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Product Specifications

**Note to users: items shown in red indicated edits / selections that need to be made to tailor the specification for the application.**

Retain and edit "Delegated-Design Submittal" Paragraph 1.h below if design services have been delegated to the contractor. The delegated design may be completed entirely by the contractor or may also involve the equipment manufacturer. Typically, the contractor would be responsible for the means and methods to attach anchors and guides to the structure, and field-fabrication of anchors. Expansion joint manufacturers may be involved in the piping analysis and selection of expansion joints and placement of anchors and guides.

**Metraloops Listed for Gas Service with carbon steel or stainless-steel fittings.**

1. General
	1. Provide flexible hose expansion loop(s) as indicated on the contract drawings or as required to accommodate any thermal expansion, contraction, or seismic movement of the piping system.
	2. Flexible hose expansion loops shall be manufactured complete with two parallel sections of corrugated metal house, compatible braid, 180⁰ return bend, with inlet and outlet connections. Field fabricated loops shall not be acceptable.
	3. Flexible loops shall be capable of movement in the ±X, ±Y, and ±Z planes.
	4. Flexible hose expansion loops shall impart no thrust loads to system support, anchors or building structure.
	5. Flexible hose expansion loops for flammable liquid or gas service up to 4” shall be CSA / AGA listed and be in conformance with UL-536.
	6. All flexible hose expansion loops shall be manufactured in accordance with the documented manufacturers weld procedure specifications in accordance with ASME Section IX.
	7. All flexible hose expansion loops shall be manufactured in accordance with ASME / ANSI B31.1
	8. Delegated-Design Submittal: Provide analysis signed and sealed by a qualified professional engineer. Submittal shall include [edit as required for project]:
		1. Design Calculations: Calculate requirements for thermal expansion of piping systems and criteria for selecting and designing expansion joints, hard-pipe loops, and swing connections.
		2. Schedule and drawings: Indicate type, manufacturer's number, size, material, pressure rating, end connections, and locations for each expansion joint, anchor and guide.
		3. Anchor Details: Detail fabrication of each anchor indicated. Show dimensions, methods of assembly, and attachment to building structure.
		4. Alignment Guide Details: Detail field assembly and attachment to building structure.
2. Products
	1. Flexible hose expansion loops to be "**Gas Metraloop**®” as manufactured by The Metraflex Company®, Chicago, IL.
	2. Corrugated Hose Stainless Steel Type 321 in accordance with ASTM A240
	3. Braid shall be 304 Stainless Steel in accordance with ASTM A240.
	4. Fittings Materials of construction
		1. Carbon steel shall be Standard weight / Sch 40 ASTM A 234 WPB
			1. End fittings shall match fittings material.
				1. Weld end in accordance with ASME B16.9
				2. MPT in accordance with ASME B1.20.1
		2. Stainless steel shall Sch 40 S Type 304 Stainless in accordance with ASTM A240
			1. End fittings shall match fitting material.
				1. Weld end in accordance with ASME B16.9
				2. MPT in accordance with ASME B1.20.1
3. Execution
	1. Install and guide per manufacturers’ installation instructions and Mechanical Contractors Association of America “Guidelines for Quality Piping Installations”.
	2. Flexible hose expansion loop return fitting shall be supported to allow movement.