps develop only the pumps design and combine them with trucks from automotive manufacturers, such as Mercedes Benz, MAN and others. This platform focuses primarily on concrete pumps. For detailed information on trucks and corresponding Danfoss products, please refer to the Trucks platform.



Work Cycle



Waltech tube fittings

Work Cycle



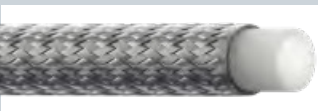
Aeroquip EC881 Dynamax two-wire braided hose

Air Conditioning



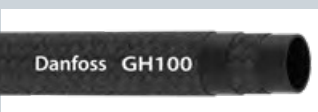
Danfoss EC007 Type C EverCool air conditioning hose

Engine



Winner PTFE high performance Teflon hoses

Engine



Danfoss GH100 braided textile biodiesel hose

Work Cycle



Winner E330 three-wire braided hose

Work Cycle



Boston EHK007 Marauder heavy duty concrete hose

Work Cycle



Waltech Walform and Walpro tube connectors

Suction / Return Line



Winner WH004 / WH006 textile-reinforced hydraulic hose

Main Pressure Line



Aeroquip GH507 four-wire spiral hose

Waltech tube fittings



Overview

Waltech tube fittings provide a complete solution for a wide range of application challenges. With a 24° cone according to ISO 8434-1 standards, these fittings also support the highest operating pressures up to 800 bar. Guardian Seal plating adds high corrosion resistance too, for a long lifetime in demanding applications.

The challenge

To maximize machine uptime in the most demanding applications, tube fittings need to both withstand high dynamic pressure and offer excellent corrosion resistance. Assembly errors can also cause tube fitting leaks during operation, due to the wrong torque being used, over/under-assembly, and more. Additionally, slower cycle times for tube assemblies increase manufacturing costs.

Solution benefits

- Waltech tube fittings support the highest operating pressures up to 800 bar with a 4:1 safety factor
- Allows easy dry assembly (i.e., without lubrication) and has defined torque values for all systems, as well as reduced torque variance
- Guardian Seal coating offers more than 1000 hours resistance to red rust corrosion, confirmed by salt spray testing per ISO 9227
- Bespoke assembly and forming machines reduce cycle times and complexity in the assembly process to ensure leak-free performance
- Our broad portfolio is also supplemented by customized fittings (e.g., special jump sizes)

Waltech Walpro



Overview

Waltech Walpro redefines the standard for cutting ring technology. The Walpro® system is a metric flareless tube fitting that consists of a body, a profile ring (cutting ring), and a nut. During assembly, the two cutting edges of the profile ring penetrate the tube, creating a safe and reliable hold function and seal. The top area of the profile ring seals along the 24° surface of the tube fitting's body.

With controlled final cutting ring assembly via the proprietary M-R7 machine, Danfoss Waltech offers an optimized assembly process that reduces cycle times to a minimum and enables high-quality, leak free results. It can also process tubes with the tightest 180° bending radii.

The challenge

In demanding applications, tube fitting systems must be able to tolerate high vibration and dynamic loads to deliver both top performance and a long service life. Errors in assembly can also result in leakages or a critical failure in application.

Solution benefits

- Meets and exceeds DIN 2353 and ISO 8431-1 requirements.
- High axial strength and the radial flexibility of the profile ring ensure excellent tube holding, clamping, and sealing.
- Increased resistance to high dynamic loads and vibration through axial ribs, inner area clamping along the complete tube length, and cutting edges that equally share the holding force.
- High quality and performance confirmed by neutral agencies, with type approvals according to IACS specifications.
- Enables easy and safe assembly due to a significant torque increase at the end of the assembly process. Operators 'feel' when assembly is complete, and overtightening is unmistakable.
- Danfoss' M-R7 cutting ring assembly machine enables easy, accurate, and safe assembly in a short cycle time.
- No uncontrolled deformation during excess tightening.
- Leading pressure performance.
- Available in carbon and stainless steel.

Waltech WalformPlus



Overview

Waltech WalformPlus is a robust, reliable, and easy to assemble tube fitting system. It enables safe tube end forming, with a primary elastomeric seal and secondary metal-to-metal sealing. For thin wall tubing, WalformPlus®-SR is also available, which includes an additional support ring to enable greater reliability and ease of assembly. The reshaped tube in WalformPlus® eliminates the only possible leak path and prevents the tube from pulling free under excessive pressure or high impulse applications.

The challenge

In demanding applications like concrete pumping, tube fitting systems face both high working pressures and high vibration environments. To ensure reliable, safe, and leak-free operations, the fitting must offer exceptional sealing and the tube must be unable to pull free. Also, since assembly errors are a leading cause of leaks, tube fitting systems must be designed to enable correct assembly.

Solution benefits

- Primary elastomeric sealing and secondary metal-to-metal sealing ensures leak-free performance.
- Eliminates the only possible leak path and prevents the tube from pulling free by ensuring resistance at the connection point that exceeds the strength of the tube material.
- Enables easy, safe and repeatable assembly. Positive locking between stud and tube guarantees absolute reliability under extreme dynamic loads and eliminates the risk of disconnection.
- Approved for safety-critical applications where cutting rings cannot be used.
- Meets and exceeds DIN EN ISO 8431-1 requirements.
- Where thick wall tubing is traditionally required, WalformPlus-SR enables higher strength tube materials in thin wall thickness to be used. Thin wall tubing can enable lighter, more compact machine designs that reduce fuel consumption.

ISO 8434-1 compliant customized fittings



Overview

To support custom machine designs making the most of available space, enabling unusual hydraulic functions, or using components not compliant with ISO 8434-1, customers need bespoke fittings. Special check valves are also required in some applications because standard alternatives cannot permanently withstand the high impulse pressures.

The challenge

In some specific situations, non-typical installation requirements mean that standard ISO 8434-1 fittings cannot be used. In these cases, customers need bespoke fittings built to their specifications to securely connect hydraulic hoses without the need to redesign their machine.

Additionally, high dynamic loads and high impulse pressures can lower their operational life of check valves or cause them to malfunction. Customized check valves enable concrete pump manufacturers to optimize their solution, increase valve lifetime, and reduce maintenance demands.

Solution benefits

- One source for all connection components in carbon and stainless steel.
- Specialized hydraulic fittings custom-built for specific applications or customer needs.
- Fittings qualified according to ISO 19879.
- Guardian Seal coating offers more than 1000 hours resistance to red rust corrosion, confirmed by salt spray testing per ISO 9227.

Boston EHK007 Marauder heavy duty concrete hose



Overview

The Marauder EHK007 is a durable and flexible concrete pumping hose, which can withstand even the harshest construction environments. Engineered for maximum toughness, the hose features an abrasion resistant synthetic rubber cover, reinforced with high tensile steel cords, and delivers an 85 bar working pressure. Hoses can be assembled on one side (end hoses) or both sides (connecting hoses). The most common sizes in application are -64 and -80 and the typical length for end hoses is three to four meters.

The challenge

To maximize machine uptime in the most demanding applications, tube fittings need to both withstand high dynamic pressure and offer excellent corrosion resistance. Assembly errors can also cause tube fitting leaks during operation, due to the wrong torque being used, over/under-assembly, and more. Additionally, slower cycle times for tube assemblies increase manufacturing costs.

Solution benefits

- Very high abrasion resistance, which enhances machine reliability and safety while also reducing maintenance costs by extending hose life
- Can be factory-assembled in custom lengths with “full-flow” concrete pumping couplings
- Danfoss’ concrete pumping hose and assemblies offer a 20% greater bending radius than competing products, making life easier for operators

Aeroquip EC881 Dynamax two-wire braided hose



Overview

Aeroquip EC881 Dynamax two-wire braided hose qualified to one million impulse cycles. Using a next-generation inner tube and “hybrid plies” reinforcement, the EC881 enables higher working pressure and an improved bending radius, as well as a long operational lifetime. The EC881 can even challenge spiral hoses in some applications, helping customers to decrease machine weight and to improve routing.

The challenge

To minimize machine downtime and operational costs, it’s essential to have a hose assembly with superior flexibility in terms of its bending radius, as well as the ability to withstand demanding and dynamic applications. Weight is also a significant factor for concrete pumping applications, which has a tangible effect on machine efficiency and fuel consumption.

Solution benefits

- A higher pressure rating than standard two-wire braided hoses. Thanks to its higher working pressure, the EC881 can also be used instead of a spiral hose to reduce machine weight and operational costs
- EC881 provides excellent flexibility (1/3 SAE 100R2 bending radius at 100°C). This enables easier installation in compact spaces and decreases failures caused by tight bends
- A next-generation inner tube enables slow aging and a low compression set, providing better sealing and leak-free performance in even dynamic applications
- Reduces downtime, with an operational life up to 5X longer than standard EN857 Type 2SC hoses, supporting as many as one million impulse cycles
- Offers 8X better abrasion resistance than standard rubber hoses, due to Dura-Tuff cover
- Aeroquip 1A type TTC fittings are qualified for zero leakage and can provide up to 1000 hours red rust protection thanks to their enhanced Dura-Kote plating

Aeroquip GH507 four-wire spiral hose



Overview

Aeroquip GH507 four wire spiral hose is a high-performing hydraulic hose, which can even meet application demands where a six wire spiral hose would previously have been needed. Meeting SAE100R15 performance standards, the GH507-20 can support working pressures up to 420 bar, has a bending radius of 420mm, and features an operational temperature range from -40 °C to 120 °C.

The challenge

Local legislation often limits the gross vehicle weight on roads and highways, so reducing the weight of hose components helps mobile equipment manufacturers to meet these rules. The routing of large bore six wire spiral hoses is also challenging, requiring considerable force and posing problems in tight installation spaces.

Solution benefits

- A four wire spiral hose that matches the performance of a six wire spiral hose
- Reduces the force to bend and makes routing easier for operators
- Long hose lifetime, qualified for 500,000 impulse cycles
- Meets the performance level of SAE 100R15
- Leakage class 0 according to SAE J1176

Danfoss EC007 Type C EverCool air conditioning Danfoss GH001 Type E EverCool air conditioning veneer hose



Overview

The premium Danfoss EC007 Type C EverCool air conditioning and Danfoss GH001 Type E EverCool air conditioning veneer hose are designed to meet all the application requirements of air conditioning systems. Typically used in on- and off-road vehicles, these hoses enable outstanding performance in terms of permeability, moisture ingress, and more.

The challenge

With customers requiring easy installation in tight spaces, air conditioning hoses must offer high flexibility, a low bending radius, and excellent kink resistance to avoid hose damage and to keep on performing. Low permeation is another must-have feature to minimize refrigeration loss and its environmental impact, as well as the downtime and servicing costs associated with system 'top offs'. At the same time, this also protects the system from catastrophic failure by minimizing moisture ingress. Air conditioning hoses also need to be very robust, offering high temperature, UV, and ozone resistance to ensure reliability and a long operational lifetime. Additionally, they should support easy crimping to accelerate field servicing.

Solution benefits

- Robust construction improves safety and reliability
- The hose offers high flexibility, kink resistance, and low bending radii to guarantee easy installation in tight compartments
- Low moisture ingress (class 1) protects the cooling system from icing up
- Very low permeation reduces greenhouse gas emissions and protects the environment
- Qualified with a wide range of refrigerants or oils, and available in sizes -4 to -24, these hoses can meet the requirements of most mobile AC systems.
- Qualified with Danfoss crimp fittings and exceeds SAJ3062 and SAE J2064 standards.
- Production facilities in the USA and Turkey ensure a smooth supply chain and reliable delivery times.

Winner EC330 three-wire braided hose



Overview

Winner EC330 is a three-wire braided hose that matches the performance of a 4SP hose. Lower weight and enhanced flexibility also makes this hose an ideal solution for applications where routing in tighter spaces is required.

The challenge

By contributing to the overall weight of mobile machinery, hoses can affect efficiency and fuel consumption. This is especially true on booms, where each additional gram of weight impacts stability and the size of hydraulic components.

Solution benefits

- Improved flexibility for easier installation in tight spaces
- Reduced outer diameter supports easier routing
- Greater flexibility means less hose length is needed, reducing inventory demands
- Thanks to its higher working pressure, the EC330 can be used instead of a spiral hose—reducing machine weight and operational costs

Winner PTFE high performance Teflon hoses



Overview

Winner PTFE high performance Teflon hoses compliments the EverFlex family by providing performance that meets and exceeds SAE 100R14–A & B and SAE J517 specifications. It is ideally suited for use in applications where classic rubber hoses fail—those requiring high and low temperature tolerances, chemical resistance, a low coefficient of friction, flexibility, and non-aging characteristics.

The EN-TW series tube is reinforced with SS304 stainless steel wire and is available in both conductive (EC-TW) and non-conductive (EN-TW) versions.

The challenge

When connecting oil systems and components, rubber hoses can fail in the high temperature and high vibration environment inside engine compartments. In addition, the oil supply to turbochargers must be guaranteed, or a complete engine failure is possible. The ideal hose solution must combine performance and high flow rates with tough durability and non-aging characteristics.

Solution benefits

- Extended operational temperature range from -54 °C up to 236 °C for heavy duty applications
- Very flexible and shock resistant
- Can withstand continuous vibration
- High flow rates, with a low coefficient of friction
- Excellent non-aging characteristics
- Supports a wide range of applications and fluids: high-pressure refrigerant lines, grease lubrication, compressor discharge, engine return lines, oil cooler lines, and fuel lines, as well as chemical transfers, electric cooling, hot presses, paint spraying, and steam

Winner WH004 hydraulic suction and return hose, Winner WH006 textile reinforced hydraulic hoses



Overview

Winner WH004 hydraulic suction and Winner WH006 textile reinforced hydraulic hoses that provide a competitive solution for all kinds of low-pressure hydraulic applications in combination with Winner two-piece hose fittings. As a suction hose, Winner WH004 also includes an additional helical steel wire to prevent collapse.

The challenge

Low-pressure hydraulic applications, such as fuel, return, and suction lines, increasingly require competitive, standard performance hose assembly solutions. Even in these standard applications, leak-free connections are essential. Hoses and fittings must be technically qualified and approved by the supplier. To maximize equipment efficiency, these lines must also be very flexible and lightweight.

Solution benefits

- The Winner R4 suction hose, WH004, and 2TE textile braided hose, WH006, both meet industry standards and are very cost-effective, as are their optional fittings
- Winner two-piece crimp fittings are non-skive for easier and quicker assembly, as well as safe and leak-free connections. The same nipple part number for wire braided standard hoses can also be used for these hoses, just by utilizing a different socket
- With stock available locally in Europe, short lead-times are possible for a wide variety of fitting terminal ends

Danfoss GH100, GH101 braided textile biodiesel hose



Overview

Danfoss GH100, GH101 braided textile biodiesel hose are engineered for maximum performance and a long service life. Thanks to a unique polymer that more effectively resists degradation, they are qualified with every blend of bio-diesel up to B100, as well as a variety of synthetic oils. Plus, with the choice of either an abrasion-resistant fabric or rubber cover and multiple fitting options, customers can specify the hose assembly that best fits their application needs.

The challenge

It's no secret that mobile machine engine compartments are taking more heat. Regulations such as EPA 07 and EPA 10 in already hot climates, plus the growing use of high-percentage biodiesel fuels up to B100, are creating conditions that significantly shorten hose life. Additionally, hoses need high vibration resistance and the ability to meet various regional standards, such as ASTM D380, ASTM D6751, EN412 and EN2240.

Solution benefits

- With an aramid poly-braid reinforcement that's durable, yet lightweight and flexible, GH100 and GH101 hoses are easier to install compared to wire-braided hoses
- The hydrogenated nitrile rubber inner tube consists of a polymer that's resistant to bio-fuels up to B100, qualified with soy (SME) and rapeseed (RME) blends of B5, B20, and B100, plus ultra-low sulfur diesel (ULSD), and synthetic oils
- The hose cover consists of a highly abrasion-resistant textile braid that offers reliable protection from external factors. Alternatively, the GH101 hose is available with a smooth rubber cover
- Due to high temperature resistance from -40 °C to 150 °C, these hoses are ideally suited for installation in hot engine compartments
- Both hose types meets all common standards (e.g., ASTM D380, ASTM D6751, EN412 and EN2240) as well as many customer specifications

Bus and Truck Platform

From food logistics to public transport, people depend on buses and trucks to keep the world moving every day. These workhorses of the transportation industry must cover millions of kilometers reliably, efficiently and safely, with as infrequent servicing as possible to keep costs down. Truck trailers also significantly increase transport capacity, efficiency, and cost-effectiveness.

The similar hydraulic and pneumatic components inside buses, trucks and trailers face a challenging environment: tight installation spaces where every centimeter matters, as well as frequent exposure to heat, vibration, and high pressures. The huge range of hydraulic and pneumatic applications in buses and trucks includes fan drives, power steering, and turbocharger oil supplies, as well as diesel fuel lines. Today, air suspension for vehicle cabs and chasses is also a standard

feature, and both the service and parking brakes are operated pneumatically. Air conditioning is also common in most truck cabs and long-distance coaches to ensure driver and passenger comfort. Additionally, in buses, doors are opened and closed by compressed air and pneumatic components enable vehicles to lean sideways so passengers can get on and off more easily.

CNG Fuel



Synflex low-pressure NG-TW hose

Engine



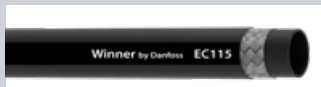
Danfoss EHW002 radiator hose

Engine



Winner PTFE high performance Teflon hoses

Work Cycle



Danfoss EC115 one-wire braided hose, Winner EC215 two-wire braided hose

Diesel & Fuel Lines



Danfoss GH100 braided textile bio-diesel hose

Compressed Air System



Aeroquip STC connector

Work Cycle



Waltech tube fittings

Power Steering



Aeroquip FC171, GH681, 1H103, 1H107 hoses for high-end low pressure steering

Air Conditioning

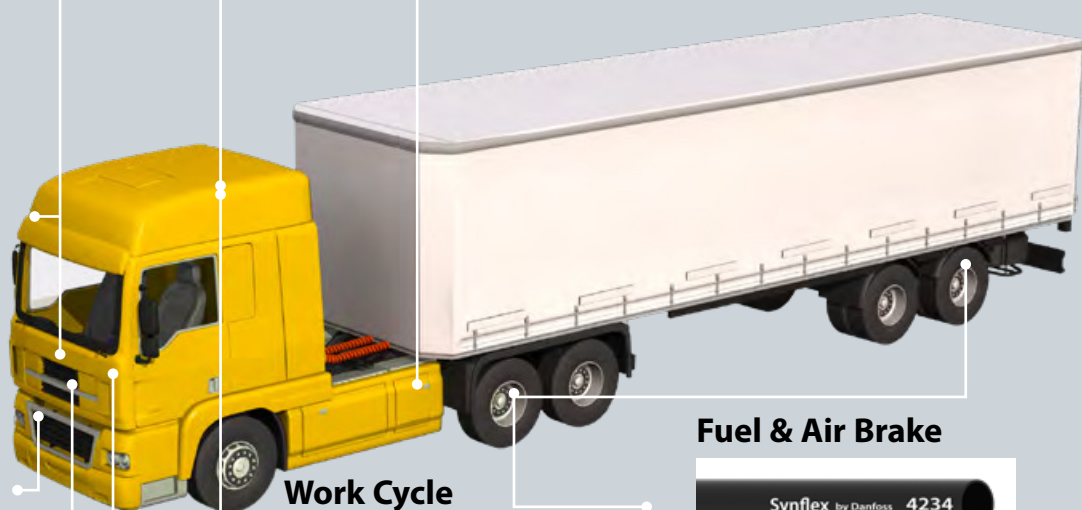


Danfoss Hansen 5400 AD Coupling

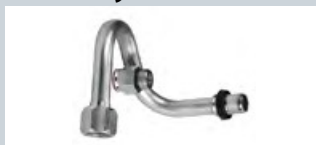
CNG Fuel



Synflex 35NG compressed natural gas CNG hose



Work Cycle



Aeroquip hydraulic high pressure special multi bended tube assembly

Fuel & Air Brake



Synflex DIN/ISO air brake and fuel tubing

Air Conditioning



Danfoss EC007 Type C EverCool air conditioning hose

Work Cycle



Waltech Walform tube connectors

Work Cycle



Waltech Walpro tube connectors

CNG Fuel



Synflex low-pressure NG-TW hose

Engine



Danfoss EHW002 radiator hose

Engine



Winner PTFE high performance Teflon hoses

Work Cycle



Winner EC115 one-wire braided hose, Winner EC215 two-wire braided hose

Work Cycle



Waltech Walpro tube connectors

Compressed Air System



Aeroquip STC connector

Work Cycle



Waltech tube fittings

CNG Fuel



Synflex 35NG compressed natural gas CNG hos

AC Drain Line



Boston EHT200 steel spiral PVC hose

Power Steering



Aeroquip FC171, GH681, 1H103, 1H107 hoses for high-end low pressure steering

Work Cycle



Aeroquip hydraulic high pressure special multi bended tube assembly

Work Cycle



Waltech Walform tube connectors

Fuel & Air Brake



Synflex DIN/ISO air brake and fuel tubing

Air Conditioning

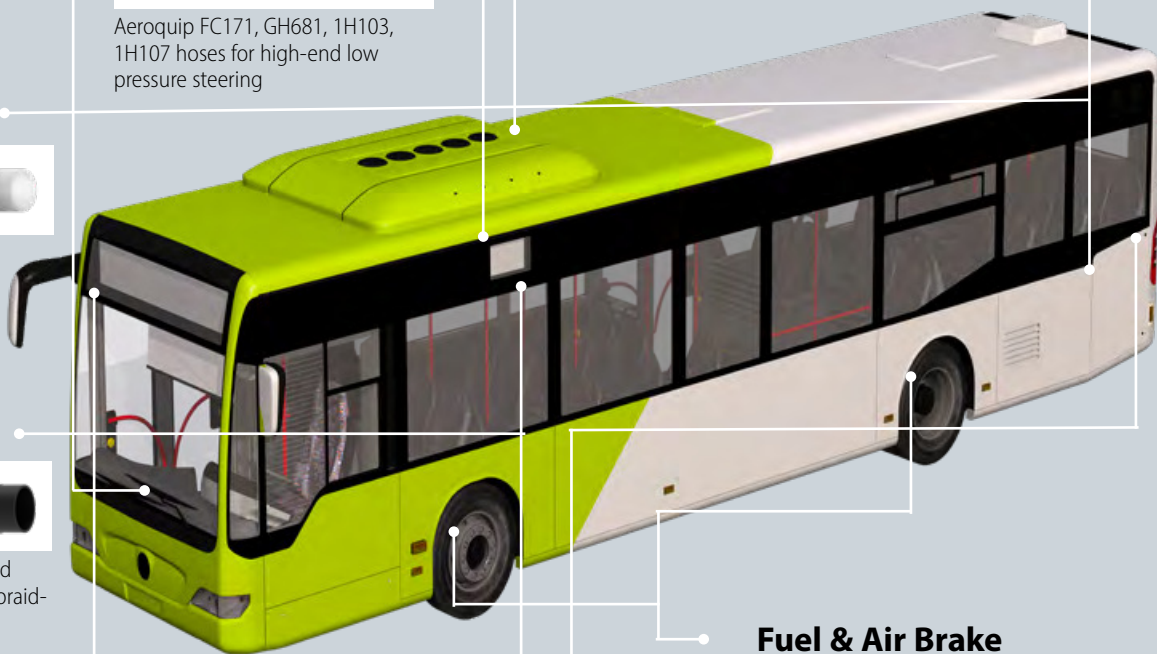


Danfoss FC800 large bore EverCool air conditioning hose

Diesel & Fuel Lines



Danfoss GH100 braided textile bio-diesel hose



Danfoss GH100 braided textile biodiesel hose



Overview

Danfoss GH100 braided textile biodiesel hose for diesel/biodiesel fuel is an elevated temperature braided textile engine hose for diesel/biodiesel fuel systems, that supports a wide temperature range and is suitable for up to 100% biodiesel fuels, as well as Rapeseed Methyl Ester (RME) and Soy Methyl Ester (SME) mixtures.

