PRIMUS LINE

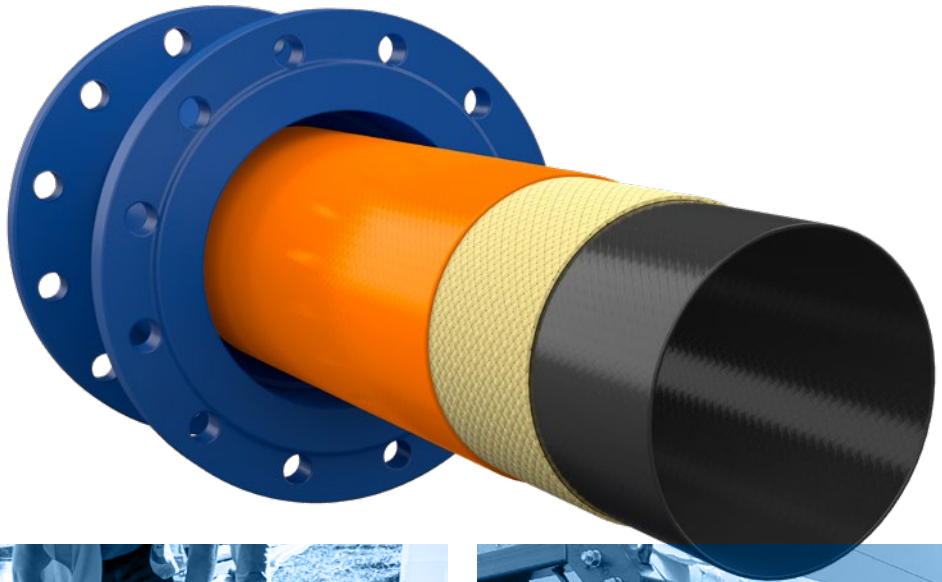
SAFE.RELIABLE.SUSTAINABLE.

REDL

"The Hose People Plus"

OVERLAND PIPING

FLEXIBLE SURFACE PIPE = LINER + CONNECTOR



PRIMUS LINE® OVERLAND PIPING – LEAK-FREE PERFORMANCE

Primus Line® Overland Piping is an environmentally orientated solution, spoolable and reusable[2] for numerous deployments. In addition, it can be rapidly installed. It is specifically developed for above-ground piping for demanding and potentially hazardous media.

The lining of the flexible pipeline consists of thermoplastic polyurethane (TPU) and offers high chemical resistance that withstands contact with highly corrosive hydrocarbon compounds.[3]

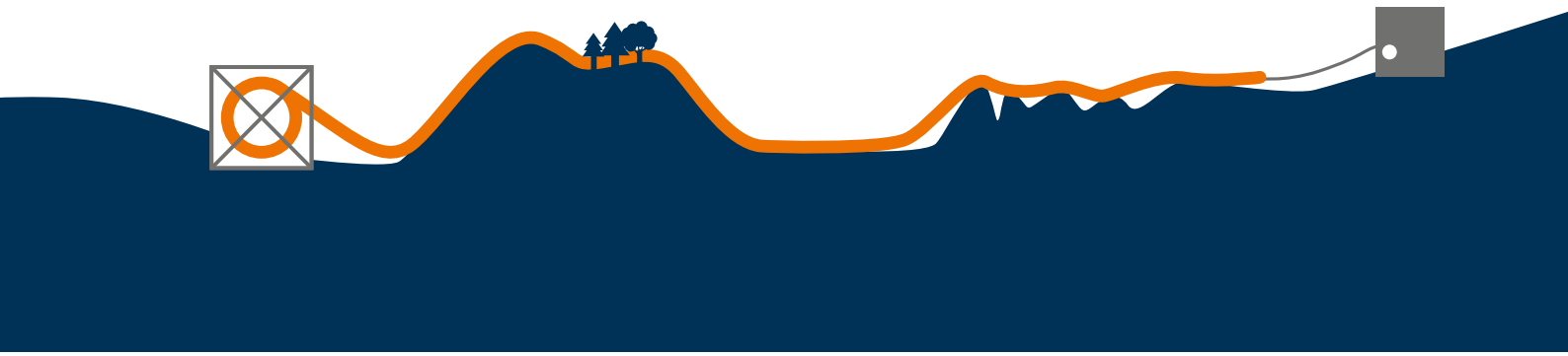
The reinforcement made of Kevlar® fabric gives Overland Piping a high tensile strength that allows for a complete stand-alone absorption of even very high operating pressures.

