

### Belclene® 400 – Unique Multifunctional Deposit Control Agent for Industrial Water

Belclene 400 deposit control agent is a sulfonated carboxylic acid terpolymer. The unique structure of Belclene 400 terpolymer results in a highly effective and wide ranging deposit control activity profile that includes;

- Calcium phosphonate stabilization and phosphate inhibition/dispersancy
- Calcium carbonate inhibition
- Zinc stabilization
- Low to moderate mild steel corrosion inhibition properties
- Halogen and calcium compatibility

These properties enable Belclene 400 to be used as for general calcium phosphate and calcium carbonate fouling and also as a building block to improve the performance of phosphate, polyphosphate, phosphonate and zinc based water treatment formulations.

Polymeric stabilisers are used in phosphate based water treatment formulations in order to:

- Maintain adequate soluble phosphate concentrations in extended phosphate treatment programs
- Eliminate the calcium phosphate fouling potential in conventional zinc/polyphosphate corrosion programs
- Control general calcium phosphate fouling

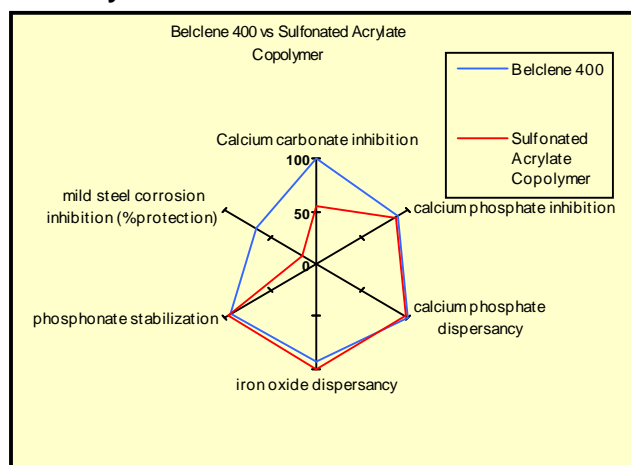
The polymer component of water treatment formulations is also required to effectively disperse iron and other particulate matter, control calcium carbonate fouling, extend phosphate activity by stabilization of calcium phosphonates, and stabilize zinc.

Belclene 400 has been consistently proven to be the best additive available to meet all these requirements and is used extensively in cooling water systems worldwide in combination with polyphosphate, phosphonates and zinc.

Belclene 400 is compatible with all common water treatment additives and shows excellent stability in the presence of chlorine.

Belclene 400 is available globally with the support of an extensive distribution network and a technical sales team dedicated to the water industry.

### Belclene 400 Deposit Control Performance Summary



### Test Conditions

Calcium carbonate inhibition	5 ppm polymer as solids, 500 ppm Ca <sup>2+</sup> , 450 ppm HCO <sub>3</sub> <sup>-</sup> , 100ppm Na <sub>2</sub> CO <sub>3</sub> , 54°C, pH8.5, 30 mins
Calcium phosphate inhibition	10 ppm polymer as solids, 250 ppm Ca <sup>2+</sup> , 10 ppm PO <sub>4</sub> <sup>3-</sup> , 70°C, pH 9, 4hrs
Calcium phosphate dispersancy	10 ppm polymer as solids, 560 ppm Ca <sub>5</sub> (PO <sub>4</sub> ) <sub>3</sub> OH, ambient temp, 60 mins, pH 8
Iron oxide dispersancy	10 ppm polymer as solids, 100 ppm Ca <sup>2+</sup> , 60 ppm HCO <sub>3</sub> <sup>-</sup> , 100 ppm Fe <sup>3+</sup> , ambient temp, 30 mins, pH 8.5
Phosphonate stabilization	20 ppm polymer as solids, 10 ppm HEDP as solids, 350 ppm Ca <sup>2+</sup> , 60°C, 4hrs, pH 9.5
Mild steel corrosion inhibition	50 ppm polymer as solids, 250 ppm Ca <sup>2+</sup> , 75 ppm Mg <sup>2+</sup> , 350 ppm alkalinity, 200 ppm Cl <sup>-</sup> , 200 ppm SO <sub>4</sub> <sup>2-</sup> , 40°C, 42hrs, pH 8.1

(ppm calcium, bicarbonate and carbonate quoted as ppm calcium carbonate)

## Features & Benefits Summary

FEATURES	BENEFITS
<ul style="list-style-type: none"><li>• Excellent calcium phosphate inhibition and dispersancy properties</li></ul>	Stabilization of extended phosphate programs across wide application window
<ul style="list-style-type: none"><li>• Stabilizes calcium phosphonates and zinc</li></ul>	Extends the performance of all organic and zinc based corrosion & scale inhibitor programs
<ul style="list-style-type: none"><li>• Disperses iron, clay and zinc deposits</li></ul>	Maintains heat transfer efficiency by keeping surfaces free from corrosion products and amorphous deposits
<ul style="list-style-type: none"><li>• Superior calcium carbonate inhibitor compared with other sulfonated polymers</li></ul>	Provides a "safety net" for alkaline programs operating under high calcium carbonate saturation indices

### Patents

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