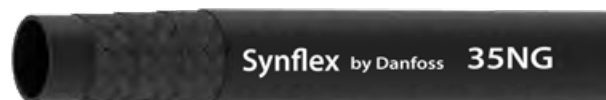
The challenge

Diesel/biodiesel engine fuel systems must operate using different fuel mixtures, including ultra-low-sulfur diesel (ULSD), blends of biodiesel up to B100, and synthetic oils. While offering a long life in application, fuel hoses must support these different regional norms and standards. They must also tolerate hot engine compartments and high vibration environments.

Solution benefits

- With an aramid poly-braid reinforcement that's durable, yet lightweight and flexible, GH100 and GH101 hoses are easier to install compared to wire-braided hoses
- The hydrogenated nitrile rubber inner tube consists of a polymer that's resistant to bio-fuels up to B100. It's qualified with SME and RME blends of B5, B20, and B100, plus ULSD and synthetic oils
- The hose cover consists of a highly abrasion-resistant textile braid that offers reliable protection from external factors. Alternatively, the GH101 hose is available with a smooth rubber cover
- Due to high temperature resistance from -40 °C to 150 °C, these hoses are ideally suited for installation in hot engine compartments
- Both hose types meets all common standards (e.g., ASTM D380, ASTM D6751, EN412 and EN2240) as well as many customer specifications

Synflex 35NG compressed natural gas CNG hose



Overview

The Synflex 35NG compressed natural gas CNG hose is a high-pressure hose specially designed for compressed natural gas up to 345 bar and low volumetric expansion. It is available in three common sizes (-04, -06 and -08) as single hose, or -04 as a twin hose in combination with a vent line. The inner tube is a conductive nylon core which dissipates static electricity. The reinforcement is a synthetic fiber, and the cover is made from black perforated polyurethane which provides extreme good UV resistance. The temperature range is -40 °C to 85 °C.

The challenge

Vehicles that run on compressed natural gas (CNG) store it in tanks at pressures up to 200 bar. CNG is still gaseous under this pressure. High-pressure lines feed the gas to a pressure regulator, which reduces the gas pressure to 3-5 bar. From there, low-pressure gas is fed to the engine. The hose lines must not become electrostatically charged by the gas flowing through them, as possible discharges through the hose wall can weaken it and cause leaks. In order to safely remove any static charge, the hose and fittings must be conductive. Environmental factors, especially UV radiation, also wear down the hose cover over time and thus weaken the line. The higher the UV resistance of the cover, the longer the lifespan of the hose.

Solution benefits

- The Synflex 35NG compressed natural gas CNG hose is specifically developed for high-pressure CNG applications like refueling dispenser stations. It is also used for the high-pressure hoses and transfer lines in vehicles like city buses or refuse vehicles. These hoses are becoming popular for tractors and other agricultural machines too, where they can help reduce CO2 emissions and fuel costs
- The robust construction of the Synflex 35NG compressed natural gas CNG hose fulfils all requirements according NGV4.2 - Class A+D and NGV3.1 - Class B
- The specifically designed perforated cover provides up to five times longer hose life than competing alternatives
- The hose dissipates static electricity by means of a conductive nylon core

Synflex low-pressure NG-TW hose



Overview

The Synflex low-pressure NG-TW hose for CNG applications hose supports the low- pressure lines between the pressure regulator and the engine. The inner tube features a conductive PTFE core which dissipates static electricity. The reinforcement is stainless steel wire, and the cover is a fire-resistant black polyester blend with blue tracer. The hose is suited to hot engine compartments with a temperature range of -40 °C to 120 °C. The NG-TW is available in sizes -6, -8, and -10 as single hoses.

The challenge

Vehicle CNG supplies use two different pressure levels: a high-pressure side up to 200 bar from the tank to the pressure regulator, and a low-pressure side around 3-5 bar from the pressure regulator to the engine. Low-pressure hoses are typically installed in hot engine compartments and must feature high temperature resistance. The hoses must also compensate for vibration and relative movement. Additionally, internal conductivity is required to dissipate any build up of static charge.

Solution benefits

- The NG-TW covers the low-pressure gas lines between the regulator and the engine. Besides this pressure difference, it meets similar requirements to the high-pressure line (Synflex 35NG compressed natural gas CNG hose)
- The hose dissipates static charge via a conductive Teflon™ fluoropolymer inner tube
- The combination of SS304 stainless steel reinforcement and a fire-resistant cover meets all the requirements for operating effectively in hot engine compartments with temperatures above 80 °C
- The NG-TW fulfills ANSI/CSA NGV3.1 - Class C and conforms to NFPA 52

Boston EHW002 radiator hose



Overview

Boston EHW002 Radiator Hose is an EPDM radiator water hose specially developed for a hot water/ antifreeze liquid mix to cool automotive and stationary engine systems.

Many available sizes from -8 (DN12) to -64 (DN102) and a broad operating temperature from -40 °C to 125 °C make this hose the right choice for demanding applications.

The challenge

Engine cooling is a critical function inside vehicles and reliable products are essential to minimize the risk of failure. Hot cooling water or antifreeze can also injure people if a hose bursts.

Cooling water hoses must be UV and ozone resistant to reduce aging and ensure a long service life.

Solution benefits

- Danfoss EHW002 series industrial hose is specially developed to support engine cooling with hot water or antifreeze
- Its EPDM cover is heat, aging, and weather resistant, while the EPDM tube is suitable for hot liquids and antifreeze
- 2 plies of high-tensile synthetic textile reinforcement guarantee a safe operating pressure of 4 bar and all sizes feature a 12 bar burst pressure

Danfoss GH001 Type E EverCool air conditioning veneer hose

Danfoss EC007 Type C EverCool air conditioning hose



Overview

The premium Danfoss GH001 Type E EverCool air conditioning veneer hose and EC007 Type C EverCool air conditioning hose are designed to meet all the application requirements of air conditioning systems. Typically used in on- and off-road vehicles, these hoses enable outstanding performance in terms of permeability, moisture ingress, and more.

The challenge

With customers requiring easy installation in tight spaces, air conditioning hoses must offer high flexibility, a low bend radius, and excellent kink resistance to avoid hose damage and to keep on performing.

Low permeation is another must-have feature to minimize refrigeration loss and its environmental impact, as well as the downtime and servicing costs associated with system 'top offs'. At the same time, this also protects the system from catastrophic failure by minimizing moisture ingress.

Air conditioning hoses also need to be very robust, offering high temperature, UV, and ozone resistance to ensure reliability and a long operational lifetime. Additionally, they should support easy crimping to accelerate field servicing.

Solution benefits

- Robust construction improves safety and reliability
- The hose offers high flexibility, kink resistance, and low bend radii to guarantee easy installation in tight compartments
- Low moisture ingress (Class 1) protects the cooling system from icing up
- Very low permeation reduces greenhouse gas emissions and protects the environment
- Qualified with a wide range of refrigerants or oils, and available in sizes -4 to -16, these hoses can meet the requirements of most mobile AC systems
- Qualified with Danfoss crimp fittings and exceeds SAE J3062 and SAE J2064 standards
- Production facilities in the USA and Turkey ensure a smooth supply chain and reliable delivery times

Danfoss FC800 EverCool air conditioning large bore hose



Overview

Danfoss FC800 EverCool air conditioning large bore hose is a highly flexible air conditioning hose with extremely tight bend radii and very low permeation and moisture ingress.

The FC800 is available in sizes -12, -16, -20 and -24 and is qualified with both crimp and reusable fittings.

The challenge

AC hoses are typically installed inside hot and cramped engine compartments. These hoses require very small bend radii, excellent kink resistance, and high heat tolerance. Low permeation is crucial too, as it helps to enable less frequent servicing and reduced operating costs. Reusable fittings are often also needed for rooftop AC systems because of the individual cut lengths required.

The challenge is to find durable products which meet these requirements while also offering excellent reliability and a long lifetime in harsh conditions.

Solution benefits

- The performance of the FC800 hose is unique in the global market because of its unusual construction, which includes a polyamide foil barrier that reduces permeation to 0.5kg/m²/yr and lowers moisture ingress to Class 1
- Thanks to its wire braid reinforcement, the hose is extremely kink resistant and enables very low bend radii
- Supporting all common refrigerants, including R1234yf, and approved for a wide range of oils, this hose is the perfect solution for bus applications

Winner PTFE high performance Teflon hose



Overview

Winner PTFE high performance Teflon hose compliments the Everflex family by providing performance that meets and exceeds SAE 100R14-A & B and SAE J517 specifications. It is ideally suited for use in applications where classic rubber hoses fail—those requiring high and low temperature tolerances, chemical resistance, a low coefficient of friction, flexibility, and non-aging characteristics.

The EN-TW series tube is reinforced with SS304 stainless steel wire and is available in both conductive (EC-TW) and non-conductive (EN-TW) versions.

The challenge

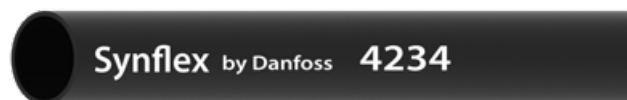
When connecting oil systems and components, rubber hoses can fail in the high temperature and high vibration environment inside engine compartments. In addition, the oil supply to turbochargers must be guaranteed, or a complete engine failure is possible. The ideal hose solution must combine performance and high flow rates with tough durability and non-aging characteristics.

Solution benefits

- Extended operational temperature range from -54 °C up to 236 °C for heavy-duty applications
- Very flexible and shock resistant
- Can withstand continuous vibration
- High flow rates, with a low coefficient of friction
- Excellent non-aging characteristics
- Supports a wide range of fluids and applications: high-pressure refrigerant lines, grease lubrication, compressor discharge, engine return lines, oil cooler lines, and fuel lines, as well as chemical transfers, electric cooling, hot presses, paint spraying, and steam

Teflon is a trademark of The Chemours Company FC, LLC used under license by Danfoss.

Synflex 4234 PHL Y DIN/ ISO tubing



Overview

Ideal for truck, bus and trailer air brake and fuel applications, Synflex DIN/ISO tubing is designed to withstand elevated pressure, to offer high flexibility, and to tolerate a broad temperature range.

The tubing is available in a range of materials, including PA12 polyamide and thermoplastic co-polyester elastomer:

- Series 4234 PHL Y • Series 4224 HIPHL • Series 4237 TEE

The challenge

To optimize costs, customers are seeking one fuel and air brake tubing solution that spans all sizes and application demands.

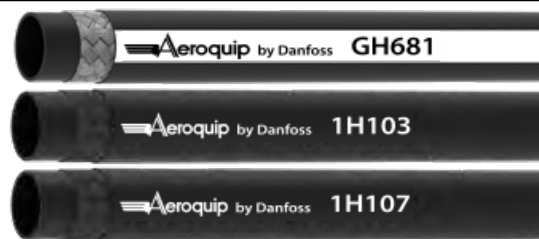
A global polyamide shortage can create the risk of availability problems, driving the need for alternative polyamide products for compressed air applications. Using co-polyester tubing can also reduce costs in non-fuel applications.

All tubing needs to be highly resistant to UV and other environmental factors to ensure a long in-application life and to reduce maintenance requirements.

Solution benefits

- Covers all DIN 73378, DIN 74324-1, and ISO 7628 standards
- Suitable for all typical truck and trailer applications: fuel, suspension, service brakes, parking brakes, and tilt or lift systems
- Available in all sizes from 4mm to 20mm
- Colored stripes enable easy identification and help prevent misconnection. Solid coloring is also available on request, but stripes reduce the comparative risk of UV aging
- Danfoss ABT products are made from virgin grades only, are 100% maintenance free, and guarantee a long operational lifespan
- Very price competitive

Aeroquip FC171, GH681, 1H103, 1H107 high- and low-pressure steering hoses



Overview

Aeroquip FC171, GH681, 1H103, 1H107 hoses for high- and low-pressure steering hoses offer a broad solution for any steering requirements.

From high-pressure operations to low-pressure return lines, many hose types can be used in power steering applications depending on a customer's requirements. Danfoss has developed tailored hose designs covering operational temperatures up to 150 °C, as well as return lines with volumetric expansion properties.

The challenge

The usual operating pressure for a power steering circuit is just 160-180 bar. The fluid is typically an ATF mineral oil which doesn't require special inner tube compounds.

However, hoses often require enhanced temperature tolerance because they are routed through hot engine compartments. Hose assemblies must also withstand ongoing vibration. Additionally, smooth operations may require return lines that can dampen out pressure peaks.

Solution benefits

- Danfoss offers a wide range of products for power steering applications
- For pressure inlet lines, even standard hoses like the GH681 are suitable. However, the FC171 offers enhanced temperature tolerance, with an operational range from -40 °C up to 125 °C
- The 1H103 is a low-pressure return line hose, suitable for intermittent temperatures up to 150 °C
- If the return line needs volumetric expansion properties, our EN26801 or 1H107 hoses are the right choice

Aeroquip STC Connector



Overview

Aeroquip STC (Snap-To –Connect) connectors are designed for repeated connection and disconnection without the need to replace the O-Ring and back-up ring unless leaks or damage can be seen.

Connectors are available from size -6 to -16 with an operational pressure up to 412 bar. Typical applications include hydraulics, power steering, power brakes, turbochargers, and fuel injection systems, as well as air conditioning and refrigeration.

The challenge

Hydraulic distribution block hose lines are connected closely together in tight spaces, which makes installation tricky, time consuming, and only completable in a set order.

As a result, hose assemblies often become twisted or damaged during installation. The challenge is to enable faster and easier installation and assembly times to reduce costs, while also ensuring reliable and secure connections.

Solution benefits

- Make fast and reliable connections one-handed, with no assembly tools
- Easy installation in tight spaces. Eliminates cross-threading, over or under torquing, and hose twisting
- Virtually zero leak performance per SAE J1176
- Direct porting eliminates the need for adapters and maximizes cost savings
- Resists external contamination
- Allows for easy disconnection with release tool

Aeroquip hydraulic high pressure special multi bended tube assembly



Overview

Danfoss custom tubes are ideal for applications featuring higher pressures or extreme heat, as well as for those where flex line geometry cannot be designed into the system. For ease of assembly and installation, tube assemblies can be bundled with mechanical bracketing. Formed tube ends also include couplings and have been qualified for various hose applications, including air conditioning, transmission oil coolers, steering, and more.

The challenge

Tubes are required for various applications where non-flexible installation is acceptable. They are commonly installed on chassis, frames, or booms where shaped and multi-bent solutions with low bend radii are needed.

Solution benefits

- Custom tube assemblies are available in a wide range of sizes and end connections
- Solderless design and shaped or roll-formed termination ends provide a one-piece character that optimizes volume flow rates
- Multi-3D bent tubing and hose-tube assemblies can be supplemented by STC couplings or Danfoss' Walform connections, offering a high-tech solution for many applications with an almost unlimited service life
- Dedicated product application team can help customers design and develop the best solution for each application

Winner EC115 one-wire braided hose, Winner EC215 two-wire braided hose



Overview

Winner EC115 (1SC) and EC215 (2SC) are one and two wire braided hydraulic hoses which provide a competitive solution for all kinds of standard hydraulic applications in combination with Winner two-piece hose fittings.

The challenge

A competitive hose assembly solution is needed for all kinds of standard hydraulic applications, such as front attachments or mobile machine legs.

Even in standard applications, leak-free connections are essential. Any hoses and fittings must be technically qualified and approved by the supplier.

Solution benefits

- Winner 1SC and 2SC braided hoses EC115 and EC215 both meet industry standards and are very cost-effective, as are their optional fittings
- Winner two-piece crimp fittings are non-skive for easier and quicker assembly, as well as safe and leak-free connections. One nipple part number can also be used for both EC115 and EC215 standard hoses just by utilizing a different socket
- With stock available locally in Europe, short lead-times are possible for a wide variety of fitting terminal ends

Waltech tube fittings



Overview

Danfoss Waltech tube fitting systems offer a complete solution for any tube fitting needs with a 24° cone according to ISO8434-1.

With the highest operating pressures up to 800 bar and Guardian Seal plating for excellent corrosion resistance, Waltech tube fittings provide a long lifetime in demanding applications.

The challenge

To maximize machine uptime in the most demanding applications, tube fittings need to withstand high dynamic pressure and offer excellent corrosion resistance.

Assembly errors can also cause tube fitting leaks during operation, due to the wrong torque being used, over/ under-assembly, and more. Additionally, slower cycle times for tube assemblies increase manufacturing costs.

Solution benefits

- Waltech tube fittings support the highest operating pressures up to 800 bar with a 4:1 safety factor
- Allows easy dry assembly (i.e., without lubrication) and has defined torque values for all systems, as well as reduced torque variance
- Guardian Seal coating offers more than 1000 hours resistance to red rust corrosion, confirmed by salt spray testing per ISO 9227
- For very aggressive media, such as certain fertilizers, we offer tube fitting systems in stainless steel 1.4571
- Bespoke assembly and forming machines reduce cycle times and complexity in the assembly process to ensure leak-free performance
- Our broad portfolio is also supplemented by customized fittings (e.g., special jump sizes)

Waltech Walpro



Overview

Waltech Walpro redefines the standard for cutting ring technology. The Walpro system is a metric flareless tube fitting that consists of a body, a profile ring (cutting ring), and a nut. During assembly, the two cutting edges of the profile ring penetrate the tube, creating a safe and reliable hold function and seal. The top area of the profile ring seals along the 24° surface of the tube fitting's body.

With controlled final cutting ring assembly via the proprietary M-R7 machine, Danfoss Waltech offers an optimized assembly process that reduces cycle times to a minimum and enables high-quality, leak free results. It can also process tubes with the tightest 180° bend radii.

The challenge

In demanding applications, tube fitting systems must be able to tolerate high vibration and dynamic loads to deliver both top performance and a long service life. Errors in assembly can also result in leakages or a critical failure in application.

Solution benefits

- Meets and exceeds DIN 23 and ISO 8431-1 requirements
- High axial strength and the radial flexibility of the profile ring ensure excellent tube holding, clamping, and sealing
- Increased resistance to high dynamic loads and vibration through axial ribs, inner area clamping along the complete tube length, and cutting edges that equally share the holding force
- High quality and performance confirmed by neutral agencies, with type approvals according to IACS specifications
- Enables easy and safe assembly due to a significant torque increase at the end of the process. Operators 'feel' when assembly is complete, and overtightening is unmistakable
- Danfoss' M-R7 cutting ring assembly machine enables easy, accurate, and safe assembly in a short cycle time
- No uncontrolled deformation during excess tightening
- Leading pressure performance
- Available in carbon and stainless steel

Waltech WalformPlus



Overview

Waltech WalformPlus is a robust, reliable, and easy to assemble tube fitting system. It enables safe tube end forming, with a primary elastomeric seal and secondary metal-to-metal sealing. For thin wall tubing, WalformPlus®-SR is also available, which includes an additional support ring to enable greater reliability and ease of assembly.

The reshaped tube in WalformPlus® eliminates the only possible leak path and prevents the tube from pulling free under excessive pressure or high impulse applications.

The challenge

In demanding applications like tractors and front loaders, tube fitting systems face both high working pressures and high vibration environments. To ensure reliable, safe, and leak-free operations, the fitting must offer exceptional sealing and the tube must be unable to pull free. Also, since assembly errors are a leading cause of leaks, tube fitting systems must be designed to enable correct assembly.

Solution benefits

- Primary elastomeric sealing and secondary metal-to-metal sealing ensures leak-free performance.
- Eliminates the only possible leak path and prevents the tube from pulling free by ensuring resistance at the connection point that exceeds the strength of the tube material.
- Enables easy, safe and repeatable assembly. Positive locking between stud and tube guarantees absolute reliability under extreme dynamic loads and eliminates the risk of disconnection.
- Approved for safety-critical applications where cutting rings cannot be used.
- Meets and exceeds DIN EN ISO 8431-1 requirements.
- Where thick wall tubing is traditionally required, WalformPlus-SR enables higher strength tube materials in thin wall thickness to be used. Thin wall tubing can enable lighter, more compact machine designs that reduce fuel consumption.

The Excavator platform

Excavators are self-propelled crawlers or wheeled machines with an upper structure capable of 360-degree rotation. Via the action of a bucket fitted to a swing or telescopic boom, they excavate, elevate, swing, and discharge material without moving the chassis or undercarriage during any part of the work cycle.

Excavators are one of the most useful and versatile pieces of heavy construction equipment on a worksite. Although originally designed primarily for digging, the excavator has evolved into a multi-purpose, multi-terrain vehicle due to the development of various attachments. Almost every day, someone finds a new use for an excavator, with attachments being constantly created or adapted.

Excavators are classified based on following parameters:

Parameters	Definition
By Weight	<13ton, mini-excavator
	>13ton and <30ton, medium excavator
	>30ton large excavator
By Transmission	Hydraulic and Mechanical
By Implementer	single and multi-buckets
By Travel	Crawler and wheeled excavators (and walker, towed, Rail)
By Power	Diesel and Electric
By Duty	common usage and special usage (such as mining)

Swing Drive



Aeroquip EC850 Dynamax four/six wire spiral hose



Aeroquip EC600 X-Flex four/six wire spiral hose

Work Cycle



Winner WH004 hydraulic suction and return hose

Pilotline



Winner WH006 textile reinforced hydraulic hoses

Work Cycle



Waltech Walform tube connectors



Aeroquip EC881 Dynamax two-wire braided hose



Danfoss Hansen Flat Face (FF) quick disconnect couplings



Danfoss Hansen H15000 and IA Series general-purpose interchange couplings



Danfoss Hansen W36000 Series screw-to-connect quick disconnect coupling

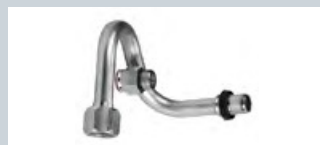


Danfoss Hansen Multi-FF Quick Disconnect Multiplate Couplings

Work Cycle



Waltech tube fittings



Aeroquip hydraulic high pressure special multi bended tube assembly



Danfoss steel adapters

Air Conditioning

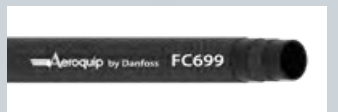


Danfoss EC007 Type C EverCool air conditioning hose



Danfoss GH001 Type E EverCool air conditioning veneer hose

Engine



Aeroquip FC699 elevated temperature engine hose



Danfoss GH100 braided textile bio-diesel hose



Winner PTFE high performance Teflon hoses

Track Drive



Winner EC426 four-spiral hose

Work Cycle



Winner WH004 hydraulic suction and return hose

Pilotline



Winner WH006 textile reinforced hydraulic hoses

Work Cycle



Waltech Walform tube connectors



Danfoss Hansen Flat Face (FF) quick disconnect couplings



Danfoss Hansen H15000 and IA Series general-purpose interchange couplings



Danfoss Hansen W36000 Series screw-to-connect quick disconnect coupling

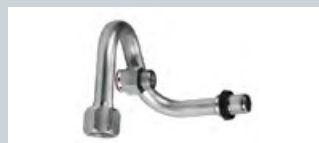


Danfoss Hansen Multi-FF Quick Disconnect Multiplate Couplings

Work Cycle



Waltech tube fittings



Aeroquip hydraulic high pressure special multi bended tube assembly



Danfoss steel adapters

Engine



Aeroquip FC699 elevated temperature engine hose

Air Conditioning



Danfoss EC007 Type C EverCool air conditioning hose



Danfoss GH001 Type E EverCool air conditioning veneer hose

Aeroquip EC850 Dynamax four/ six wire spiral hose



Overview

Aeroquip EC850 Dynamax four/ six wire spiral hose (six spiral layers for size -20) with a highest working pressure of 500 bar.