Its outer layer made of TPU offers protection from UV light and abrasion as well as the required flexibility for repeated installations and coiling of the reusable[4] system.

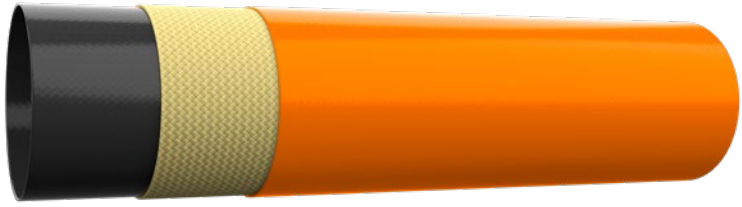
Specially developed high-pressure end fittings with flanges or specialised quick couplers compatible with Victaulic notch are used to link various flexible pipelines. They can also be connected to pumps or other pipeline assets.

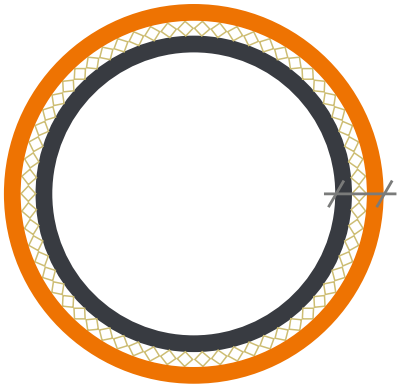
FAST AND EASY DEPLOYMENT

Primus Line® Overland Piping makes it easy to pass through rough and hard-to-reach terrain. It adapts naturally to surface irregularities.



COMPOSITE LINER





Wall thickness = 6 mm / 0.24 inches

TECHNICAL DETAILS[5]

- Available in nominal diameters from DN 150 to DN 350 / from 6 inches to 14 inches
- Maximum operating pressure depending on diameter:
  56 bar to 20 bar / 812 psi to 290 psi
- Design values for temperatures greater than 30 °C / 86 °F
  and, under certain conditions, up to 60 °C / 140 °F
- Design values for installation around bends
- Friction coefficient: k = 0.028 mm

Inner layer

Thermoplastic polyurethane (TPU)

- High chemical resistance
- High abrasion resistance
- Corrosion resistant

Reinforcement

Seamless, woven Kevlar® fabric

- Accommodates operating pressure by itself
- Up to 10 times stronger than steel of equal weight

Outer layer

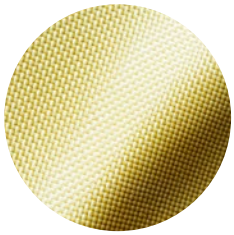
Thermoplastic polyurethane (TPU)

- High abrasion resistance, protecting the fabric during installation and operation
- High UV-resistance

The Primus Line® Overland Piping system is suited for the following fluids:[6]

- Raw water
- Process water
- Flowback water
- Residential wastewater
- Industrial wastewater
- Fire water
- Brine
- Formation water
- Injection water
- Brackish water
- Sea water
- Supply water
- Treated wastewater
- Other media only after detailed review and approval

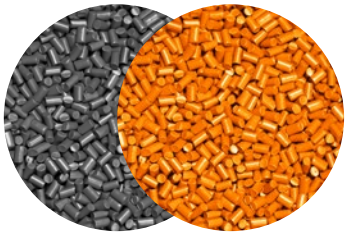
WE EXCLUSIVELY UTILISE TOP-QUALITY RAW MATERIALS



Kevlar®

Kevlar® is a high-strength, lightweight para-aramid synthetic fiber known in the industry for its exceptional tensile strength and durability.

The chemical structure of Kevlar® is comprised of several repeating inter-chain bonds. These chains are cross-linked with hydrogen bonds, providing a tensile strength up to 10 times greater than steel on the same weight basis. For us, it is the perfect reinforcement material for temporary surface pipelines due to its ability to withstand mechanical stress, resist abrasion and adapt to changing terrain. Kevlar®'s thermal stability makes it ideal for diverse environments.



