

RECOMMENDED SPECIFICATION FOR FLOSAFE, INC. PowerGuard PP in PP DOUBLE CONTAINMENT PIPING SYSTEMS FOR PRESSURIZED CARRIER PIPING APPLICATIONS

PART ONE – GENERAL

1.0 Furnish a complete pre-engineered, fully anchored double containment piping and leak detection system, excluding all pumps, filters, instrumentation, valves, external supporting means, installation, testing, and burial. The system is to include all inner and outer piping, fitting, internal support and anchor materials, floor drains, leak detection apparatus (other than leak detection cable, and exclusive of conduit, and installation of the apparatus) and all associated joining equipment.

1.1 The system shall be a fully anchored FloSafe PowerGuard PP inside of PP Double Containment Piping System, with pressurized carrier process piping, as manufactured by FloSafe, Inc., of Kansas City, KS, in the USA.

1.2 The design of the system, and the suitability of the product for the specified project design conditions shall be the responsibility of the owner's appointed designer of record, and shall be in accordance with the ANSI/ASME B31.3 Process Piping Code, and all other applicable plumbing, building codes, local, state and federal legislative requirements, and the recommendations of FloSafe, Inc. of Kansas City, KS.

PART TWO – PRODUCTS

2.0 Materials

Primary (Carrier) and secondary containment pipe and fittings shall be manufactured from a co-polymerpolypropylene resin (Type II resin according to ASTM D 4101).

2.1 Primary (Carrier) Pipe

Primary (carrier) pipe shall be (choose one) SDR 11 SDR 17.6 SDR 33 dimensions according to DIN 8077.

2.2 Primary Fittings

Primary (carrier) fittings shall be injection-molded and/or seamless pressure pattern fittings according to DIN 16962, in sizes where such fittings are available.

2.3 Secondary Containment Pipe

Secondary containment pipe shall be (choose one) SDR 11 SDR 17.6 SDR 33 dimensions according to DIN 8077. Each length of pipe shall be fully anchored by means of FloTrue™ Internal anchors which are back- welded to the carrier piping.

2.4 Secondary Containment Fittings

Secondary containment fittings shall be made using injection-molded and/or seamless pressure pattern fittings according to DIN 16962, in sizes where such fittings are available, and shall be fabricated from pipe in sizes where such fittings are unavailable. All secondary containment fittings shall be prefabricated to house the corresponding primary (carrier) fittings as a subassembly by FloSafe, Inc., and all factory joints pre-tested prior to shipment. All secondary containment fittings shall be fully anchored to the corresponding primary fittings using FloTrue Internal Anchors.

2.5 Internal Supports

All mid-line internal supports shall be FloSafe molded collar-style FloTrue internal anchors, machined to fit within the inside diameter of the corresponding secondary containment piping (according to manufacturing tolerances determined by FloSafe, Inc.), and shall be back-welded to the carrier piping.

2.6 Pipe End Plate Internal Anchor Supports

All piping end plates used to internally anchor each end of standard factory lengths of piping shall be FloSafe FloTrue™ Internal anchors, and shall be back-welded to the carrier piping systems.

2.7 Closure Fittings

All closure fittings, where required, shall be FloSafe Powerclosure Couplings.

PART THREE – EXECUTION

3.0 Joining Method

The system shall be joined by the following methods:

3.1 Primary System Joining Method (choose one):

- Primary system shall be joined by Powerfusion Electrofusion (ASTM F 1290)
- Primary system shall be joined by socket fusion (ASTM D 2657, Proc. 1)
- Primary system shall be joined by butt fusion (ASTM D2657, Proc 2))

3.2 Containment System Joining Method

- The containment system shall be joined by the Powerfusion Electrofusion Method (ASTM F 1290).

3.3 Installation and Testing

Installation and testing shall be in accordance with contract drawings, the manufacturer's recommendations, and the local plumbing codes. The test pressure for the primary (carrier) piping system, shall be according to the authority having local jurisdiction, but in no case should exceed 150% of the design pressure of the system for a period of one hour. The test pressure for the containment piping system shall also be according to the authority having local jurisdiction, but in no case shall exceed 5 psi, if a pneumatic test is conducted. Visual inspection of carrier pipe joints during testing shall be in accordance with the ANSI/ASME B31.3 Process Piping Code, para. A345, and any applicable plumbing code, or other requirements of the authority having local jurisdiction.

