

# elastopipe

–the future of safe fire water systems



TRELLEBORG



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## U n i q u e   p i p i n g   s y s t e m f o r   f i r e   w a t e r

The Elastopipe system is a patented piping system designed for deluge and sprinkler systems in harsh environments. Elastopipe is made of synthetic rubber and it replaces today's rigid steel, titanium, copper nickel and fiber-glass piping.



The unique features of Elastopipe make it ideal in deluge and sprinkler systems on offshore oil and gas installations and ships and in industrial plants, mines and other hazardous environments. It can be used to partly or fully replace old systems.

Elastopipe is ideal for use in temporary deluge systems when high safety levels need to be maintained during modifications. Its flexibility enables it to be moved and reused.

## N o c o r r o s i o n

Metal corrosion can cause blocking of pipes and nozzles, leading to production shut downs or reduction in capacity. The new OLF recommendations are based on the Scandpower report: "Water-based fire fighting systems – guidelines for test, maintenance and design", and Elastopipe is recommended for use in fire water systems because the synthetic rubber from which it is made is non-corroding.

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## L e s s e n g i n e e r i n g w o r k

Elastopipe is an innovative piping system. The design of optimal routing when using flexible Elastopipe differs to that used for traditional rigid pipes.

It is possible to achieve a substantial reduction in the number of construction drawings and accurate measurements needed, as well as the amount of engineering work required. No prefabrication is necessary and installations may be modified spontaneously on site.

## J e t f i r e r e s i s t a n c e

The functional abilities of fire water systems can also be threatened by fire, fragments from explosions and other types of impact.

Elastopipe is fire resistant, and can even withstand jet fires with a heat flux of  $390 \text{ kW/m}^2$ , temperatures above  $1250 \text{ }^\circ\text{C}$  and flame speeds which exceed the speed of sound for one hour, with no water in the pipe for the first five minutes (OTI 95634).



## I m p a c t r e s i s t a n c e

Elastopipe's resistance to explosions is unrivalled and is only limited by the choice of support system used. Its impact resistance is demonstrated by there being no reduction in burst pressure following an impact of 800 J. The durability of Elastopipe ensures safe transportation and installation.

## M i n i m i s e d   w a t e r   h a m m e r

Elastopipe's smooth inner surface (Hazen-Williams factor of  $c=155$ ) that last throughout the product's life and its flexible bends, ensure high water flow speeds (limited by legislation to a maximum of 10 m/s). A complete evaluation of hydraulic properties has been made by Kværner (TV 89108-001).

The flexible material of the Elastopipe serves to dramatically reduce dynamic pressure

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effects, e.g. water hammer. Based on real measurements, Fantoft Process have simulated the dynamic pressure effects. The reported reduction in water hammer of up to 60 %, is clearly demonstrated during the commissioning tests of deluge systems.

The reduction in noise and vibration is remarkable. Compared to the flow noise in traditional pipes, the Elastopipe Spray System on KV Svalbard is almost quiet.

## N o h o t w o r k

Full Elastopipe installation details are provided in User Manual TV89104-004. Installation can be completed without the use of adhesives, welding or hot work, while the production and processing of oil and gas can continue unaffected.

Elastopipe can be cut with a hand-held pipe cutter without the risk of sparks occurring, and the pipes are joined mechanically using



airoperated hand tools. Since Elastopipe is flexible it can easily be bent to a radius equal to five times its own diameter.

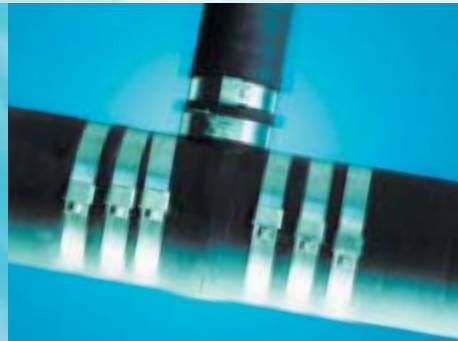
Installation is therefore simpler, faster and cheaper than with rigid pipes, and installation time can be reduced by up to 50 % compared to steel systems.

## The complete Elastopipe system

The supply of an Elastopipe system includes all the necessary components, from the skid to the nozzles. The basic component is the Elastopipe, manufactured in 1" – 8" ID pipe sizes and supplied in reels of up to 40 meters in length.