TPU

Thermoplastic polyurethane is for our solution the ideal polymer for the inner and outer layers of our flexible pipeline. It offers a high level of flexibility, impact resistance, high abrasion resistance, chemical compatibility, resistance to UV radiation, moisture, extreme temperatures, bonding capability, and processability. TPU ensures the pipeline's durability, protection and reliable performance in above-ground environments.

Lab tests have shown that TPU has a up to 5 times higher abrasion resistance than HDPE.

LEAK-FREE CONNECTORS[7]

M-CONNECTOR
WITH FLANGE

- A pull-proof hold between our flexible pipe and the Primus Line M-Connector is established purely by mechanical forces.[8]
- This is achieved by pressing the core into the bushing with hydraulic equipment that is suitable for on-site use. Not only does this speed up the assembly, it opens up the possibility of reusing the connector multiple times.
- Available in nominal diameters from DN 150 to DN 350 / 6 inches to 14 inches with flanges according to DIN, ANSI and AS4087 with PN10 / PN16 or 150 psi / 300 psi flanges. Project-individual solutions are available on request.

Q-CONNECTOR

- Compatible with the patented notch by Victaulic and as such flexibly deployable with a large range of other compatible components.
- Available in nominal diameters from DN 150 to DN 350 / 6 inches to 14 inches.

HDPE VS. PRIMUS LINE®

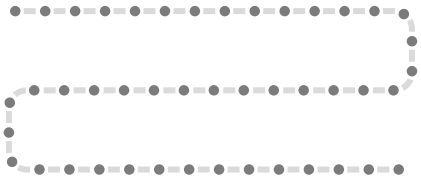
Requirements for construction of 6 km / 3.7 miles of pipeline:[16]

	HDPE	PRIMUS LINE® OVERLAND PIPING
MOBILISATION	• 4 - 6 trucks • 2 excavators • 300 - 500 pipe shots	→ 1 - 2 trucks → 1 mini-excavator or winch → 2 - 5 pipe reels
EQUIPMENT	• 2 excavators • fusion welding equipment • heating tents	→ 1 mini-excavator or winch → basic hand tools
INSTALLATION TIME WITH ONE CREW	• 25 - 30 days installation time	→ 1 - 2 days installation time
REMOVAL TIME	• 7 - 10 days removal	→ 1 - 2 days respool
FUSION WELDING	• required at every pipe shot	→ not required
MANPOWER	• 4 - 6 people	→ 3 - 4 people
COLD WEATHER APPLICATION	• - 20 °C / - 4 °F and below requires heating tents	→ can be deployed in - 40 °C / - 40 °F without heating

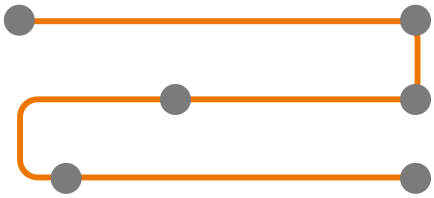
HDPE VS. PRIMUS LINE®

Connections needed on 6 km / 3.7 miles of temporary surface pipeline:[17]

