

COFLEXIP RIM FIRE PROTECTION SYSTEMS



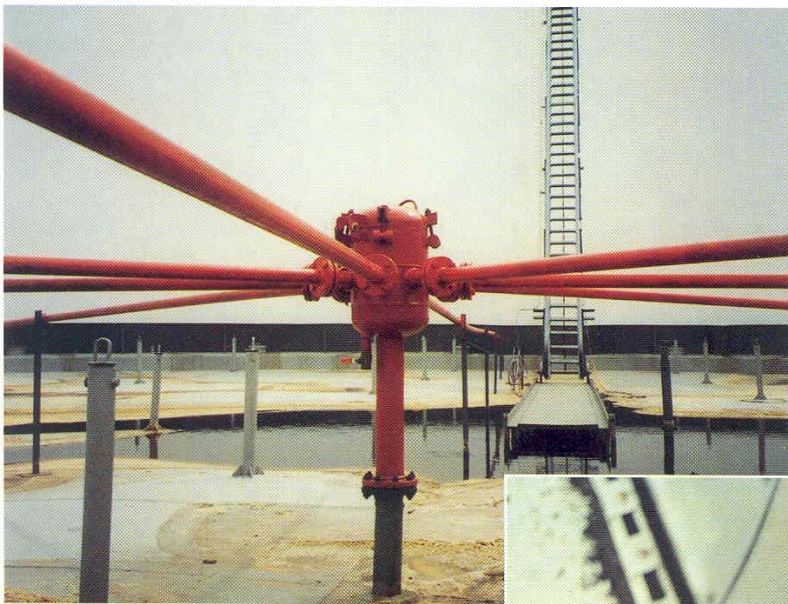
COFLEXIP, the company that introduced the maintenance-free flexible steel pipe used by major oil companies for roof drain, skimmer and suction systems, has developed a quick and more economical way to deliver expanded foam to the seal area.

The COFLEXIP rim fire protection system dramatically changes the way rim fires are extinguished in floating-roof tanks.

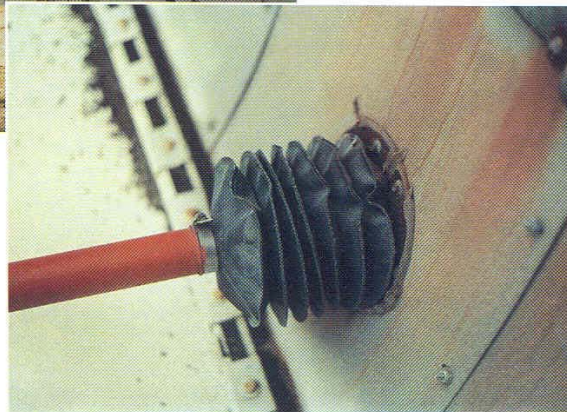
The COFLEXIP system speeds fire-extinguishing foam through a flexible in the centre of the tank and out to the tank rim.

Even if the floating roof is at its lowest point, the foam reaches the rim rapidly.

Until now, the most common method utilised a stand-pipe system which has to deliver an extremely large volume of foam before the rim is covered, especially when the roof is in a mid to low position. In the COFLEXIP system, the foam travels through the flexible pipe and exits at the seal rim of the floating roof, precisely where the fire is located, thus rapidly flooding the seal rim area and quickly extinguishing the flames. From the proportioning equipment outside the dike wall, a high back pressure foam maker directs the finished foam through a rigid pipe to the base of the tank shell and, via the Coflexip foam line, the foam is pumped to the tank roof.



Typical foam manifold



Bellow for seal transit

RIM FIRE PROTECTION SYSTEM ADVANTAGES

- **Faster, safer, more efficient,**
- **Rapid foam delivery,**
- **Low maintenance,**
- **Minimum total foam usage,**
- **Damage possibilities minimised,**
- **Easy and less costly installation,**
- **Normally only one foam maker and one supply line per tank.**

On top of the roof, a distribution manifold then directs the foam through radial piping across the roof to the seal rim area.

A critical point in the design is the configuration of the primary and secondary seal. The system is capable of discharging foam directly over the primary seal and under the secondary seal, giving two major advantages :

- 100 % of the foam is directed into the seal area in the shortest period of time.
- If the secondary seal is of a non-flammable material, a foam dam may not be required.

This allows a substantial cost reduction in material, labour and foam requirements. The COFLEXIP rim fire protection system is also adaptable to tanks with internal floating roofs. The main advantage for internal floaters is that you increase the yield of the tank by

eliminating the fixed foam chambers on the tank shell. With the COFLEXIP system you have an efficient, cost effective and safety oriented system. COFLEXIP can provide a detailed bid, including complete drawings and results of scale model or computer testing. Simply supply the following information :

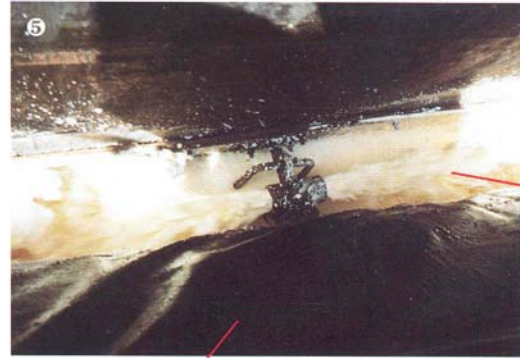
- Plan view of the tank top, with diameter and layout of all roof support legs ;
- Sectional side view, giving tank height plus upper and lower roof positions ;
- Length of pipe run from dyke to tank shell ;
- Inlet pressure to foam maker.