The challenge

Mobile hydrostatic drives, direct drive steering, and other system applications require extremely high operating pressures 20% above SAE 100R15.

Depending on the machine type, pressure ratings of up to 500 bar can be achieved. The connectivity between hydraulic components is very complex in this application, requiring flexible hoses in combination with multi-bended fittings. This is essential on at least one end of the hose assembly to optimize routing.

All the components used in this application need to be reliable and safe. There must be no leakage of hydraulic fluid between hoses and fittings.

Solution benefits

- EC850 hoses are the best choice for high-pressure hydrostatic drive applications up to 500 bar.
- Thanks to a four wire layer design in sizes -10, -12 and -16, these hoses provide outstanding flexibility at high pressures.
- Improved flexibility and a tight bend radius enhance installation and routing capabilities.
- Offers 8X better abrasion resistance than standard rubber hoses, due to DURA-TUFF cover.
- Can be combined with customized multi-bended fittings without brazing or welding points, eliminating the risk of leaks.
- Internal skive type 1W fittings with their double O-ring design eliminate 'sweating' of the hose assembly during cool-down.
- 1W fittings can provide up to 1000 hours of red rust protection thanks to their enhanced DURA-KOTE plating.

Aeroquip EC600 X-Flex four/six wire spiral hose



Overview

Aeroquip EC600 X-Flex four/six wire spiral hose provide excellent flexibility at a working pressure of 420 bar and exceed both SAE 100R15 and ISO 18752 standards.

The challenge

Hydrostatic drive hose lines are one of the most critical hydraulic applications on mobile machines like excavators.

Compact installation space demands hoses with very tight bend radii, even at this high-pressure rating. The connectivity between hydraulic components is very complex in this application, requiring flexible hoses in combination with multi-bended fittings. This is essential on at least one end of the hose assembly to optimize routing.

All the components used in this application need to be reliable and safe. There must be no leakage of hydraulic fluid between hoses and fittings.

Solution benefits

- EC600 hoses offer a very tight bending radius (1/2 of SAE) that can reduce the hose length required through shorter routing. Improved flexibility (force-to-bend) also enables easier installation in tight spaces.
- By making the hose assembly smaller and lighter, these hoses enable a more compact installation space.
- Weight reduction in the hose assembly increases machine efficiency and reduces total cost of ownership.
- Can be combined with customized multi-bended fittings without brazing or welding points, eliminating the risk of leaks.
- Internal skive type 1W fittings with their double O-ring design eliminate 'sweating' of the hose assembly during cool-down.
- 1W fittings can provide up to 1000 hours of red rust protection thanks to their enhanced DURA-KOTE plating.

Aeroquip EC881 Dynamax two-wire braided hose



Overview

Aeroquip EC881 Dynamax two-wire braided hose provide an improved bend radius, higher working pressure, and a long operational lifetime of up to one million impulse cycles.

The challenge

An excavator arm is always under dynamic movement, as are the hose assemblies connecting the hydraulic system inside the arm.

To minimize machine downtime and operational costs, it's essential to have a hose assembly with superior flexibility, as well as a long operational lifetime in dynamic applications.

Similarly, the attached fittings also need to support a long lifetime in-application by offering high corrosion resistance and the ability to maintain leak-free operations year after year.

Solution benefits

- EC881 hoses provide excellent flexibility (1/3 SAE 100R2 bending radius at 100°C). This enables easier installation in compact spaces and decreases failures caused by tight bends.
- The DURA-PULSE hose tube has slow aging and a low compression set, which provides better sealing and leak-free performance even in dynamic applications.
- Reduces downtime, with an operational life up to 5X longer than standard EN857 Type 2SC hoses, supporting as many as one million impulse cycles.
- Offers 8X better abrasion resistance than standard rubber hoses, due to DURA-TUFF cover.
- Aeroquip 1A type TTC fittings are qualified for zero leakage and can provide up to 1000 hours of red rust protection thanks to their enhanced DURA-KOTE plating.

Winner WH004 hydraulic suction and return hose, Winner WH006 textile reinforced hydraulic hose



Overview

Winner WH004 (R4) and Winner WH006 (2TE) are textile reinforced hydraulic hoses which provide a competitive solution for all kinds of standard hydraulic applications in combination with Winner two-piece hose fittings. WH004 is a suction hose and consists of an additional helical steel wire to prevent hose collapse.

The challenge

Low-pressure hydraulic applications, such as fuel, return, and suction lines, require competitive, standard performance hose assembly solutions.

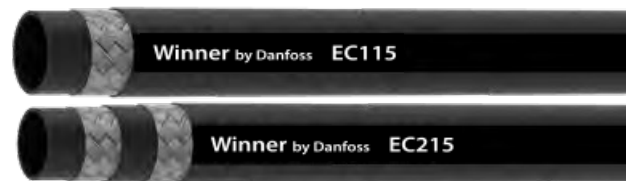
Even in these standard applications, leak-free hose and fitting connections are essential and must be technically qualified and approved by the supplier.

To maximize equipment efficiency, these lines must also be very flexible and low weight.

Solution benefits

- The Winner R4 suction hose, WH004, and 2TE textile braided hose, WH006, both meet industry standards and are very cost-effective, as are their optional fittings.
- Winner two-piece crimp fittings are non-skive for easier and quicker assembly, as well as safe and leak-free connections. The same nipple part number for wire braided standard hoses can also be used for these hoses, just by utilizing a different socket.
- A variety of different fitting terminal ends are available now.

Winner EC115 one-wire braided hose, Winner EC215 two-wire braided hose



Overview

Winner (1SC) and EC215 (2SC) are one and two-wire braided hydraulic hoses which provide a competitive solution for all kinds of standard hydraulic applications in combination with Winner two-piece hose fittings.

The challenge

Unlike large excavators which have highly demanding requirements for hose assemblies, mini-excavators designed for standard applications instead require competitive hose assembly solutions due to the overall cost pressures on the equipment.

Even in these standard applications, a leak-free hose and fitting connection is essential and must be technically qualified and approved by the supplier.

Solution benefits

- Winner 1SC and 2SC braided hoses EC115 and EC215 both meet industry standards and are very cost-effective, as are their optional fittings.
- Winner two-piece crimp fittings are non-skive for easier and quicker assembly, as well as safe and leak-free connections. One nipple part number can also be used for both EC115 & EC215 standard hoses just by using a different socket.
- A variety of different fitting terminal ends are available now.

Winner EC426 four-spiral hose



Overview

Winner EC426 (4SP) is a four spiral hose which provides a competitive solution for all kinds of standard hydraulic applications in combination with 4S type non-skive fittings.

The challenge

Unlike large excavators which have highly demanding requirements for hose assemblies, track drive and swing drive applications on a mini-excavator require competitive hose assembly solutions due to the overall cost pressures on the equipment.

Even in these standard applications, a leak-free hose and fitting connection is essential and must be technically qualified and approved by the supplier.

Solution benefits

- Winner EC426 (4SP) spiral hoses meet industry standards and are very cost-effective, as are their optional fittings.
- 4S type one-piece crimp fittings are non-skive for easier and quicker assembly, as well as safe and leak-free connections.
- The DURA-SEAL O-Ring design on 4S type fittings ensures zero leakage.

Danfoss GH001 Type E EverCool air conditioning veneer hose, Danfoss EC007 Type C EverCool air conditioning hose



Overview

Danfoss GH001 Type E EverCool air conditioning veneer hose and Danfoss EC007 Type C EverCool air conditioning hose is offering also one of the best on field performance on the market.

The challenge

With installation in tight spaces, air conditioning hoses must offer a very low bend radius and excellent kink resistance. Since hoses are installed in hot compartments, they also need to be very robust and temperature resistant. In addition, low permeation is another must-have feature to minimize refrigeration loss.

Solution benefits

- Robust construction improves safety and reliability.
- Ozone and UV resistant.
- High kink resistance and small bending radii enables easy installation in tight compartments.
- Extremely low permeation and moisture ingress.
- Qualified with a wide range of fittings.
- Back-up production facilities in Turkey ensure global availability and reliable delivery times.
- Very price competitive.

Aeroquip FC699 elevated temperature engine hose



Overview

Aeroquip FC699 elevated temperature engine hose is an affordable, lightweight, and flexible solution for the conveyance of fuel and oil in demanding conditions.

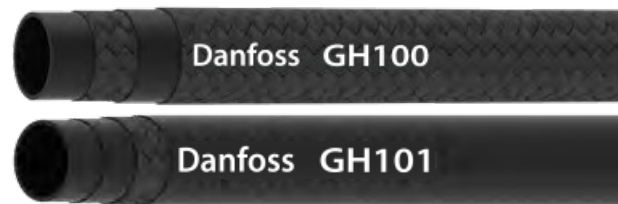
The challenge

With high temperatures and little space, engine compartments are a tough environment for hoses. To convey gasoline and diesel with up to 10% biofuel (B10) content, excavator manufacturers need robust, flexible, and cost-competitive hoses with extended service life performance.

Solution benefits

- High temperature tolerance up to 300 F / 150 C ideal for engine compartments.
- Extended service life performance thanks to superior abrasion resistance.
- Lightweight design reduces total vehicle weight for improved fuel efficiency.
- Enhanced appearance.

Danfoss GH100, GH101 braided textile biodiesel hoses



Overview

Danfoss GH100, GH101 braided textile biodiesel hoses for diesel/biodiesel fuel systems support a wide temperature range and are suitable for up to 100% biodiesel fuels, as well as Rapeseed Methyl Ester (RME) and Soy Methyl Ester (SME) mixtures.

The challenge

Diesel/biodiesel engine fuel systems must operate using different fuel mixtures, including ultra-low-sulfur diesel (ULSD), blends of biodiesel up to B100, and synthetic oils while offering a long life in application. Fuel hoses must support different regional norms and standards and tolerate hot engine compartments and high vibration environments.

Solution benefits

- With an aramid textile braid reinforcement that's durable, yet lightweight and flexible, GH100 hoses are easier to install compared to wire-braided hoses.
- The hydrogenated nitrile rubber inner tube consists of a polymer that's resistant to bio-fuels up to B100.
- The hose cover consists of a highly abrasion-resistant textile braid that offers reliable protection from external factors. Alternatively, the GH101 hose is available with a smooth rubber cover.
- Due to high temperature resistance from -40 C to 150 C, these hoses are ideally suited for installation in hot engine compartments.
- Both hose types meet all common standards (e.g., ASTM D380, ASTM D6751, EN412 and EN2240) as well as many customer specifications.

Winner PTFE high performance Teflon hose



Overview

Winner PTFE high performance Teflon hoses are designed for demanding applications where excellent temperature and vibration resistance is essential. The range consists of the:

- 2807 series premium product
- S- and SC- series
- EN-TW and EC-TW value series products

The challenge

Customers require seamless, high-performance oil system connections and components that can deliver in the high temperature and high vibration environment inside engine compartments. In addition, the oil supply to turbo chargers must be guaranteed, or a complete engine failure is possible. Oil lines also require effective protection against dirt and flying particles.

Solution benefits

- Extended operating temperature range from -73 C to 260 C for heavy duty applications.
- Broad fluid compatibility.
- Highly flexible and shock resistant.
- Able to withstand continuous vibration.
- Supports a wide range of applications and fluids: hydraulics, high-pressure refrigerant, grease lubrication, compressor discharge, engine return lines, oil cooler lines, and fuel lines.

Aeroquip hydraulic high pressure special multi bended tube assembly



Overview

Custom tubes are designed for low, medium and high-pressure applications. These high-quality, seamless tubes are precision-built and offer a wide range of terminal end solutions.

The challenge

Hydraulic and air conditioning applications require multi-bended tubes with optimized port-to-port connections that also minimize the risk of any leakages.

Solution benefits

- Danfoss offers 3D multi-bended tubing up to 60mm x 3mm in diameter and with a maximum pole length of 3,000mm.
- Solderless solutions enable an optimized volume flow rate.
- Formed terminal ends including Walform technology enable tube assemblies to be produced nearly without brazing, which reduces the risk of leaks.
- STC Quick Connect couplings also enable easy and torsion-free installation. Formed directly onto the pipe, these couplings offer the ideal solution for an efficient connection.

Waltech tube fittings



Overview

Waltech tube fittings provide a complete solution for a wide range of application challenges.

With a 24° cone according to ISO 8434-1 standards, these fittings also support the highest operating pressures up to 800 bar. Guardian Seal plating adds high corrosion resistance too, for a long lifetime in demanding applications.

The challenge

To maximize machine uptime in the most demanding applications, tube fittings need to withstand both high dynamic pressure and offer excellent corrosion resistance.

Assembly errors can cause tube fitting leaks during operation, due to the wrong torque being used, over/under-assembly, and more.

Increased cycle times for tube assemblies are driving up manufacturing costs.

Solution benefits

- Waltech tube fittings support the highest operating pressures up to 800 bar with safety factor four.
- Allows easy dry assembly (without lubrication) and has defined torque values for all systems, as well as reduced torque variance.
- We've developed assembly and forming machines specifically to accelerate the assembly process and ensure leak-free performance.
- Our Guardian Seal coating offers more than 1000 hours resistance to red rust corrosion, confirmed by salt spray testing per ISO 9227.

Waltech WalformPlus



Overview

Waltech WalformPlus is the leading and most popular cold-forming metric tube fitting system in the world.

For very thin wall tubing, the forming system WalformPlus-SR with an additional support ring can be used, which combines high reliability with ease of assembly.

The challenge

To create more compact, efficient and cost-effective excavators, the size and weight of tube assemblies is critical. Greater weight directly translates into higher fuel consumption.

However, in demanding applications with high dynamic pressure and vibration, thick wall tubing has been considered essential to ensure long-term reliability and leak-free operations.

Solution benefits

- Waltech Walform-SR is a tube forming system for thin wall tubing. By using a support ring as part of the forming system, higher strength tube materials in thin wall thickness can be used in applications where thicker tubes were previously required.
- Enables more compact excavators and significantly lowers their weight, reducing energy consumption and optimizing fuel usage.
- Engineered to ensure lasting reliability even under loads with high dynamic pressure and vibration.

Waltech Walpro



Overview

The Walpro system is a metric tube fitting that consists of a body, profile ring (cutting ring), and nut. During assembly, the two cutting edges of the profile ring penetrate the tube, creating a safe and reliable hold function and seal. With controlled final assembly using the M-R7 machine, Danfoss Waltech also offers an optimized assembly process that increases quality and reduces assembly time to a minimum.

The challenge

In demanding applications like excavators, tube fitting systems must be able to tolerate high vibration and dynamic loads. Errors in assembly can result in leakages or a critical failure in application, so a robust assembly process must be guaranteed.

Solution benefits

- Meets and exceeds DIN 2353 / ISO 8431-1 requirements.
- Walpro® provides clamping on the complete length of the cutting ring and therefore has high resistance to vibration and dynamic loads.
- Walpro® allows easy and safe assembly due to a significant increase in assembly torque at the end of the process.
- Danfoss' M-R7 cutting ring assembly machine allows easy and safe assembly in a short cycle time. The controlled final assembly process of the M-R7 ensures that the cutting ring is 100% assembled on the tube within a very small tolerance.
- Available in carbon and stainless steel.

Waltech WalringPlus



Overview

Waltech WalringPlus is a two-edge carbon steel cutting ring with additional soft sealing for both possible leak paths. Specifically optimized for thin wall tubing in steel and stainless steel, it's designed to enable easy, repeatable assembly and to prevent the possible causes of leaks for dependable in-application performance.

The challenge

In demanding applications like excavators, tube fitting systems must be able to tolerate high vibration and dynamic loads. Errors in assembly can result in leakages or a critical failure in application, so a robust assembly process must be guaranteed. Additionally, to reduce weight, high-strength thin wall tubing is sometimes used in applications. This requires a tube insert to be used during cutting ring assembly, leading to higher costs and reduced flow rates.

Solution benefits

- The soft seal of WalringPlus ensures leaks will be prevented if small scratches occur in the tube or stud. Furthermore, the soft seal prevents 'sweating' due to fluctuating operating temperatures in the application.
- The design offers a clear block-stop-assembly function which provides a clear and noticeable torque increase for the operator at the end of assembly and prevents the risk of incorrect assembly.
- Through a combination of optimized cutting-edge geometry, block-stop-assembly function and soft sealing, WalringPlus allows safe assembly for very thin wall tubing without the need to use additional insert sleeves.

Danfoss steel adapters



Overview

Designed for applications with very high operating pressures, Danfoss' steel adapter range features excellent corrosion resistance and offers a wide variety of different terminal ends and configurations.

The challenge

Many excavator manufacturers need ORFS, BSP, and JIC terminal ends that meet the ISO8434-1 standard for tube fittings. For demanding applications in the construction sector, steel adapters must also be designed to withstand high dynamic pressure and provide excellent corrosion resistance.

Solution benefits

- Danfoss offers a wide range of steel adapters with ORFS, BSP, JIC, and other terminal ends.
- Rated to withstand up to 125% higher operating pressures than SAE standards while still offering a 4:1 safety factor.
- All of Danfoss' steel adapter range provides high corrosion resistance of at least 720 hours against red rust.

Danfoss Hansen Flat Face (FF) quick disconnect couplings



Overview

Danfoss Hansen Flat Face (FF) quick disconnect couplings provide greater performance at higher pressures along with higher flow rates.

The challenge

With growing demand for more powerful and compact machines, system pressure is rising while engine compartments shrink. As a result, manufacturers need high pressure and high impulse pressure solutions.

To enable machines with lower energy loss and optimized fuel consumption, couplings must be able to support higher pressures and flow rates. To improve excavator efficiency, it's vital to reduce the pressure drop between the boom and any attachments through an optimized flow.

Solution benefits

- FF couplings are designed to connect top performing hydraulic lines. As well as leak-free operations, they support increased pressures to help meet demand for high pressure and high impulse pressure solutions.
- Exceeds ISO 16028 standards, with 60% higher working pressures up to 400 bar and up to 74% higher flow rates that reduce energy loss.
- Exceptional corrosion resistance of up to 1000 hours due to environmentally-friendly nickel-free coating.
- Can connect under residual pressure up to 350 bar.
- Multiple direct porting solutions are possible, including integrated elbows for a compact and lean Fluid Conveyance line.

Danfoss Hansen Multi-FF Quick Disconnect Multiplate Coupling

Overview

Danfoss Hansen Multi-FF Quick Disconnect Multiplate Coupling further extends all the benefits of our Flat Face couplings.

Multi-FF is designed for any application requiring multiple hydraulic fluid connections for power transmission.



The challenge

When excavator manufacturers need multiple lines to connect to an attachment, the connection process becomes more costly, complex and time-consuming.

A robust system is needed that can support two to six FF couplings simultaneously and that enables simple manual connection up to 350 bar.

Solution benefits

- Robust internal mechanism and linear connection for long service lifetime.
- Simple design allows for use by untrained operators, using optimum force-to-connect.
- Integrated contamination protection through sealing band and dust caps.
- Improved servicing due to easy-to-replace couplings, and dust cap and safety pin mechanism.
- Modular design that allows for customized solutions with electrical connectors or specialized couplings.
- Enables connection under pressure up to 350 bar, connection under residual pressure up to 350 bar.

Danfoss Hansen H15000 and IA Series general-purpose interchange couplings



Overview

H15000 Series are general-purpose industrial interchange couplings that meet the ISO 7241-1 Series A standard. Both series feature a rugged ball latch mechanism with self-sealing poppet valves.

The challenge

Couplings according to ISO7241-1 are often required when connecting excavator attachments.

Solution benefits

- Danfoss' ISO-A portfolio includes standard products with a wide range of end-connections.
- ½" size available in push-pull version (double acting sleeve, bulkhead-mounted).
- Performance exceeds market requirements.

Danfoss Hansen W36000 Series screw-to-connect quick disconnect coupling



Overview

Danfoss' W36000 Series is a screw-to-connect quick disconnect coupling. Due to its design and the materials used, the W36000 Series quick disconnect coupling has excellent resistance to vibration in mechanical and hydraulic applications.

The challenge

For attachments with high vibration, screw-to-connect couplings are often used for the connection to the excavator. Residual pressure at the attachment can cause issues during connection.

Solution benefits

- Danfoss' W36000 screw-to-connect product range includes all end connections for the EMEA market.
- Includes 'hammer-proof' versions.
- Can be connected against 50 bar residual pressure.

Forklift and aerial lift platform

From construction sites to warehouses, forklift trucks and aerial lift platforms play a crucial role in material handling and staff mobility, enhancing the efficiency of day-to-day operations. Machines that are lighter, more compact, and more powerful are in great demand today, since they have the versatility to take on a wider range of tasks and their lower fuel consumption improves profitability. Additionally, narrower aisles and higher storage heights in warehouses are increasing the amount of available space, but are also making smaller and more agile vehicles essential.

To maximize productivity, the hydraulic systems inside lifting machines must enable precise control, tough reliability, and excellent safety. Not only can hydraulic components face extreme temperature changes—for instance, as warehouse fork-

lifts enter and exit cold storage areas—they must also remain strong and viable under continuous bending and abrasion to ensure a long operational lifetime and lower maintenance costs. For machines to lift the heaviest possible loads, hydraulic systems must also be lightweight, especially in the arms. However, components must be more durable and flexible too, due to the higher pressure and more compact space inside smaller but more powerful machines.

Control and return line



Winner WH004 hydraulic suction and return hose



Winner WH006 textile reinforced hydraulic hose

Fork Position



Danfoss Hansen H15000 and IA Series general-purpose interchange couplings

Work Cycle Mast



Synflex thermoplastic hoses
Synflex 3TB0
Synflex 3TR7
Synflex 31CT
Synflex 3TR8

High pressure work cycle



Aeroquip GH681 one-wire braided hose



Aeroquip EC881 two-wire braided hose

Connector



Waltech tube fittings

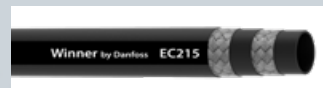


Danfoss Steel Adapters

Work Cycle and Pilot



Winner EC115 one-wire braided hose



Winner EC215 two-wire braided hose

Air Conditioning



Danfoss EC007 Type C EverCool air conditioning hose

Hydrostatic Drive



Aeroquip EC850 Dynamax four/six wire spiral hose



Aeroquip EC600 X-Flex four/six wire spiral hose

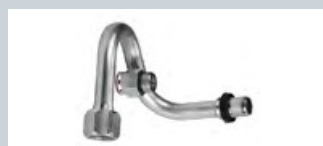


Aeroquip GH425 four wire spiral hose

Work Cycle



Waltech tube fittings



Aeroquip hydraulic high pressure special multi bended tube assembly

Oil Supply Engine



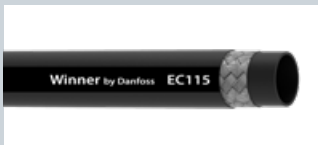
Aeroquip FC699 elevated temperature engine hose

Work Cycle Cylinder

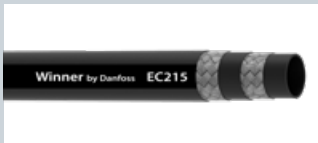


Synflex thermoplastic hoses
Synflex 3TR8
Synflex 3TR7
Synflex 31CT

Work Cycle



Winner EC115 one-wire braided hose



Winner EC215 two-wire braided hose

Work Cycle



Waltech Walform and Walpro tube connectors

Connector

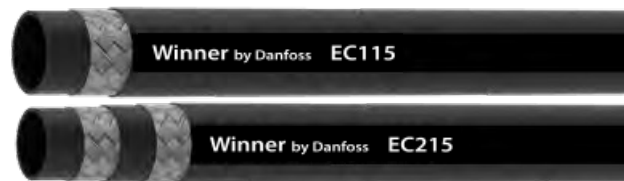


Waltech tube fittings



Danfoss steel adapters

Winner EC115 one-wire braided hose, Winner EC215 two-wire braided hose



Overview

Winner EC115 (1SC) and EC215 (2SC) are one and two wire braided hydraulic hoses which provide a competitive solution for all kinds of standard hydraulic applications in combination with Winner two-piece hose fittings.

