Water Supply and Heating Systems

BASALTTHERM®

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Unique 3 layer pipe reinforced with basalt fiber, made from the next generation polypropylene PP-RCT. An Unrivalled product!

25.03.2020

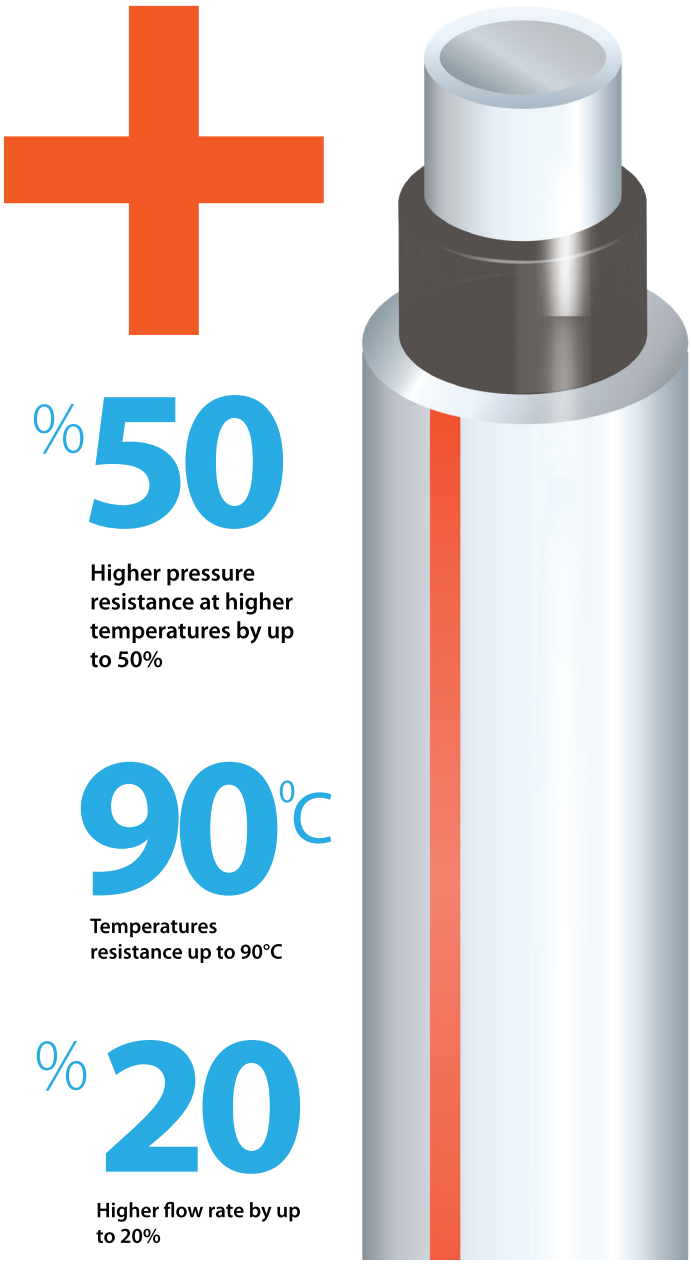
wavin

What is **BASALT**THERM® ?

BASALTTHERM® is the latest development of Wavin Pilsa. A state of the art pipe made from the new generation materials PP-RCT and Basalt fiber. An unique pipe designed for hot and cold water and central heating systems.

Benefits of **BASALT**THERM®

Key benefits of Wavin Pilsa **BASALT**THERM® are;
- 4-x lower linear thermal expansion
- No need to shave before welding



%50

Higher pressure resistance at higher temperatures by up to 50%

90°C

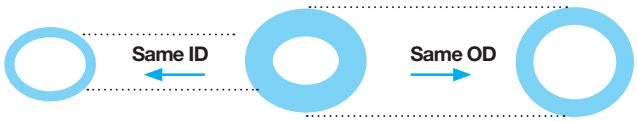
Temperatures resistance up to 90°C

%20

Higher flow rate by up to 20%

Properties of PP-RCT

The actual pipe dimesion is regulated by the norms (EN ISO 15874 or DIN 8077) where dimensions depend on material classification and service conditions such as pressure and temperature broken down into application classes. Due to higher material strength, PP-RCT materials allow the use of higher S series (reduced wall thicknesses) for the same application class. Reduction in wall thickness provides benefits to our customers such as increase within the inner flow sections and decrease in pressure loss. This may enable our customers to select smaller dimension pipe.



