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| Version | Date | Description of Revisions |
| 1 | August 30, 2006 | Approved final document. |
| 2 | August 12, 2014 | First draft review (AV) |
| 3 | June 8, 2015 | Second Draft for Review (AV) |
| **4** | **September 16, 2015** | **Updated, Finalized Specification – Reference eDOCS #5823661-v4 (AV)** |
| 5 | May 23, 2017 | Updated references to standards ASME B16.5-2013, ASME B16.42-2016, ASTM A106/A106M-15, ASTM A193/A193M-16, ASTM A194/A194M-17, ASTM A216/A216M-16, ASTM A234/A234M-16, ASTM A307-14e1, ASTM A563-15, ASTM D3222-05(2015) (AAM) |

NOTE:

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| Item | Description | |
| PVDF Lining | Polyvinylidene fluoride (PVDF) meeting the requirements of ASTM D3222-05(2015), Minimum lining thicknesses for nominal pipe sizes: | |
| 50 mm & smaller: | 1.5 mm thick |
| 75 mm: | 2.0 mm thick |
| 100 mm: | 2.5 mm thick |
| 150 mm: | 3 mm thick |
| 200mm to 300 mm: | 4 mm thick |
| Pipe | PVDF-lined black carbon steel pipe; seamless, ERW, or electric welded meeting the requirements of ASTM A53/A53M-12, Type E or S, ASTM A106/A106M-15, ASTM A135/A135M-09(2014), or A587-96(2012). Approved products:   1. Crane Co., Resistoflex 2. The Dow Chemical Company 3. Approved Equivalent.   Minimum Pipe Wall Thickness: | |
| 150 mm & smaller: | Schedule 40. |
| 200 to under 300 mm: | Schedule 30. |
| 300 mm: | Schedule 20. |
| Fittings | PVDF-lined ASME B16.42-2016, Class 150 flanged ductile iron meeting requirements of ASTM A395/A395M-99(2014). Approved products:   1. Crane Co., Resistoflex 2. The Dow Chemical Company 3. Approved Equivalent.   or ASME B16.5-2013, Class 150 flanged cast steel meeting requirements of ASTM A216/A216M-16, Grade WCB. Approved products:   1. Crane Co., Resistoflex 2. Dow Chemical USA 3. Approved Equivalent.   Fabricated carbon steel fittings composed of PVDF-lined 1,035 kPag carbon steel flanges in accordance with this data sheet, PVDF-lined carbon steel pipe in accordance with this data sheet, and PVDF-lined carbon steel butt-weld fittings meeting the requirements of ASTM A234/A234M-16, Grade WPB a wall thickness same as pipe. | |
| Pipe and Fitting Vents | Install 1.5 mm minimum to 3 mm maximum diameter vent holes in the pipe wall:   * One vent every 1000 mm along the pipe rotated approximately 90 degrees to the preceding vent; * One vent every 450 mm along field-flared pipe rotated approximately 90 degrees to the preceding vent; * Minimum of two vents per pipe spool; * Two vents 180 degrees apart located within 150 mm of each flange.   Provide vent extensions to the outside of pipe insulation or other overwrap. Use 3 mm, 13,800- or 20,700 kPag WOG, half couplings welded to the pipe before lining is installed with a 3 mm carbon steel pipe for the vent. | |
| Joints | Flanged. | |
| Flanges | ASME B16.42-2016, Class 150 ductile iron Van Stone (lap joint) or threaded meeting the requirements of ASTM A395/A395M-99(2014) or ASME B16.5-2013, Class 150 carbon steel Van Stone (lap joint), slip-on or socket-weld meeting the requirements of ASTM A105/A105M-14 or A181/A181M-14.  Flange facing shall be molded PVDF or extended and flared PVDF pipe or fitting lining forming a raised-face gasket surface. | |
| Bolting | Carbon steel, ASTM A307-14e1, Grade B square head bolts and ASTM A563-15, Grade A heavy hex head nuts.  Corrosive Conditions: Stainless steel, ASTM A193/A193M-16, Grade B8M studs and ASTM A194/A194M-17, Grade 8M hex head nuts. | |
| Gaskets | Tetrafluoroethylene (TFE) envelope, flat ring type.  When the mating flange has a flat face, provide a filler gasket between the outside diameter of the raised-face PVDF flange liner and the flange outside diameter to protect the flange from excessive bolting moment. | |

**END OF SECTION**