The challenge

A competitive hose assembly solution is needed for all kinds of standard hydraulic applications, such as front attachments or mobile machine legs.

Even in standard applications, leak-free connections are essential. Any hoses and fittings must be technically qualified and approved by the supplier.

Solution benefits

- Winner 1SC and 2SC braided hoses EC115 and EC215 both meet industry standards and are very cost-effective, as are their optional fittings.
- Winner two-piece crimp fittings are non-skive for easier and quicker assembly, as well as safe and leak-free connections. One nipple part number can also be used for both EC115 and EC215 standard hoses just by utilizing a different socket.
- With stock available locally in Europe, short lead-times are possible for a wide variety of fitting terminal ends.

Aeroquip EC881 two-wire braided hose



Overview

Aeroquip EC881 two-wire braided hose qualified to one million impulse cycles. Using a next-generation inner tube and "hybrid plies" reinforcement, the EC881 enables higher working pressure and an improved bending radius, as well as a long operational lifetime. The EC881 can even challenge spiral hoses in some applications, helping customers to decrease machine weight and to improve routing.

The challenge

To minimize machine downtime and operational costs, it's essential to have a hose assembly with superior flexibility in terms of its bending radius, as well as the ability to withstand demanding and dynamic applications. Weight is also a significant factor for concrete pumping applications, which has a tangible effect on machine efficiency and fuel consumption.

Solution benefits

- A higher pressure rating than standard two wire braided hoses. Thanks to its higher working pressure, the EC881 can also be used instead of a spiral hose to reduce machine weight and operational costs.
- EC881 provides excellent flexibility (1/3 SAE 100R2 bending radius at 100°C). This enables easier installation in compact spaces and decreases failures caused by tight bends.
- A next-generation inner tube enables slow aging and a low compression set, providing better sealing and leak-free performance in even dynamic applications.
- Reduces downtime, with an operational life up to 5X longer than standard EN857 Type 2SC hoses, supporting as many as one million impulse cycles.
- Offers 8X better abrasion resistance than standard rubber hoses, due to DURA-TUFF cover.
- Aeroquip 1A type TTC fittings are qualified for zero leakage and can provide up to 1000 hours red rust protection thanks to their enhanced DURA-KOTE plating.

Aeroquip GH681 one-wire braided hose



Overview

The Aeroquip GH681 braided hose is qualified to one million impulse cycles and exceeds 1SC pressure ratings, making it useful for a wide variety of mobile machinery applications.

The challenge

Heat, vibration, and other challenging conditions inside mobile machine engine compartments can shorten hose life. In power steering applications, hydraulic hoses also need to be able to reduce the noise and vibration generated by the oil pump.

Solution benefits

- Aeroquip GH681 has an operating temperature rating up to 126°C (260°F) making it ideal for hot engine compartments.
- Suited to a broad range of hydraulic systems, as well as demanding applications such as power steering.
- 1 million impulse cycle performance.
- Flexible and easy to route in tight spaces.
- High abrasion resistance minimizes hose failures.
- Both crimp and reusable fittings are offered with DURA-KOTE plating for superior corrosion protection.

Aeroquip FC699 elevated temperature engine hose



Overview

Aeroquip FC699 elevated temperature engine hose is an affordable, lightweight, and flexible solution for the conveyance of fuel and oil in demanding conditions.

The challenge

With high temperatures and little space, engine compartments are a tough environment for hoses. To convey gasoline and diesel with up to 10% biofuel (B10) content, vehicle manufacturers need robust, flexible, and cost-competitive hoses.

Solution benefits

- The Aeroquip FC699 fuel hose is suitable for gasoline, diesel, and biodiesel up to 15% (B15).
- Very robust, with abrasion-resistant construction and a high temperature operating range from -40°C to 150°C for a long in-service lifetime.
- Extremely flexible to enable installation in tight spaces.
- Lightweight design reduces total vehicle weight for improved fuel efficiency.

Winner WH004 hydraulic suction and return hose, Winner WH006 textile reinforced hydraulic hoses



Overview

Winner WH004 (R4) and Winner WH006 (2TE) are textile reinforced hydraulic hoses that provide a competitive solution for all kinds of low-pressure hydraulic applications in combination with Winner two-piece hose fittings. As a suction hose, Winner WH004 also includes an additional helical steel wire to prevent collapse.

The challenge

Low-pressure hydraulic applications, such as fuel, return, and suction lines, increasingly require competitive, standard performance hose assembly solutions.

Even in these standard applications, leak-free connections are essential. Hoses and fittings must be technically qualified and approved by the supplier.

To maximize equipment efficiency, these lines must also be very flexible and low weight.

Solution benefits

- The Winner R4 suction hose, WH004, and 2TE textile braided hose, WH006, both meet industry standards and are very cost-effective, as are their optional fittings.
- Winner two-piece crimp fittings are non-skive for easier and quicker assembly, as well as safe and leak-free connections. The same nipple part number for wire braided standard hoses can also be used for these hoses, just by utilizing a different socket.
- With stock available locally in Europe, short lead-times are possible for a wide variety of fitting terminal ends.

Aeroquip hydraulic high pressure special multi bended tube assembly



Overview

Custom tubes are ideal for applications featuring higher pressures or extreme heat, as well as for those where flex line geometry cannot be designed into the system. For ease of assembly and installation, tube assemblies can be bundled with mechanical bracketing. Formed tube ends also include couplings and have been qualified for various hose applications, including air conditioning, transmission oil coolers, steering, and more.

The challenge

Tubes are required for various applications where non-flexible installation is acceptable. They are commonly installed on chassis, frames, or booms where shaped and multi-bent solutions with low bend radii are needed.

Solution benefits

- Dedicated product application team to help customers design and develop the best solution for each application.
- Custom tube assemblies are available in a wide range of sizes and end connections.
- Solderless design and shaped or roll-formed termination ends provides a one-piece character that optimizes volume flow rates.
- Multi-3D bent tubing and hose-tube assemblies can be supplemented by STC couplings or our Walform connections, offering a high-tech solution for many applications with an almost unlimited service life.

Aeroquip EC850 Dynamax four/six wire spiral hose



Overview

Aeroquip EC850 Dynamax four/six wire spiral hose (six spiral layers for size -20) with a working pressure up to 500 bar.

The challenge

Hydrostatic drive hose lines are one of the most critical hydraulic applications in mobile machines like telehandlers.

Depending on the machine type, pressure ratings of up to 500 bar can be achieved. The connectivity between hydraulic components is very complex in this application, requiring flexible hoses in combination with multi-bent fittings. This is essential on at least one end of the hose assembly to optimize routing.

All the components used in this application need to be reliable and safe. There must be no leakage of hydraulic fluid between hoses and fittings.

Solution benefits

- EC850 hoses are the best choice for high-pressure hydrostatic drive applications up to 500 bar.
- Thanks to a four wire layer design in sizes -10, -12 and -16, these hoses provide outstanding flexibility at high pressures.
- Improved flexibility and a tight bend radius enhance installation and routing capabilities.
- Offers 8X better abrasion resistance than standard rubber hoses, due to DURA-TUFF cover.
- Can be combined with customized multi-bent fittings without brazing or welding points, eliminating the risk of leaks.

Aeroquip EC600 X-Flex® four/six wire spiral hose



Overview

Aeroquip EC600 X-Flex® four/six wire spiral hoses provide excellent flexibility at a working pressure of 420 bar and exceed both SAE 100R15 and ISO 18752 standards.

The challenge

Unlike large excavators which have highly demanding requirements for hose assemblies, track drive and swing drive applications on a mini-excavator require competitive hose assembly solutions due to the overall cost pressures on the equipment.

Even in these standard applications, a leak-free hose and fitting connection is essential and must be technically qualified and approved by the supplier.

Solution benefits

- EC600 hoses offer a very tight bend radius (1/2 of SAE) that can reduce the hose length required through shorter routing. Improved flexibility (force-to-bend) also enables easier installation in tight spaces.
- By making the hose assembly smaller and lighter, these hoses enable a more compact installation space.
- Weight reduction in the hose assembly increases machine efficiency and reduces total cost of ownership.
- Can be combined with customized multi-bent fittings without brazing or welding points, eliminating the risk of leaks.

Danfoss EC007 Type C EverCool air conditioning hose



Overview

Danfoss EC007 Type C EverCool air conditioning hose is designed for air conditioning systems, enabling enhanced performance at a competitive price.

The challenge

With customers requiring easy installation in tight spaces, air conditioning hoses must offer high flexibility, a low bending radius, and excellent kink resistance to avoid hose damage and to keep on performing.

Low permeation is another must-have feature to minimize refrigeration loss and its environmental impact, as well as the downtime and servicing costs associated with system 'top ups'. At the same time, this also protects the system from catastrophic failure by minimizing moisture ingress.

Air conditioning hoses also need to be very robust, offering high temperature, UV, and ozone resistance to ensure reliability and a long operational lifetime. Additionally, they should support easy crimping to accelerate field servicing.

Solution benefits

- Robust construction improves safety and reliability.
- The hose offers high flexibility, kink resistance, and low bending radii to guarantee easy installation in tight compartments.
- Barrier design with a rubber inner tube means the EC007 is qualified with various fittings.
- Very low permeation reduces greenhouse gas emissions and protects the environment.
- Qualified with a wide range of refrigerants or oils, and available in sizes -4 to -14, the EC007 hose can meet the requirements of most mobile AC systems.
- Qualified with our crimp fittings and exceeds SAE J3062 and SAE J2064 standards.
- Production facilities in the USA and Turkey ensure a smooth supply chain and reliable delivery times.

Aeroquip GH425 four-wire spiral hose



Overview

Aeroquip GH425 four wire spiral hose delivers high performance in tough applications, exceeding EN 856 Type 4SP standards.

The challenge

Hydrostatic drive hose lines are one of the most critical hydraulic applications on mobile machines like forklifts.

Compact installation space demands hoses with very tight bend radii, even at this high-pressure rating.

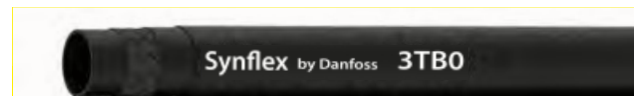
Alongside these flexibility requirements, hose assemblies must also tolerate torsion of up to +/- 8° on forklifts, depending on the end connections used. This requires not only a robust hose design, but also well assembled fittings which fit very smoothly onto the hose and ensure a perfect connection.

All the components used in this application need to be reliable and safe. There must be no leakage of hydraulic fluid between hoses and fittings.

Solution benefits

- Extended product life expectancy over standard EN856 Type 4SP hoses.
- Allows for use in a broader range of hydraulic systems where 4SH hoses may have been required in the past.
- Provides additional abrasion resistance which is a leading cause of hydraulic hose failures.
- Exceeds 400.000 impulse cycles.
- Higher pressure ratings than specified in EN856 Type 4SP.
- Dura-Tuff cover- offering eight times more resistance than the average rubber covers.
- Robust design based on Aeroquip's 2755 hose.
- Fully qualified 1T/4S fittings for the toughest requirements.

Synflex 3TB0 thermoplastic hydraulic hose



Overview

The Synflex 3TB0 thermoplastic hydraulic hose is designed for hydraulic applications in cold environments. Meeting SAE 100R7 requirements, the hose offers flexibility and resistance to low temperatures—making it the right choice for forklifts working in cold storage applications.

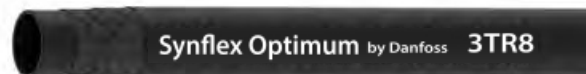
The challenge

Low temperature environments can create challenges for the typical hydraulic hoses used in material handling equipment. It makes them less flexible and more brittle, interfering with routing that is often critical in forklift applications.

Solution benefits

- 3TB0 is a thermoplastic hose designed for cold environments. It stays flexible even at temperatures as low as -50°C.
- Thanks to its cold temperature resistance, bonding capabilities, and abrasion resistant cover, the 3TB0 hose is an ideal solution for forklifts working in cold storage applications.
- 3TB0 can be bonded to form flat, compact, and flexible multi-lines, which simplify routing and eliminates the problem of tangling in multiple hose applications. Twin line hoses also have a small outer diameter and provide fast response times in hydraulic systems.

Synflex Optimum 3TR8 thermoplastic hydraulic hose



Overview

Meeting SAE 100R8 standards, the Synflex Optimum 3TR8 thermoplastic hydraulic hose is designed for use in material handling equipment, hydraulic tools, and general hydraulic lines where high pressure and low weight is required.

The challenge

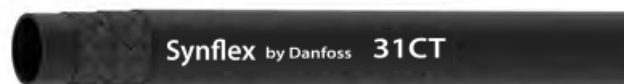
To reduce operational costs, it's important to reduce both the weight of material handling machines and their power requirements whenever possible. Machines that are lighter, more compact, and more efficient have the versatility to take on a wider range of tasks and their lower fuel consumption improves profitability.

The outer diameter and abrasion resistance of the hydraulic hoses in material handling applications like forklifts can also be critical. Outer diameter selection should be in line with sheave width, since a larger outer diameter causes additional wear on the hose that can shorten its life.

Solution benefits

- With pressure rates up to 350 bar and a weight about two-times lower than equivalent wire braided hoses, the 3TR8 can help equipment manufacturers build lighter machines and reduce power requirements.
- Thanks to its two-layer reinforced design and polyurethane cover, the 3TR8 also offers a smaller outer diameter and excellent abrasion resistance for a longer in-application life.

Synflex 31CT thermoplastic hydraulic hose



Overview

The Synflex 31CT thermoplastic hydraulic hose is an ideal solution for telehandler boom applications or aerial lift platforms thanks to its excellent abrasion resistance, low weight, and bonding capabilities.

The challenge

To create more compact, efficient and cost-effective material handling equipment, the size and weight of hoses is critical. Greater weight directly translates into higher fuel consumption.

In demanding applications with high dynamic pressure and vibration, robust hoses are also essential to ensure long-term reliability and leak-free operations.

Solution benefits

- A highly abrasion resistant polyurethane cover increases operational lifetime. Hoses can move on pulleys for long periods without jacket degradation.
- Low hose expansion also enables smooth, precise steering.
- Offers a tight bending radius and can form multi-lines of up to eight hoses for easier and more compact routing.

Synflex Optimum 3TR7 thermoplastic grease line hose



Overview

Meeting SAE 100R7 standards, the Synflex Optimum 3TR7 thermoplastic hydraulic hose is designed for use in various hydraulic applications inside material handling, agriculture, and construction equipment.

The challenge

In certain applications, hose routing can be a critical issue due to the limited space available. Hose flexibility is therefore essential.

Low resistance to abrasion and ozone can also impair performance in application and shorten hose life, ultimately increasing cost of ownership.

Solution benefits

- Thanks to its lightweight design and improved hose cover, the 3TR7 requires 50% less routing force which also reduces the chance of kinking.
- The 3TR7's thermoplastic polyurethane cover also offers excellent resistance to abrasion, UV, and ozone, enabling a longer in-application life.

Waltech tube fittings



Overview

Waltech tube fittings provide a complete solution for a wide range of application challenges. With a 24° cone according to ISO 8434-1 standards, these fittings also support the highest operating pressures up to 800 bar. Guardian Seal plating adds high corrosion resistance too, for a long lifetime in demanding applications.

The challenge

To maximize machine uptime in the most demanding applications, tube fittings need to both withstand high dynamic pressure and offer excellent corrosion resistance. Assembly errors can also cause tube fitting leaks during operation, due to the wrong torque being used, over/under-assembly, and more. Additionally, slower cycle times for tube assemblies increase manufacturing costs.

Solution benefits

- Waltech tube fittings support the highest operating pressures up to 800 bar with a 4:1 safety factor.
- Allows easy dry assembly (i.e., without lubrication) and has defined torque values for all systems, as well as reduced torque variance.
- Guardian Seal coating offers more than 1000 hours resistance to red rust corrosion, confirmed by salt spray testing per ISO 9227.
- Bespoke assembly and forming machines reduce cycle times and complexity in the assembly process to ensure leak-free performance.
- Our broad portfolio is also supplemented by customized fittings (e.g., special jump sizes).

Waltech WalformPlus



Overview

WalformPlus is a robust, reliable, and easy to assemble tube fitting system. It enables safe tube end forming, with a primary elastomeric seal and secondary metal-to-metal sealing. For thin wall tubing, WalformPlus-SR is also available, which includes an additional support ring to enable greater reliability and ease of assembly.

The reshaped tube in WalformPlus eliminates the only possible leak path and prevents the tube from pulling free under excessive pressure or high impulse applications.

The challenge

In the demanding lift pole applications in forklifts, tube fitting systems face both high working pressures and pressure peaks. To ensure reliable, safe, and leak-free operations, the fitting must offer exceptional sealing and the tube must be unable to pull free. Also, since assembly errors are a leading cause of leaks, tube fitting systems must be designed to enable correct assembly.

Solution benefits

- Meets and exceeds DIN EN ISO 8431-1 requirements.
- Primary elastomeric sealing and secondary metal-to-metal sealing ensures leak-free performance.
- Eliminates the only possible leak path and prevents the tube from pulling free by ensuring resistance at the connection point that exceeds the strength of the tube material.
- Enables easy, safe and repeatable assembly due to considerably lower tightening torque, short tightening travel, no turning of the tube during assembly, and a significant torque increase at the end of assembly so overtightening is unmistakable.
- Positive locking between stud and tube guarantees absolute reliability under extreme dynamic loads and eliminates the risk of disconnection.
- Where thick wall tubing is traditionally required, WalformPlus-SR enables higher strength tube materials in thin wall thickness to be used. Thin wall tubing can enable lighter, more compact machine designs that reduce fuel consumption.

Waltech WalringPlus



Overview

Waltech WalringPlus is a two-edge carbon steel cutting ring with additional soft sealing for both possible leak paths. Specifically optimized for thin wall tubing in steel and stainless steel, it's designed to enable easy, repeatable assembly and to prevent the possible causes of leaks for dependable in-application performance.

The challenge

In the demanding lift pole applications in forklifts, tube fitting systems face both high working pressures and pressure peaks. To reduce machine weight and fuel consumption, many material handling OEMs are using thin wall tubing with higher material strength. When assembling cutting ring systems on thin wall tubing, an insert is usually required to prevent the tube collapsing, but this reduces overall flow rates and increases pressure drops. A robust assembly process must also be guaranteed to prevent assembly-related failures in the field.

Solution benefits

- The soft seal of WalringPlus ensures leakages will be prevented if small scratches in the tube or stud occur. The soft seal also prevents "sweating" due to alternating operating temperatures in the application.
- The design offers a clear block-stop-assembly function which provides a feelable and clear torque increase for the operator at the end of assembly and prevents the risk of wrong assembly.
- Through a combination of optimized cutting-edge geometry, block-stop-assembly function, and soft seal, WalringPlus enables safe assembly for very thin wall tubing without the need to use additional insert sleeves.
- The M-R7 cutting ring assembly machine allows easy and safe assembly in a short cycle time. The controlled final assembly process of the M-R7 ensures that the cutting ring is 100% assembled on the tube within a very small tolerance

Waltech Walpro



Overview

The Walpro system is a metric tube fitting that consists of a body, profile ring (cutting ring) and nut. During assembly, the two cutting edges of the profile ring penetrate the tube, creating a safe and reliable hold function and seal.

With controlled final assembly by using the M-R7 cutting ring assembly machine, Waltech offers an optimized assembly process that increases quality and reduces assembly time to a minimum.

The challenge

In demanding applications, tube fitting systems must be able to tolerate high vibration and dynamic loads to deliver both top performance and a long service life. Errors in assembly can also result in leakages or a critical failure in application.

Solution benefits

- Meets & exceeds DIN 2353 / ISO 8431-1 requirements.
- Walpro clamps onto the complete length of the cutting ring and therefore has high resistance against vibration and dynamic loads.
- Walpro allows easy and safe assembly due to a significant increase in assembly torque at the end of the assembly process.
- The M-R7 cutting ring assembly machine allows easy and safe assembly in a short cycle time. The controlled final assembly process of the M-R7 ensures that the cutting ring is 100% assembled on the tube within a very small tolerance.
- Available in carbon and stainless steel.

Danfoss Hansen H15000 and IA Series general-purpose interchange couplings



Overview

The Danfoss H15000 and IA series industrial interchange coupling meet the ISO 7241-1 Series A standard. Both series feature a rugged ball latch mechanism with self-sealing poppet valves.

The challenge

When connecting attachments to a forklift's forks, couplings according to ISO7241-1 are often required. To avoid the need for additional adapters, specific end connections are required.

Solution benefits

- The ISO-A portfolio includes standard products with a wide range of sizes and end connections.
- ½" size available in push-pull version (double acting sleeve, bulkhead-mounted).
- Performance exceeds market demands.

Danfoss steel adapters



Overview

Designed for applications with very high operating pressures, our steel adapter range features excellent corrosion resistance and offers a wide variety of different terminal ends and configurations.

The challenge

Several manufacturers of forklifts or aerial lift platforms use components with ORFS, BSP, and JIC terminal ends which require adapters to connect. For demanding applications in material handling platforms, steel adapters must also be designed to withstand higher operating pressures that exceed international standards and provide excellent corrosion resistance.

Solution benefits

- We offer a wide range of steel adapters with ORFS, BSP, JIC, and other terminal ends.
- Rated to withstand up to 125% higher operating pressures than SAE standards.
- All our steel adapters provide high corrosion resistance of 720+ hours in red rust environments.

The Railway Platform

Countless trains, trams, and subways run around the clock every day—transporting passengers and goods of all kinds from one place to another.

Rail transport is environmentally friendly and enables long distances to be covered quickly, efficiently, and at high speeds. Mountains, rivers, and even straits can be overcome with the help of tunnels and bridges. In many major cities, metro trains run deep underground, offering travelers and commuters a fast and reliable route to their desired destination.

There are a wide variety of pneumatic and hydraulic applications in modern trains. Compressed air and hydraulics are vital to the operation of everything from automatic doors and air suspension, to service and parking brakes, air conditioning, and sanitary applications.

In all of this, passenger safety is paramount. Every component must be engineered for possible hazards, with fire protection being one of the most critical considerations. Combustible components, regardless of their function or composition, must meet the key fire protection standard EN45545-2. This includes hoses and hose lines of all kinds. In particular, flammability by oxygen content, smoke density, and smoke toxicity are evaluated.

However, a distinction is drawn between both the type of train and whether it travels overland, through tunnels, or underground. Accordingly, trains are classified in Hazard Levels from 1 (low requirements) to 3 (high requirements), while components face different standards if they are inside (R22) or outside (R23) the passenger compartment.