In below table, you can see differences between PPR and PP-RCT pipes. All below pipes (both PPR and PP-RCT) meet the required operating parameters (service life of 50 years, operating pressure of 10 bars and water temperature of 60°C and 70°C). As shown below, it is possible to use thinner wall pipe compared to standard PPR, which provides higher inner flow section (shown as A). This may allow the use of smaller diameters (in the example, OD 20 mm PPR pipe's inner flow section is only 5% smaller than OD 25 mm PP-RCT pipe; however, OD 25 mm PP-RCT pipe's inner flow section is 48% larger than OD 25 mm PPR pipe)

Parameter		PP - RCT	PPR	PP - RCT
OD	mm	20	25	25
Pipe Serie	-	3,2	2	3,2
Wall Thickness	mm	2,8	5,1	3,5
ID	mm	14,4	14,8	18
İnner Flow Area A	mm	163	172	255
Δ A	%	-%5	0	%48

Properties of Basalt Fiber

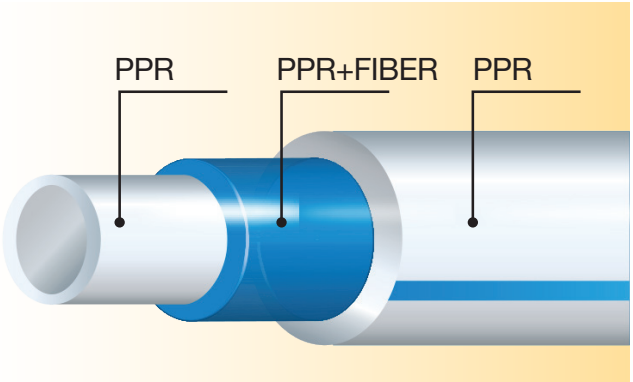
Basalt fiber is made by pulping melted basalt stones of suitable composition.

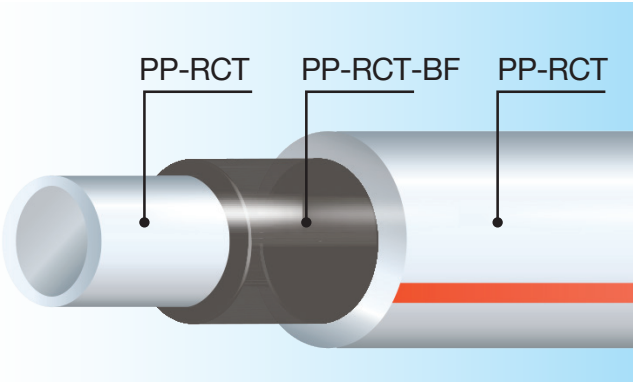
It is very durable and flexible and used in many different industries.

Properties of basalt fiber significantly exceed glass fiber. *(in example tensile strength recyclable. is higher by up to 20%.)*

