Application areas for fittings and pipes made of PP-R and PP-R CT according to DIN 8077

Cold water pipelines:
Continuous operation temperature up to 20°C
Continuous operation pressure up to 20 bar

Warm water pipelines:
Continuous operation temperature up to 70°C
Continuous operation pressure up to 10 bar

Heating pipelines:
Continuous operation temperature up to 70°C
Continuous operation pressure up to 3 bar
(Installation pressure according to DIN EN 12828)

		Operating years					
		1	5	10	25	50	100
	Temperature °C	Max. Operating pressure (bar) according to DIN 8077					
Field of application: Drinking water and sanitary installation							
G 8160 B **PP-R CT Pressure Pipe** 20° C/1,6 MPa, 60° C/0,8 MPa	20	16,6	16,0	15,8	15,5	15,3	15,1
	40	12,3	11,9	11,7	11,5	11,3	11,1
	60	8,9	8,6	8,4	8,2	8,1	–
	70	7,5	7,2	7,0	6,9	6,8	–
	80	6,2	6,0	5,9	5,7	–	–
	95	4,7	4,4	4,3	–	–	–
G 8200 B **PP-R CT Pressure Pipe** 20° C/2,0 MPa, 70° C/1,0 MPa	20	26,3	25,4	25,1	24,6	24,3	24,0
	40	19,6	18,9	18,6	18,2	17,9	17,6
	60	14,2	13,6	13,4	13,1	12,8	–
	70	11,9	11,4	11,2	10,9	10,7	–
	80	9,9	9,5	9,3	9,1	–	–
	95	7,4	7,1	6,9	–	–	–
G 8200 **PP-R Pressure Pipe** 20° C/2,0 MPa, 70° C/1,0 MPa	20	29,9	28,1	27,4	26,4	25,7	25,0
	40	21,6	20,2	19,6	18,8	18,3	17,8
	60	15,4	14,3	13,9	13,3	12,9	–
	70	12,9	12,0	11,6	10,0	8,5	–
	80	10,8	9,6	8,1	6,5	–	–
	95	7,6	5,2	4,3	–	–	–
G 8215 B **PP-R CT Stabi composite pipe** 20° C/2,0 MPa, 70° C/1,0 MPa	20	25,0	24,2	23,9	23,5	23,1	22,8
	40	18,6	18,0	17,7	17,3	17,1	16,8
	60	13,5	13,0	12,7	12,4	12,2	–
	70	11,3	10,9	10,7	10,4	10,2	–
	80	9,5	9,0	8,9	8,6	–	–
	95	7,1	6,7	6,6	–	–	–
G 8200 FW **PP-R CT Fiber composite pipe** **Watertec** 20° C/2,0 MPa, 70° C/1,0 MPa	20	25,0	24,2	23,9	23,5	23,1	22,8
	40	18,6	18,0	17,7	17,3	17,1	16,8
	60	13,5	13,0	12,7	12,4	12,2	–
	70	11,3	10,9	10,7	10,4	10,2	–
	80	9,5	9,0	8,9	8,6	–	–
	95	7,1	6,7	6,6	–	–	–
Field of application: Air conditioning, Industrial plants							
G 8160FC **PP-R CT Fiber composite pipe** **Climatec** 20° C/1,6 MPa, 70° C/0,8 MPa	20	19,9	19,3	19,0	18,6	18,4	18,1
	40	14,8	14,3	14,1	13,8	13,6	13,3
	60	10,7	10,3	10,1	9,9	9,7	–
	70	9,0	8,6	8,5	8,3	8,1	–
	80	7,5	7,2	7,0	6,9	–	–
	95	5,6	5,3	5,2	–	–	–

Classification of operating conditions according toDIN EN ISO 15874-1

The selection of a particular application class according to the following table should be agreed among the contracting parties.
For each application class allowable operating pressure p_D of 4 bar[2)], 6 bar, 8 bar or 10 bar applies, depending on the application.

Application class	Calculation-temperature T_D °C	Service life[b] at T_D Years	T_{max} °C	Service life at T_{max} Year(s)	T_{mal} °C	Service life at T_{mal} h	Typical application area	PP-R pipe system SDR 6	PP-R CT pipe system SDR 7,4
1[a]	60	49	80	1	95	100	Warm water supply (60°C)	10 bar	10 bar
2[a]	70	49	80	1	95	100	Warm water supply (70°C)	8 bar	10 bar
4[b]	20 2,5 Followed by 40 20 Followed by 60 25 Followed by (see next column)		70 Followed by (see next column)	2,5	100	100	Floor heating and Low temperatur radiator connections	10 bar	10 bar
5[b]	20 14 Followed by 60 25 Followed by 80 10 Followed by (see next column)		90 Followed by (see next column)	1	100	100	High temperature radiator connections	6 bar	8 bar

