



# SUBMITTAL AND DATA SHEET FOR HYDRONIC PIPING SYSTEM

Pestan North America, LLC  
P.O. Box 45  
Titusville, PA 16354  
Fax: 888.213.4342

## PROJECT INFORMATION

Job Name: \_\_\_\_\_

Location: \_\_\_\_\_

Engineer: \_\_\_\_\_

Submitted To: \_\_\_\_\_

Reference    Approval    Construction

Submitted By: \_\_\_\_\_

Reference: \_\_\_\_\_

## SUBMITTAL INFORMATION

Approval: \_\_\_\_\_

Date: \_\_\_\_\_

Construction: \_\_\_\_\_

Drawing #: \_\_\_\_\_

## MECHANICAL PIPE and FITTINGS

### Identification:

SDR7.4 and SDR9 Pipe - green with 4 grey stripes, made of PP-RCT with Fiber Composite Layer  
 SDR11 and SDR17.6 Pipe – solid green, made of PP-RCT with Fiber Composite Layer  
 Socket and Saddle Outlet Fittings – solid green, made of PP-RCT  
 Butt Fusion Fittings – solid green or green with matching pipe markers, made of PP-RCT with  
 Fiber Composite Layer

**Applications:** Heating and cooling systems, compressed air and vacuum, direct burial, industrial, geothermal and chemical applications.

**In accordance with following standards and codes:** NSF/ANSI -14, CSA-B137.11, ASTM F 2389, ISO 15874, DIN 8077-8078, UMC, CMC, IMC®; ICC-ES PMG – 1106

Wall Thickness	Allowed Pressure (psi) for Service Life of 50+ years						
	SDR7.4		SDR9		SDR11		SDR17.6
Safety Factor	1.25	1.5	1.25	1.5	1.25	1.5	1.25**
50° F	487	406	387	322	308	257	160
68° F	423	352	335	280	266	222	135
73° F	400	335	324	270	252	210	133
86° F	364	303	289	241	230	192	121
104° F	312	260	248	206	197	164	103
122° F	265	221	211	176	167	140	88
140° F	223	186	177	148	141	118	70
160° F	187	155	147	123	117	97	62
180° F	100* (149)	100* (120)	100* (120)	100	100	85	50

Pressure Ratings of the Fittings	
Socket and Saddle Outlet Fittings	Butt Fusion Fittings
Engineered with greater safety factor than the pipe	Same pressure ratings as the matching pipe

\*ASTMF2389 X1.1.4 requires the pressure rating at 180°F to be calculated based on an application class 5 from ISO 15874-2, but if the calculated pressure exceeds 100 psi, it has been arbitrarily lowered to 100 psi to conform with U.S. plumbing codes.

\*\*Recommended Safety Factor by ISO 15874 & DIN 8077-8078

For more information, please see attached documents or visit our website at [www.PestanPipes.com](http://www.PestanPipes.com).

If you have questions please call us at 814.827.8034 or email at [support@pestanpipes.com](mailto:support@pestanpipes.com).

Revised on 1/1/16. This information may have been updated. Please download the latest version at [www.Pestanpipes.com](http://www.Pestanpipes.com).



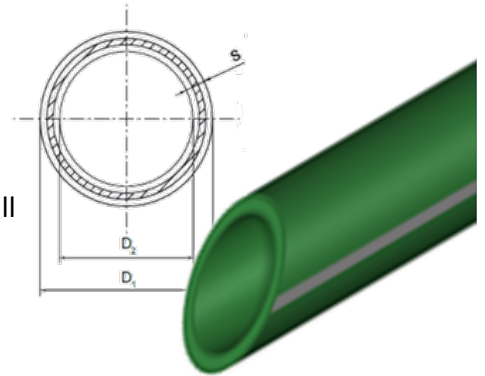
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## MECHANICAL PIPE

Material: PP-RCT with Fiber Composite Layer

For more information, please see attached documents or visit our website at [www.PestanPipes.com](http://www.PestanPipes.com). If you have questions please call us at 814.827.8034 or email at [support@pestanpipes.com](mailto:support@pestanpipes.com).



Revised on 1/1/16. This information may have been updated. Please download the latest version at [www.Pestanpipes.com](http://www.Pestanpipes.com).