Manufacturing of basalt fiber is very ecological and 100 %

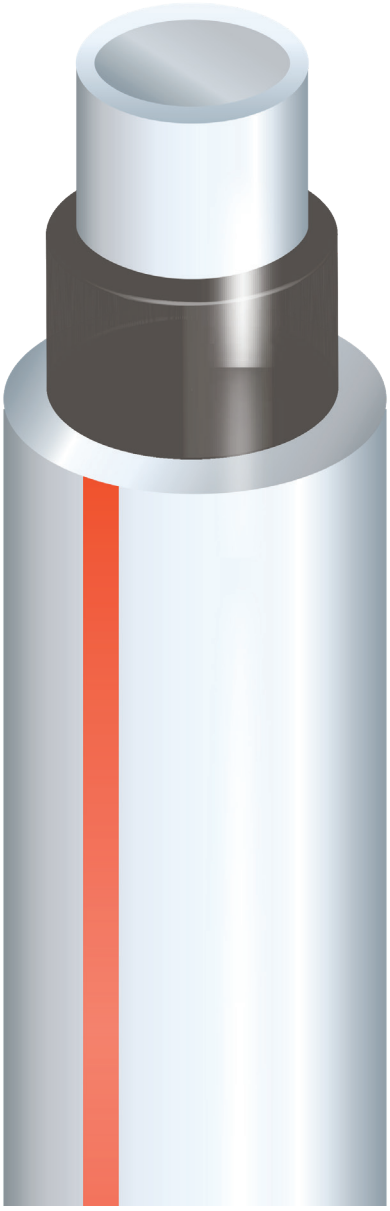
Comparison of FIBER and FIBER BASALT parameters





	Wall Thickness (mm)		
Pipe Dia	PPR	PPR-FIBER	**BASALT**THERM®
ø 20 mm	3,4	3,4	2,8
ø 25 mm	4,2	4,2	3,5
ø 32 mm	5,4	5,4	4,4
ø 40 mm	6,7	6,7	5,5
ø 50 mm	8,3	8,3	6,9
ø 63 mm	10,5	10,5	8,6
ø 75 mm	12,5	12,5	8,4
ø 90 mm	15,0	15,0	10,1
ø 110 mm	18,3	18,3	12,3
ø 125 mm	20,8	20,8	14,0

Product Range & Standarts



Wavin Pilsa BASALTTHERM® pipes are produced in the Tables&Graphs following (outer) dimensions : 20, 25, 32, 40, 50, 63 mm (S3,2) and 75, 90, 110, 125 mm (S4). BASALTTHERM® pipes are connectable to all Pilsa PPR plastic pipes and fittings.

Wavin Pilsa BASALTTHERM® pipes are produced according to EN ISO 15874 standards.

S	D (mm)	t (mm)	L (mm)
3,2	20	2,8	4000
	25	3,5	4000
	32	4,4	4000
	40	5,5	4000
	50	6,9	4000
	63	8,6	4000
4	75	8,4	4000
	90	10,1	4000
	110	12,3	4000
	125	14,0	4000

D: Pipe Diameter
t: Wall Thickness
L: Length

Storing Conditions

You must ensure the protection of pipes from mechanical damages especially in non-heated premises (warehouse, open halls etc.) as pipes are fragile at temperatures below 5 °C. For this reason pipes should be kept in areas above 5°C