Engine / Fuel Lines

Danfoss EC045 textile reinforced hydraulic hose 2TE (EN854)

Heating / Cooling Circuit

Danfoss EC045 textile reinforced hydraulic hose 2TE (EN854)

Danfoss EC060 textile reinforced hydraulic hose 3TE (EN854)

Danfoss Aluminum Coupling 4DB

Danfoss Flexmaster

Cable Protection

Danfoss EC045 textile reinforced hydraulic hose 2TE (EN854)

Air Conditioning

Danfoss FC800 EverCool air conditioning large bore hose

Danfoss Hansen 5400 AD Coupling low air inclusion quick disconnect coupling

Pneumatic Door System

Danfoss EC045 textile reinforced hydraulic hose 2TE (EN854)

Pneumatic Pantograph Control Systems

Danfoss EC045 textile reinforced hydraulic hose 2TE (EN854)

Condensate Lines

Danfoss EC045 textile reinforced hydraulic hose 2TE (EN854)

Danfoss EC060 textile reinforced hydraulic hose 3TE (EN854)

Rain Water / Waste Water

Danfoss EC190 SAE 100R4 suction hose for railway application

Air Brake Applications

Danfoss EC045 textile reinforced hydraulic hose 2TE (EN854)

Danfoss EC060 textile reinforced hydraulic hose 3TE (EN854)

Waltech WalformPlus-SR

Waltech WalringPlus (cutting ring with soft seals)

Waltech Walpro (metallic sealing cutting ring)

Danfoss EC155 rail air break hose (EN15807)

Hydraulic brake circuit

Danfoss EC112 one wire braided hydraulic hose 1SC (EN857)

Danfoss EC212 two wire braided hydraulic hose 2SC (EN857)

Danfoss Hansen Flat Face (FF) quick disconnect couplings

Wheel Flange Lubrication

Danfoss EC045 textile reinforced hydraulic hose 2TE (EN854)

Fill and Drain

Danfoss Hansen HW15000 quick disconnect coupling

Sanding Lines

Danfoss EC045 textile reinforced hydraulic hose 2TE (EN854)

Danfoss EC060 textile reinforced hydraulic hose 3TE (EN854)

Train Converters

Danfoss Hansen Aluminum Flat Face ADB coupling

Hydraulic Applications

Danfoss EC112 one wire braided hydraulic hose 1SC (EN857)

Danfoss EC212 two wire braided hydraulic hose 2SC (EN857)

Waltech WalformPlus/WalformPlus-SR

WalringPlus / Walpro

Danfoss steel adapters

Danfoss Hansen Flat Face (FF) quick disconnect couplings

Aeroquip STC connector

Danfoss EC045 textile reinforced EN854 2TE hydraulic hose



Overview

The Danfoss EC045 textile reinforced EN854 2TE hydraulic hose matches the performance of a traditional 2TE textile hose, but also meets the EN45545-2 HL2 railway standard for internal applications (R22) and the HL3 standard for external applications (R23).

The challenge

Several rolling stock and train applications are powered by compressed air. Typically, standard shoe or disk brake systems rely on pneumatic cylinders. Additionally, retarder systems and parking brakes, as well as door and suspension systems, operate using compressed air.

The hoses in these systems must withstand demanding conditions and prevent damage from gas permeation to ensure a long in-application life.

Solution benefits

- EC045 is a low-pressure hose developed for air brake systems up to an operational pressure of 10-15 bar.
- Usually installed between the bogie and the undercarriage, these hoses are flexible enough to compensate for relative movements and torsion.
- EC045 is also available with a pin-pricked hose cover to permit the escape of air and trapped gases that can otherwise permeate the tube and build up in the reinforcement area, causing blistering of the cover.

Danfoss EC060 textile reinforced EN854 3TE hydraulic hose



Overview

The Danfoss EC060 textile reinforced hydraulic hose 3TE (EN854) is an enhanced version of the 2TE hose, supporting a higher operational pressure. Thanks to a design focus on robust construction, the hose is qualified according to EN45545-2 HL2 for internal applications (R22) and the HL3 standard for external applications (R23).

The challenge

Some railway compressed air applications require highly flexible hoses which can withstand permanent vibration, relative movement, torsion, and other demanding environmental factors.

This is particularly important for hoses on underground trains. To ensure a long service life, the hoses in these applications must offer high durability and extreme reliability.

Solution benefits

- With its robust 2-layer textile construction, the EC060 guarantees dependable operations. It is the first choice for challenging and demanding applications in the compressed air segment.
- In particular, the hose boasts outstanding torsion performance and fulfils enhanced safety requirements.

Danfoss EC112, EC212 EN857 and EC109, EC209 EN853 one and two wire braided hoses



Overview

Danfoss EC112 (1SC) and EC212 (2SC) according EN857 and EC109 (1SN) and EC209 (2SN) according EN853 are one and two-wire braided hoses which provide a competitive solution for all kinds of standard hydraulic applications, as well as EN45545-2 compliance.

The challenge

Track-laying and railway maintenance machines use hydraulic systems to power many different repair functions. Track servicing trains are full of cylinders, pumps, valves, and motors which need to be connected by hoses that meet the EN45545 standard.

Solution benefits

- Our one and two-wire braided railway hose portfolio meets EN857/EN853 hydraulic standards, as well as vital EN45545 HL3 safety requirements.
- All hose types are also qualified with non-skive TTC fittings for easier and quicker assembly, as well as safe and leak-free connections. A variety of different fitting terminal ends are available now.

Danfoss EC190 textil and steel wire reinforced suction hose



Overview

The Danfoss EC190 SAE 100R4 is a textile and steel helix wire reinforced suction hose for railway applications. The hose construction also includes an anti-static copper strand to remove electrostatic charge.

The challenge

Drainage and wastewater lines are needed in all train carriages and wagons to convey fluids to tanks or the ground.

Solution benefits

- The EC190 hose meets EN45545 HL2 R22/ R23 standards and is ideal for classic suction applications involving petroleum, lubricating oils, fuel, gasoline, air, water, and water glycol. The hose is also well-suited to the typical demands of rolling stock wastewater or drainage applications.
- The hose is available from sizes -12 to -48, with OTC fitting availability up to size -32 only.
- It is suitable for conveying hydraulic oil up to 125°C, air to 75°C, water to 85°C, and water glycol up to 95°C.

Danfoss EC155 four spiral textile cord reinforced air brake hose



Overview

Danfoss EC155 is a 4 spiral textile cord reinforced air brake hose specifically designed to connect the air brake systems of carriages by using half couplings according EN15807:2011. Its construction enables an extremely low bend radius and high kink resistance. EC155 meets the UIC830-1 standard, as well as EN45545-2 R23 HL2, making it unique on the market.

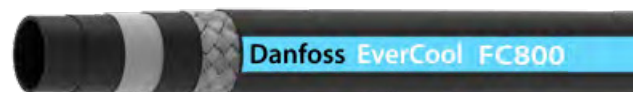
The challenge

In railway air brake lines, hose assemblies on either end of a wagon carry compressed air from the compressor unit through all the carriages. These hose lines must meet the UIC830-1 and EN15807 standards, as well as offer high flexibility, a low bend radius, excellent kink resistance, and a strong tolerance for oil, ozone, UV, and other environmental factors.

Solution benefits

- EC155 meets all the requirements of wagon-to-wagon air brake systems and is available in all the common sizes required.
- Tough construction based on 4 spiral layers provides maximum kink resistance and an extremely low bend radius.
- As well as boasting robust design, the hose also meets UIC830-1, EN15807, and EN45545 standards.

Danfoss FC800 EverCool air conditioning large bore hose



Overview

The Danfoss FC800 EverCool air conditioning large bore hose offers outstanding performance in terms of permeation, moisture ingress, kink resistance, and bend radius.

The challenge

The air conditioning systems in large passenger train carriages require a lot of cooling power. To conduct this power through the to AC circuit, large bore AC hoses are used to connect equipment. High-performance hoses are essential for systems to run efficiently.

Easy installation, as well as hose properties like low permeation, low moisture ingress, low bend radius, and high kink resistance, are essential to reduce energy consumption and refrigeration fluid loss—enabling a longer system life.

Solution benefits

- The FC800 hose is the perfect solution for rolling stock applications.
- The hose offers unique performance in the global market because of its unusual construction, which includes a polyamide foil barrier that reduces permeation to 0.5kg/m²/yr and class 1 moisture ingress.
- Thanks to its wire braid reinforcement, the hose is also extremely kink resistant and has a very low bend radius.
- Available in sizes -12, -16, -20 and -24, the hose ensures sufficient cooling power is available at the vaporizer.
- It's also compatible with all common refrigerants, including R1234yf, and approved for use with a wide range of oils.

Waltech tube fittings



Overview

Waltech Tube Fitting Systems offer a complete solution for any tube fittings with a 24° cone according to ISO 8434-1. With the highest operating pressures up to 800 bar and Guardian Seal plating for high corrosion resistance, Waltech tube fittings provide a long lifetime in demanding applications. The portfolio is available in carbon steel and stainless steel.

The challenge

The tube fitting assembly process is a potential cause of in-application leaks due to variation in torque values and incorrect assembly. Increased cycle times for tube assemblies are also driving up manufacturing costs. Additionally, in demanding railway applications, tube fittings need to be especially resistant to both vibration and corrosion.

Solution benefits

- Waltech tube fittings offer the highest operating pressures, up to 800 bar with safety factor 4, and can also withstand high vibration loads in application.
- Guardian Seal coating offers more than 1000 hours resistance to red rust corrosion, after salt spray testing according to ISO 9227. As an alternative, the complete portfolio is also available in stainless steel.
- To ensure quicker assembly and fewer errors, Waltech tube fittings allow easy assembly without lubrication for nuts (dry assembly), defined torque values for all systems, and reduced torque variance.
- Custom-made assembly machines can further reduce cycle times and complexity, enabling the fastest and most reliable cutting ring assembly and tube end forming (Walform).

Waltech WalformPlus



Overview

Waltech WalformPlus is the leading and most popular tube end cold-forming system for metric tube fittings in the world.

For very thin wall tubing in steel and stainless steel, the forming system Waltech WalformPlus-SR with an additional support ring can be used, which combines high reliability with ease of assembly.

The challenge

In demanding railway applications with high vibration, a tube connection system needs to provide rock-solid reliability and long-lasting leak-free operations.

Incorrect assembly can lead to leakages that can cause early failures in the application and equipment downtime. In railway applications where different tube sizes and materials are used, any forming system also needs to be suitable for thin wall stainless steel tubes.

Solution benefits

- Waltech WalformPlus-SR is a tube end forming system optimized for thin wall tubing. By using a support ring as part of the forming system, carbon steel or stainless tube materials in very thin wall thickness can be used.
- WalformPlus-SR is engineered to ensure lasting reliability even under loads with dynamic pressure and vibration.
- With the Walform forming machine, a robust and safe assembly process can also be guaranteed.

Waltech WalringPlus



Overview

Waltech WalringPlus is a two-edge carbon steel cutting ring with additional soft sealing for both possible leak paths. Specifically optimized for thin wall tubing in steel and stainless steel, it's designed to enable easy, repeatable assembly and to prevent the possible causes of leaks for dependable in-application performance.

The challenge

Demanding and high vibration railway applications can lead to leakages within tube assemblies, causing equipment downtime and unhappy end customers.

Incorrect tube fitting assembly can also lead to leakages that can cause early failures in application and unplanned maintenance.

In railway applications, very thin tube sizes in carbon steel and stainless steel are also used that require a tube insert when assembling with a cutting ring that leads to higher assembly costs and reduced flow rates.

Solution benefits

- The soft seal of WalringPlus ensures leakages will be prevented if small scratches in the tube or stud occur. Furthermore, the soft seal prevents "sweating" due to alternating operating temperatures in the application.
- The design also offers a clear block-stop-assembly function which provides a feelable and clear torque increase for the operator at the end of assembly and prevents the risk of wrong assembly.
- Through a combination of optimized cutting-edge geometry, block-stop-assembly function, and soft sealing, WalringPlus also allows safe assembly for very thin wall tubing without the need to use additional insert sleeves.
- WalringPlus suited to carbon steel tubing and can be qualified for specific stainless steel tube materials upon request.

Waltech Walpro



Overview

The Walpro system is a metric tube fitting that consists of a body, profile ring (cutting ring), and nut. During assembly, the two cutting edges of the profile ring penetrate the tube, creating a safe and reliable hold function and seal. With controlled final assembly using the M-R7 cutting ring machine, Waltech offers an optimized assembly process that increases quality and reduces assembly time to a minimum.

The challenge

Demanding and high vibration railway applications can lead to leakages within tube assemblies, causing equipment downtime and unhappy end customers.

Incorrect tube fitting assembly can also lead to leakages that can cause early failures in application and unplanned maintenance.

Solution benefits

- Available in carbon and stainless steel, the Walpro system meets and exceeds DIN 2353 / ISO 8431-1 requirements.
- It clamps along the complete length of the cutting ring and therefore offers a high resistance against vibration and dynamic loads.
- Walpro also allows easy and safe assembly due to significant increase of assembly torque at the end of the assembly process.
- The M-R7 cutting ring assembly machine also enables easy and safe assembly in a short cycle time. The controlled final assembly process of the M-R7 ensures that the cutting ring is 100% assembled on the tube within a very small tolerance.

RW series



Overview

The RW series is a non-drip dedicated coupling for the hydraulic brake lines on train and tramway bogies. It supports working pressures up to 160 bar and comes in two sizes: 6mm and 9mm. Constructed in stainless steel and equipped with extra seals to protect the locking mechanism against dust and water, these couplings are highly resistant to demanding environments.

The challenge

In railway applications, brake line couplings are exposed to vibration and shocks since they can be assembled directly on brake callipers.

Couplings also need excellent resistance to adverse environmental conditions like dust, water, or flying ballast. Additionally, to maintain system efficiency, no air can be allowed to enter hydraulic brake circuits during connection and disconnection.

Solution benefits

- The RW series' stainless-steel construction and double sealing barrier under the sleeve and on the plug protects it against all kinds of environmental challenges.
- A long plug nose supports very easy mechanical guiding, and robust construction enables the couplings to withstand extreme vibration.
- Furthermore, a flat face design and double shut off valve system allows couplings to be connected and disconnected without any entry of air or loss of fluid. This enables fast and safe brake system maintenance.

Danfoss Hansen Flat Face (FF) quick disconnect couplings



Overview

Danfoss Hansen Flat Face (FF) quick disconnect couplings provide greater performance at higher pressures along with higher flow rates. Due to their flat face design, these couplings enable connection and disconnection without spillage or air inclusion.

The challenge

In railway applications, hydraulic lines face both high pressures and high vibration environments. This creates a challenge for hydraulic couplings, which must be robust enough to ensure reliable operations.

Additionally, the pressure drop caused by the inner diameter of hydraulic couplings can reduce system efficiency. If adapters are required to connect couplings, this can also create the risk of additional leak points.

Solution benefits

- The FF series exceeds ISO 16028 standards, with 60% higher working pressures up to 400 bar.
- It is also qualified for vibration resistance according to EN61373, offering high reliability in the most demanding railway applications.
- Up to 74% higher flow rates compared to the ISO 16028 standard reduces pressure drop and increases efficiency.
- Exceptional corrosion resistance of up to 1000 hours due to our environmentally-friendly nickel-free coating.
- Can connect under residual pressure up to 350 bar.
- Multiple direct porting solutions are possible, including integrated elbows for a compact and lean fluid conveyance line.

Danfoss Hansen ADB Flat Face coupling



Overview

The Danfoss Hansen aluminum flat face ADB series is a full range of couplings for liquid cooling applications (up to 25 bar) which allow no loss of fluid during disconnection, and no air inclusion during connection. Thanks to their aluminum construction, the couplings are both light weight and highly resistant to environmental conditions.

The challenge

Railway applications are a challenging high vibration environment that impacts all components in the liquid cooling circuit. However, when cooling couplings are used in the electrical cabinets of locomotives, no leaks or droplets of water are acceptable.

Additionally, a high pressure drop due to a cooling system coupling negatively impacts overall system efficiency. Certain cooling fluid media can also reduce the lifetime of cooling couplings.

Solution benefits

- ADB couplings offer a flat face design that avoids any kind of spillage in application or during connection.
- A railway-specific ADB version is qualified for vibration resistance according to EN61373, offering high reliability in the most demanding railway applications.
- With an optimized internal design, ADB couplings offer 29% to 62% higher flow compared to ISO 16028 requirements - enabling high cooling system efficiency.
- Aluminum construction offers high corrosion resistance, as well as high endurance against mechanical load and environmental impacts - lowering maintenance costs.

Railway Quick Disconnect Coupling



Overview

Railway Quick Disconnect Coupling are specifically designed for the railway market, in particular for the filling of diesel locomotives with water glycol engine coolant.

The challenge

Water glycol engine coolant can corrode couplings, shortening their lifetime in application and creating operational downtime. When filling diesel locomotives with water glycol, there is also a risk of spillage if the wrong couplings are used.

Solution benefits

- Using stainless steel for the plug, and brass or stainless steel for the socket, HW15000 quick disconnect couplings provide excellent resistance to different fluid media.
- To avoid the risk of spillage, the coupling's valve opens in two stages and a socket lock prevents accidental disconnection.

R4000 Series steel check valves



Overview

Useful in a wide range of hydraulic applications, R4000 series check valves are designed to allow fluid flow in only one direction, or to limit the line to the cracking pressure. Standard cracking pressures are 0.5 and 1 bar, but alternatives can be offered upon request.

The challenge

With varied railway applications using different fluid media and operating pressures, train manufacturers need a wide range of check valve configurations.

High operating pressures and high vibration operating environments also demand a robust check valve design that must still come at a competitive price point.

Solution benefits

- To support a broad range of different railway applications, R4000 series check valves are available in sizes from 1/8" to 2", multiple body materials (steel, brass, stainless steel), and seal materials (NBR, FKM, EPDM).
- With the highest operating pressures up to 700 bar, these check valves can be used in very demanding applications.
- A wide range of cracking pressures also allows the check valves to meet specific application requirements.
- A one-piece body design allows for competitive pricing without compromising on technical performance.

Danfoss Hansen 5400 AD Coupling



Overview

Danfoss Hansen 5400 series quick disconnect couplings are leakproof line connectors which can be disconnected and connected as often as desired without losing refrigerant or allowing the entry of air.

The challenge

When installing train air conditioning lines, it's often necessary to assemble and refill sub systems. Doing so requires a quick disconnect coupling that can withstand vacuum and refrigerant gas pressure when disconnected.

Once assembled on the train, the subsystems then need to be connected under pressure without a loss of refrigerant gas or the entry of air.

In addition, long-term leak-free performance is essential to maintain air conditioning system efficiency.

Solution benefits

- The 5400 Series coupling is specifically designed to meet the requirements of AC circuits.
- Tubular valve construction prevents fluid loss, ingress of dirt, and air inclusion during coupling. This reliably protects the AC system from failures.
- The thread-together design allows for connection and disconnection against pressure as many times as desired, while Guardian Seal plating offers more than 1000 hours red rust corrosion resistance.
- Additionally, brazed or threaded end connections are available on tubing or hoses for added installation versatility. A lock washer and jam nut are also included for optional bulkhead mounting.

Danfoss Hansen Q9000 series quick disconnect coupling



Overview

Danfoss Hansen Q9000 series is a brake away coupling range for hydraulic braking systems.

The challenge

In railway applications, breaking couplings must ensure a reliable seal against air ingress during connection and disconnection to maintain the system's operational efficiency and reliable performance.

Solution benefits

- The Quick Disconnect Q9000 series features a pull-to-connect double shut-off valve which ensures minimal air inclusion and fluid loss.
- Developed in accordance with ISO 5676 and NFU 16-006 standards, the couplings are also constructed in zinc trivalent plated steel with standard NBR seals to help ensure robust performance.

Flexmaster flexible connector system



Overview

The Flexmaster system creates leak-proof connections between two tube ends in low pressure applications. The system is designed to allow an alignment error of $\pm 2^\circ$ between tubes.

The challenge

Secure and leak-free connections are essential in even low-pressure railway applications. However, when joining two tubes with a standard connection system, no misalignment between the tubes can be tolerated. Standard tube connection systems also have limited availability of different sizes and configurations.

Solution benefits

- Available in wide range of sizes up to 127mm, the Flexmaster system can be used in many different low-pressure applications.
- The ability to solve tube alignment errors of $\pm 2^\circ$ also allows for greater design flexibility.

Danfoss steel adapters



Overview

Designed for applications with high operating pressures, the Danfoss steel adapter range offers a wide variety of different terminal ends and configurations. These steel adapters also boast high levels of corrosion resistance.

The challenge

Railway applications often need different steel adapter configurations with ORFS, BSP and JIC terminal ends.

Steel adapters must also withstand high levels of dynamic pressure and vibration, as well as provide excellent corrosion resistance, to enable a long lifetime in demanding railway applications.

Solution benefits

- We offer a wide range of steel adapters with ORFS, BSP, JIC and other terminal ends.
- These steel adapters are rated to withstand up to 125% higher operating pressure than SAE standards, while maintaining a 4:1 safety factor.
- Our steel adapter range also provides high corrosion resistance of a minimum of 720 hours against red rust corrosion.

Aeroquip STC connectors



Overview

Aeroquip STC (Snap-To-Connect) connectors are designed to be repeatedly connected and disconnected without replacing the O-Ring and Back-Up Ring, unless a leak or damage is observed. Connectors are available from sizes -6 to -16, with operational pressures up to 412 bar. Key applications include hydraulics, power steering, power brakes, turbochargers, and fuel injection systems, as well as air conditioning and refrigeration.

The challenge

As hydraulic machinery becomes more compact and powerful, hoses need to be connected more closely together in ever tighter spaces. As a result, installation is becoming more complex and time-consuming, requiring assembly to follow a set order. While it's essential not to twist or damage hoses during installation, assembly also needs to become faster to save time and money.

Solution benefits

- Enables fast and reliable connections to be made one-handed, with no assembly tools.
- Eliminates cross-threading, over or under torquing, and hose twisting. Installs easily in confined areas.
- Virtually zero-leak performance per SAE J1176.
- Direct porting eliminates adapters to maximize cost savings.
- Resists external contamination.
- Easy disconnection with release tool.

The Wind Turbine Platform

For thousands of years, people have used windmills to pump water or to grind grain. Today's wind turbines follow the same fundamental principle, converting the wind's kinetic energy into rotary mechanical energy, but this is then transformed into electricity via a generator.

To produce more power, wind turbine designs are increasing in size—with some now exceeding 250 meters in height, 100 meters in blade length, and 10 MW in terms of power production. Worldwide, wind farms generate hundreds of gigawatts of power, and this is only increasing year-on-year as the crucial energy transition from fossil fuels to renewables gathers pace. Fluid conveyance solutions are vital for both wind turbine power transmission and cooling systems, such as the gearbox, brakes, electrical inverters, blade pitch, yaw control, and more. These products must be compact, flexible, and light enough to fit inside cramped nacelles already packed with equipment. They must also be robust and reliable enough to ensure the wind turbine can continue providing critical power, as well as avoid costly downtime and maintenance.

Generator and / gear box cooling systems



Winner WH004 / WH006 textile-reinforced hydraulic hose



Danfoss large brass hydraulic (12HK) quick disconnect couplings

Hydraulic Power Unit



Aeroquip GH681 one-wire braided hydraulic hose

Pitch control



Danfoss high pressure (2UH) quick disconnect couplings



Winner EC115 one-wire braided hose, Winner EC215 two-wire braided hose

Inverters



Danfoss Hansen Aluminum Flat Face ADB coupling



Boston EHW027 channeled hot water suction & discharge hose and Boston EHW026 flat corrugated hot water suction & discharge hose

Hydraulic Power Unit



Synflex Optimum 3TR7N thermoplastic hydraulic hose



Waltech WalringPlus tube connectors



Waltech Walform tube connectors



Aeroquip GH425 four spiral hose



Waltech tube fittings

Winner EC115 one-wire braided hose, Winner EC215 two-wire braided hose



Overview

Winner EC115 (1SC) and EC215 (2SC) are one and two-wire braided hydraulic hoses which provide a competitive solution for all kinds of standard hydraulic applications in combination with Winner two-piece hose fittings.

