



GENERAL PRODUCT SHEET

FREECAP® – Fluid Reactive Expanding Elastomer Casing Annulus Packer

PRODUCT DESCRIPTION:

The FREECAP® is a packer that swells upon contact with wellbore fluids. Different elastomers are available that will expand in water-based fluids or oil-based fluids. Two basic configurations of FREECAP are currently available: FREECAP I, which is integral to the casing, and FREECAP II, which is a slide-on version. FREECAP I packers are made by bonding the swellable elastomer onto any oilfield tubulars. Metal end rings assist in increasing the differential pressure rating by reducing the extrusion gap between the packer and the borehole/casing ID.

The length of time required to swell and seal off a particular annulus is dependent on several factors. Factors common to both the oil and water swell compounds are fluid temperature and the difference between the initial packer OD and the average borehole ID. For the oil-activated packers, oil composition is the controlling factor. For the water swellable packers, water salinity is the controlling factor.

Each swellable elastomer compound developed by TAM is custom designed and tested to meet customer needs. FREECAPs are highly reliable, have no moving parts, and require no inflation or manipulation to seal, removing the inherent risks of mechanical tools.

PROVIDES SOLUTIONS FOR:

- Zonal isolation
- Flow diversion
- Stimulation placement
- Intelligent well completions
- Water/gas shut off
- Open and cased hole scab liners
- Cement integrity
- Selective production

FEATURES:

- Anti-extrusion end rings for FREECAP I, FREECAP II, and FREECAP III packers
- Modular slide-on FREECAP II and FREECAP III allow for last-minute placement flexibility
- Set in permeable formations, a long FREECAP, 10 ft to 20 ft (3 m to 6 m), seals more efficiently as it reduces bypass through the formation
- Manufactured to accommodate control lines
- Provides effective sealing in irregular wellbore shapes or corroded casing
- Can be supplied with both water and oil swell elastomers on the same mandrel to ensure swelling in either environment

BENEFITS:

- Temperature ratings from 50°F to 575°F (10°C to 302°C)
- 15,000 psi differential capability
- Good alternative to cementing and perforating
- Reduces rig time and construction costs



**FREECAP® – Fluid Reactive Expanding Elastomer Casing Annulus Packer****TOOL TYPE:**

FREECAP I packers are offered in 3 ft to 20 ft (1 m to 6 m) lengths on 10 ft to 30 ft (3 m to 9 m) casing or tubing joints. They can be manufactured with any seal up to 6 ft less than a full casing joint, but special tooling and handling may apply. When they are made up as part of the regular casing/liner string, no specialized tools or personnel are needed.

FREECAP II packers are built as slide-on packers, which allows on-site placement on either blank pipe or at the end of the screen section. They are offered in 1 ft to 3 ft (0.3 m to 0.9 m) lengths with IDs designed to slide over the maximum API casing OD tolerance. The FR II is also offered in a higher pressure version, with a robust ID seal and 5' seal length. O-rings installed in both ends seal the annulus between the ID of the packer and the OD of the casing. The packers can be manufactured with custom seal lengths.

FREECAP III packers are built as slide-on packers which allow on-site placement on either blank pipe or at the end of screen section. The elastomer section slides directly onto the casing with each two part end ring securing the elastomer to the base pipe. Set screws are

used to anchor the end ring to the base pipe to back up the swellable elastomer when under differential load.

COMMON TOOL SIZES*:

Base Pipe OD		Element OD	
in.	mm	in.	mm
2.88	73.2	4.13 - 5.25	104.9 - 133.4
3.50	88.9	4.75 - 5.88	120.6 - 149.4
4.00	101.6	5.25 - 6.25	133.4 - 158.8
4.50	114.3	5.63 - 7.00	143 - 177.8
5.00	127	6.25 - 7.25	158.8 - 184.1
5.50	139.7	7.00 - 8.13	177.8 - 206.5
6.63	168.3	8.00 - 9.25	203.2 - 235
7.00	177.8	8.00 - 9.25	203.2 - 235
7.63	193.7	9.25 - 10.25	235 - 260.3
9.63	244.5	11.63 - 14.38	295.4 - 364.3

*Packer dimensions can be adjusted to fit specific scenarios

FREECAP Isolation System Overview

Parameter	General Specification	Comment
Manufacturing Process	Wrapped and bonded to base pipe	Same process for all elastomers
Percent Swell	200% volumetric swell	4.5 x 5.75 in. (114.3 mm x 146 mm) - Max OD 7.66 in. (194.6 mm)
Temperature Limits	70-220°F (21-104°C); 220-375°F (104-191°C), 375-575°F (191-302°C)	Elastomer dependent. Oil and water swell available in all temperature ranges.
Swell Times*	5 to 17 days	A variety of oil and water swell elastomers available to work in this time frame
Seal Lengths	1, 3, 5, 10, 15, 20, and 30 ft (30, 91, 152, 305, 457, 610, and 914 cm)	Custom lengths can easily be manufactured
Differential Pressure	1000 psi to 15,000 psi	Ratings may vary depending on difference between manufactured packer OD and sealing ID
Running Procedure	Typical casing handling procedures	No problems to circulate past packer or rotate to get in well
Dogleg Severity	Standard mandrel length up to 30 deg/100ft	Using a longer mandrel will allow deployment in wells with dogleg severity greater than 30 deg/100ft
Packer Manufactured OD	Standard is 3/8 in. (9.5 mm) less than sealing ID	Some applications such as cement enhancement by require reduced ODs to accommodate flow rate during cementing
Centralization	1/4 in. (6.4 mm) less than sealing ID	Typical for horizontal applications

*General averages, dependent on temperature and fluid composition