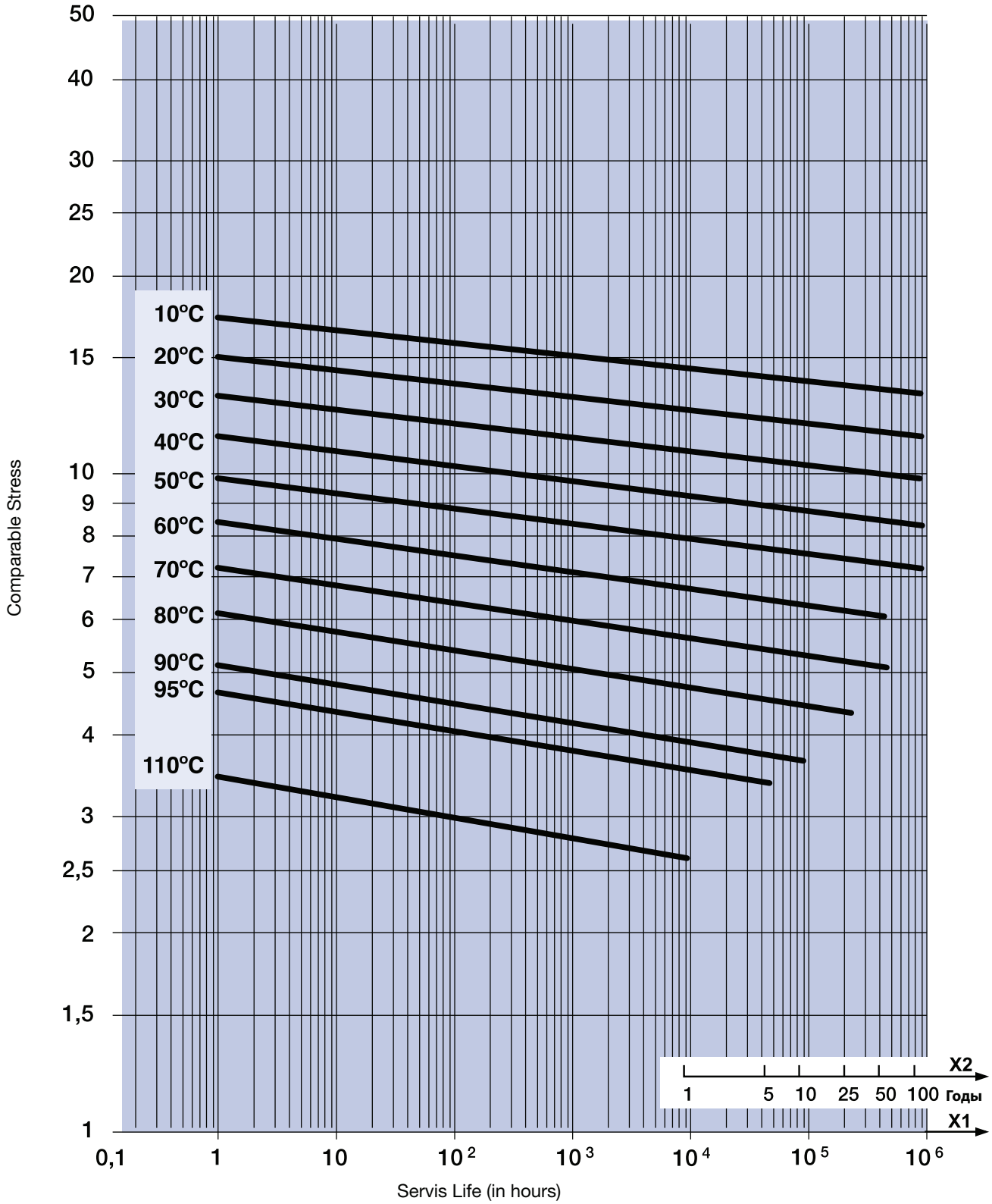
Table & Graphics

Operating parameters of BASALTTHERM® pipes for water and heating systems (according to EN ISO 15874, DIN 8077- 2007) safety factor is 1,5

Temperature °C	Time in Operations (Years)	Max. Allowable Overpressure (Bar)	
		S 4	**S 3,2**
10	1	24,0	30,2
	5	23,2	29,3
	10	22,9	28,9
	25	22,5	28,4
	50	22,2	28,0
20	1	20,9	26,3
	5	20,2	25,4
	10	19,9	25,1
	25	19,6	24,6
	50	19,3	24,3
30	1	18,1	22,7
	5	17,4	22,0
	10	17,2	21,7
	25	16,9	21,2
	50	16,6	20,9
40	1	15,5	19,6
	5	15,0	18,9
	10	14,7	18,6
	25	14,4	18,2
	50	14,2	17,9

Temperature °C	Time in Operations (Years)	Max. Allowable Overpressure (Bar)	
		S 4	**S 3,2**
50	1	13,3	16,7
	5	12,8	16,1
	10	12,6	15,8
	25	12,3	15,5
	50	12,1	15,2
60	1	11,2	14,2
	5	10,8	13,6
	10	10,6	13,4
	25	10,4	13,1
	50	10,2	12,8
70	1	9,4	11,9
	5	9,1	11,4
	10	8,9	11,2
	25	8,7	10,9
	50	8,5	10,7
80	1	7,9	9,9
	5	7,5	9,5
	10	7,4	9,3
	25	7,2	9,1
95	1	5,9	7,4
	5	5,6	7,1

Mechanical Strength PP-RCT Isothermal Line valid For Pilsa BASALTTHERM® Pipes



The regression curve shows an impressive long term resistance at high temperatures and indicates the service life cycle.