PART FOUR – LEAK DETECTION SYSTEM

4.0 Leak detection system shall be a continuously monitoring automatic conductivity sensing probe system as supplied by FloSafe, Inc. The location of probes, and the type and location of provisions to incorporate the probes at desired locations shall be as shown on the contract drawing details. The alarm panel, system map, and operating manual and instructions shall be provided by FloSafe, Inc. All wiring and conduit needed for installation of the leak detection system shall be provided by the contractor.

4.0 (alternate) Leak detection system shall be a continuously monitoring leak detection cable system provided by others. The design and installation details of the leak detection system shall be provided by the manufacturer of the leak detection system, or its agents, and in any case shall be limited to mains where the carrier size is 4" nominal (110 mm) or larger, and shall be limited to straight sections of the system between consecutive fittings. Straight sections of cable shall be connected to one another by jumper cable, as recommended by the cable manufacturer, or shall be separately wired back to the alarm panel. The system mapping, start-up, training and commissioning of the system shall be the responsibility of the leak detection cable manufacture.

RECOMMENDED SPECIFICATION FOR FLOSAFE, INC. PowerGuard PVDF in PP DOUBLE CONTAINMENT PIPING SYSTEMS FOR PRESSURIZED CARRIER PIPING APPLICATIONS

PART ONE – GENERAL

1.0 Furnish a complete pre-engineered, fully anchored double containment piping and leak detection system, excluding all pumps, filters, instrumentation, valves, external supporting means, installation, testing, and burial. The system is to include all inner and outer piping, fitting, internal support and anchor materials, floor drains, leak detection apparatus (other than leak detection cable, and exclusive of conduit, and installation of the apparatus) and all associated joining equipment.

1.1 The system shall be a fully anchored FloSafe PowerGuard PVDF inside of Polypropylene double containment piping system, with pressurized carrier piping, as manufactured by FloSafe, Inc., of Kansas City, KS, in the USA.

1.2 The design of the system, and the suitability of the product for the specified project design conditions shall be the responsibility of the owner's appointed designer of record, and shall be in accordance with the ANSI/ASME B31.3 Process Piping Code, and all other applicable piping or plumbing codes, building codes, local, state and federal legislative requirements, and the recommendations of FloSafe, Inc. of Kansas City, KS.

PART TWO – PRODUCTS

2.0 Materials

Primary (Carrier) pipe and fittings shall be manufactured from an emulsion grade homopolymer PVDF resin (Type I resin according to ASTM D 3222). Secondary containment pipe and fittings shall be manufactured from a copolymer polypropylene resin (Type II resin according to ASTM D 4101).

2.1 Primary (Carrier) Pipe

Primary (carrier) pipe shall be (choose one) SDR 21 (Pressure Class 230 psi) SDR 33 (Pressure Class 150 psi) dimensions according to ISO 10931.

2.2 Primary Fittings

Primary (carrier) fittings shall be injection-molded and/or seamless pressure pattern fittings where such fittings are available, with dimensions according to ISO 10931-3: 1996 (E).

2.3 Secondary Containment Pipe

Secondary containment pipe shall be (choose one) SDR 11 SDR 17.6 SDR 33 dimensions according to DIN 8077. Each length of pipe shall be fully anchored by means of FloTrue™ Internal anchors, back-welded to the carrier piping system.

2.4 Secondary Containment Fittings

Secondary containment fittings shall be manufactured from a co-polymer polypropylene resin (Type II according to ASTM D 4101), and shall be injection-molded and/or seamless pressure pattern fittings where such fittings are available, with dimensions according to DIN 16962. All secondary containment fittings shall be prefabricated to house the corresponding primary (carrier) fittings as a subassembly by FloSafe, Inc., and all factory joints pre-tested prior to shipment. All secondary containment fittings shall be fully anchored to the corresponding primary fittings using FloTrue Internal Anchors.

