SUMMARY DATA SHEET

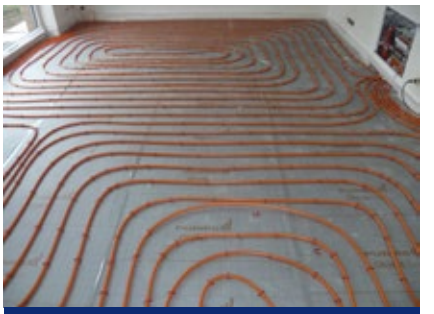
Solutions for **Pipe and Fitting Applications**

BOREALIS بروج Borouge

Polyethylene pipe solutions

BorSafe™

Tailor made PE pressure pipe products from our proprietary bimodal process



PE-X

One stop shop for experience and innovation in cross-linked polyethylene

Borcoat™ PE

Compatible, tested and proven systems for multi-layer pipe coating

Polypropylene pipe solutions

BorECO™

Economical solutions with engineered-in longevity for non-pressure pipe systems

PP-R and PP-RCT

Unique high performance from next-generation polypropylene for pressure pipe systems

Borcoat™ PP

Complete coating system solution under extreme conditions with proven track record

Solutions for pipe and fitting applications
Enabling life's essentials

Grade	Classification	Type	Colour	TYPICAL VALUES				Typical applications
				MFR (190 °C/5,0 kg) g/10 min	Density kg/m³	Tensile stress at yield MPa	Tensile modulus MPa	
Polyethylene Pressure Pipes								
BorSafe HE3490-LS	PE100	HDPE	Black	0.25	960	25	1,100	PE100 Drinking water, gas, sewage, industrial, irrigation, cable conduits; low sagging and high stiffness
BorSafe HE3490-LS-H	PE100-RC	HDPE	Black	0.25	960	25	1,100	PE100-RC Drinking water, gas, sewage, industrial for demanding installation conditions: No Dig, sandless, relining, Horizontal Directional Drilling (HDD); low sagging and high stiffness
BorSafe HE3490-LS-HW	PE100-RC	HDPE	Black	0.22	958	24	1,050	PE100-RC Optimized drinking water formulation, also for gas, sewage, industrial for demanding installation conditions: No Dig, sandless, relining, Horizontal Directional Drilling (HDD); low sagging and high stiffness
BorSafe HE3490-LS-HP	PE100-RC	HDPE	Black	0.25	958	24	1,050	PE100-RC Optimized drinking water formulation, also for gas, sewage, industrial for demanding installation conditions: No Dig, sandless, relining, Horizontal Directional Drilling (HDD); low sagging and high stiffness; chlorine classification CC3
BorSafe HE3490-SLS-H	PE100-RC	HDPE	Black	0.17	958	25	1,050	PE100-RC Super Low Sag Large diameter, heavy wall thickness pipes, optimized drinking water formulation, gas, sewage, industrial for demanding installation conditions: No Dig, sandless, relining, Horizontal Directional Drilling (HDD); high stiffness
BorSafe HE3492-LS-H	PE100-RC	HDPE	Orange	0.25	952	24	1,000	PE100-RC for gas for demanding installation conditions: No Dig, sandless, relining, Horizontal Directional Drilling (HDD); also used as stripe compound
BorSafe HE3493-LS-H	PE100-RC	HDPE	Natural	0.23	949	23	950	PE100-RC co-extruded layers, special-coloured layers, Drinking water contact, sewage, industrial, cable conduits & ducts for demanding installation conditions: No Dig, sandless, relining, Horizontal Directional Drilling (HDD) and for sheets, rods, semi-finished products; PE-RT Type 2 for industrial applications
BorSafe HE3494-LS-HP	PE100-RC	HDPE	Dark blue	0.23	950	23	950	PE100-RC Optimized drinking water formulation, for demanding installation conditions: No Dig, sandless, relining, Horizontal Directional drilling (HDD)
BorSafe HE3490-IM-W	PE100	HDPE	Black	0.47	959	24	1,100	PE100 Injection moulded PE100 pressure rated fittings, valves, optimized Drinking water formulation
BorSafe HE3470-LS	PE80	HDPE	Black	0.30	957	22	1,000	HDPE 80 Drinking water, gas, sewage, industrial, irrigation
BorSafe ME3440	PE80	MDPE	Black	0.8	954	20	800	MDPE 80 flexible drinking water, gas, sewage, industrial
BorSafe ME3440-W	PE80	MDPE	Black	0.8	954	20	800	MDPE 80 flexible, Optimized drinking water formulation, also for gas, sewage, industrial
BorSafe ME3441	PE80	MDPE	Yellow	0.8	945	20	800	MDPE 80 flexible, for gas distribution networks
BorSafe ME3444	PE80	MDPE	Light blue	0.8	948	20	800	MDPE 80 flexible, Optimized drinking water formulation; also used as stripe compound

