

Global Oilfield Solutions

Corrosion Inhibitors for Production:
Basocorr™

 **BASF**
We create chemistry

To protect and to preserve: Basocorr™

Mitigation of corrosion in the production and field treatment of crude oil is of major importance to the oil industry to avoid the consequences of pipeline and equipment failures. Apart from the choice of materials of adequate resistance, corrosion inhibitors represent one of the best ways of providing effective protection and thus minimizing operating costs.

Various parameters effect the corrosion rate including:

- Metallurgy
- Composition and water content of the crude
- Composition of the water
- Total pressure
- Partial Pressure of CO₂ and H₂S
- Temperature and pH
- Mechanical stress in the material and vibration
- Flow velocity
- Deposited or suspended solids

Corrosion inhibitors can impact the corrosion rate by various means, and organic film-forming inhibitors constitute one of the most important classes of corrosion inhibitors. They are adsorbed at the metal surface creating a diffusion barrier which reduces the corrosion rate. To allow for a cost-effective solution, these additives have to rapidly form a persistent film at low concentrations. **Basocorr™** products satisfy these requirements for a large variety of conditions and applications.



Cover picture: SEM (Scanning Electron Microscopy) image of an unprotected L80 steel coupon after a corrosion test (false color representation)



Applications

Basocorr™ products can be applied in all applications in which corrosive media, e.g. aqueous solutions or emulsions are encountered in the production and field treatment of crude oil.

- Production and injection wells
- Pipelines for production or injection water
- Oil treatment units
- Separators and pumps
- Oil and water storage tanks

The **Basocorr™** portfolio comprises several classes of corrosion inhibitor actives which are designed for use in production environments. They are effective in CO₂ and/or CO₂/H₂S environments, under various flow regimes, high temperature and various salinities. Additionally, they have synergistic performance interactions with other surfactants or corrosion inhibitors. **Basocorr™** products can be utilized in batch or continuous applications.

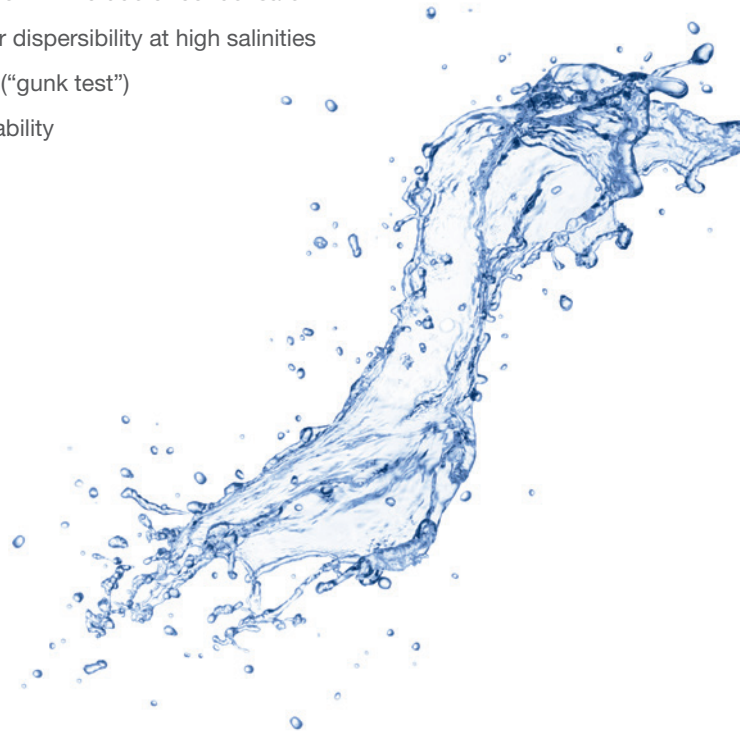
- Continuous dosing in a oil or gas well (e.g. into the annulus or through a capillary string)
- Continuous injection into flow lines by means of a metering pump
- Batch treatment of oil and gas wells
- Batch treatment of flow lines (flushing with an inhibitor solution)