2.5 Internal Supports

All mid-line internal supports shall be FloSafe molded collar-style FloTrue™ internal anchors, machined to fit within the inside diameter of the corresponding secondary containment piping (according to manufacturing tolerances determined by FloSafe, Inc.), and shall be back-welded to the carrier piping system.

2.6 Pipe End Plate Internal Anchor Supports

All piping end plates used to internally anchor each end of standard factory lengths of piping shall be FloSafe FloTrue™ Internal anchors, and shall be back-welded to the carrier piping systems.

2.7 Closure Fittings

All closure fittings, where required shall be FloSafe Power-closure Couplings.

PART THREE – EXECUTION

3.0 Joining Method

The system shall be joined by the following methods:

3.1 Primary System Joining Method (choose one):

- Primary system shall be joined by Powerfusion Electrofusion (ASTM F 1290)
- Primary system shall be joined by socket fusion (ASTM D 2657, Proc. 1)
- Primary system shall be joined by Butt Fusion (ASTM D2657, Proc 2)

3.2 Containment System Joining Method

- The containment system shall be joined by the Powerfusion Electrofusion Method (ASTM F 1290).

3.3 Installation and Testing

Installation and testing shall be in accordance with contract drawings, the manufacturer's recommendations, and the local plumbing codes. The test pressure for the primary (carrier) piping system, shall be according to the authority having local jurisdiction, but in no case should exceed 150% of the design pressure of the system for the project design conditions, for a period of not more than one hour. The test pressure for the containment piping system shall also be according to the authority having local jurisdiction, but in no case shall exceed 5 psi, if a pneumatic test is conducted. Visual inspection of carrier pipe joints during testing shall be in accordance with the ANSI/ASME B31.3 Process Piping Code, para. A345.

PART FOUR – LEAK DETECTION SYSTEM

4.0 Leak detection system shall be a continuously monitoring automatic conductivity sensing probe system as supplied by FloSafe, Inc. The location of probes, and the type and location of provisions to incorporate the probes at desired locations shall be as shown on the contract drawing details. The alarm panel, system map, and operating manual and instructions shall be provided by FloSafe, Inc. All wiring and conduit needed for installation of the leak detection system shall be provided by the contractor.

4.0 (alternate) Leak detection system shall be a continuously monitoring leak detection cable system provided by others. The design and installation details of the leak detection system shall be provided by the manufacturer of the leak detection system, or its agents, and in any case shall be limited to mains where the carrier size is 4" nominal (110 mm) or larger, and shall be limited to straight sections of the system between consecutive fittings. Straight sections of cable shall be connected to one another by jumper cable, as recommended by the cable manufacturer, or shall be separately wired back to the alarm panel. The system mapping, start-up, training and commissioning of the system shall be the responsibility of the leak detection cable manufacture.

RECOMMENDED SPECIFICATION FOR FLOSAFE, INC.

PowerGuard PVDF in PVDF DOUBLE CONTAINMENT PIPING SYSTEMS FOR PRESSURIZED CARRIER PIPING APPLICATIONS

PART ONE – GENERAL

1.0 Furnish a complete pre-engineered, fully anchored double containment piping and leak detection system, excluding all pumps, filters, instrumentation, valves, external supporting means, installation, testing, and burial. The system is to include all inner and outer piping, fitting, internal support and anchor materials, floor drains, leak detection apparatus (other than leak detection cable, and exclusive of conduit, and installation of the apparatus) and all associated joining equipment.

1.1 The system shall be a fully anchored FloSafe PowerGuard PVDF inside of PVDF double containment piping system, with pressurized carrier piping, as manufactured by FloSafe, Inc., of Kansas City, KS, in the USA.

1.2 The design of the system, and the suitability of the product for the specified project design conditions shall be the responsibility of the owner's appointed designer of record, and shall be in accordance with the ANSI/ASME B31.3 Process Piping Code, and all other applicable piping or plumbing codes, building codes, local, state and federal legislative requirements, and the recommendations of FloSafe, Inc. of Kansas City, KS.

