



Rigid-T

Rigid-T comes with high-purity tubes compliance to semiconductor or Biopharmaceutical specification with minimum contamination to customer process.

The spool fabrication is done in a clean and controlled environment with orbital welding procedure.

Both inner & outer pipe surface are polished, degreased, ultrasonic cleaned, and final-rinsed with high purity RO water, before it is used in process application.

All Rigid-T products come with CSM renowned customer service, from conceptual design to implementation, and are backed by a 5 year or optional extended 10 years vacuum warranty

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Engineered as modular sections, these stainless steel coaxial vacuum insulated piping spools are joined together with close tolerance bayonet connections, forming a complete cryogenic transfer system.

Each section is evacuated, sealed and tested for vacuum integrity to ensure minimal heat gain. Rigid-T comes with internal bellows at required intervals to serve as thermal expansion compensators according to EJMA 10,000 cycle fatigue calculation.

Installation for Rigid-T can be done easily both indoor and outdoor, by incorporating flexible sections strategically to offset misalignments.

CSM offers a complete line of components including in-line venting devices, phase separators and gas traps to maximize the cryogenic system performance.

Features and Benefits

- Fabricated by orbital welding to ensure process integrity
- Polished outer jacket provides clean pipe surface for cleanroom requirement
- Rigid-T pipes are durable, easy to install and practically maintenance free
- Excellent flow characteristics make Rigid-T an ideal for pipe mains
- Super insulation and proprietary chemical getters ensures long lasting vacuum integrity



Rigid-T with Degasser to biomedical freezer

Rigid-T with Ultraflex hose to cryokinetic semicon wafer cleaning equipment



Rigid-T Specifications

Model	R2T	R5T	R10T	R15T
Process Tube	0.5" ODT (12.7 mm OD)	0.75" ODT (19.05 mm OD)	1.125" ODT (29 mm OD)	1.5" ODT (38.1 mm OD)
Jacket Pipe (Sch 5)	1.5" IPS (48.3 mm OD)	2" IPS (60.3 mm OD)	2.5" IPS (73.03 mm OD)	3" IPS (88.9 mm OD)
Steady State Heat Leak	0.17 btu/hr/ft (0.16 watts/m)	0.42 btu/hr/ft (0.40 watts/m)	0.49 btu/hr/ft (0.47 watts/m)	0.62 btu/hr/ft (0.59 watts/m)
Bayonet Heat Leak	6.1 btu/hr (1.8 watts)	4.0 btu/hr (1.2 watts)	8.1 btu/hr (2.4 watts)	7.8 btu/hr (2.3 watts)
Max. Operating Pressure	150 psig (10.3 bar)	150 psig (10.3 bar)	150 psig (10.3 bar)	150 psig (10.3 bar)
Weight (exclude Bayonet)	1.8 lbs/ft (2.7 kg/m)	2.0 lbs/ft (3.0 kg/m)	3.1 lbs/ft (4.6 kg/m)	4.4 lbs/ft (6.5 kg/m)
Vacuum Insulation Type	Static or Dynamic Vacuum			
Maximum Length	Max. single line length 40' (12.2 m)			
Material Construction	Stainless Steel Series 300			
Standard Testing	Dimensional Check Heat leak checked 1 x 10 ⁻⁹ cc/s			
Optional	Pneumatic pressure test, Vacuum retention testing, LN2 cold shock, pre-material certs., X-ray, ASME B31.3 certification, CFOS cleaning for O2 services			

Typical Rigid-T, Engineered Modular Piping System