[a] Pertinent to the national regulations either application class 1 or application class 2 may be selected.
[b] If there is more than one operational temperature for one application area, the corresponding sevice life time should be summed (for example the temperature collective for class 5 for a period of 50 years consists of:

- 20°C over 14 years followed by
- 60°C over 25 years followed by
- 80°C over 10 years followed by
- 90°C over 1 year followed by
- 100°C over 100 h)

Explanation:
The column **T_{mal}** gives the highest allowed temperature (for example at disruption of the controlling), max 100° C
The column **Service life at T_{mal}** shows that this breakdown temperature allows a max period of 100 h (over 50 years) whereas single breakdown segments should not exceed 3 hours.

REMARK:
This norm does not apply when higher values are assigned to T_D, T_{max} and T_{mal} than those quoted on the table.

2) 1 bar = 10^5 N7m^2 = 0,1 MPa

Allowed operating pressures
for warm and hot water pipelines made of PP-R and PP-R CT

			PP-R	PP-R CT
Time-Temperature collective	Temperature	Operating period (Years)	Allowed operating pressures Nominal pressure PN 20, SDR 6[1] (bar)	Allowed operating pressures Nominal pressure PN 20, SDR 7,4 (bar)
Continuous temperature 70°C including **30 days per year with →**	75°C	5	14,12	13,3
		10	13,66	13,0
		25	11,69	12,7
		45	10,13	12,5
	80°C	5	13,80	12,2
		10	13,36	12,0
		25	11,04	11,7
		42,5	9,70	11,5
	85°C	5	13,28	11,1
		10	12,53	10,9
		25	10,03	10,6
		37,5	9,09	10,5
	90°C	5	12,57	10,1
		10	10,94	9,9
		25	8,76	9,6
		35	8,07	9,5
Continuous temperature 70°C including **60 days per year with →**	75°C	5	14,06	13,1
		10	13,32	12,8
		25	11,30	12,5
		45	9,83	12,3
	80°C	5	13,09	12,0
		10	12,44	11,7
		25	10,52	11,5
		40	9,31	11,3
	85°C	5	11,96	10,9
		10	11,33	10,4
		25	9,04	10,4
		35	8,32	10,3
	90°C	5	10,79	9,9
		10	9,66	9,7
		25	7,71	9,4
		30	7,39	9,4
Continuous temperature 70°C including **90 days per year with →**	75°C	5	13,85	13,0
		10	13,40	12,7
		25	11,13	12,4
		45	9,65	12,2
	80°C	5	13,19	11,8
		10	12,32	11,6
		25	9,86	11,3
		37,5	8,94	11,2
	85°C	5	12,36	10,8
		10	10,52	10,6
		25	8,42	10,3
		32,5	7,90	10,2
	90°C	5	10,40	9,8
		10	8,79	9,6
		25	7,03	9,3

[1] SDR = Standard Dimension Ratio = diameter / wall thickness

Allowed operating pressures

Permissible operation pressure for hot and cold water pipes PP-RCT (SDR7.4 to SDR11)

Time/Temperature Collective	Temperature	Operation Years	Operation Pressure SDR 7.4[1)]	Operation Pressure SDR 9[1)]	Operation Pressure SDR 11[1)]
Continuous Temperature of 70°C for 180 days a year with →	75°C	5	12.7	10.1	8.0
		10	12.5	9.9	7.9
		25	12.2	9.7	7.7
		40	12.0	9.5	7.6
	80°C	5	11.6	9.2	7.3
		10	11.4	9.0	7.2
		25	11.1	8.8	7.0
		30	11.0	8.8	6.9
	85°C	5	10.5	8.4	6.6
		10	10.3	8.2	6.5
		25	10.1	8.0	6.3
	90°C	5	9.6	7.6	6.0
		10	9.4	7.4	5.9
		18	9.2	7.3	5.8
Continuous Temperature of 70°C for 210 days a year with →	75°C	5	12.7	10.1	8.0
		10	12.4	9.9	7.8
		25	12.1	9.6	7.6
		40	12.0	9.5	7.5
	80°C	5	11.6	9.2	7.3
		10	11.3	9.0	7.1
		25	11.1	8.8	7.0
		30	11.0	8.7	6.9
	85°C	5	10.5	8.3	6.6
		10	10.3	8.2	6.5
		25	10.0	8.0	6.3
	90°C	5	9.5	7.6	6.0
		10	9.3	7.4	5.9
		15	9.2	7.3	5.8

[1)] SDR – Standard Dimension Ratio = diameter / wall thickness