

# Overview of oil types

March, 31th 2008

This News presents an overview of oil types and their technical specifications for Danfoss Commercial Compressors products. Each Danfoss oil is specifically selected and eventually tuned with additives for optimal performance in the indicated compressor series. When oil top-up is needed, always use the oil type as listed in below table. Otherwise compressor warranty may be voided.

## Compressors and oil types

	Compressor series	Refrigerant	Factory charged oil type		Oil type for top-up
<b>Maneurop Reciprocating compressors</b>	LT *	R502	Mineral	160P	160P
	LTE *	R404A	Polyolester	160PE **	160Z or 160SZ
	LTZ * (<2419720)	R404A	Polyolester	160PZ	160Z
	LTZ * (>2419719)	R404A	Polyolester	160Z	160Z
	NTZ	R404A	Polyolester	160Z	160Z
	MPZ	R404A	Polyolester	160MPZ	160MPZ
	MT	R22	Mineral	160P	160P
	MTE *	R404A, R134a	Polyolester	160PE **	160Z or 160SZ
	MTZ	R404A, R134a, R407C	Polyolester	160PZ	160PZ
VTZ	R404A, R134a, R407C	Polyolester	160PZ	160PZ	
<b>Performer Scroll compressors (Residential &amp; light commercial A/C)</b>	HRM	R22	Alkylbenzene	Alkylbenzene	160ABM
	HLM	R22	Alkylbenzene	Alkylbenzene	160ABM
	HCM	R22	Alkylbenzene	Alkylbenzene	160ABM
	HRP	R407C	Polyolester	160HZ	160HZ
	HLP	R407C	Polyolester	160HZ	160HZ
	HCP	R407C	Polyolester	160HZ	160HZ
	HRH	R410A	Polyolester	160HZ	160HZ
	HLH (except HLH061)	R410A	Polyolester	160HZ	160HZ
	HLJ + HLH061	R410A	Polyvinylether	PVE	PVE
<b>Performer Scroll compressors (Light - large commercial A/C)</b>	SK *	R134a	Polyolester	160SZ	160SZ
	SM	R22	Mineral	160P	160P
	SY	R22	Polyolester	320SZ	320SZ
	SZ	R407C, R134a	Polyolester	160SZ	160SZ
	SH	R410A	Polyolester	160SZ	160SZ
<b>Scroll compressors</b>	MS *	R22	Polyolester	300S **	Shell Clavus S68
	MSE *	R134a	Polyolester	300SE **	Shell Lubester 3771
	MSZ *	R407C, R134a	Polyolester	300SZ **	Lubrizol CPI 2916S
<b>Speerall Scroll compressors (Refrigeration)</b>	LFZ	R404A	Polyolester	160SZ	160SZ
	MFZ	R404A	Polyolester	160SZ	160SZ

\* Discontinued compressor series  
 \*\* Discontinued oil

## Oil Specification

<b>160P</b>		<b>Mineral</b>
Property	Specification	Test method
Viscosity at 40°C	29.8 - 31.8 cSt	NFT T 60 100
Viscosity at 100°C	4.4 cSt (min)	NFT T 60 100
Density at 15°C	0.892 g/ml	NFT T 60 101
Colour	0.5 (max)	ASTM D 1500
Pour point	-36 °C (max)	NFT 60 105
Flash point	186 °C	NFT 60 118
Dielectric strength at 25°C	30 kV (min)	ASTM D 877
Acid value (Tan)	0.05 mgKOH/g (max)	ASTM D 664

<b>160PZ</b>		<b>Polyolester</b>
Property	Specification	Test method
Viscosity at 40°C	31 - 33 cSt	ASTM D 445
Viscosity at 100°C	5.6 cSt	ASTM D 445
Density at 15.6°C	0.97 g/ml	ASTM D 4052
Colour	100	ASTM D 1209
Pour point	-45 °C (max)	ASTM D 97
Flash point	217 °C	ASTM D 93
Dielectric strength at 25°C	47 kV (min)	ASTM D 1816
Acid value (Tan)	0.15 mgKOH/g (max)	ASTM D 974

<b>160MPZ</b>		<b>Polyolester</b>
Property	Specification	Test method
Viscosity at 40°C	31 - 33 cSt	ASTM D 445
Viscosity at 100°C	5.6 cSt	ASTM D 445
Density at 15.6°C	0.97 g/ml	ASTM D 4052
Colour	100	ASTM D 1209
Pour point	-45 °C (max)	ASTM D 97
Flash point	217 °C	ASTM D 93
Dielectric strength at 25°C	47 kV (min)	ASTM D 1816
Acid value (Tan)	0.15 mgKOH/g (max)	ASTM D 974

<b>160Z</b>		<b>Polyolester</b>
Property	Specification	Test method
Viscosity at 40°C	30 - 34 cSt	ASTM D 445
Viscosity at 100°C	5.2 - 6.2 cSt	ASTM D 445
Density	0.975 - 0.981 g/ml	ASTM 1298
Colour	150 (max)	ISO 2210
Pour point	-46 °C (max)	ASTM D 97
Flash point	270 °C	ASTM D 92
Dielectric strength at 25°C	88 kV (min)	
Acid value (Tan)	0.04 mgKOH/g (max)	ASTM D 974