Black Pipe grade	Corresponding stripe grade and Application and RAL colour (similar to)
BorSafe HE3490-LS	BorSafe HE3495-LS-H Drinking water, dark blue, RAL 5005
BorSafe HE3490-LS-H	BorSafe HE3496-LS-H Gas, yellow, RAL 1018
BorSafe HE3490-LS-HW	BorSafe HE3497-LS-H Pressure- or Vacuum-sewage, Industrial, red brown, RAL 8023
BorSafe HE3490-LS-HP	BorSafe HE3492-LS-H Gas, orange, RAL 1033
BorSafe HE3490-SLS-H	BorSafe HE3499-LS-H Drinking Water, light blue, RAL 5012
BorSafe ME3440 BorSafe ME3440-W BorSafe HE3470-LS	BorSafe ME3444 Drinking water, light blue, RAL 5012

Grade	Colour	MFR (190 °C/21.6 kg) g/10 min	Density kg/m³	PEX pipe standards	Resin form	Typical applications
Cross-linkable Polyethylene for pressure pipes (PE-X)						
HE1878	Natural	3	956	EN ISO15875, DIN16892, ASTM F876	Powder for PE-Xa	Plumbing & heating, gas, drinking water, industrial
HE1878E	Natural	10.5	953	EN ISO15875, DIN16892, ASTM F876	Powder for PE-Xa	Plumbing & heating, gas, drinking water, industrial
HE1878E-C3	Natural	9	953,5	EN ISO15875, DIN16892, ASTM F876, ASTM F2023	Mini pellets for PE-Xa	Unique fully stabilized minipellet PE-Xa solution meeting highest available chlorine resistance requirements as well as UV resistance (ASTM F876) for demanding plumbing, heating and industrial applications
HE2591	Natural	10.5	945	EN ISO15875, DIN16892, ASTM F876	Powder for PE-Xa	Plumbing & heating, gas, drinking water, industrial
HE2590	Natural	9	945,5	EN ISO15875, DIN16892, ASTM F876, ASTM F2023	Pellets for PE-Xc	Plumbing & heating, gas, drinking water, industrial

Grade	Colour	MFR (190 °C/2.16 kg) g/10 min	Density kg/m³	Resin form	Typical applications
Polyethylene Steel Pipe Coating					
Borcoat HE3450	Black	0.5	958	Pellets	Bimodal HDPE top coat, design temp. -40 °C up to +80 °C
Borcoat HE3453	Natural	0.5	940	Pellets	UV and thermal stabilized bimodal HDPE top coat for colouring non-black coatings
Borcoat ME0420	Natural	1.2	934	Pellets	Grafted adhesive for HDPE systems
Borcoat ME0433	Natural	4.5	934	Powder	Grafted adhesive for HDPE systems
Borcoat HE7405	Black	8	944	Powder	PE rough coat to better adhere concrete weight coating and for improved safety during handling operation