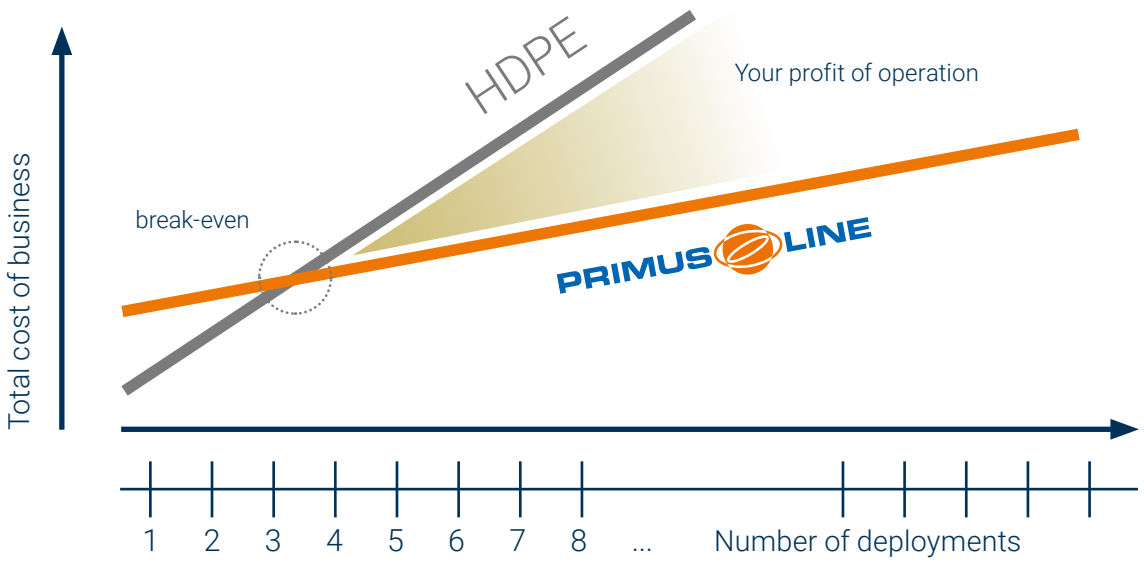
300 - 500 connection points



6 - 12 connections points



Total cost of business:[18]



Disclaimer and technical requirements:

The installation of the Primus Line® system has to be performed by an accredited and trained installer. The execution of the work on site is done in accordance with the manufacturer's installation manual. The design guidelines - including but not limited to the maximum allowable operating and testing pressure for the installed system - are documented in the manufacturer's Submittal Support Document. Product specific information available on product datasheet. The installation company is requested to provide the manufacturer's operating instructions to the network operator. It is the responsibility of the installing company to work with the most current guidelines of the manufacturer which will be made available by the manufacturer upon request or via cloud access. In case of any doubts on the technical properties of the product or the suitability for a certain application, please contact the Primus Line technical experts in your region.

1, 7, 8, 20: Please consider that the following information serves purely informative purposes about the product and does not provide any warranties or guarantees with regard to the product presented. Rather, the following information as well as the conditions for the suitability and usage of the product must be specifically assessed and verified for each individual case. We, as the manufacturer of the product shown, will be happy to provide you with customized advice for your project. Please note, however, that the ultimate responsibility for operation and compliance with regulatory and, in particular, environmental regulations is with the user of the product.

2, 4, 11, 15, 21: Please consider that reusability depends on the particular use and the possibility of cleaning of the product. The information given serves purely informative purposes about the product and does not provide any warranties or guarantees with regard to the product presented. The reusability must be specifically assessed and verified for each individual case. We, as the manufacturer of the product shown, will be happy to provide you with customized advice for your project. Please note, however, that the ultimate responsibility for operation and compliance with regulatory and, in particular, environmental regulations is with the user of the product.

3, 6, 9, 19: Please consider that not all of the exemplarily listed uses are permitted in every country. The information given serves purely informative purposes about the product and does not provide any warranties or guarantees with regard to the product presented. The permissibility of the specific use of the product must be specifically assessed and verified for each individual case. We, as the manufacturer of the product shown, will be happy to provide you with customized advice for your project. Please note, however, that the ultimate responsibility for operation and compliance with regulatory and, in particular, environmental regulations is with the user of the product.

5, 13, 16, 17, 18: Please consider that the technical details given are to be understood as average values. The specifications given serve purely informative purposes about the product and do not provide any warranties or guarantees with regard to the product presented. Rather, the specific values largely depend on the specific type of use and must be specifically assessed and verified for each individual case. We, as the manufacturer of the product shown, will be happy to provide you with customized advice for your project.

10, 12, 14: Please consider that the information given serves purely informative purposes about the product and does not provide any warranties or guarantees with regard to the product presented. Rather, the specific savings largely depend on the specific type of use and circumstances of each case. We, as the manufacturer of the product shown, will be happy to provide you with customized advice for your project. Please note, however, that the ultimate responsibility for operation is with the user of the product.

Distributor of Rädlinger Primus Line® Overland Piping

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