

## Design guide

# Piping connections



Typically, manifolds for multiple Energy Recovery Devices are made in hard piping, using flexible couplings between the devices discharge and inlet ports.

This paper shows some design rules based on Victaulic® Flexible couplings style 77 in Duplex. Other supplier of flexible couplings may have different design rules.

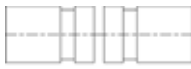
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**It is always the customer's responsibility to design the manifolds according to the design rules of the flexible couplings used.**

## Description

Experience in the market shows that precise welding of a steel manifold with multiple connections is difficult. The individual position of the manifold connections may exceed the flexibility of a single flexible coupling.

- To reduce stress on the discharge and inlet it is preferred to use flexible hoses or a minimum of 2 flexible couplings combined on the same pipe.
- When using hard piping, it is important to allow a gap between each individual Victaulic connection. See "Spacing" in table below.
- The use of only one flexible coupling to discharge or inlet should be accurately controlled to ensure the proper alignment of the manifold.
- Do not force any misaligned pipes to connect to discharge or inlet.
- Do not use the discharge or inlet connection as support for pipes. The pipes must have separate support close to the end of the pipe.

Victaulic® Flexible coupling Style 77DX Cut grooved Pipe SC40				End load <sup>3)</sup> [N]
	Spacing [mm]	Max. radial offset <sup>1)</sup> [mm]	Max. angle <sup>2)</sup> [Deg.] or [mm]	
1½"	3.2	0 mm	3° - 52' or 66	15120
2"	3.2	0 mm	3° or 52	23575
2½"	3.2	0 mm	2° - 30' or 44	34250
3"	3.2	0 mm	2° or 36	51150
4"	6.4	0 mm	3° - 12' or 56	84500
6"	6.4	0 mm	2° - 24' or 36	184000

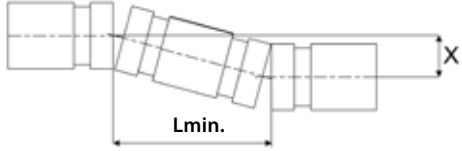
## Notes

Reference should always be made to the I-100 Victaulic® Field Installation Handbook for the product you are installing  
www.victaulic.com

All References are based Victaulic "Duplex – grooved couplings 17.20".

- <sup>1)</sup> At least 2 flexible couplings must be used to compensate radial misalignment. Angular deflection of each joint must not exceed Maximum angle from centerline. See example reference "Victaulic – Design Data 26.01 page 3.
- <sup>2)</sup> The grooved piping method will not allow both maximum linear movement and maximum angular movement simultaneously at the same joint.
- <sup>3)</sup> End Loads are total, from all internal and external loads, based on duplex stainless steel pipe.

## Example

Victaulic® Flexible coupling <b>Style 77DX</b> Cut grooved Pipe SC40	 <p>Minimum length at radial offset [mm]</p>	
3" pipe	<b>X</b>	<b>Lmin</b>
	<b>1</b>	1000/36 x <b>1</b> = 28 mm
	<b>2</b>	1000/36 x <b>2</b> = 56 mm
	3	1000/36 x 3 = 84 mm
	4	1000/36 x 4 = 111 mm
	5	1000/36 x 5 = 139 mm

## Pipe support

Flexible coupling Styles 77 and others standard grooved-type couplings allow angular, linear and rotational movement at each joint, to accommodate expansion, contraction, settling,

vibration, noise and other piping movement. This must be considered when determine hanger and support bracing. See Reference Victaulic – Design Data 26.01.

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