Length Change Table of Wavin Pilsa BASALTTHERM® related to temperature

Pipe Length (m)	Temperature Differences ΔT(C°)									
	10	20	30	40	50	60	70	80	90	100
	Change in linear elongation ΔI (mm)									
0.1	0.03	0.07	0.10	0.14	0.17	0.21	0.24	0.28	0.31	0.35
0.2	0.07	0.14	0.21	0.28	0.35	0.42	0.49	0.56	0.63	0.70
0.3	0.10	0.21	0.31	0.42	0.52	0.63	0.73	0.84	0.94	1.05
0.4	0.14	0.28	0.42	0.56	0.70	0.84	0.98	1.12	1.26	1.40
0.5	0.17	0.35	0.52	0.70	0.87	1.05	1.22	1.40	1.57	1.75
0.6	0.21	0.42	0.63	0.84	1.05	1.26	1.47	1.68	1.89	2.10
0.7	0.24	0.49	0.73	0.98	1.22	1.47	1.71	1.96	2.20	2.45
0.8	0.28	0.56	0.84	1.12	1.40	1.68	1.96	2.24	2.52	2.80
0.9	0.31	0.63	0.94	1.26	1.57	1.89	2.20	2.52	2.83	3.15
1.0	0.35	0.70	1.05	1.40	1.75	2.10	2.45	2.80	3.15	3.50
2.0	0.70	1.40	2.10	2.80	3.50	4.20	4.90	5.60	6.30	7.00
3.0	1.50	2.10	3.15	4.20	5.25	6.30	7.35	8.40	9.45	10.50
4.0	1.40	2.80	4.20	5.60	7.00	8.40	9.80	11.20	12.60	14.00
5.0	1.75	3.50	5.25	7.00	8.75	10.50	12.25	14.00	15.75	17.50
6.0	2.10	4.20	6.30	8.40	10.50	12.60	14.70	16.80	18.90	21.00
7.0	2.45	4.90	7.35	9.80	12.25	14.70	17.15	19.60	22.05	24.50
8.0	2.80	5.60	8.40	11.20	14.00	16.80	19.60	22.40	25.20	28.00
9.0	3.15	6.30	9.45	12.60	15.75	18.90	22.05	25.20	28.35	31.50
10	3.50	7.0	10.50	14.00	17.50	21.00	24.50	28.00	31.50	35.00

Expansion

Heat Expansion coefficient of the Pilsatherm PP-RCT pipes with respect to metal pipes is higher. This should specifically be considered in Project calculations.

Expansion Calculations

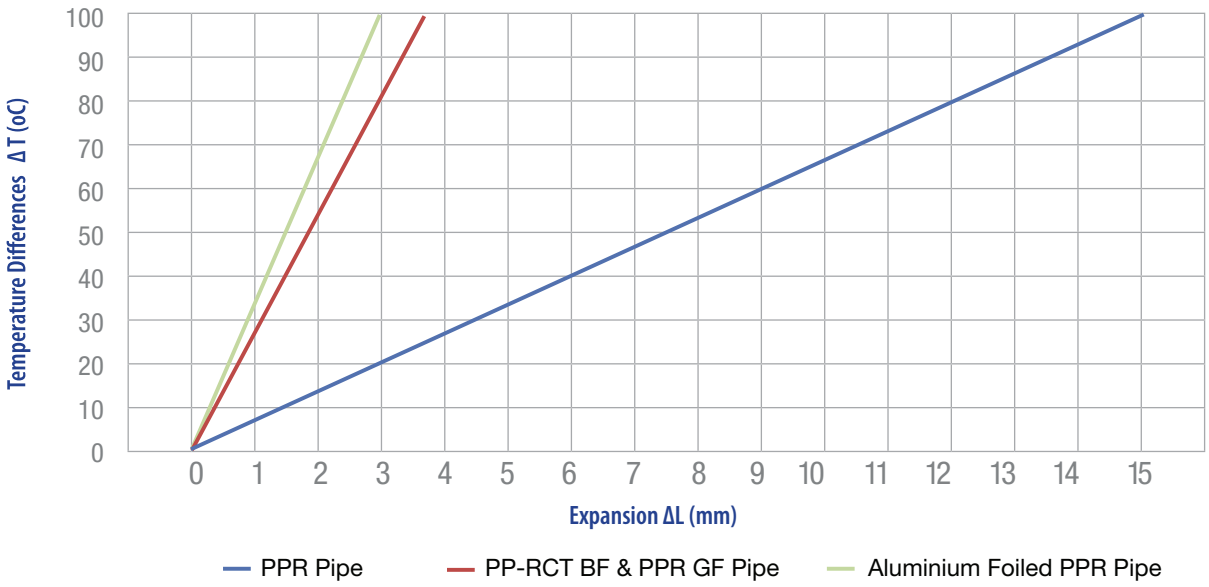
$$\Delta I = L \times \Delta T \times \alpha$$