All fittings for connections, branching and the mounting of nozzles are made of titanium materials in accordance with Norsok

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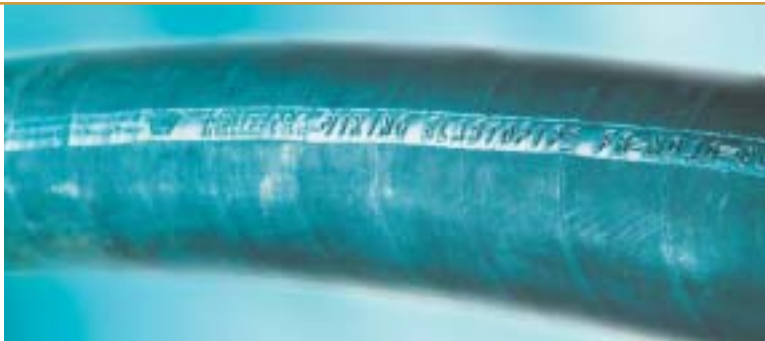


standard MDS-T01, minimum schedule S-40S. Branching and nozzles can easily be mounted on existing installations by using the half shell clamps supplied.

The choice of support system is essential for a straightforward and cost-effective installation without sagging. The most common support used include clamps, traditional channels, bars and angles. Elastopipe can also be supported by cable trays and flexible supports, or be laid directly on the structure or in the supports of old pipes.

## H e a t t r a c i n g

The operating temperature of Elastopipe ranges from  $-30\text{ }^{\circ}\text{C}$  to  $+70\text{ }^{\circ}\text{C}$ , and heat tracing may be necessary in order to prevent pipes and nozzles from becoming blocked by ice plugs. Its 15-17 mm elastomeric wall acts as a good thermal insulator (thermal conductivity of  $k = 0.4\text{ W/mK}$ ). An optional heat tracing system with internal cables reduces energy consumption and protects from external



damage. The flexibility of Elastopipe allows water to repeatedly freeze and melt in the pipe without any damage occurring.

## Q u a l i t y c o n t r o l

All pipe fittings are labelled, thus ensuring that every component can be traced and subjected to quality control. All personnel are provided with essential training and certification prior to each installation.

## E l a s t o p i p e   c h o s e n b y   l e a d i n g   o p e r a t o r s

Since the first pilot installation in 1998, installations on BP's Valhall and Ula, Statoil's Gullfaks, Heidrun and Statfjord, Norsk Hydro's Heimdal, Troll and Oseberg and Phillips' Ekofisk and Eldfisk platforms have been added to the reference list. It has also been installed on the Royal Norwegian Navy's MTB's and the coast guard ship KV Svalbard.

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## A p p r o v a l s

The documentation and results are summarised in Test Specification TV 89101-003. DNV has verified that the results are in accordance with the specified requirements TV 89101-001. The System Manual TV 89104-004 outlines the engineering work, installation and quality control and is an important part of the DNV-verification.

In accordance with EU directive "97/23/EC PED", the normal use of Elastopipe in a 150# deluge or sprinkler system requires no CE labeling.

## The development of Elastopipe

The ELASTOPIPE™ project commenced in 1996. It combines Trelleborg Vikings' expertise in manufacturing heavy-duty pipes and hoses with our long experience of protecting systems from corrosion, heat and fire.

The project was initiated in cooperation with Phillips Petroleum, Norsk Hydro, BP Amoco,

Statoil, SFK (Royal Norwegian Navy Material Command), the SND (the Norwegian Regional and Industrial Development Fund) and Statsbygg; their active technical and financial participation helped to secure this new fire safety technology.



STATOIL



BP Amoco



SND



STATSBYGG



HYDRO

## **T h e c o m p a n y**

Trelleborg Viking AS was established in 1896 and is the largest producer of rubber products in Norway. Our rubber products have served the offshore industry for more than 30 years. We are certified in accordance with ISO 9001 for the “Design, Manufacture and Sale of Technical Rubber and Plastic Products”, and environmental standard ISO 14001.

Trelleborg is a global industrial group with annual sales amounting to SEK 19 billion and approximately 15,500 employees in 40 countries.

**ELASTOPIPE™**