The challenge

Wind turbines require a competitive hose assembly solution. Tight installation space also means flexible hoses are needed, especially for large return lines.

Leak-free connections are equally essential. Any hoses and fittings must be technically qualified and approved by the supplier.

Solution benefits

- Winner 1SC and 2SC braided hoses EC115 and EC215 both meet industry standards and are very cost-effective, as are their optional fittings.
- Winner two-piece crimp fittings are non-skive for easier and quicker assembly, as well as safe and leak-free connections. One nipple part number can also be used for both EC115 and EC215 standard hoses just by utilizing a different socket.
- With stock available locally in Europe, short lead-times are possible for a wide variety of fitting terminal ends.

Boston EHW027 channeled hot water suction & discharge and Boston EHW026 flat corrugated hot water suction & discharge hoses



Overview

Boston EHW027 channeled hot water suction & discharge and Boston EHW026 flat corrugated hot water suction & discharge hoses are designed for cooling applications. With an EPDM tube and cover, these hoses can handle high temperatures up to 125°C. Channel or flat corrugated covers also make these hoses extremely flexible—enabling easy routing.

The challenge

Hose flexibility is vital to enable easier cooling system installation in wind turbine applications where space is always tight. High temperature resistance is also important to ensure a long in-application lifetime and low maintenance costs.

Solution benefits

- Extremely flexible and easy to route (EHW027 is 40% more flexible than a standard smooth cover hose).
- An EPDM tube and cover ensures resistance to high temperatures and enables a long life in application.

Synflex Optimum 3TR7N thermoplastic hydraulic hose



Overview

The Synflex Optimum thermoplastic hydraulic 3TR7N hose meets and exceeds SAE 100R7 requirements. It is a non-conductive hose compliant with ANSI92.2. Designed with an innovative inner tube compound, it offers improved flexibility and chemical resistance. A polyurethane outer cover provides outstanding abrasion resistance and non-conductive properties.

The challenge

In wind turbine applications where equipment operates close to high-voltage power lines, there is a risk of electrical shock. This means non-conductive hydraulic hoses must be used to ensure safety. Hose flexibility and high abrasion resistance are also needed to ensure a long in-application lifetime.

Solution benefits

- A non-conductive cover makes this hose an ideal choice for applications where the risk of electrical shock exists.
- A non-stick cover reduces the required routing force by 50% and helps enable easier installation.
- A highly abrasion resistant cover protects the hose, increases in application lifetime, and lowers cost of ownership.

Winner WH004 hydraulic suction and return hose



Overview

Winner WH004 (R4) is a textile reinforced hydraulic suction hose which also includes an additional helical steel wire to prevent collapse.

It provides a competitive solution for hydraulic suction and return line applications in combination with Winner two-piece hose fittings.

The challenge

Wind turbine manufacturers require a cost-effective and reliable hose assembly solution for various low-pressure hydraulic applications—including pressure, return, and suction lines.

Since maintenance costs are high for wind turbines, leak-free hose and fitting connections are also essential. The lines must also be flexible and low-weight to ensure efficient equipment installation and operation.

Solution benefits

- Winner WH004 (R4) textile-braided suction hose, along with its optional fittings, is a cost-effective solution that meets industry standards.
- Offers the advantage of high flexibility in even large hose sizes, which is particularly useful for return lines.
- Winner two-piece crimp fittings are non-skive for easier and quicker assembly, as well as safe and leak-free connections. The same nipple part number for wire braided standard hoses can also be used for these hoses, just by utilizing a different socket.
- With stock available locally in Europe, short lead-times are possible for a wide variety of fitting terminal ends.

Aeroquip® GH681 one-wire braided hose



Overview

Aeroquip GH681 high performing one-wire braided hose is qualified to one million impulse cycles and exceeds 1SC pressure ratings, making it useful for a wide variety of mobile machinery applications.

The challenge

Since maintenance costs are high for wind turbines, leak-free hose and fitting connections are essential. Both hoses and fittings must provide reliable, long-term performance, which demands enhanced corrosion resistance for steel parts.

Tight space constraints are also a major factor in component selection. Lines must be flexible and low-weight to ensure efficient equipment installation and operation.

Solution benefits

- Aeroquip GH681 has an operating temperature rating up to 126°C (260°F).
- Suited to a broad range of hydraulic systems where a long lifetime of 1 million cycles is required.
- Flexible and easy to route in tight spaces.
- DURA-TUFF cover provides additional abrasion resistance to minimize hydraulic hose failures.
- Both crimp and reusable fittings are offered with DURA-KOTE plating for superior corrosion protection (up to 1000 hours red rust protection).

Aeroquip GH425 four-wire spiral hose



Overview

Aeroquip GH425 is a four-spiral hydraulic hose exceeding the performance requirements of EN856 4SP for higher pressure hydraulic applications.

The challenge

A reliable hose assembly solution is needed for the high-pressure hydraulic applications inside wind turbines.

A leak-free hose and fitting connection is essential and must be technically qualified and approved by the supplier.

Both hoses and fittings must provide reliable performance, including enhanced corrosion resistance for steel parts.

Solution benefits

- Aeroquip GH425 is a reliable and robust 4SP spiral hose for demanding high-pressure applications.
- DURA-TUFF cover provides additional abrasion resistance to minimize hydraulic hose failures.
- A very highly abrasion resistant BRUISER cover is also available.
- One-piece and non-skive type fittings are offered with DURA-KOTE plating for superior corrosion protection (up to 1000 hours red rust protection).

Waltech WalformPlus



Overview

Waltech WalformPlus is a robust, reliable, and easy to assemble ISO 8434-1 metric tube fitting system. It enables safe tube end forming, with a primary elastomeric seal and secondary metal-to-metal sealing. For thin wall tubing, WalformPlus-SR is also available, which includes an additional support ring to enable greater reliability and ease of assembly.

The reshaped tube in WalformPlus eliminates the only possible leak path and prevents the tube from pulling free under excessive pressure or high impulse applications.

The challenge

In wind turbines, the mounted tube is exposed to strong forces that can cause it to pull free from the tube assembly with catastrophic results. Therefore, this connection must be incredibly secure to ensure both safety and reliable operation.

Incorrect tube assembly, such as applying too much torque during final assembly, can also lead to in-application failures that result in leaks and costly equipment downtime.

Solution benefits

- WalformPlus is approved for safety-critical applications where cutting rings are not permitted.
- WalformPlus can withstand the highest axial forces without the risk of pulling free, with higher strength at the connection point than the tube material itself.
- Redundancy built-in, with both elastomeric and metal-on-metal sealing to eliminate leakages.
- Reduces assembly time and cost and enables safe, reliable and easy assembly.
- With the WalformPlus machine, a robust and safe assembly process can be guaranteed.

Waltech WalringPlus



Overview

Waltech WalringPlus is a two-edge carbon steel cutting ring with additional soft sealing for both possible leak paths. Specifically optimized for thin wall tubing in steel and stainless steel, it's designed to enable easy, repeatable assembly and to prevent the possible causes of leaks for dependable in-application performance.

The challenge

Leaks in wind turbine hydraulic systems can cause costly equipment downtime and safety issues. Incorrect tube assembly, such as applying too much torque during final assembly, is a leading cause of these problems.

Additionally, if very thin wall tubing is used in wind turbine applications, it traditionally requires the use of a tube insert during assembly with a cutting ring. This leads to higher costs and reduced flow rates.

Solution benefits

- The soft seal of WalringPlus ensures leaks will be prevented in the event of small scratches in the tube or stud. Furthermore, the soft seal prevents "sweating" due to varying operating temperatures in application.
- The design offers a clear block-stop-assembly function which provides a feelable torque increase for the operator at the end of assembly and prevents the risk of incorrect assembly
- A combination of optimized cutting-edge geometry, a block-stop-assembly function, and soft sealing means WalringPlus also enables safe assembly for very thin wall tubing without the need to use additional insert sleeves.
- WalringPlus is qualified for carbon steel tubes and can be qualified upon request for specific stainless steel tube materials.

Waltech tube fittings



Overview

Waltech tube fittings offer a complete solution for any tube fittings with 24° cone according to ISO8434-1.

With the highest operating pressures up to 800 bar and Guardian Seal plating for excellent corrosion resistance, Waltech tube fittings provide a long lifetime in demanding applications.

The challenge

To maximize uptime in the most demanding wind turbine applications, tube fittings need to withstand high dynamic pressure and to resist corrosion that can reduce the lifetime of components and increase maintenance costs.

Assembly errors can also cause tube fitting leaks during operation, due to the wrong torque being used, over/under-assembly, and more. Additionally, slower cycle times for tube assemblies increase manufacturing costs.

Solution benefits

- Waltech tube fittings support the highest operating pressures up to 800 bar with a 4:1 safety factor.
- Allows easy dry assembly (i.e., without lubrication) and has defined torque values for all systems, as well as reduced torque variance.
- Guardian Seal coating offers more than 1000 hours resistance to red rust corrosion, confirmed by salt spray testing per ISO 9227.
- Bespoke assembly and forming machines reduce cycle times and complexity in the assembly process to ensure leak-free performance.
- Our broad portfolio is also supplemented by customized fittings (e.g., special jump sizes).

Danfoss HK series interchange couplings



Overview

Danfoss HK series sets the industry standard for ISO-7241-1B general purpose industrial interchange couplings. The HK series features a rugged ball latch mechanism with automatic self-sealing poppet valves in a wide array of port configurations and body/seal materials, as well as multiple valved and non-valved configurations.

The challenge

Wind turbines often use liquid cooling in dusty or corrosive environments where air cooling is not practical. In such cases, cooling fluid transfer couplings must be resistant to saltwater mist.

Additionally, the high flow requirements in this application demand a large coupling size to avoid high pressure drops and a reduction in overall efficiency.

Solution benefits

- The Danfoss B12HK coupling series according to ISO 7241-1B is suited to gear box heat exchanger connections in wind turbines.
- A 1½" body size ensures a high flow rate in liquid cooling circuits that enables a low pressure drop and increased efficiency.
- Constructed in brass, the B12HK series is both cost-effective and suited to the harsh salt mist environment in off-shore wind farms.

Danfoss Hansen ADB Flat Face coupling



Overview

The Danfoss Hansen Aluminium Flat Face ADB coupling series is a full range of couplings for liquid cooling applications up to 25 bar. It ensures no loss of fluid during disconnection, and no entry of air during connection. The aluminium design is light weight and boasts excellent durability in harsh environmental conditions.

The challenge

In wind turbines, only limited space is available for the connection of liquid cooling lines. Additionally, no water spillage is acceptable. If any type of leak occurs, the cabinet must be entirely changed because the insulation of components will be compromised.

Any pressure drop due to system couplings also has a negative impact on wind turbine efficiency. Additionally, couplings must offer high corrosion resistance against water glycol media, as well as saltwater mist, since maintenance in wind turbine nacelles is very costly.

Solution benefits

- A specifically designed short version of the ADB series has been created to fit inside wind turbine cabinets.
- The ADB coupling offers a flat face design that avoids any kind of spillage during connection or in application.
- With an optimized internal design, the ADB coupling offers high flow rates and a low pressure drop—enabling high cooling system efficiency.
- Construction in aluminum offers high corrosion resistance, as well as excellent durability under high mechanical loads and harsh environmental conditions. This reduces maintenance costs.

Danfoss high pressure 2UH series quick disconnect ball latch coupling



Overview

Danfoss high pressure 2UH series quick disconnect ball latch coupling is reaching up to 14500 psi or 1000 bar such as bolt tensioning.

The challenge

The bolt tensioning applications in wind turbines operate at very high pressures. As such, couplings must be able to withstand extreme pressures for a long period of time.

Couplings also need to be interchangeable with those from other producers in the market to be compliant with existing tools and parts.

Solution benefits

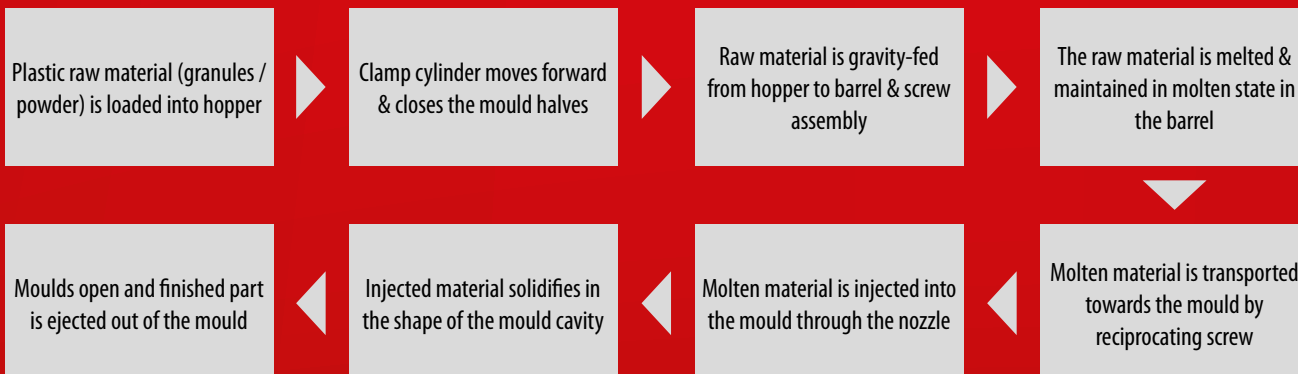
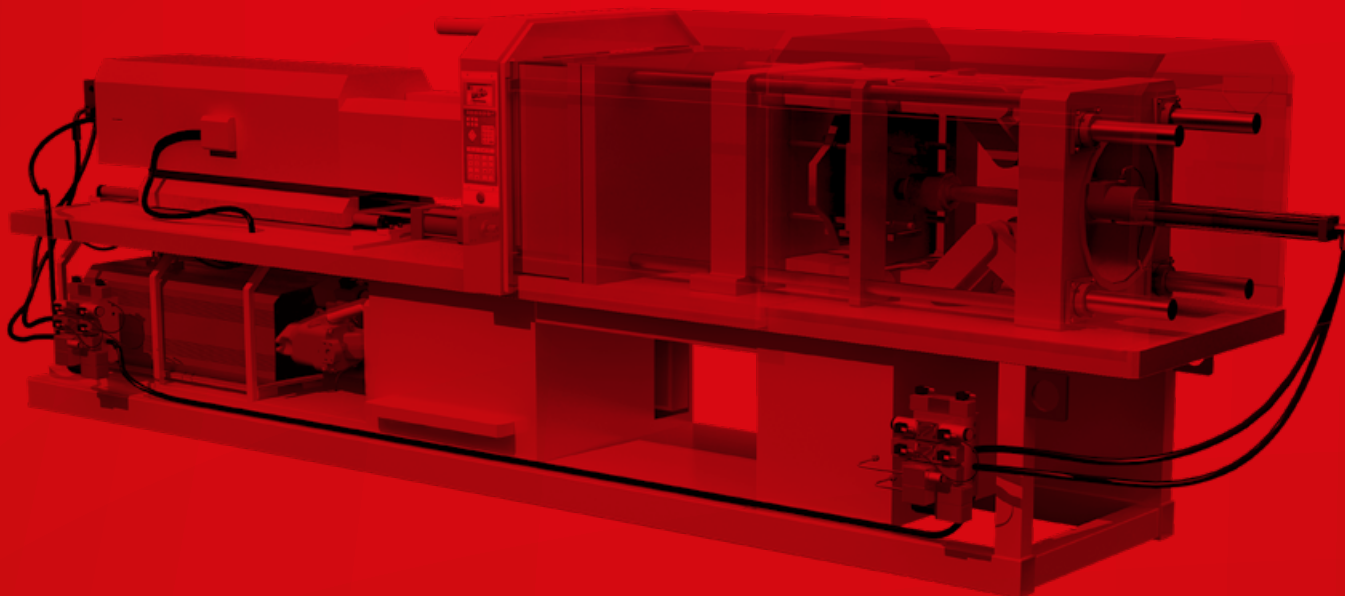
- 2UH series couplings can withstand the highest pressure requirements up to 1000 bar.
- 2UH couplings are interchangeable with those from other producers, enabling existing tools to be used.
- A robust design allows high resistance against mechanical stress, even after a long time in application.

Injection Molding Machine Platform

Plastic injection molding machines (IMMs) operate around-the-clock and so the hydraulics that support them must offer continuous reliability. Modern IMMs use integrated hydraulic systems for pull in, clamp, and ejection operations, with many now also relying on proportional pumps to optimize energy efficiency. As such, IMMs demand top quality hoses and the highest pressure industrial fittings to prevent downtime. Hydraulic leaks and unpredictable pressure drops can disrupt production by slowing cycle speeds, increasing rejects, and creating greater waste. When pressure fluctuates unpredictably due to intermittent failures in hoses, valves, or fittings, sophisticated precision controls can be rendered useless. Even costly investments in advanced pump and

valve technology that enables leak-free operations for up to 10 million cycles can be wiped out if substandard hoses and fittings fail elsewhere. In the worst case, hydraulic failures can even cause mold damage.

Danfoss innovative and durable hydraulic products and solutions support the highest pressure levels and leak-free operations. Meanwhile, our compact low-weight design, simple and reliable assembly, tight bending radii, and ability to create customer-specific solutions all enable manufacturers to take IMM productivity and performance even further.



Injection



Waltech tube connection systems
Walform / Walpro
WalringPlus

Injection



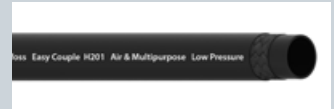
Boston EHT200 steel spiral PVC hose

Injection

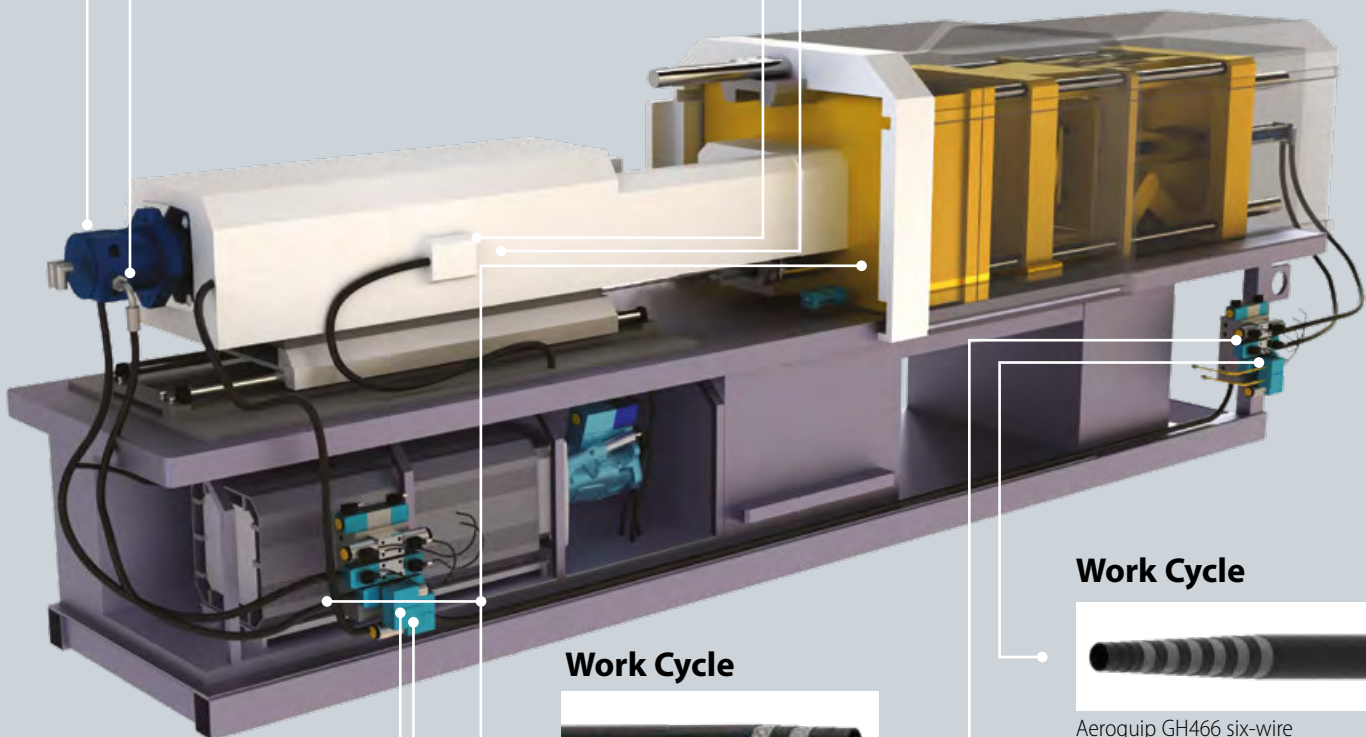


Waltech non-return valves

Injection



Boston H201 Easy Couple hose



Work Cycle



Aeroquip GH466 six-wire
spiral hose

Work Cycle



Aeroquip EC881 Dynamax two-wire
braided hose

Heating/Cooling



Boston EHA510 multipurpose EPDM
hose

Heating/Cooling



J50000 liquid cooling coupling



Waltech tube fittings

Waltech tube fittings



Overview

Waltech tube fittings provide a complete solution for a wide range of application challenges. With a 24° cone according to ISO 8434-1 standards, these fittings also support the highest operating pressures up to 800 bar. Guardian Seal plating adds high corrosion resistance too, for a long lifetime in demanding applications.

The challenge

In demanding applications, tube fittings need to withstand high dynamic pressure and to provide excellent corrosion resistance.

The tube fitting assembly process is a potential cause of in-application leaks and failures due to variation in torque values and incorrect assembly.

Increased cycle times for tube assemblies are driving a rise in manufacturing costs.

Solution benefits

- Waltech tube fittings support the highest operating pressures up to 800 bar with a 4:1 safety factor.
- Guardian Seal coating offers >1000 hours resistance to red rust corrosion after salt spray test according to ISO 9227.
- Waltech tube fittings allow easy assembly without lubrication for nuts (dry assembly), defined torque values for all systems and reduced torque variance.
- To reduce cycle times and assembly complexity, Danfoss Waltech offers bespoke machines for fast and reliable cutting ring assembly and tube forming.

Waltech Walpro



Overview

Waltech Walpro two-edge cutting ring redefines the standard for cutting ring technology. The Walpro system is a metric flareless tube fitting that consists of a body, a profile ring (cutting ring), and a nut. During assembly, the two cutting edges of the profile ring penetrate the tube, creating a safe and reliable hold function and seal. The top area of the profile ring seals along the 24° surface of the tube fitting's body.

The challenge

The tube fitting assembly process is a potential cause of in-application leaks and failures due to variation in torque values and incorrect assembly.

The tube fitting assembly process can have a negative impact on overall costs due to long cycle times.

Solution benefits

- Two Edge Cutting Ring Meets & exceeds DIN 2353 / ISO 8431-1 requirements.
- High resistance to vibration and dynamic loads through axial ribs, inner area clamping along the complete tube length, and cutting edges that equally share the holding force.
- Walpro allows easy and safe assembly due to a significant increase in assembly torque at the end of the process.
- Danfoss M-R7 cutting ring assembly machine allows easy and safe assembly in a short cycle time. The M-R7 also ensures the cutting ring is 100% assembled on the tube within a very small tolerance.

Waltech WalformPlus



Overview

WalformPlus is a robust, reliable, and easy to assemble tube fitting system. It enables safe tube end forming, with a primary elastomeric seal and secondary metal-to-metal sealing. For thin wall tubing, WalformPlus-SR is also available, which includes an additional support ring to enable greater reliability and ease of assembly. The reshaped tube in WalformPlus eliminates the only possible leak path and prevents the tube from pulling free under excessive pressure or high impulse applications.