Grade	Colour	Designation	MFR (230 °C/2.16 kg) g/10 min	Tensile stress at yield MPa	Tensile modulus MPa	Charpy impact notched (+23°C) kJ/m²	Charpy impact notched (-20°C) kJ/m²	Typical applications
Polypropylene for coating and thermal insulation of steel pipes								
Borcoat BB108E-1199	White	PP	0.9	26	1,100	25	4	UV and thermal stabilised white topcoat in pellet form
Borcoat BB108E-1199-PW	White	PP	0.9	26	1,100	25	4	UV and thermal stabilised white powder for rought coat applications
Borcoat BB700E-7032	Grey	PP	2.1	24	900	30	6	Thermal insulation syntactic layers
Borcoat EA165E	Natural	PP	0.3	20	900	70	20	Injection moulded subsea field joints, impact resistant top coats
Borcoat BB127E	Natural	PP	7.5	20	1,000	15	4	Grafted adhesive for PP coating systems, design temperature onshore up to 110°C, offshore up to 140°C, in pellet form
Borcoat BB127E-PW	Natural	PP	7.5	20	1,000	15	4	Grafted adhesive for PP coating systems, design temperature onshore up to 110°C, offshore up to 140°C, in powder form
BA202E	Natural	PP	0.3	28	1,200	50	5	Solid or foamed layer in thermal insulation systems
Borcoat BB133E-1199-LT	White	PP	1.2	22	1,000	60	5	Solid or foamed layer in thermal insulation systems with good low temp. performance (-20°C)
Borcoat BB122E-LT	Natural	PP	7	18	900	40	6	Grafted adhesive for PP coating systems, especially designed for low temperatures (-20°C), available in pellet form for extrusion and in powder form for spray applications

Grade	Peel strength adhesion at 23 °C in N/cm	Peel strength adhesion at elevated temperature in N/cm
Borcoat ME0420	> 200	> 50 N/cm at 80 °C
Borcoat ME0433	> 180	> 50 N/cm at 80 °C
Borcoat BB127E	> 250	> 60 N/cm at 110 °C
Borcoat BB127E-PW	> 250	> 60 N/cm at 110 °C

Test methods:
Classification = EN ISO 12162
MFR = EN ISO 1133
Density = EN ISO 1183
Tensile modulus, 1 mm/min = EN ISO 527
Tensile stress at yield, 50 mm/min = EN ISO 527
Peel strength = EN ISO 21809-1
Charpy impact strength, notched = EN ISO 179/1eA

Borealis has a broad product portfolio for various pressure and non-pressure pipe applications.
For detailed information, please contact our local sales representatives or visit us at www.borealisgroup.com

Grade	Colour	Designation	MFR (230 °C/2.16 kg) g/10 min	Tensile stress at yield MPa	Flexural modulus MPa	Charpy impact notched (+23 °C) kJ/m²	Charpy impact notched (-20 °C) kJ/m²	Typical applications
Block Copolymer								
BorECO BA2000	Natural	PP-HM	0.25	36	2,000	30	2	Underground drainage & sewage, soil & waste, solid wall systems
BorECO BA212E	Natural	PP-HM	0.25	31	1,800	50	5	Underground drainage & sewage, soil & waste, solid & structured wall systems
BorECO BC212IM	Natural	PP-HM	4.5	32	1,800	8	4	Intended for injection moulding, especially in the field of sewage and underground drainage systems
BorECO BA415E	Natural	PP-B	0.45	29	1,600	60	5	Underground drainage & sewage, soil & waste, solid & structured wall systems
BA202E	Natural	PP-B	0.3	28	1,300	50	5	Non-pressure pipes and fittings; thinwalled corrugated pipes and profiles
BEC5012	Natural	PP-B	0.25	28	1,400	80	5	Underground drainage & sewage, soil & waste systems
BB412E	Natural	PP-B	1.3	28	1,300	25	5	Cable conduit pipes
BA160E-8229	Black	PP-B	0.3	30	1,300	50	5	Injection moulding of compression fittings for pressure pipes; irrigation
BA204E	Natural	PP-B	0.8	27	1,300	35	4	Underground drainage & sewage, soil & waste systems

