

Product Information

www.wateradditives.com

Belcor® 585 - High Performance Corrosion Inhibitor for Industrial Water Systems

Belcor 585 is the newest all-organic high performance dual functional product that offers the corrosion protection benefits of traditional phosphino and phosphono polymers, phosphonate and molybdate based programs along with enhanced anti-scalant properties for use in industrial water systems.

Belcor 585 is a high performance corrosion inhibitor that offers;

- Enhanced corrosion and scale protection in one product
- Ease of use in formulations
- Reduced environmental impact since it is inherently biodegradable and has a low P content

Belcor 585 gives the water treater the ability to minimize corrosion problems and maximize consumer plant longevity and productivity due to its robust application properties.

Part of Belcor 585's dual functionality is that it provides calcium carbonate scale inhibition. Belcor 585, therefore, also allows the water treatment formulator excellent opportunities to reduce formulation components, simplify blending processes and reduce raw material inventory.

Belcor 585 typical physical properties

Appearance	Clear dark amber solution
Solids content	51 - 58%
pH (neat)	< 1.0
SG at 20°C	1.29 - 1.37
Viscosity at 25°C (mm ² s ⁻¹)	26

Belcor 585 corrosion inhibition performance

Belcor 585 has excellent corrosion inhibition activity and can be used in moderate to highly corrosive conditions. Belcor 585's activity is not affected by the presence of high levels chloride or sulfate ions as shown in Figure 1.

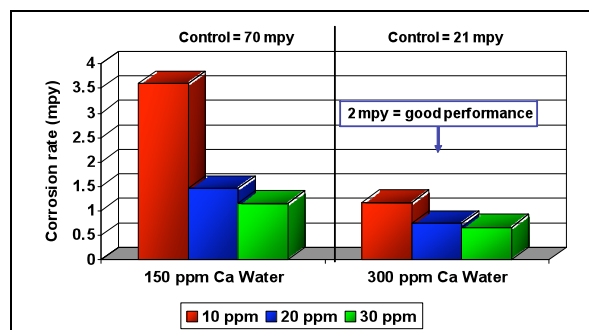


Figure 1: Corrosion inhibition performance of Belcor 585 under different conditions

Test conditions:

Rotating mild steel coupons: flow rate 1 ms⁻¹ (3 fts⁻¹)

Temperature: 40°C (104°F)

Dose: as solids

Water chemistry: 150 ppm Ca water 300 ppm Ca water

Calcium	150 ppm as CaCO ₃	300 ppm as CaCO ₃
Total hardness	225 ppm as CaCO ₃	450 ppm as CaCO ₃
Chloride	200 ppm	212 ppm
Sulfate	200 ppm	142 ppm
pH	8.5	8.3

Belcor 585 also exhibits superior corrosion inhibition performance compared to other corrosion inhibitors. Figure 2 shows comparative performance to phosphono polymaleic acid (PPMA) and HPA corrosion inhibitors in the 150 ppm calcium water described above.

Results demonstrate that;

- Both Belcor 585 and HPA give under 2 mpy corrosion rates at the same dose levels.
- Twice as much PPMA was required (40 ppm solids) compared to Belcor 585 (20 ppm solids) to achieve a corrosion rate of less than 2 mpy.
- Sodium molybdate alone is not an effective corrosion inhibitor

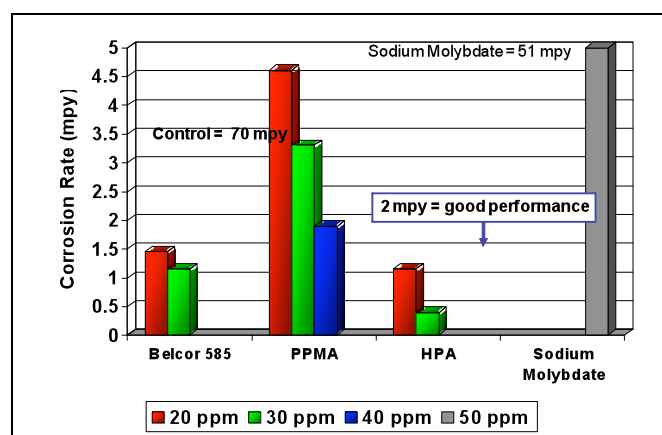


Figure 2: Belcor 585 performance compared to competitor corrosion inhibitor

Belcor 585 provides corrosion and fouling protection equivalent to that of HPA in 150 ppm calcium water and superior to PPMA in both 150 ppm and 300 ppm calcium water as shown in Figures 3 & 4.

