

Glass Fiber Reinforced PP-R Multilayer Composite Pipes

Safe and Practical for
All Hot water and Heating Applications



wavin

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Glass Fiber Reinforced PP-R Multilayer Composite Pipes

Glass Fiber multilayer pipes are produced from PP-R raw material according to EN15874-2 European Standard. Pipes with better compressive strength and lower thermal expansion should be preferred in hot water applications. Wavin Composite pipes offer suitable solutions for such tasks.

Table 1: Properties of PP-R Raw Material

| Features | Data | Unit | Test Method | Value |
|---|---------------|-----------|--------------|-------------|
| Density | +23°C | g/cm3 | ISO 1183 | 0,90-0,91 |
| Melt Flow Index | MFR 230/5 | g/10 min. | ISO 1133 | 0,4-0,6 |
| | MFR 230/2,16 | g/10 min. | ISO 1183 | 0,2-0,5 |
| | MFR 230/5 | g/10 min. | ISO 1133 | 0,8-1,3 |
| Yields Stress | 50 mm/min. | Mpa | ISO 527 | 23-28 |
| Elongation at Yield | 50 mm/min. | % | ISO 527 | >10 |
| Tensile Modulus | secant | Mpa | ISO 527 | 850 |
| Bell Indentation Hardness D | 132 N/30s | Nmm2 | ISO 2039/1 | 48 |
| Shore Hardness D | (3 sec value) | - | DIN 53505 | 65 |
| Charpy Impact Strength | +23°C | KJ/m2 | ISO 179/1eU | No Breakage |
| | 0 | KJ/m2 | ISO 179/1eU | No Breakage |
| | -30°C | KJ/m2. | ISO 179/1eU | 43 |
| Charpy Notched Impact Strength | +23°C | KJ/m2 | ISO 179/1eU | 22 |
| | 0 | KJ/m2 | ISO 179/1eU | 4 |
| | -30°C | KJ/m2 | ISO 179/1eU | 2,5 |
| Vicat Softening Temperature | VST / A /50 | °C | ISO 360/A | 132 |
| Melting Range | - | °C | DSC | 140-150 |
| Thermal Conductivity | - | W/Mk | DIN 52612 | 0,24 |
| Coefficient of Linear Thermal Expansion (20-90 C) | - | 1/K | DIN 53752 | 1,5.10-4 |
| Surface Resistance | - | Ohm | DIN vde 0303 | > 1014 |