The challenge

Injection molding applications put considerable force on the mounted tube, which can lead to a catastrophic failure if the tube pulls free from the assembly.

Incorrect tube fitting assembly can lead to premature failures in-application that cause leaks and equipment downtime.

Using too much torque during final tube fitting assembly can lead to in-application leaks, especially for small tube sizes.

Solution benefits

- WalformPlus is approved for safety-critical applications where cutting rings are not permitted.
- WalformPlus can withstand the highest axial forces without the risk of pulling free, with higher strength at the connection point than the tube material itself.
- Redundancy built-in, with both elastomeric and metal-on-metal sealing to eliminate leakages.
- Reduces assembly time and cost and enables safe, reliable and easy assembly.

Waltech non-return valves



Overview

Waltech in-line pipe mounted check valves are non-return valves with ISO8434-1 (24° cone) terminal ends on one or both sides. They allow only a one-way flow in the hydraulic circuit.

The challenge

The high operating pressure inside injection molding machines demands non-return valves with excellent mechanical resistance, even for large tube sizes.

Valves may also need to support different opening pressures, depending on the application.

Solution benefits

- Waltech non-return valves can be assembled between tubes, as well as between port and tube assemblies. They offer both type E inch studs to DIN EN ISO 1179-2 and type E metric studs to DIN EN ISO 9974-2 as standard terminal ends.
- A wide range of opening pressures from 0.1 bar to 3 bar enables Waltech non-return valves to be used in many different applications.
- Available in steel and stainless steel (1.4571).
- Available in a complete range of sizes from 6mm to 38 mm (tube OD).
- Customized solutions for higher operating pressures can be created.

Waltech WalringPlus



Overview

Waltech WalringPlus is a two-edge carbon steel cutting ring with additional soft sealing for both possible leak paths. Specifically optimized for thin wall tubing in steel and stainless steel, it's designed to enable easy, repeatable assembly and to prevent the possible causes of leaks for dependable in-application performance.

The challenge

Incorrect tube fitting assembly is a potential cause of in-application leaks and failures.

The tube fitting assembly process can have a negative impact on overall costs due to long cycle times.

Solution benefits

- The soft seal of WalringPlus ensures leakages will be prevented if small scratches in the tube or stud occur. Furthermore, the soft seal prevents "sweating" due to alternating operating temperatures in the application
- The design offers a clear block-stop-assembly function which provides a feelable and clear torque increase for the operator at the end of assembly and prevents errors.
- A combination of optimized cutting-edge geometry, a block-stop-assembly function, and soft sealing, means WalringPlus enables safe assembly for very thin-wall tubing without the need to insert additional sleeves.

J50000 liquid cooling coupling



Overview

J50000 liquid cooling couplings are commonly seen in injection molding applications on cooling and heating lines. A stainless steel, vibration-resistant structure enables them to be used in the most demanding application environments.

The challenge

When connecting and disconnecting thermal management lines, even small leaks can cause downtime and dissatisfaction.

Cooling couplings must be able to withstand the high vibration environment inside injection molding applications.

Using different cooling media can negatively impact the lifetime of seals or cooling couplings.

Solution benefits

- The J50000 series offers a flat face design that prevents any leaks when connecting or disconnecting lines.
- Double sealing under connection ensures high protection against in-application leaks.
- Due to robust design, the J50000 can also be used in high vibration applications.
- A stainless-steel body, in combination with FKM seals, enables resistance to a wide range of cooling media for a long in-application lifetime.

Boston EHA510 multipurpose EPDM hose



Overview

The Boston EHAa multipurpose EPDM hose with an EPDM inner tube delivers high temperature resistance and a long in-application life. It's designed to carry hot water, cooling liquids and light chemicals.

The challenge

Effective cooling requires a hose that can provide excellent resistance to hot water and water glycol emulsions.

Solution benefits

- High temperature resistance.
- UV and light chemical resistance.
- Up to 20 bar working pressure.
- The EHA510 hose features an EPDM inner tube and outer cover that enables it to transfer hot water up to 120°C.

Boston EHT200 steel spiral PVC hose



Overview

The Boston HT200 series industrial steel spiral PVC hose is a flexible, smooth and transparent PVC hose with a steel wire helix. It is ideal for use as a loader hose in injection molding applications.

The challenge

Flexibility and high resistance to crushing or abrasion are crucial characteristics for the loader hose in injection molding applications.

A transparent inner tube and cover are also often required as this allows operators to monitor material flow.

Solution benefits

- Thanks to its flexible, smooth, transparent, and abrasion-resistant design, the EHT200 hose offers great performance in injection molding applications.
- Strong and very flexible thanks to a steel wire helix.
- Transparent tube and cover enable the monitoring of material transfer.
- Meets FDA and UE10/2011 regulations.
- Available in sizes from 5/16" up to 6".

Boston H201 Easy Couple hose



Overview

The Boston H201 Easy Couple hose is a versatile and high-quality solution for transferring water, oil, air, and fuel. Very flexible and kink-resistant, the hose can be used in a wide range of industrial machines.

The challenge

Routing hoses is a growing challenge in today's increasingly compact machinery, making more flexible and kink-resistant hoses essential.

Color-coded hoses are also often a requirement for manufacturers. They accelerate maintenance and help to prevent errors, as workers can easily recognize different hose lines.

Solution benefits

- With excellent flexibility and various cover colors, H201 hoses can easily meet the requirements of injection molding machine builders.
- Versatile hose can be used in many applications, reducing inventory requirements.
- Supported by an engineered system of hose connectors with a wide range of options.
- Socketless fittings allow for rapid preparation of assemblies with no equipment required.
- Flexible and kink-resistant thanks to a standard braid. The hose will not coil up when pressurized like spiral braided products.
- Available in black, red, blue, gray, yellow and green covers.

Aeroquip GH466 six-spiral hose



Overview

The Aeroquip GH466 six spiral hose is a premium high-pressure product. Two spiral layer reinforcement enables the hose to support working pressures up to 420 bar, while internal skive 1W fittings with wire trap provide a safe and leak-free connection.

The challenge

Hoses must meet tough safety demands in injection molding applications. Manufacturers often specify additional safety requirements, such as fitting blow-off avoidance to eliminate the risk of injuries.

Solution benefits

- The GH466 hose is qualified up to two million impulse cycles for a long in-application lifetime and features internal skive fittings for a safe and leak-free connection.
- Up to 420 bar working pressure.
- 1W fittings with wire trap eliminate the risk of fitting blow-off.
- Patented O-ring seal prevents "sweating".
- Can be combined with multibent fittings without welding points to avoid the risk of leaks.

Aeroquip EC881 Dynamax two-wire braided hose



Overview

Aeroquip Dynamax EC881 is a high-performing two-wire braided hose qualified to one million impulse cycles. Using a next-generation inner tube and “hybrid plies” reinforcement, the EC881 enables higher working pressure and an improved bending radius, as well as a long operational lifetime. The EC881 can even challenge spiral hoses in some applications, helping customers to decrease machine weight and to improve routing.

The challenge

To minimize machine downtime and operational costs, it's essential to have a hose assembly with superior flexibility, as well as a long operational lifetime in dynamic applications. Similarly, attached fittings also need to support a long in-application lifetime with high corrosion resistance and zero leakage even after years of use.

Solution benefits

- EC881 hoses provide excellent flexibility (1/3 SAE 100R2 bending radius at 100°C). This enables easier installation in compact spaces and decreases failures caused by tight bends.
- Reduces downtime, with an operational life up to 5X longer than standard EN857 Type 2SC hoses, supporting as many as one million impulse cycles.
- 1A fittings can provide up to 1000 hours red rust protections thanks to enhanced DURA-KOTE plating.
- The hose tube has slow aging and a low compression set, which provides better sealing and leak-free performance in even dynamic applications.

Combine Harvester Platform

Combine harvesters are regarded as the synonym of modern agriculture. It not only transforms the manual farming tasks into a more industrial procedure but also offers top-notch efficiency to farmers. Combine harvesters are designed with three critical features in mind: efficiency, visibility and comfort. Easy to use and extremely durable, their safe operation is critical in the harvesting season. Leak free hydraulic system performance to preserve soil from contamination.



Pilot Lines



Winner WH006 textile reinforced hydraulic hose



Aeroquip GH681 one-wire braided hose

Case Drain Hoses



Winner WH004 hydraulic suction and return hose



Aeroquip GH681 one-wire braided hose

Compressed Air Lines



Winner WH006 textile reinforced hydraulic hose

Engine Hoses



Danfoss GH100 braided textile biodiesel hose



Aeroquip FC699 elevated temperature engine hose



Winner PTFE high performance Teflon hose

Air Conditioning



Danfoss GH001 Type E EverCool air conditioning veneer hose



Danfoss EC007 Type C EverCool air conditioning hose



Danfoss Hansen 5400 AD Coupling

Grain Tank



Aeroquip STC connectors

Hydraulic Components



Waltech WalringPlus



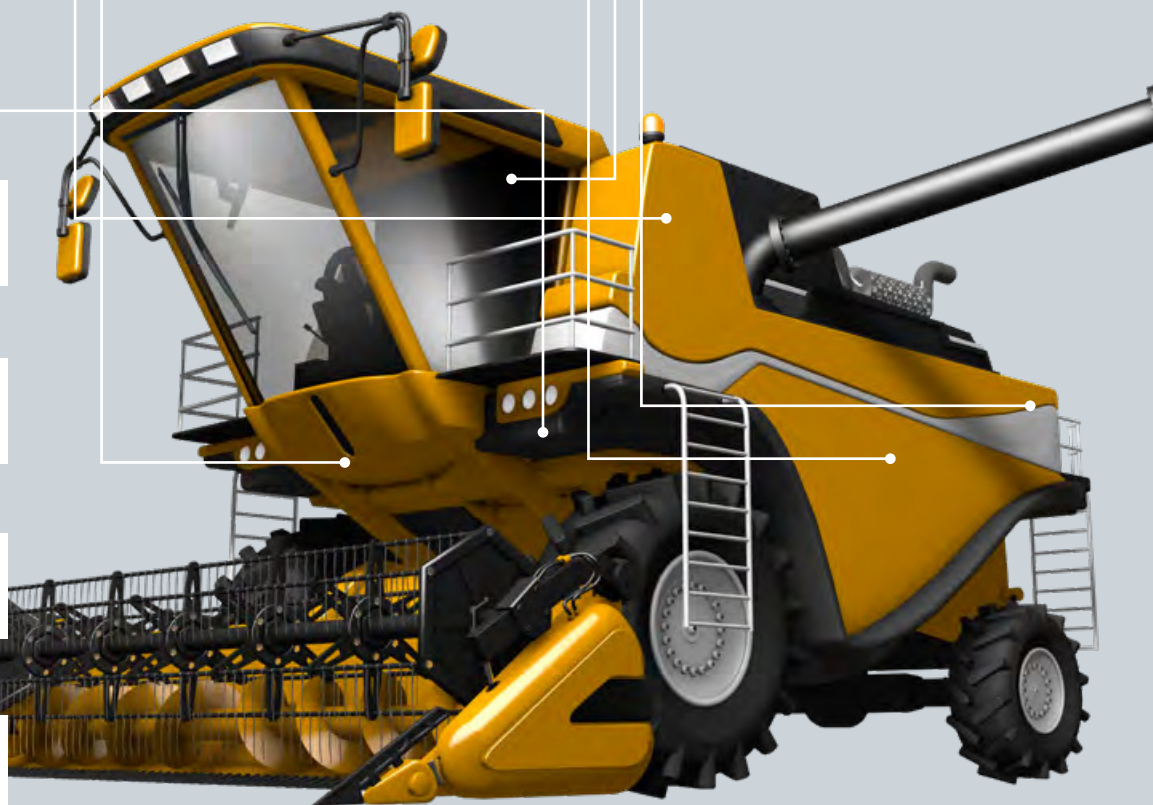
Waltech tube fittings



Waltech WalformPlus



Danfoss steel adapters



Combine Header - Cutting Unit



Danfoss Hansen Flat Face (FF) quick disconnect couplings



Waltech Walpro



Aeroquip EC881 Dynamax two-wire braided hose



Danfoss Hansen Multi-FF Quick Disconnect Multiplate Coupling

Cooling Fan Hoses



Aeroquip GH681 one-wire braided hose



Aeroquip EC881 Dynamax two-wire braided hose

Lifting Device Hydraulic Steering



Aeroquip EC881 Dynamax two-wire braided hose

Axial Piston Pump



Winner WH004 hydraulic suction and return hose

Hydrostatic Drive



Aeroquip EC600 X-Flex four/six wire spiral hose



Aeroquip EC850 Dynamax four/six wire spiral hose



Waltech WalformPlus



Aeroquip hydraulic high pressure special multi bended tube assembly



Danfoss Hansen Flat Face (FF) quick disconnect couplings

Overview

Danfoss Hansen Flat Face (FF) quick disconnect couplings provide greater performance at higher pressures along with higher flow rates. Due to flat face design, it enables connection and disconnection without spillage or air inclusion.



The challenge

Combine harvester manufacturers are seeking a component that can enhance fuel efficiency, including FF couplings that can reduce the pressure drop in the work cycle through optimised flow to result in reduced fuel consumption.

Solution benefits

- Designed to connect top performing hydraulic lines without fluid loss and offer increased pressures to meet demand for high-pressure and high-impulse pressure solutions.
- Higher flow rates: up to 74% flow rate compared with ISO 16028, plus higher working pressure that exceeds 60% ISO 16028, with higher operating pressure up to 400 bar.
- Advanced levels of corrosion resistance, up to 1000 hours, using environmentally friendly (nickel free) coating.
- Enables connection under residual pressure up to 350 bar

Danfoss Hansen Multi-FF Quick Disconnect Multiplate Coupling

Overview

Danfoss multiplate system for quick-disconnect couplings (Multi-FF) further extends all the benefits of our Flat Face couplings. Multi-FF is designed for any application requiring multiple hydraulic fluid connections for power transmission.



The challenge

Combine harvester manufacturers require a robust multiplate coupling for connecting the hydraulic lines of the harvester to the cutting unit with optionality and flexibility. They require an innovative system that can support two Flat Face couplings simultaneously and the option to support simple manual connection up to 350 bar. Multi-FF provides manufacturers with the option to connect electrical connections, alternative materials, a one-side handle, as well as the ability to integrate Danfoss Snap-To-Connect system.

Solution benefits

- Robust internal mechanism and linear connection for long service lifetime.
- Simple design allows for use by untrained operators, using optimum force-to-connect.
- Integrated contamination protection through sealing band and dust caps.
- Improved servicing due to easy- to-replace couplings, and dust cap and safety pin mechanism.
- Modular design that allows for customised solutions with electrical connectors or specialised couplings.
- Enables connection under pressure up to 350 bar, connection under residual pressure up to 350 bar.

Aeroquip STC connectors



Overview

Aeroquip STC connector is designed to be connected and disconnected repeatedly without replacing the O-Ring and Back-Up Ring, unless leakage or damage is observed. Available from size -6 to -16. The operation pressure is up to 412bar and available from size -6 to -16. Applications is hydraulics, power steering, power brakes, turbochargers, fuel injection systems but as well air

The challenge

For hydraulic distribution blocs hose lines are requested to get connected close to each other on tight spaces which takes time and installation requires to follow a set order. Hose assemblies are often twisted and get damaged during installation. Reduce assembly times to save cost.

Solution benefits

- Fast reliable one-hand connections requiring no assembly tools.
- Eliminates cross-threading, over or under torquing, and hose twisting. Installs easily in confined areas.
- Virtually zero leak performance per SAE J1176
- Direct porting eliminates adapters to maximize cost savings
- Resists external contamination
- Allows easy disconnection with release tool

Danfoss Hansen 5400 AD Coupling



Overview

The 5400 serie air conditioning coupling are leakproof line connectors which can be disconnected and connected as often as desired without losing medium or including air.

The challenge

AC line installation in combine harvesters often requires to assemble and prefill sub systems. Doing so requires a quick disconnect coupling which is tight enough to withstand vacuum and Refrigerant gas pressure in disconnected mode. The subsystems then need to be connected under pressure once assembled on the harvester without loss of gas and air entrance. In addition to this, AC systems requires long lasting leak-free performance to maintain a good system efficiency.

Solution benefits

- The 5400 series AC coupling is specially designed to fulfill the requirements of AC circuits.
- The 5400 series tubular valve construction prevents fluid loss, the ingress of dirt and air inclusion during coupling. This reliably protects the AC system from failures.
- Brazed or threaded end connections for versatility of installation on tubing or hose are available.
- Thread together design allows connection and disconnection against pressure as many times as desired
- Lock washer and jam nut standard for optional bulkhead mounting.
- Guardian Seal™ plating offers >1000 hours red rust corrosion resistance.

Waltech tube fittings



Overview

Danfoss Waltech tube fitting systems offer a complete solution for any tube fittings with 24° cone according to ISO8434-1. With highest operating pressures up to 800 bar and Guardian Seal plating for high corrosion resistance Danfoss Waltech tube fittings provide long lifetime in demanding applications. The wide range of our catalog portfolio is supplemented by customized fittings like e.g. jump sizes and many more

The challenge

For demanding applications tube fittings need to withstand a high dynamic pressure and need to provide sufficient resistance against possible corrosion. The assembly process of tube fittings is a potential cause of leakages in the application due to variation in torque values and incorrect assembly. Increased cycle times for tube assemblies are driving increase in manufacturing costs.

Solution benefits

- Danfoss tube fittings offering highest operating pressures up to 800 bar with safety factor 4.
- Danfoss's Guardian Seal coating offers more than 1000 hours resistance to red rust corrosion after salt spray test according to ISO 9227.
- Waltech tube fittings allow easy assembly without lubrication (dry assembly), defined torque values for all systems and reduced torque variance.
- To increase the quality, as well as to reduce cycle times and complexity of assembly processes Danfoss is offering machines for cutting ring assembly and tube end forming.

Waltech WalringPlus



Overview

Danfoss Waltech WalringPlus is a two-edge carbon steel cutting ring with additional soft sealing for both possible leak paths. Specifically optimized for thin wall tubing in steel and stainless steel, it's designed to enable easy, repeatable assembly and to prevent the possible causes of leaks for dependable in-application performance.

The challenge

The demanding combine harvester application with high vibration can lead to leakages on tube assemblies in the application causing equipment downtime and end customer dissatisfaction. Incorrect assembly of tube fitting can lead to early failures in the application what is causing leakage in the application and downtime of equipment. In order to reduce weight also very thin tube sizes in carbon steel are used what need the usage of a tube insert when assembling with a cutting ring leading to higher costs and reduced flow rates.

Solution benefits

- The soft seal of WalringPlus ensures leakages will be prevented if small scratches in the tube or stud occur. Further the soft seal prevents "Sweating" due to alternating operating temperatures in the application.
- The design offers a clear block-stop-assembly function which provides a feelable and clear torque increase for the operator at the end of assembly and prevents the risk of wrong assembly.
- Through a combination of optimized cutting-edge geometry, block-stop-assembly function and soft seal WalringPlus allows the safe assembly also for very thin wall tubing without the need to use additional insert sleeves.

Waltech WalformPlus



Overview

Waltech WalformPlus is the leading and most popular cold-forming metric tube fitting system in the world. For very thin wall tubing, the forming system WalformPlus with an additional support ring can be used, which combines high reliability with ease of assembly.

The challenge

To create more compact, efficient and cost-effective combine harvesters, the size and weight of tubes is critical. Greater weight directly translates into higher fuel consumption. However, in demanding applications with high dynamic pressure and vibration, thick walled tubing has been considered essential to ensure long-term reliability and leak-free operations.

Solution benefits

- Waltech Walform system meets & exceeds DIN EN ISO 8431-1 requirements
- Danfoss Walform-SR is optimized for very thin wall tubing
- By using a support ring as part of the forming system, higher strength tube materials in thin wall thickness can be used in applications where thicker tubes were previously required.
- Enables more compact combine harvesters and significantly lowers their weight, reducing energy consumption and optimizing fuel usage.
- Engineered to ensure lasting reliability even under loads with high dynamic pressure and vibration.

Waltech Walpro



Overview

The Waltech Walpro system is a metric tube fitting that consists of a body, profile ring (cutting ring) and nut. During assembly, the two cutting edges of the profile ring penetrate the tube, creating a safe and reliable hold function and seal. With the controlled final assembly by using the M-R7 cutting ring assembly machine, Danfoss offers an optimized assembly process that increases quality and reduces assembly time to a minimum.

The challenge

For demanding applications cutting ring systems need to withstand a high dynamic pressure and need to provide sufficient resistance against possible corrosion. The assembly process of tube fittings is a potential cause of leakages in the application due to variation in torque values and incorrect assembly. Increased cycle times for tube assemblies are driving increase in manufacturing costs.

Solution benefits

- Waltech Walpro is providing clamping on the complete length of the cutting ring therefore has high resistance against vibration and dynamic load.
- Waltech Walpro allows easy and safe assembly due to significant increase of assembly torque at the end of the assembly process.
- With the M-R7 cutting ring assembly machine easy and safe assembly in a short cycle time is guaranteed. The controlled final assembly process of the M-R7 ensures that the cutting ring is 100% assembled on the tube within a very small tolerance

Winner PTFE high performance Teflon hose



Overview

Danfoss Everflex and Winner PTFE high-performance Teflon hoses are designed for demanding applications where excellent temperature and vibration resistance is essential. The range consists of the:

- 2807 series premium product
- S- and SC- series
- EN-TW and EC-TW value series products

The challenge

Customers require seamless, high-performance oil system connections and components that can deliver in the high temperature and high vibration environment inside engine compartments. In addition, the oil supply to turbo chargers must be guaranteed, or a complete engine failure is possible. Oil lines also require effective protection against dirt and flying particles.

Solution benefits

- Extended operating temperature range from -73 °C to 260 °C for heavy duty applications.
- Broad fluid compatibility.
- Highly flexible and shock resistant.
- Able to withstand continuous vibration.
- Supports a wide range of applications and fluids: hydraulics, high-pressure refrigerant, grease lubrication, compressor discharge, engine return lines, oil cooler lines, and fuel lines.

Aeroquip EC850 Dynamax four/ six wire spiral hose



Overview

Aeroquip Dynamax EC850 is a four spiral layer hydraulic hose (six spiral layers for size -20) with a highest working pressure of 500 bar.

The challenge

Mobile hydrostatic drives, direct drive steering, and other system applications require extremely high operating pressures 20% above SAE 100R15. Depending on the machine type, pressure ratings of up to 500 bar can be achieved. The connectivity between hydraulic components is very complex in this application, requiring flexible hoses in combination with multi-bended fittings. This is essential on at least one end of the hose assembly to optimize routing. All the components used in this application need to be reliable and safe. There must be no leakage of hydraulic fluid between hoses and fittings.

Solution benefits

- EC850 hoses are the best choice for high-pressure hydrostatic drive applications up to 500 bar.
- Thanks to a four-wire layer design in sizes -10, -12 and -16, these hoses provide outstanding flexibility at high pressures.
- Improved flexibility and a tight bend radius enhance installation and routing capabilities.
- Offers 8X better abrasion resistance than standard rubber hoses, due to DURA-TUFF cover.
- Can be combined with customized multi-bended fittings without brazing or welding points, eliminating the risk of leaks.
- Internal skive type 1W fittings with their double O-ring design eliminate 'sweating' of the hose assembly during cool-down.
- 1W fittings can provide up to 1000 hours of red rust protection thanks to their enhanced DURA-KOTE plating.

Aeroquip EC600 X-Flex four/six wire spiral hose



Overview

Aeroquip EC600 X-Flex four/six wire spiral hose provide excellent flexibility at a working pressure of 420 bar and exceed both SAE 100R15 and ISO 18752 standards.

