

# PEN-X breaker surfactant package

Enhances the cleanup or dispersion of oil- or synthetic-based filtercakes

## Applications

- Wells with bottomhole temperature below 250 degF [121 degC]
- Water wetting of nonaqueous filtercake by stripping the oil or synthetic elements from particle components in the filtercake
- Openhole completions such as barefoot, stand-alone screens, expandable screens, and openhole gravel packs

## How it enhances viscosity

PEN-X\* breaker surfactant package enhances penetration of nonaqueous filtercakes by destabilizing the emulsion around the calcium carbonate or barite particle. Usable by itself in a brine to help disperse a barite-laden oil-based filtercake or it can be added to a VERSA-OUT\* water-based filtercake breaker system to enhance the cleanup of a calcium carbonate by water wetting the filtercake. PEN-X package can also be added to the FAZE-OUT\* reversible-system water-based filtercake breaker for improved dispersion and water wetting.

- Slow-acting water-wetting surfactant and solvent
- Thorough and uniform destruction of FAZEPRO\* reversible invert-emulsion reservoir drill-in fluid system or VERSAPRO\* invert-emulsion reservoir drill-in fluid system filtercakes when used with the D-STRUCTOR\* organic-acid precursor breaker
- Controlled removal of a uniform dispersion and water-wetting
- Can be placed during completion operation
- Can be mixed at the rig site with rig equipment
- Avoids an intervention trip

## Typical Physical Properties

Physical appearance	Gold liquid
Specific gravity	1.050–1.080
Flash point	160 degF [71 degC]
Pour point	–45 degF [–43 degC]

All specifications are subject to change without notice.

## How it works

PEN-X package is used when bottomhole temperature is below 250 degF [121 degC],<sup>†</sup> when a faster reaction is desired, or for more tenacious filtercakes.

Typically used in combination with D-STRUCTOR breaker or a VERSA-OUT breaker system to dissolve the soluble material in the oil- or synthetic-based filtercake, leading to full filtercake dissolution over an extended time and depending on the bottomhole temperature.

If the oil- or synthetic-based filtercake is barite laden, PEN-X package can be used to help pull the oil from the barite particle and help disperse the filtercake.

Recommended usage is 5 to 20% by volume. Use with the D-STRUCTOR breaker. PEN-X package is compatible with seawater, potassium chloride, sodium chloride, calcium chloride, sodium bromide, calcium bromide, sodium formate, and potassium formate.

## Toxicity and handling

Bioassay information is available upon request. Handle as an industrial chemical, wearing protective equipment and observing the precautions as described in the material safety datasheet (MSDS).

## Packaging and storage

Packaged in 55-galUS drums or cubic-meter totes and is available from all M-I SWACO plant and warehouse locations.

Store in a dry location away from heat or ignition sources, and minimize dust.

<sup>†</sup>Contact M-I SWACO for a high temperature formulation of PEN-X package for temperatures exceeding 250 degF [121 degC].