	Part Number [CODE]	Dimension N.D. - O.D. [in -mm]	Outer Diameter, D <sub>1</sub> [mm] [in]		Inner Diameter, D <sub>2</sub> [mm] [in]		Wall Thickness, s [mm] [in]		Pipe Length [ft]	Weight [lb/ft]	# of Items in the Bag
SDR 7.4	18002150	½" - 20	20	0.79	14.4	0.57	2.8	0.11	13	0.11	25
	18002151	¾" - 25	25	0.98	18	0.71	3.5	0.14	13	0.17	20
SDR 9	18002170	1" - 32	32	1.26	24.8	0.98	3.6	0.14	13	0.22	14
	18002171	1¼" - 40	40	1.58	31	1.22	4.5	0.18	13	0.34	10
	18002172	1½" - 50	50	1.97	38.8	1.53	5.6	0.22	13	0.53	8
	18002173	2" - 63	63	2.48	48.8	1.92	7.1	0.28	13	0.85	5
	18002174	2½" - 75	75	2.95	58.2	2.29	8.4	0.33	13	1.19	3
	18002175	3" - 90	90	3.54	69.8	2.75	10.1	0.4	13	1.72	2
	18002177	4" - 125	125	4.92	97	3.82	14	0.55	13	3.28	1
	18002180	6" - 160	160	6.3	124.2	4.9	17.9	0.71	13	5.37	1
	18002182	6" - 160	160	6.3	124.2	4.9	17.9	0.71	19	5.37	1
	18002181	8" - 200	200	7.87	155.2	6.11	22.4	0.88	19	8.39	1
	18002183	10" - 250	250	9.84	194.2	7.65	27.9	1.1	19	13.05	1
18002184	12" - 315	315	12.4	244.6	9.63	35.2	1.39	19	20.75	1	
SDR 11	18002190	1" - 32	32	1.26	26.2	1.03	2.9	0.11	13	0.19	14
	18002191	1 ¼" - 40	40	1.58	32.6	1.28	3.7	0.15	13	0.29	10
	18002192	1½" - 50	50	1.97	40.8	1.61	4.6	0.18	13	0.45	8
	18002193	2" - 63	63	2.48	51.4	2.02	5.8	0.23	13	0.72	5
	18002194	2½" - 75	75	2.95	61.4	2.42	6.8	0.27	13	1	3
	18002195	3" - 90	90	3.54	73.6	2.9	8.2	0.32	13	1.44	2
	18002197	4" - 125	125	4.92	102.2	4.02	11.4	0.45	13	2.77	1
	18002198	6" - 160	160	6.3	130.9	5.15	14.6	0.58	13	4.52	1
	18002200	6" - 160	160	6.3	130.9	5.15	14.6	0.58	19	4.52	1
	18002199	8" - 200	200	7.87	163.4	6.43	18.3	0.72	19	7.04	1
SDR 17.6	18002185	10" - 250	250	9.84	204.6	8.06	22.7	0.89	19	10.95	1
	18002186	12" - 315	315	12.4	257.8	10.15	28.6	1.13	19	17.26	1
	18002160	4" - 125	125	4.92	110.8	4.36	7.1	0.28	19	1.8	1
	18002161	6" - 160	160	4.92	141.8	5.58	9.1	0.36	19	2.93	1
	18002162	8" - 200	200	7.87	177.2	6.98	11.4	0.45	19	4.57	1
	18002163	10" - 250	250	9.84	221.6	8.72	14.2	0.56	19	7.11	1
	18002164	12" - 315	315	12.4	279.2	10.99	17.9	0.71	19	11.25	1

## 23 21 00 HYDRONIC PIPING AND PUMPS

### SECTION 232113 - HYDRONIC PIPING

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. This Section includes the materials of pipes and fittings, joining methods and specialty items for following:
  - 1. Hot water heating piping.
  - 2. Chilled water piping.
  - 3. Condenser water piping.
  - 4. Make-up water piping
  - 5. Air Vent piping
  - 6. Safety-Valve Inlet and Outlet Piping
  - 7. Air control devices (air separators / expansion tanks)

##### 1.2 REFERENCES

- A. ASTM F 2389 - 10 Standard Specification for Pressure-rated Polypropylene (PP) Piping Systems.
- B. CSA B137.11 – Polypropylene (PP-R) Pipe and Fittings for Pressure Applications.
- C. NSF / ANSI 14 – Plastic Piping System Components and Related Materials.