Initial recommendation

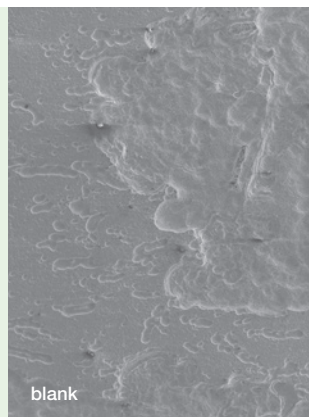
Basocorr™ products can be formulated to accommodate specific applications and requirements. Guidance can be given upon request. In general we recommend mixing at least 2 of the surfactant based corrosion inhibitors (e.g. **Basocorr™** E1000, E1005, E1100, 2000, 2005) in a ratio of either 1:1, 2:1 or 1:2 at a total activity of 10–40% with 2–6% **Basocorr™ ME** for synergist performance in carbon dioxide environments (in hydrogen sulfide environments **Basocorr™ ME** is not needed). For water-based formulations comprising **Basocorr™ E** types we recommend the use of a co-solvent due to their increased lipophilic character.

Further recommended tests to check the suitability of our products:

- Foaming tendency (for separators and scrubbers)
- Interaction with other process chemicals, e.g. demulsifiers or scale inhibitors
- Emulsification with crude or condensate
- Solubility or dispersibility at high salinities
- Flowability (“gunk test”)
- Thermal stability



SEM micrographs of SAE 1018 coupons after corrosion test



blank



with Basocorr™

Product range

Group 1

Environmentally benign products for highly regulated markets

Basocorr™ E types have been specially selected to serve markets with strict environmental regulations such as the North Sea. Their environmental profile is characterized by very high biodegradation and low toxicity.

Basocorr™ E1000, E1100:

- based on an alkyl polyglucoside, selected especially
- based on environmental profile, very high biodegradation (OECD 306) and low toxicity (algae, crustacean, fish, sediment reworker)

Basocorr™ E1005:

- ester based quaternary (quat.) ammonium salt, selected especially
- based on environmental profile, high biodegradation (OECD 306), low toxicity (algae, crustacean, fish, sediment reworker and molecular weight of >700 g/mol)

Group 2

High performance products for standard conditions

Basocorr™ products of Group 2 have been selected to offer our customers high performance alternatives to classical benzyl quat. based corrosion inhibitors.

Basocorr™ 2000:

- based on an amine oxide, cost-efficient alternative to quat based products

Basocorr™ 2005:

- based on alkyl propionate chemistry was selected for high performance in acidic conditions

Basocorr™ Corrosion Inhibitors

General information					Availability			
Group	Product	Product Description	Form	Concentration (%)	CEFAS	NA	SA	EU
1	Basocorr™ E1000	Alkyl polyglucoside	Viscous liquid	52	■	■	■	■
	Basocorr™ E1100	Alkyl polyglucoside	Viscous liquid	50	■	■	■	■
	Basocorr™ E1005	Ester quat.	Paste	85	■	■	■	■
2	Basocorr™ 2000	Amine oxide	Liquid	30		■	■	■
	Basocorr™ 2005	Modified amino acid salt	Liquid	30		■	■	■
3	Basocorr™ ME	2-Mercaptoethanol	Liquid	100		■	■	■

* not REACH registered yet



Group 3

Synergists and Precursors

Basocorr™ ME:

- based on 2-mercaptoethanol, utilized as a synergist for CO₂ corrosion



AP	pH	Flash point (°C)	Solubility					
			Water	Isopropanol	Kerosene	Ethylene Glycol	Aromatic ¹	EGMBE ²
■	11	N/A	Dispersible	Insoluble	Insoluble	Dispersible	Insoluble	Insoluble
■	12	>93	Dispersible	Insoluble	Insoluble	Dispersible	Insoluble	Insoluble
■	3	>100	Dispersible	Dispersible	Dispersible	Dispersible	Soluble	Soluble
■	7	N/A	Soluble	Insoluble	Insoluble	Soluble	Insoluble	Insoluble
■	7.5	>100	Soluble	Insoluble	Insoluble	Soluble	Insoluble	Soluble
■	5	70.5	Soluble	Soluble	Insoluble	Soluble	Soluble	Soluble

¹ refers to aromatic solvents like toluene, xylene, naphtha

² Ethylene glycol monobutylether

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