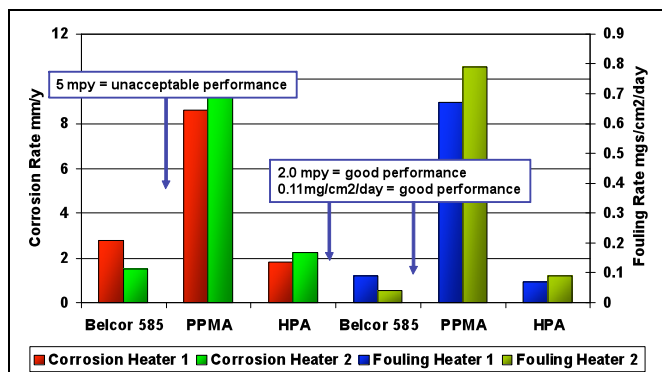


Figure 3: Comparative corrosion and fouling rates in 150 ppm calcium water

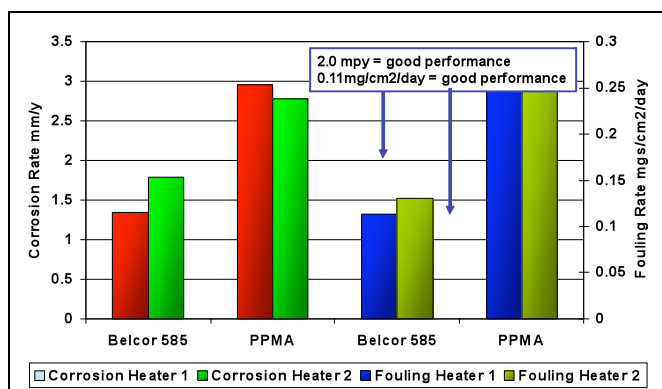


Figure 4: Comparative corrosion and fouling rates in 300 ppm Ca water.

Belcor 585 halogen demand

As shown in Figure 3, Belcor 585 exhibits less interaction with halogens compared to HPA when oxidizing biocides such as chlorine or bromine are used for microbiological control. The halogen demand of Belcor 585 is comparable to that of competitor products with the added benefit of enhanced corrosion protection.

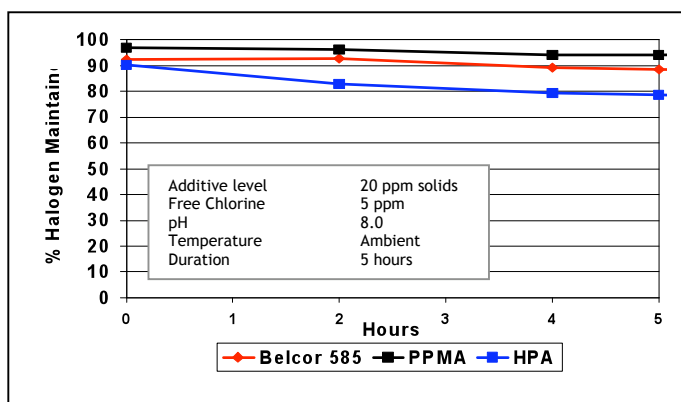


Figure 5: Belcor 585 halogen demand

Superior film integrity using Belcor 585

Treatment with Belcor 585 leads to the formation of a uniform film over the metal surface. The superior film integrity observed with the use of Belcor 585 compared to HPA is illustrated below in Figure 6. The new metal surface displays a rough/sharp surface whereas the consistent film

obtained with Belcor 585 is evidenced by a smoother metal surface.