PART TWO – PRODUCTS

2.0 Materials

Primary (Carrier) and secondary containment pipe and fittings shall be manufactured from an emulsion grade homopolymer PVDF resin (Type I resin according to ASTM D 3222).

2.1 Primary (Carrier) Pipe

Primary (carrier) pipe shall be (choose one) SDR 21 (Pressure Class 230 psi) SDR 33 (Pressure Class 150 psi) dimensions according to ISO 10931.

2.2 Primary Fittings

Primary (carrier) fittings shall be injection-molded and/or seamless pressure pattern fittings where such fittings are available, with dimensions according to ISO 10931-3 : 1996 (E).

2.3 Secondary Containment Pipe

Secondary containment pipe shall be (choose one) SDR 21 (Pressure Class 230 psi) SDR 33 (Pressure Class 150 psi) dimensions according to ISO 10931. Each length of pipe shall be fully anchored by means of FloTrue™ Internal anchors Back-welded to the carrier piping system.

2.4 Secondary Containment Fittings

Secondary containment fittings shall be manufactured from an emulsion grade homopolymer PVDF resin (Type 1 according to ASTM D 3222). All secondary containment fittings shall be prefabricated to house the corresponding primary (carrier) fittings as a subassembly by FloSafe, Inc., and pretested prior to shipment. All secondary containment fittings shall be fully anchored to the corresponding primary fittings using FloTrue Internal Anchors.

2.5 Internal Supports

All mid-line internal supports shall be FloSafe molded collar-style FloTrue™ internal anchors, machined to fit within the inside diameter of the corresponding secondary containment piping (according to manufacturing tolerances determined by FloSafe, Inc.), and shall be back-welded to the carrier pipe.

2.6 Pipe End Plate Internal Anchor Supports

All piping end plates used to internally anchor each end of standard factory lengths of piping shall be FloSafe FloTrue™ Internal anchors, and shall be back-welded to the carrier piping systems.

2.7 Closure Fittings

All closure fittings, where required shall be FloSafe Powerclosure Couplings.

PART THREE – EXECUTION

3.0 Joining Method

The system shall be joined by the following methods:

3.1 Primary System Joining Method (choose one):

- Primary system shall be joined by Powerfusion Electrofusion (ASTM F 1290)
- Primary system shall be joined by socket fusion (ASTM D 2657, Proc. 1)
- Primary system shall be joined by Butt-Fusion (ASTM D-2657, Proc 2)

3.2 Containment System Joining Method

- The containment system shall be joined by the Powerfusion Electrofusion Method (ASTM F 1290).

3.3 Installation and Testing

Installation and testing shall be in accordance with contract drawings, the manufacturer's recommendations, and the local plumbing codes. The test pressure for the primary (carrier) piping system, shall be according to the authority having local jurisdiction, but in no case should exceed 150% of the design pressure of the system for the project design conditions, for a period of not more than one hour. The test pressure for the containment piping system shall also be according to the authority having local jurisdiction, but in no case shall exceed 5 psi, if a pneumatic test is conducted. Visual inspection of carrier pipe joints during testing shall be in accordance with the ANSI/ASME B31.3 Process Piping Code, para. A345.

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4.0 Leak detection system shall be a continuously monitoring automatic conductivity sensing probe system as supplied by FloSafe, Inc. The location of probes, and the type and location of provisions to incorporate the probes at desired locations shall be as shown on the contract drawing details. The alarm panel, system map, and operating manual and instructions shall be provided by FloSafe, Inc. All wiring and conduit needed for installation of the leak detection system shall be provided by the contractor.

4.0 (alternate) Leak detection system shall be a continuously monitoring leak detection cable system provided by others. The design and installation details of the leak detection system shall be provided by the manufacturer of the leak detection system, or its agents, and in any case shall be limited to mains where the carrier size is 4" nominal (110 mm) or larger, and shall be limited to straight sections of the system between consecutive fittings. Straight sections of cable shall be connected to one another by jumper cable, as recommended by the cable manufacturer, or shall be separately wired back to the alarm panel. The system mapping, start-up, training and commissioning of the system shall be the responsibility of the leak detection cable manufacture.