##### 1.3 DEFINITIONS

- A. Definitions: In accordance with local mechanical codes and ASTM F 2389.

##### 1.4 SUBMITTALS

- A. Product Data: For each type of the following:
  - 1. Plastic pipe and fittings.
  - 2. Valves.
  - 3. Fire protection materials.
  - 4. UV resistant coating.
  - 5. Thermal and vapor barriers.
  - 6. Fusion welding process.
- B. Qualification Data: For Installer.

- C. Field quality-control:
  - 1. Cleaning process and reports.
  - 2. Inspection and test reports.

#### 1.5 QUALITY ASSURANCE

- A. Material : Certified as complying with NSF / ANSI 14, and ASTM F 2389 or CSA B137.11.
- B. Material : Comply with Manufacturer's specifications.
- C. Special Engineered Products: Certified as complying with NSF /ANSI 14.
- D. Piping specifications and ordering information : Contact Manufacturer.
- E. Fittings specifications and ordering information : Contact Manufacturer.
- F. Valves specifications and ordering information : Contact Manufacturer.

#### 1.6 WARRANTY

- A. Manufacturer : Warrant pipe and fittings to be free of manufacturing defects. Warranty period: 10 years.
- B. Warranty : Cover labor and material costs of repairing or replacing defective products and repairing damage caused by failure of the piping system due to manufacturing defect.
- C. Warranty : In effect only upon submission by the Contractor to the Manufacturer with a valid Pressure Test Form and documents confirming that the system was tested and passed the Manufacturer's Pressure Test.
- D. Warranty : Effective only if the pipe and fittings are installed by an installer who has been certified and trained by Manufacturer or a Manufacturer's affiliate. Certification has to be current and specific to the type of fusion performed.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURER

- A. PESTAN N.A. P.O. BOX 26, Titusville, PA 16354 P: 814-827-8034 ; [www.PestanPipes.com](http://www.PestanPipes.com) .

#### 2.2 PLASTIC PIPE

- A. Pipe : PESTAN Mechanical Pipe.

- B. Pipe : Manufactured from a PP-RCT or PP-R resin meeting the short-term properties and long-term strength requirements of ASTM F 2389 or CSA B137.11.
- C. Rework or recycled materials are not permitted for pipe.
- D. Pipe : Manufactured by a factory extrusion process.
- E. Hot water pipe : Manufactured in a three layer extrusion process and contain a fiber middle layer to restrict thermal expansion.
- F. Pipe : Comply with the rated pressure requirements of ASTM F 2389.
- G. Pipe : Certified as complying with NSF /ANSI 14, and ASTM F 2389 or CSA B137.11

### 2.3 PLASTIC PIPE FITTINGS

- A. Fittings : PESTAN fittings.
- B. Fittings : Manufactured from a PP-RCT or PP-R resin meeting the short-term properties and long-term strength requirements of ASTM F 2389 or CSA B137.11.
- C. Rework or recycled materials are not permitted for fittings.
- D. Fittings :
  - 1. Certified as complying with NSF / ANSI 14, and ASTM F 2389 or CSA B137.11.
  - 2. For sizes 20 mm (1/2 inch nominal) to 125 mm (4 inches nominal) : Socket fusion type.
  - 3. For size 125 mm (4 inches nominal) pipe to pipe and pipe to flange adapter connections: Socket or Butt fusion type.
  - 4. For sizes 160 mm (6 inches nominal) and above: Butt fusion type.
  - 5. Outlets for all sizes: Saddle Fusion.

### 2.4 VALVES

- A. Valves : PESTAN valves.
- B. Valves : Manufactured in accordance with the manufacturer's specifications and complying with the performance requirements of ASTM F 2389 or CSA B137.11.

### 2.5 SMOKE AND FIRE RATINGS

- A. Protect piping with CAN/ULC-S102.2-03 or ASTM E 84 insulation; where indicated on drawings or where a Plenum-rated Piping System is required.

## 2.6 UV PROTECTION

- A. Protect pipe with UV resistant coating or with alternative UV protection recommended by Manufacturer, that will be exposed to direct UV light for more than 30 days.

## 2.7 THERMAL AND VAPOR BARRIER

- A. Provide piping with thermal (radiant, conductive, convective) and vapor barrier insulation ; where indicated on drawings that standard pipe insulation is required.
- B. Pipe insulation: UV resistant, CFC-free, non-fibrous, and resistant to mold growth.