Grade	Colour	Designation	MFR (230 °C/2.16 kg) g/10 min	Tensile stress at yield MPa	Tensile modulus MPa	Charpy impact notched (+23 °C) kJ/m²	Charpy impact notched (-20 °C) kJ/m²	Typical applications
Polypropylene Homopolymer								
BE60-7032	Grey	PP-H	0.3	30	1,300	50	5	Industrial, pressure & non-pressure pipe systems, sheets, profiles
BE50	Natural	PP-H	0.3	36	1,650	7	2	Industrial, non-pressure pipe systems, sheets, profiles
BE55	Natural	PP-H	0.35	36	1,700	9	2	Industrial, non-pressure pipe systems, sheets, profiles
Random Copolymer								
RA130E-8427	Grey	PP-R	0.25	25	850	20	2	Plumbing & heating, industrial
RA130E-6017	Green	PP-R	0.3	25	850	20	2	Plumbing & heating
RA130E	Natural	PP-R	0.25	25	850	20	2	Plumbing & heating
RA7050	Steel-grey	PP-RCT	0.3	25	850	40	2	Plumbing & heating
RA7050-GN	Green	PP-RCT	0.3	25	850	40	2	Plumbing & heating
RA7050-LG	Light-grey	PP-RCT	0.3	25	850	40	2	Plumbing & heating
RA7050-GF	Steel-grey	PP-RCT	0.7	70	5,200	15	–	Glass fiber reinforced plumbing & heating multi-layer pipes, 30% glass fiber content

Solutions for pipe and fitting applications
Enabling life's essentials

Borealis is one of the world's leading providers of advanced and circular polyolefin solutions and a European market leader in base chemicals and the mechanical and chemical recycling of plastics. We leverage our polymers expertise and decades of experience to offer value adding, innovative and circular material solutions for key industries. In re-inventing for more sustainable living, we build on our commitment to safety, our people and excellence as we accelerate the transformation to a circular economy and expand our geographical footprint.

As a trusted and experienced partner with more than 50 years of experience (since 1967), Borealis offers market leading polyethylene and polypropylene materials for pipe systems in water and gas distribution, waste water and sewage disposal, plumbing, heating, and industrial, along with multi-layer steel pipe coating solutions for onshore and offshore oil and gas pipelines. With the proprietary Borealis Borstar® technology as the main foundation, complimented by selected other processes, Borealis can offer a wide variety of tailored pipe solutions.

In addition, Borcycle™ M and the ISCC Plus certified Borcycle™ C compounds based on mechanically and chemically recycled feedstock as well as the ISCC Plus certified Bornewables™ compounds using renewable-based feedstock meet a growing demand for high-sustainability building and infrastructure pipe polymers. At the same time, they align with Borealis's EverMinds™ platform to promote and accelerate the transformation of the plastics industry towards circularity.

By offering more durable and reliable as well as circular pipe solutions, Borealis' step-change innovations continue to boost the sustainability of pipe networks by making them safer, leak free, longer lasting and more efficient with installation costs reduced by up to 60 % compared to the traditional pipe material.

Based on Borealis' European assets, its Middle Eastern joint venture Borouge as well as the American joint venture Baystar®, Borealis confirms its position as a partner of choice for global pipe customers, helping to meet the growing needs and requirements of the building and infrastructure industry today and in the future.

For more information visit:

www.borealisgroup.com
www.borouge.com
www.waterfortheworld.net

Making everyday life easier | Date of issue: October 2024

About Borealis Borealis is one of the world's leading providers of advanced and sustainable polyolefin solutions. In Europe, Borealis is also an innovative leader in polyolefins recycling and a major producer of base chemicals. We leverage our polymer expertise and decades of experience to offer value-adding, innovative and circular material solutions for key industries such as consumer products, energy, healthcare, infrastructure and mobility. With customers in over 120 countries and head office in Vienna, Austria, Borealis employs around 6,000 people. In 2023, we generated a net profit of EUR 216 million. OMV, the integrated energy, fuels & feedstock and chemicals company headquartered in Vienna, Austria, owns 75% of our shares. The Abu Dhabi National Oil Company (ADNOC), based in the United Arab Emirates (UAE), owns the remaining 25%.

In re-inventing essentials for sustainable living, we build on our commitment to safety, our people, innovation and technology, and performance excellence. We are accelerating the transformation to a circular economy of polyolefins and expanding our geographical footprint to better serve our customers around the globe. Our operations are augmented by two important joint ventures: Borouge (with ADNOC, headquartered in the UAE); and Baystar™ (with TotalEnergies, based in the US).

www.borealisgroup.com | www.borealisevermindscom

FOR MORE INFORMATION:
visit **www.borealisgroup.com** and **www.borouge.com**

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