Table 2: Service Life Of PPR Pipe

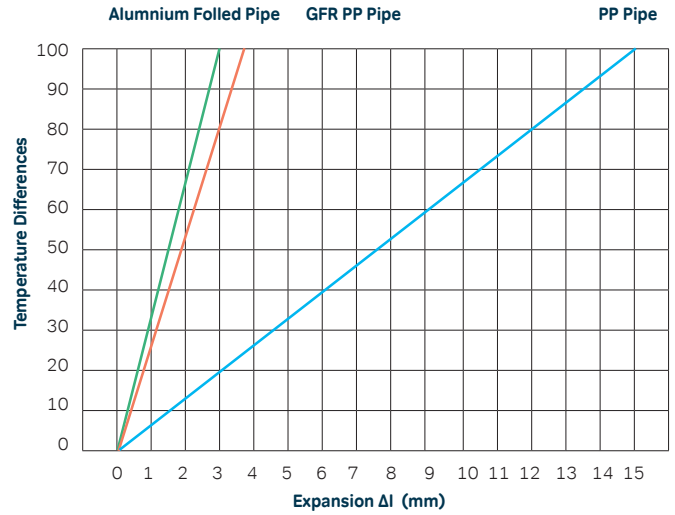
| Temperature °C | Service Life in Years | Nominal Pressure (Bar) | |
|----------------|-----------------------|------------------------|-------------------|
| | | S 2,5 SDR 6 PN25 | S3,2 SDR 7,4 PN20 |
| 10 | 1 | 35,1 | 27,8 |
| | 5 | 33,0 | 26,2 |
| | 10 | 32,2 | 25,6 |
| | 25 | 31,1 | 24,7 |
| | 50 | 30,3 | 24,1 |
| 20 | 100 | 29,6 | 23,5 |
| | 1 | 29,9 | 23,7 |
| | 5 | 28,1 | 22,3 |
| | 10 | 27,4 | 21,7 |
| | 25 | 26,4 | 21,0 |
| 30 | 50 | 25,7 | 20,4 |
| | 100 | 25,0 | 19,9 |
| | 1 | 25,4 | 20,2 |
| | 5 | 23,8 | 18,9 |
| | 10 | 23,2 | 18,4 |
| 40 | 25 | 22,3 | 17,7 |
| | 50 | 21,7 | 17,2 |
| | 100 | 21,1 | 16,8 |
| | 1 | 21,6 | 17,1 |
| | 5 | 20,2 | 16,0 |
| 50 | 10 | 19,6 | 15,5 |
| | 25 | 18,8 | 15,0 |
| | 50 | 18,3 | 14,5 |
| | 100 | 17,8 | 14,1 |
| | 1 | 18,2 | 14,5 |
| 60 | 5 | 17,0 | 13,5 |
| | 10 | 16,5 | 13,1 |
| | 25 | 15,9 | 12,6 |
| | 50 | 15,4 | 12,2 |
| | 100 | 14,9 | 11,8 |
| 70 | 1 | 15,4 | 12,2 |
| | 5 | 14,3 | 11,3 |
| | 10 | 13,9 | 11,0 |
| | 25 | 13,3 | 10,5 |
| | 50 | 12,9 | 10,2 |
| 80 | 1 | 12,9 | 10,3 |
| | 5 | 12,0 | 9,5 |
| | 10 | 11,6 | 9,2 |
| | 25 | 10,0 | 8,0 |
| | 50 | 8,5 | 6,7 |
| 95 | 1 | 10,8 | 8,6 |
| | 5 | 9,6 | 7,6 |
| | 10 | 8,1 | 6,4 |
| | 25 | 6,5 | 5,1 |
| 95 | 1 | 7,6 | 6,1 |
| | 5 | 5,2 | 4,1 |
| | 10 | 4,3 | 3,4 |

*Security Factor (C): 1,5

Features of Glass Fiber Reinforced PP-R Multilayer Composite Pipes

- Consists of PPR inner and outer layers and a special mixture of Glass Fiber (GF) PP middle layer.
- The glass fiber reinforced (GFR) layer within the two PPR layers reduces the pipe's thermal extension. The GFR pipes can provide all performance features which solid wall pipe have. Service life and conditions may be checked from relevant tables (Table2) due to operating pressure and temperature.
- Glass fiber reinforced (GFR) pipe has similar thermal expansion coefficient with aluminum stabil PPR pipe has. (Graphic 1)
- The mixture of Polypropylene and Glass Fiber minimizes elongation from heat. That is why installation requires less bracketing and fixing points.
- Alternative solution to conventional pipe systems suitable for e.g., cooling and air conditioning systems, sanitary installations, industrial pipeline construction and rainwater utilization systems.

Graphic 1: Elongation of various PP pipes



| | | |
|--------------------|-------------------------------------|--------|
| Complied Standards | DIN 8077/8078, EN 15874-2, TS 13715 | |
| Pressure Class | SDR 7,4 | SDR 6 |
| Diameter Range | 20-125 | 20-125 |

Why choose Wavin Glass Fiber Reinforced PP-R Multilayer Composite Pipes?

- 1 Easy to install
- 2 Saving on Time
- 3 Cost-Efficient
- 4 Less Expansion
- 5 Compliance to European Standards
- 6 Reliable Technology High Quality

Advantages of GFR Pipes:

- GFR PPR pipe elongates less during the heat changes.
- Unlike aluminium foiled pipes; there is no need to shave the end of the pipe. The welding process should begin directly. This provides ease of installation.
- Can be easily used for hot water systems
- It is a lighter product compared to metal pipes. Therefore, it is easy to carry and install. The linear coefficient of thermal expansion value is small. (0,035mm/WmK). Less bracketing is necessary compared to solid wall pipes.
- Due to the glass fiber reinforced layer, thermal conductivity is smaller than solid wall pipe. that is why less insulation will be enough.
- It does not cause a change in the color, smell or the taste of water. It has a hygienic structure.

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