## PART 3 - EXECUTION

### 3.1 PIPING APPLICATIONS

- A. Install listed pipe materials and joining methods below in the following applications:
  - 1. Above ground : Polypropylene piping in SDR 7.4, 9, 11, or 17.6 based on the required minimum pressure rating and use temperature, in accordance with manufacturer's instructions and ASTM F2389
  - 2. Underground : Polypropylene piping in SDR 7.4, 9, 11, or 17.6 per manufacturer's instructions and ASTM D2774.

### 3.2 PIPING INSTALLATIONS

- A. Install hangers and supports at intervals specified in the applicable Plumbing or Mechanical Code and as recommended by Pipe Manufacturer.
- B. Support vertical piping at each floor penetration and as specified in the applicable Plumbing or Mechanical Code.
- C. Fire stopping : Compatible with the PESTAN Piping and meet the requirements of ASTM E 814 or ULC S115 , "Fire Tests of Through-Penetration Firestops".
- D. Remove pipe insulations or fire resistive coating where the pipe passes through a fire stop and, if required by the firestop manufacturer, for 3 inches beyond the firestop outside of the fire barrier.
- E. Protect piping from excessive heat generated from pumps operating at shut-off conditions.

- F. Provide a suitable protection method, such as temperature relief valve , or other comparable level of protection, set to a maximum temperature of 85 degree C (185 degree F) ; where the possibility exists that the pump will work with no flow.
- G. Provide heat tracing or freeze protection where specified for the piping. Provide a type that is suitable for use with plastic piping and be self regulating type to ensure the surface temperature of the pipe and fittings will not exceed 70 degree C (158 degree F).

### 3.3 PIPE JOINT CONSTRUCTION

- A. Fittings: Joined using in accordance with ASTM D 2657 and Manufacturer's specifications and the following:
  - 1. For sizes 20 mm (1/2 inch nominal) to 125mm (4 inches nominal) : Use socket fusion.
  - 2. For size 125mm (4 inches nominal) pipe to pipe and pipe to flange adapter connections: Use socket or butt fusion.
  - 3. For sizes 160 mm (6 inches nominal) and above: Use butt fusion.
  - 4. Outlets for all sizes: Saddle Fusion.
- B. Install fittings and joints with electrofusion for repairs as applicable for the fitting or joint type. All electrofusion joints shall be made in accordance with the pipe and fitting manufacturer's specifications and product standards.
- C. Fusion machines, equipment and tools: Specified by the Pipe and Fittings Manufacturer.
- D. Joint preparation, setting, alignment, fusion process, cooling times and working pressures: In accordance with the Pipe and Fitting Manufacturer's specifications.

### 3.4 VALVE APPLICATIONS

- A. Install gate valves close to the main on each branch and riser serving 2 or more equipment connections and where indicated.
- B. Install gate or ball valves on the inlet to each equipment item and where indicated.
- C. Install drain valve at the base of each riser, at low points of horizontal runs, and where required to drain hydronic piping system.
- D. Install swing check valve on the discharge side of each pump and where as indicated.
- E. Install ball valves in each hot water circulating loop and the discharge side of each pump.

### 3.5 FIELD QUALITY CONTROL

- A. Cleaning :
  - 1. Flush pipes and fittings with cold water after finishing the installation.

- B. Field Testing and Inspection:
1. Inspect and test piping systems in accordance with the recommendations and requirements of authorities having jurisdiction and as specified by the Pipe and Fittings Manufacturer.
  2. Test the piping in accordance with the requirements of the authority having local jurisdiction in addition to Pipe Manufacturer's testing requirement ; upon completion of the piping installation.
  3. Manufacturer's test pressure : 150 percent of the system operating pressure or 1034 kPa (150 psi), whichever is greater.
  4. Isolate components from the pressure test ; when pressure testing systems components rated lower than 150 psi.
  5. Use water, air, or a mixture of both to complete the required Manufacturer's test . Use extreme caution ; when pressure testing with air.
  6. Perform pressure testing while the system is fully accessible and allowing access to the segments of the system in need of the attention.
  7. Repair installation and repeat testing ; if leaks are detected.
  8. Perform, document and submit tests to Pipe Manufacturer ; before the system becomes operational.
  9. Contact Manufacturer at website ; [www.PestanPipes.com](http://www.PestanPipes.com) for more information.

END OF SECTION 232113