<b>160SZ</b>		<b>Polyolester</b>
Property	Specification	Test method
Viscosity at 40°C	30 - 34 cSt	ASTM D 445
Viscosity at 100°C	5.2 - 6.2 cSt	ASTM D 445
Density	0.975 - 0.981 g/ml	ASTM 1298
Colour	150 (max)	ISO 2210
Pour point	-46 °C (max)	ASTM D 97
Flash point	270 °C	ASTM D 92
Dielectric strength at 25°C	88 kV (min)	
Acid value (Tan)	0.04 mgKOH/g (max)	ASTM D 974

<b>160HZ</b>		<b>Polyolester</b>
Property	Specification	Test method
Viscosity at 40°C	27 - 33 cSt	ASTM D 445
Viscosity at 100°C	4.8 - 5.8 cSt	ASTM D 445
Density at 15.6°C	0.986 - 1.00 g/ml	ASTM D 4052
Colour	0.5 (max)	ASTM D 1500
Pour point	-40 °C (max)	ASTM D 97
Flash point	230 °C (min)	ASTM D 92
Dielectric strength at 25°C	25 kV (min)	ASTM D 877
Acid value (Tan)	0.05 mgKOH/g (max)	ASTM D 974

## Oil Specification

320SZ		Polyolester
Property	Specification	Test method
Viscosity at 40°C	58 - 70 cSt	ASTM D 445
Viscosity at 100°C	8.9 cSt	ASTM D 445
Density at 15.6°C	0.957 g/ml	ASTM D 1298
Colour	-	
Pour point	-43 °C	ASTM D 97
Flash point	263 °C	ASTM D 92
Dielectric strength at 25°C	49.4 kV	ASTM D 877
Acid value (Tan)	0.05 mg KOH /g (max)	ASTM D 974

160ABM		Alkylbenzene
Property	Specification	Test method
Viscosity at 40°C	39 cSt	NFT 60 100
Viscosity at 100°C	5.2 cSt	NFT 60 100
Density at 15°C	0.87 g/ml	NFT 60 100
Colour	Colourless	ASTM D 1500
Pour point	-42 °C (max)	NFT 60 105
Flash point	180 °C	NFT 60 118
Dielectric strength at 25°C	25 kV (min)	
Acid value (Tan)	0.05 mgKOH/g (max)	DIN 51 558

PVE		Polyvinylester
Property	Specification	Test method
Viscosity at 40°C	61.2 - 74.8 cSt	JIS K2263
Viscosity at 100°C	-	
Density at 15°C	0.929 - 0.945 g/ml	JIS K2249
Colour	1.0 (max)	JIS K2580
Pour point	-30 °C (max)	JIS K2269
Flash point	180 °C	JIS K2265
Dielectric strength at 25°C	-	
Acid value (Tan)	0.02 mgKOH/g (max)	JIS K2501

## Ordering

Code no.	Packaging*		Type	Description	Application
	type	Qty.			
120Z5033	Multipack	12	160HZ	POE lubricant, 160HZ, 1 litre can	HRP, HLP, HCP, HRH, HLH (except HLH061)
120Z0046	Multipack	12	160MPZ	POE lubricant, 160MPZ, 1 litre can	MPZ
7754019	Multipack	12	160PZ	POE lubricant, 160PZ, 1 litre can	MTZ
7754020	Multipack	8	160PZ	POE lubricant, 160PZ, 2 litre can	MTZ
7754023	Multipack	12	160SZ	POE lubricant, 160SZ, 1 litre can	SZ, SH, MFZ, LFZ
7754024	Multipack	8	160SZ	POE lubricant, 160SZ, 2 litre can	SZ, SH, MFZ, LFZ
7754027	Single pack	1	160SZ	POE lubricant, 160SZ, 1 gallon can	SZ, SH, MFZ, LFZ
7754121	Multipack	12	320SZ	POE lubricant, 320SZ, 1 litre can	SY
7754122	Multipack	8	320SZ	POE lubricant, 320SZ, 2 litre can	SY
7754025	Multipack	12	160Z	POE lubricant, 160Z, 1 litre can	NTZ, LTZ
7754026	Multipack	8	160Z	POE lubricant, 160Z, 2 litre can	NTZ, LTZ
7754009	Multipack	8	160ABM	Alkylbenzene oil 160ABM, 2 litre can	HRM, HLM, HCM
7754001	Multipack	8	160P	Mineral oil, 160P, 2 litre can	SM, MT, LT
7754002	Multipack	4	160P	Mineral oil, 160P, 5 litre can	SM, MT, LT
5402007	Single pack	1	160P	Mineral oil, 160P, 1 gallon can	SM, MT, LT
Contact DCC			PVE	Polyvinylester	HLJ & HLH061

\* Multipacks refer to deliveries from Danfoss Commercial Compressors to central Danfoss stocks or direct deliveries to OEM customers. These products may be available as single packs for end customers.