

**Product data sheet**  
**SAERTEX-LINER® ENVIRONMENT, TYPE S+**

As of: May 5, 2021

GENERAL INFORMATION	
Product group	GRP LINER sewage
Product range	SAERTEX-LINER® ENVIRONMENT
Design	Type S+
Utilization	Municipal wastewater, rainwater, combined sewage
Reinforcing material	Multiaxial fabric made of glass fiber
Resin type	Styrene-free vinyl ester resin (SFVE)
Impregnation	Pre-impregnated at the factory
Curing procedure	Light-cured pipe lining (UV-CIPP)
Installation procedure	Pull in place
Inflation procedure	Compressed air
Shelf life	Up to 6 months at temperatures from 7°C – 18°C/45°F - 65°F
Pressure table	Available
EC Safety Data Sheet	Available

DESIGN CHARACTERISTICS			
Maximum operating pressure (MDP)	Gravity pipeline	up to 1 bar/up to 14 psi	
Host pipe profile	All types	Circular	
Diameter range	DN 150-1500/6" – 60"	DN 250-1200/10" – 48"	
Structural wall thickness	3 mm-12mm, in 1 mm increments	4 mm-12mm, in 1 mm increments	
Permissible elongation	≤400: DN + 2% >400: DN + 4%	On request	
Inner foils with barrier function**	Standard	FastPlus*	Pressure
Outer foils**	Integrated gliding foil with UV light protection and permanent foil with barrier function		
Material characteristics group according to DWA M 144-3	19		
Liner construction as outlined in:	DIBt approval Z-42.3-350, Annex 1 and 2, abZ/AB		

\* FastPlus available for DN 200 to DN 1500/8"-60" diameter, max wall thickness 12 mm

\*\* Details see section "FOILS"

COMPOSITE REINFORCEMENT	
Glass fiber type according to DIN 61850	Permanently corrosion and chemical resistant, ECR
Number of layers multiaxial fabric	at least 2
Glass area weight per mm wall thickness	1100 g/m <sup>2</sup> ± 150 g/m <sup>2</sup>
Specific density according to DIN EN ISO 1183-2	1.6 g/cm <sup>3</sup> ± 0.5 g/cm <sup>3</sup>
Glass content according to DIN EN ISO 1172	≥ 46% (mass-based)
Barcol hardness according to DIN EN 59	≥ 50 IRHD
Longitudinal seam	Yes
Winding	No

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FOILS			
Inner foils with barrier function	Standard	FastPlus*	Pressure
- Remains in the liner	Temporary	Semi-permanent	Permanent
- Materials	PE/PA	PE/PA, nonwoven PET	PE/PA, nonwoven PET
- Thickness	Up to 200 µm	Up to 400 µm	Up to 400 µm
Protective outer gliding foil, UV light protection*, integrated			
- Material	PVC, fabric reinforced in places		
- Thickness	Up to 500 µm		
Permanent outer foil with barrier function			
- Material	PE/PA/PE and nonwoven PP		
- Thickness	Up to 200 µm		

\*Up to DN 600/24 inch and max. 2.5 t liner weight and corresponding condition of host pipe installation possible without additional gliding foil.

Notes (terms ISO 11296- 4):

- Temporary: Foil is removed after curing.
- Semi-permanent: Facilitates liner installation and curing without post-installation functions. Remains in the liner.
- Permanent: Facilitates liner installation and curing with post-installation functions. Remains in the liner.

MECHANICAL CHARACTERISTICS	
Short-term circumferential E modulus according to DIN EN 1228	≥ 12.950 N/mm <sup>2</sup> : 1,878,235 psi
Short-term bending E modulus according to DIN EN ISO 11296-4 // DIN EN ISO 178	≥ 15.000 N/mm <sup>2</sup> : 2,175,565 psi
Short-term bending stress according to DIN EN ISO 11296-4 // DIN EN ISO 178	≥ 230 N/mm <sup>2</sup> : 33,355 psi
Long-term circumferential E modulus* <sub>ex 50 years</sub> according to DIN EN 761	9.450 N/mm <sup>2</sup> : 1,370,605 psi
Long-term bending stress E modulus* <sub>ex 50 years</sub> according to DIN EN 761	165 N/mm <sup>2</sup> : 23,930 psi
Retention factor A after 2,000 hours* according to DIN EN 761	1.37/72%
Creep tendency after 24 hours according to DIN EN ISO 899-2	≤ 5 %

\* These values are used for the static calculation of the liner's stability according to DWA-A 143-2. Preliminary values after 2,000 h test.