Call for a free estimate on a COFLEXIP RIM FIRE PROTECTION SYSTEM. We will be happy to discuss your specific needs.

Foam line specifications	3"		4"		6"		6" 3 layers	
	English	Metric	English	Metric	English	Metric	English	Metric
Internal diameter	3.0 in	7.6 cm	4.0 in	10.2 cm	6.0 in	15.2 cm	6.0 in	15.2 cm
Outer diameter	3.9 in	9.8 cm	4.9 in	12.4 cm	7.3 in	18.6 cm	7.18 in	18.3 cm
Linear weight empty	4.6 lbs/ft	6.8 kg/m	6 lbs/ft	8.9 kg/m	12.8 lbs/ft	18.5 kg/m	11.8 lbs/ft	17.6 kg/m
Minimum bending radius (storage)	2.1 ft	0.6 m	2.6 ft	0.8 m	4 ft	1.2 m	4 ft	1.2 m
Working pressure	150 psi	10.3 b	150 psi	10.3 b	60 psi	4.2 b	150 psi	10.3 b
Test pressure	225 psi	15.5 b	225 psi	15.5 b	75 psi	5.3 b	225 psi	15.5 b
Minimum Hydrostatic collapse pressure	245 psi	17 bars	200 psi	14 bars	115 psi	8 bars	175 psi	12 bars
Working temperature	Up to 100° C or 212° F							

NOTE : The design and characteristics of the pipe structure may be modified at any time by COFLEXIP.

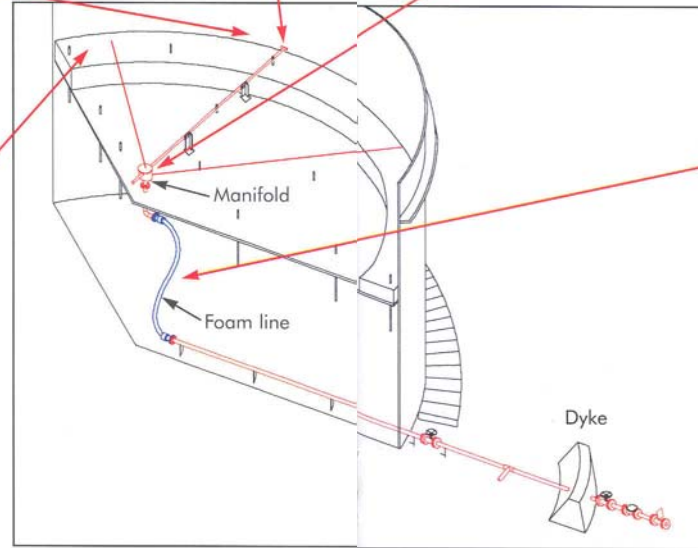
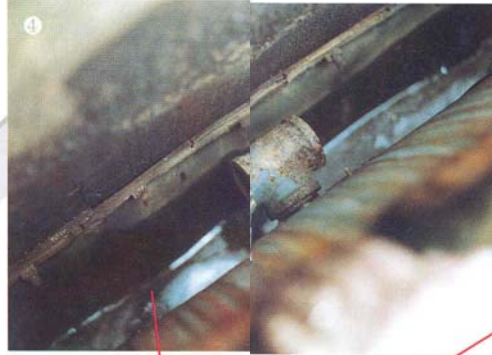
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5 Time 3' 00"
The foam delivered from each outlet meets up and blankets the entire seal area

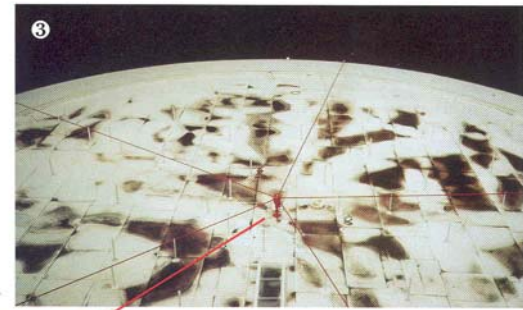


4 Time 0' 30"
The outlets fitted inside the seal area deliver the foam exactly where it is needed for maximum efficiency.



The COFLEXIP RIM FIRE PROTECTION SYSTEM : How it works

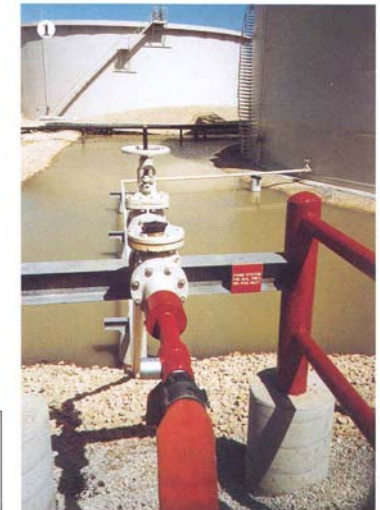
From hook-up to seal area full of foam in 3 minutes.
Numerous full size tests have been carried out confirming this time scale. The values given here are taken from these tests and are therefore typical. This timing is calculated and is part of our standard design package. A video showing one such test and test reports can be presented on request.



3 Time 0' 20"
The foam is distributed to the rim of the roof by the manifold and the radial piping.



2 Time 0' 10"
The foam is carried to a manifold on the roof through the COFLEXIP foam line, allowing correct delivery whatever the roof position.



1 Time 0' 0"
The foam is pumped through the piping from outside the dyke to the foam line inside the tank.