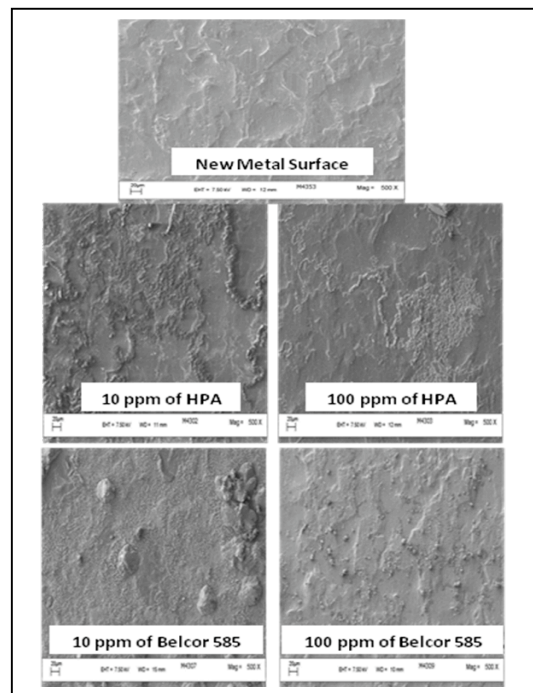


Figure 6 - SEM photos illustrating film integrity when using Belcor 585.

Belcor 585 calcium carbonate control properties

In addition to its outstanding corrosion inhibition performance, Belcor 585 exhibits excellent activity as a calcium carbonate scale inhibitor. Figure 7 indicates that at levels of 4 ppm inhibitor (as solids) Belcor 585 performs as well as PBTC for calcium carbonate control.

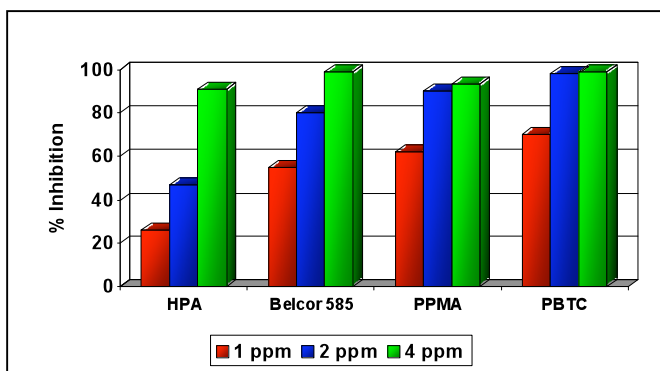


Figure 7: Belcor 585 calcium carbonate inhibition properties

Test conditions:

Duration: 30 minutes
Dose: solids
Temperature: 70°C (158°F)
Water chemistry:
Calcium: 375 ppm as CaCO₃
Magnesium: 105 ppm as CaCO₃
Carbonate: 85 ppm as CaCO₃
Bicarbonate: 220 ppm as CaCO₃
pH: 8.2
LSI: 2.4

Environmentally Favorable

As a highly effective, inherently biodegradable and low P containing additive, Belcor 585 can help to reduce the environmental impact of cooling water programs. The low P content of Belcor 585 also reduces the need for biocides through minimization of a nutrient source.

Conclusion

Belcor 585 is an exciting new corrosion inhibitor that will extend end user asset life, maximize plant reliability and minimize down time. Belcor 585 provides high performance corrosion inhibition and offers reliable, flexible solutions for a wide range of water treatment applications.

Patents

BWA Water Additives (BWA) owns or is the licensee of patents and patent applications, which may cover the products and/or uses described in this brochure.

The following are registered trademarks of BWA
Belcor, Drop and Swirl logo.

® Registered US Patent and Trademark Office.

© 2008 BWA, All rights reserved.

V0908

BWA Water Additives
Europe and Middle East Region
2 Brightgate Way, Cobra Court
Stretford, Manchester M32 0TB
United Kingdom
Telephone + 44 161 864 6699
Fax + 44 161 864 6666

BWA Water Additives
Americas Region
1979 Lakeside Parkway, Suite 925
Tucker, GA 30084
USA
Telephone + 1 678 802 3050
Or 800 600 4523
Fax + 1 678 802 3024

BWA Water Additives
Asia Pacific Region
Telok Blangah East Post Office
PO Box 129
Singapore 910901
Telephone + 65 9758 0554
Fax + 65 6234 3606

Visit our website at: www.wateradditives.com

The information contained in this product sheet is based on data available to BWA Water Additives and is thought to be correct. Since BWA, has no control over the use of this information by others, BWA does not guarantee the same results described herein will be obtained, and makes no warranty of merchantability or fitness for a particular purpose or any express or implied warranty. This information is intended for use by technically trained personnel at their discretion and risk. BWA Water Additives UK Limited is a private limited company registered in England and Wales at 2 Brightgate Way, Manchester M32 0TB, Registered No. 5657343