The challenge

Hydrostatic drive hose lines are one of the most critical hydraulic applications on mobile machines like combine harvesters. Compact installation space demands hoses with very tight bend radii, even at this high-pressure rating. The connectivity between hydraulic components is very complex in this application, requiring flexible hoses in combination with multi-bent fittings. This is essential on at least one end of the hose assembly to optimize routing. All the components used in this application need to be reliable and safe. There must be no leakage of hydraulic fluid between hoses and fittings.

Solution benefits

- EC600 hoses offer a very tight bend radius (1/2 of SAE) that can reduce the hose length required through shorter routing. Improved flexibility (force-to-bend) also enables easier installation in tight spaces.
- By making the hose assembly smaller and lighter, these hoses enable a more compact installation space.
- Weight reduction in the hose assembly increases machine efficiency and reduces total cost of ownership.
- Offers 8X better abrasion resistance than standard rubber hoses, due to DURA-TUFF cover.
- Can be combined with customized multi-bended fittings without brazing or welding points, eliminating the risk of leaks.
- Internal skive type 1W fittings with their double O-ring design eliminate 'sweating' of the hose assembly during cool-down.
- 1W fittings can provide up to 1000 hours of red rust protection thanks to their enhanced DURA-KOTE plating.

Aeroquip EC881 Dynamax two-wire braided hose



Overview

Aeroquip EC881 Dynamax two-wire braided hose provide an improved bend radius, higher working pressure, and a long operational lifetime of up to one million impulse cycles.

The challenge

Agriculture equipment such as combine harvesters require long-life hose assemblies for the working cycle of e.g. Lifting devices or the steering unit. Equipment downtimes during the harvesting season can cause inadvertent circumstances resulting in harvesting delays. Not only the hose, but the hose & fitting combination needs to provide a reliable and long-life solution.

Solution benefits

- EC881 hoses provide excellent flexibility (1/3 SAE 100R2 bending radius at 100 °C). This enables easier installation in compact spaces and decreases failures caused by tight bends.
- The DURA-PULSE hose tube has slow aging and a low compression set, which provides better sealing and leak-free performance even in dynamic applications.
- Reduces downtime, with an operational life up to 5X longer than standard EN857 Type 2SC hoses, supporting as many as one million impulse cycles.
- Offers 8X better abrasion resistance than standard rubber hoses, due to DURA-TUFF cover.
- Aeroquip 1A type TTC fittings are qualified for zero leakage and can provide up to 1000 hours of red rust protection thanks to their enhanced DURA-KOTE plating.

Winner WH004 hydraulic suction and return hose



Overview

The Aeroquip GH681 high performing one-wire braided hose is qualified to one million impulse cycles and exceeds 1SC pressure ratings, making it useful for a wide variety of mobile machinery applications.

The challenge

Agriculture equipment such as combine harvesters require long-life hose assemblies for fan cooling applications. Equipment downtimes during the harvesting season can cause inadvertent circumstances resulting in harvesting delays. Not only the hose, but the hose & fitting combination needs to provide a reliable and long-life solution.

Solution benefits

- Aeroquip GH681 has an operating temperature rating up to 126 C (260 F) making it ideal for hot engine compartments.
- Suited to a broad range of hydraulic systems, as well as demanding applications such as fan cooling.
- 1 million impulse cycle performance.
- Flexible and easy to route in tight spaces.
- High abrasion resistance minimizes hose failures.
- Both crimp and reusable fittings are offered with DURA- KOTE plating for superior corrosion protection.

Aeroquip GH681 one-wire braided hose



Overview

Winner WH004 (R4) is a textile reinforced hydraulic hose that provides a competitive solution for all kinds of low-pressure hydraulic applications in combination with Winner two-piece hose fittings. As a suction hose, Winner WH004 also includes an additional helical steel wire to prevent collapse.

The challenge

Low-pressure hydraulic applications, such as fuel, return, and suction lines, increasingly require competitive, standard performance hose assembly solutions. Even in these standard applications, leak-free connections are essential. Hoses and fittings must be technically qualified and approved by the supplier. To maximize equipment efficiency, these lines must also be very flexible and low weight.

Solution benefits

- The Winner R4 suction hose, WH004 meets industry standards and is very cost-effective, as are their optional fittings.
- Winner two-piece crimp fittings are non-skive for easier and quicker assembly, as well as safe and leak-free connections. The same nipple part number for wire braided standard hoses can also be used for these hoses, just by utilizing a different socket.
- With stock available locally in Europe, short lead-times are possible for a wide variety of fitting terminal ends.

Winner WH006 textile reinforced hydraulic hose



Overview

Winner WH006 (2TE) is a textile reinforced hydraulic hose which provide a competitive solution for all kinds of standard hydraulic applications in combination with Winner two-piece hose fittings.

The challenge

Low-pressure hydraulic applications, such as fuel, compressed air and pilot lines, require competitive, standard performance hose assembly solutions. Even in these standard applications, leak-free hose and fitting connections are essential and must be technically qualified and approved by the supplier. To maximize equipment efficiency, these lines must also be very flexible and low weight.

Solution benefits

- The Winner 2TE textile braided hose, WH006 meets industry standards and is very cost-effective, as are their optional fittings.
- Winner two-piece crimp fittings are non-skive for easier and quicker assembly, as well as safe and leak-free connections. The same nipple part number for wire braided standard hoses can also be used for these hoses, just by utilizing a different socket.
- A variety of different fitting terminal ends are available now

Danfoss GH001 Type E EverCool air conditioning veneer hose



Overview

Danfoss GH001 Type E EverCool air conditioning veneer hose delivers high-performance air conditioning, exceeding SAE J2064 standards.

The challenge

With customers requiring easy installation in tight spaces, air conditioning hoses must offer high flexibility, a low bend radius, and excellent kink resistance to avoid hose damage and to keep on performing. Low permeation is another must-have feature to minimize refrigeration loss and its environmental impact, as well as the downtime and servicing costs associated with system 'top ups'. At the same time, this also protects the system from catastrophic failure by minimizing moisture ingress. Air conditioning hoses also need to be very robust, offering high temperature, UV, and ozone resistance. Additionally, they should support easy crimping for quicker field servicing and more.

Solution benefits

- The GH001 hose combines durable construction with industry-leading features.
- A custom-designed dual-extruded inner tube guarantees extremely low permeation and optimal adhesion to the rubber layer.
- High temperature resistance up to 140 °C ensures a long life in hot engine compartments.
- As an alternative to crimped hose assemblies, Danfoss's E-Z Clip can be used for small series, for sampling, or for field servicing.
- The GH001 is qualified with all common refrigerants, including R1234yf. Its EPDM cover is also UV and ozone resistant.
- Production facilities in the USA and Turkey ensure a smooth supply chain and reliable delivery times.

Danfoss EC007 Type C EverCool air conditioning hose



Overview

Danfoss EverCool EC007 Type C air conditioning hose is designed for air conditioning systems, enabling enhanced performance at a competitive price.

The challenge

With customers requiring easy installation in tight spaces, air conditioning hoses must offer high flexibility, a low bending radius, and excellent kink resistance to avoid hose damage and to keep on performing. Low permeation is another must-have feature to minimize refrigeration loss and its environmental impact, as well as the downtime and servicing costs associated with system 'top ups'. At the same time, this also protects the system from catastrophic failure by minimizing moisture ingress. Air conditioning hoses also need to be very robust, offering high temperature, UV, and ozone resistance to ensure reliability and a long operational lifetime. Additionally, they should support easy crimping to accelerate field servicing.

Solution benefits

- Robust construction improves safety and reliability.
- The hose offers high flexibility, kink resistance, and low bending radii to guarantee easy installation in tight compartments.
- Barrier design with a rubber inner tube means the EC007 is qualified with various fittings.
- Very low permeation reduces greenhouse gas emissions and protects the environment.
- Qualified with a wide range of refrigerants or oils, and available in sizes -4 to -14, the EC007 hose can meet the requirements of most mobile AC systems.
- Qualified with Danfoss crimp fittings and exceeds SAE J3062 and SAE J2064 standards.
- Production facilities in the USA and Turkey ensure a smooth supply chain and reliable delivery times.

Danfoss GH100 braided textile biodiesel hose



Overview

Danfoss ESP GH100 elevated temperature braided textile engine hose for diesel/biodiesel fuel systems supports a wide temperature range and is suitable for up to 100% biodiesel fuels, as well as Rapeseed Methyl Ester (RME) and Soy Methyl Ester (SME) mixtures.

The challenge

Diesel/biodiesel engine fuel systems must operate using different fuel mixtures, including ultra-low-sulfur diesel (ULSD), blends of biodiesel up to B100, and synthetic oils. While offering a long life in application, fuel hoses must support these different regional norms and standards. They must also tolerate hot engine compartments and high vibration environments.

Solution benefits

- With an aramid poly-braid reinforcement that's durable, yet lightweight and flexible, GH100 and GH101 hoses are easier to install compared to wire-braided hoses.
- The hydrogenated nitrile rubber inner tube consists of a polymer that's resistant to bio-fuels up to B100, qualified with SME and RME blends of B5, B20, and B100, plus ULSD and synthetic oils.
- The hose cover consists of a highly abrasion-resistant textile braid that offers reliable protection from external factors. Alternatively, the GH101 hose is available with a smooth rubber cover.
- Due to high temperature resistance from -40 °C to 150 °C, these hoses are ideally suited for installation in hot engine compartments.
- Both hose types meets all common standards (e.g., ASTM D380, ASTM D6751, EN412 and EN2240) as well as many customer specifications.

Aeroquip FC699 elevated temperature engine hose



Overview

Aeroquip FC699 elevated temperature engine hose is an affordable, lightweight, and flexible solution for the conveyance of fuel and oil in demanding conditions.

The challenge

With high temperatures and little space, engine compartments are a tough environment for hoses. To convey gasoline and diesel with up to 10% biofuel (B10) content, vehicle manufacturers need robust, flexible, and cost-competitive hoses.

Solution benefits

- The Aeroquip FC699 fuel hose is suitable for gasoline, diesel, and biodiesel up to 15% (B15).
- Very robust, with abrasion-resistant construction and a high temperature operating range from -40 °C to 150 °C for a long in-service lifetime.
- Extremely flexible to enable installation in tight spaces.
- Lightweight design reduces total vehicle weight for improved fuel efficiency.

Aeroquip hydraulic high pressure special multi bended tube assembly



Overview

Custom tubes are designed for low, medium and high-pressure applications. These high-quality, seamless tubes are precision-built and offer a wide range of terminal end solutions.

The challenge

Hydraulic and air conditioning applications require customized multi-bended tubes with optimized port-to-port connections that also minimize the risk of any leakages.

Solution benefits

- Danfoss offers 3D multi-bended tubing up to 60mm x 3mm in diameter and with a maximum pole length of 3,000mm.
- Solderless solutions enable an optimized volume flow rate.
- Formed terminal ends including WALFORM technology enable tube assemblies to be produced nearly without brazing, which reduces the risk of leaks.
- STC Quick Connect couplings also enable easy and torsion-free installation. Formed directly onto the pipe, these couplings offer the ideal solution for an efficient connection.

Danfoss steel adapters



Overview

Danfoss steel adapter range offers a wide range of different terminal ends and configurations. Danfoss steel adapter exhibits high levels of corrosion resistance and is also designed for application within increased operating pressures.

The challenge

There is demand within the combine harvester manufacturing sector for ORFS, BSP and JIC terminal ends covered by ISO8434-1 standards for tube fittings. For demanding applications in the agricultural sector, steel adapters must also be designed to withstand high levels of dynamic pressure and provide corrosion resistance.

Solution benefits

- Danfoss offers a wide range of steel adapters with ORFS, BSP, JIC and other terminal ends.
- The steel adapters are rated to withstand up to 125% higher operating pressure compared with SAE standards.
- All of Danfoss's steel adapter range provides high corrosion resistance of 720 hours in red rust environments.

The Data center Platform

A data center is a dedicated place used to house computer / IT systems and components of storage. Because of the amount of energy used, systems are heating up. For that reason, engineers are looking for different ways of thermal management. Nowadays, data centers are becoming more and more liquid cooled: Here are the solutions offered by our Danfoss Power Solution division.

For decades, our fluid conveyance experts have helped shape and evolve the direct-to-chip liquid cooling market, delivering high-performing solutions designed specifically to meet the growing demands of today's data center.

For increased performance, energy efficiency and cost savings, there is simply no substitute for direct-to-chip liquid cooling. No other system unlocks the full potential of your data center while simplifying installation and maintenance like Danfoss fluid conveyance solutions.

**Count on Danfoss'
decades of data center
experience to help
lead the future of data
center liquid cooling**

Direct to chip data center liquid cooling

Source Line



Hansen FD83 quick disconnect couplings



Boston Emperor EHW094 thermoplastic hose



Boston Royal EHW194 rubber hose



Danfoss Hansen MLDB flat face dry break coupling



Danfoss socketless fittings

Blind mate Rack supply



Danfoss blind mate hands-free self-centering quick disconnect coupling



Danfoss 4246 Synflex Eclipse® formable thermal tubing

Rack supply



Danfoss Hansen ADB flat face dry break coupling



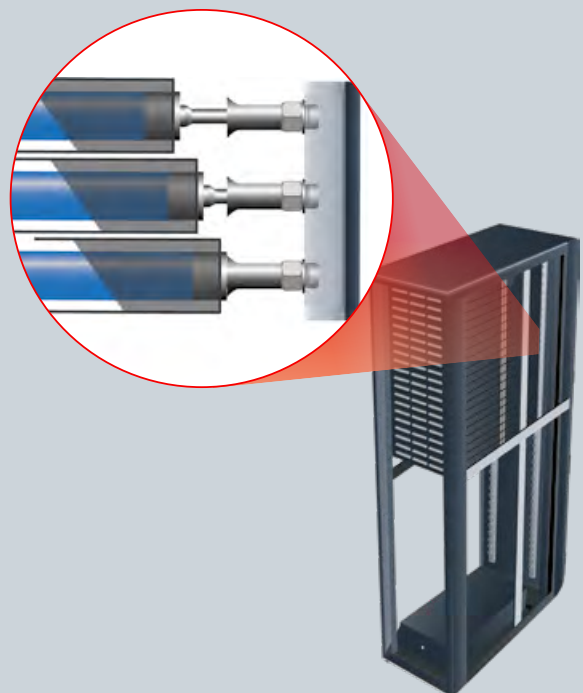
Danfoss UQD universal disconnect coupling



Boston Emperor EHW094 thermoplastic hose



Boston Royal EHW194 rubber hose



Hansen FD83 quick disconnect couplings



Overview

Hansen FD83 is designed for liquid cooling applications in data centers where full flow, fluid compatibility and safety are essential. The FD83 identical halves include two interlock features to eliminate spillage and ensure maximum safety. Valves cannot be opened until the coupling halves are mated and coupling halves cannot be disconnected until both halves are closed. The coupling is available in stainless steel and composite plastic materials in 1" and 2" body sizes.

The challenge

The source line for data center racks must convey a high flow to allow cooling of all plates in one rack. Limitation in flow lead to pressure drop in the cooling system what reduces efficiency of the overall system and therefore lead to higher energy consumption.

An accidental disconnection or leakage in the source line can lead to a severe failure impacting the multiple data center racks.

Solution benefits

- Full flow design enable lowest pressure drop also at very high flow rates ensuring highest efficiency in source line for data center racks
- Large body sizes of 1" and 2" are enabling high flow with compromise in pressure drop
- 303 Stainless steel or engineered plastic in combination with EPDM seals provide broad fluid compatibility
- Dual interlock safety feature eliminates accidental opening of coupling when disconnected
- Design provides reliable performance and minimal spillage during maintenance or service
- 100% helium leak tested products offer highest quality assurance.

Boston Royal EHW194 rubber hose



Overview

Liquid cooling hose EHW194 is designed for use in liquid cooling applications. Thanks to its EPDM inner tube it offers excellent fluid compatibility and high temperature resistance. EHW194 has a flame retardant cover and meets UL94 rating requirement. The cover is also non-conductive and is available in black, blue, red and grey colors.

The challenge

Hoses used in liquid cooling application for data centers should be designed with inner tube material that helps to avoid absorption of corrosion inhibitors. Fire resistance of the cover is another critical feature that these hoses should have.

Solution benefits

- Peroxide – cured EPDM inner tube that helps to prevent absorption of corrosion inhibitors used in liquid cooling
- UL94 V0 flammability rating
- Multiple color options available
- Non-conductive cover
- Operating Temp: -40C to +125C (-40F to 302F)
- Sizes -04, -06, -08, -10 -12, -16 and -32

Boston Emperor EHW094 thermoplastic hose



Overview

TPU liquid cooling hose EHW094 is designed with thermoplastic inner tube that provides very good fluid compatibility and excellent flexibility. TPU outer cover offers great fire resistance and meet UL94 V0 testing requirements.

The challenge

Fire resistance of hoses used in liquid cooling application in data centers is critical. To ensure maximum safety cooling hoses should meet most stringent testing requirements of UL94.

Solution benefits

- TPU tube and cover, textile braid reinforcement
- UL94 V0 flammability rating
- Non-conductive with di-electric testing at 25K volts
- Multiple color options available
- Operating Temp: -40C to +150C (-40F to 302F)
- Sizes: -04, -06, -08, -12

Danfoss Hansen MLDB flat face dry break coupling



Overview

Danfoss Hansen MLDB series stainless steel coupling is a flat face/dry break coupling used for fluid transfer applications. The MLDB Series offers the ability to connect with less force, higher sealing performance and are available in multiple configurable end connections. Sizes are available from 1/4" up to 1".

The challenge

In the data center cabinet, no spillage or droplets of water are accepted due to potential contact with electronic components. The pressure drop of a coupling in a data center rack has a negative impact on the system efficiency. For cooling applications in data center racks the coupling needs to offer corrosion resistance against water glycol media. Electrochemical corrosion can also be a topic, depending on the material of the coil plate.

Solution benefits

- 316 Stainless steel in combination with EPDM seals provide broad fluid compatibility. On the top of this, Stainless steel is providing also good resistance to electrochemical corrosion.
- MLDB offers a flat face design that avoids any kind of spillage in application or during connection.
- With optimized internal design the MLDB coupling offers high flow rates and a low pressure drop enabling high efficiency of the cooling system.
- Color coding options available to avoid crossing inlet and outlet lines.

Danfoss Hansen ADB flat face dry break coupling



Overview

The Danfoss Hansen ADB coupling series is a full range of couplings for liquid cooling applications (up to 25 bar) which allow no loss of fluid during disconnection, and no air entrance during connection. The aluminium design offers light weight combined with high endurance to environmental exposure. Sizes are available from 1/4" up to 1".

The challenge

In data centers only limited space is available for connection of liquid cooling lines. In the data center cabinet, no spillage or droplets of water are accepted due to potential contact with electronic components. The pressure drop of a coupling in a data center rack has a negative impact on the system efficiency. For cooling applications in data center racks the coupling needs to offer corrosion resistance against water glycol media.

Solution benefits

- The ADB coupling offers a flat face design that avoids any kind of spillage in application or during connection.
- With optimized internal design the ADB coupling offers high flow rates and a low pressure drop enabling high efficiency of the cooling system.
- Aluminium body material in combination with EPDM seals provide broad fluid compatibility.
- The Aluminum material offers a high corrosion resistance as well as high endurance against mechanical load and environmental impacts leading to low service costs.
- Color coding options available to avoid crossing inlet and outlet lines.

Danfoss UQD universal disconnect coupling



Overview

UQD is a universal quick disconnect coupling. Designed for high flow rate and no spillage, the UQD coupling is perfect for in-rack applications with smaller hose lines. The UQD is available in sizes 2 mm, 4 mm, 6 mm and 8 mm.

The challenge

For in rack applications the available space is limited when connecting the coupling to the rack manifold. In the data center cabinet, no spillage or droplets of water are accepted due to potential contact with electronic components. The pressure drop of a coupling in a data center rack has a negative impact on the system efficiency. For cooling applications in data center racks the coupling needs to offer corrosion resistance against water glycol media. Electrochemical corrosion can also be a topic, depending on the material of the coil plate. Global rack builder players might require standardized interchangeability to ease supply chain.

Solution benefits

- Push-to-connect design allows easy connection of the UQD to the rack also when limited space is available.
- UQD offers a flat face design that avoids any kind of spillage in application or during connection.
- Internal design optimized to achieve low pressure drop allowing high system efficiency.
- 303 Stainless steel in combination with EPDM seals provide broad fluid compatibility. On the top of this, Stainless steel is providing also good resistance to electrochemical corrosion.
- Interchange meets OCP Standard and therefore can
- be connected with 3rd party products.
- 100% helium leak tested products offer highest quality assurance.

Danfoss socketless fittings



Overview

Simply to assemble. No clamps, bands, or sockets required. No crimping machine or any other tools necessary. Just push the hose on the nipple and the special fir-tree nipple design fixes the hose securely on the fitting.

The challenge

Standard fittings require extra brackets or collar to prevent leaks, brackets adds to bill of material, cost and impacts ease of installation. Standard fittings require tooling to insert the fittings impacting ease of installation. The needs to decrease assembly time and trust a leak free connection are critical

Solution benefits

- Stainless steel bring good corrosion resistance, including electrochemical one
- Configurable end connections available
- Easy and quick to assemble since no clamp nor tool are required
- Qualified with FC332, GH109, EHW094, and EHW194 hoses

Danfoss blind mate hands-free self-centering quick disconnect coupling



Overview

Blind mate is a hand-free self-centering quick disconnect coupling. The Blindmate's self-centering design offers misalignment compensation, ensuring simple and secure connection between the blade and rack manifold. The blind mate coupling is available in 3 mm and 5 mm body sizes.

The challenge

Limited space in data centers making it valuable to connect the server blades directly the rack manifold. In order to have an easy connection the connection must allow misalignment between blade and manifold. In the data center cabinet, no spillage or droplets of water are accepted. The pressure drop of a coupling in a data center rack has a negative impact on the system efficiency. For cooling applications in data center racks the coupling needs to offer corrosion resistance against water glycol media.

Solution benefits

- The blindmate coupling offers a self-centering design with radial, angular and axial misalignment compensation for easy connection of the server blade into the rack manifold.
- Designed for hands free connection the blind mate allows easy insertion of the server blade.
- Blindmate offers a flat face design that avoids any kind of spillage in application or during connection.
- Internal design optimized to achieve low pressure drop allowing high system efficiency.
- 303 Stainless steel in combination with EPDM seals provide broad fluid compatibility including electrochemical one.
- Interchange meets OCP Standard and therefore can be connected with 3rd party products.
- 100% helium leak tested products offer highest quality assurance.

Danfoss 4246 Synflex Eclipse® formable thermal tubing



Overview

Synflex Eclipse tubing has improved flexibility over other nylon tubing. This translates into easier installation and handling at low temperatures. Longer service life in the harshest environments. The unique construction promotes burr free cuts, which yields improved assemblies with either push-to-connect or compression fittings.

The challenge

Laying many cooling lines close to each other in confined spaces and with tight bending radii. Easy installation without the use of clamps. Identification of inlet or outlet lines through color coding.

Solution benefits

- Nylon
- UL94 HB Rating
- Thermoformable to custom routing configurations
- Multiple color options available
- Operating Temp: -40C to +100C (-40F to 212F)
- Sizes: 2mm ID up to 12.1mm ID
- Extreme high abrasion resistance

About Danfoss Power Solutions FC

Danfoss hoses, fittings, and tooling provide the ultimate fluid conveyance solutions for a variety of equipment and applications around the world. We proudly engineer to support a sustainable future for tomorrow.

To learn more please visit: <http://www.danfoss.com/en/about-danfoss/our-businesses/power-solutions>

Go to www.danfoss.com for further product information.

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