ΔI = Change in pipe length (mm)

ΔT = Change in operating (working) temperature (Kelvin-K) (Celsius - C°)

α = Coefficient of the PP-RCT Pipe - Length (0.035mm/mK)

Linear Expansion Graph of Pilsatherm Pipes



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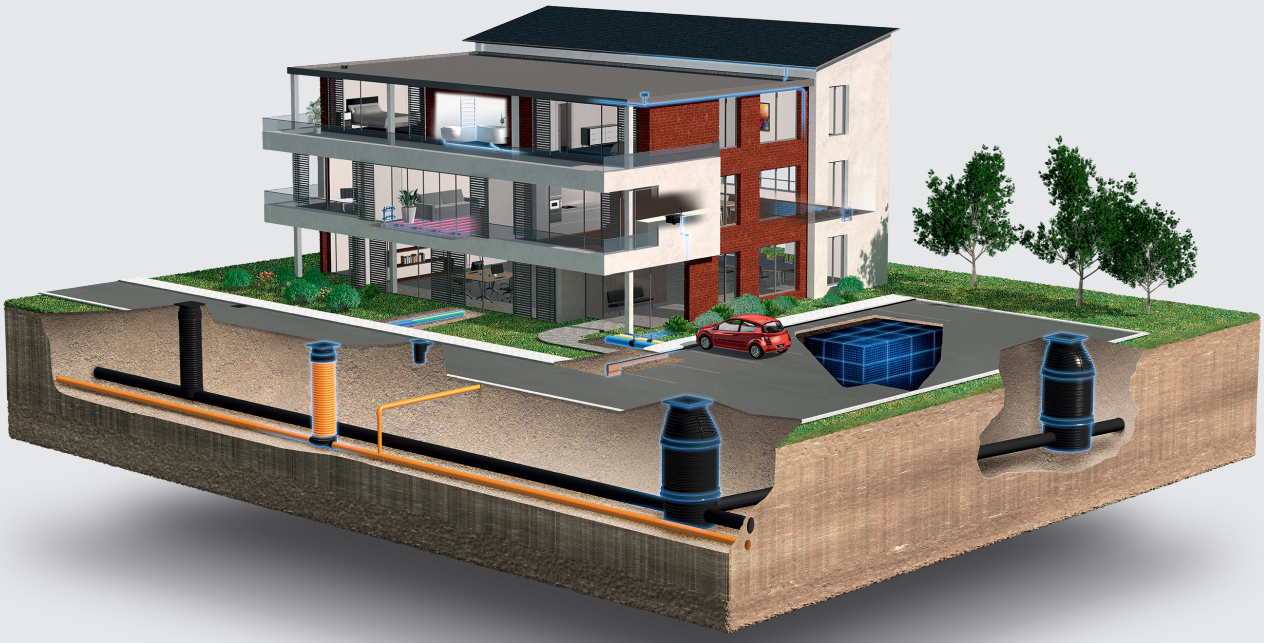

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To Advance Life Around the World.

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