

# Phix I®

## Technical Data Sheet

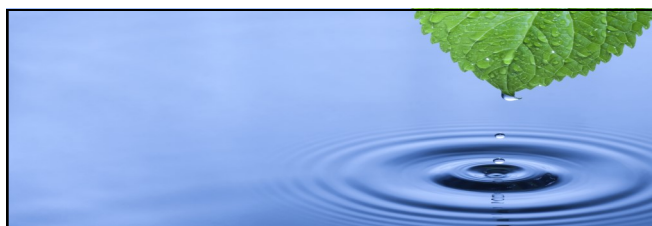
Phix I® is the only synthetic sulfuric acid replacement on the market with similar reactive properties to 50% sulfuric acid yet with none of the harmful side effects. Phix I® is safe to handle, does not burn skin like traditional sulfuric acid and has a corrosion rate low enough to qualify as a DOT non-hazardous material. Phix I® is non regulated by US DOT, non-fuming and will not corrode or rust most metals. Phix I® is OSHA and EPA compliant and carries a triple zero hazardous materials index score. Phix I® will not release any dangerous fumes and has been proven to pose no inhalation risk. Phix I® exceeds all US DOT corrosion requirements. Phix I® can be added to your water or become part of a self-monitoring application system. Phix I® will easily neutralize any high pH base fluid, while emitting much lower exothermic reaction properties.

### FEATURES AND BENEFITS:

- Effectively lowers and balances pH • reduced health & safety risks • reduced system corrosion • ability to greatly reduce alum use
- Does not require an expensive handling system
- Efficient pH control without the drawbacks associated with combination sulfuric & alum usage • thus reducing deposition, retention and drainage problems
- Outperforms conventional 50% sulfuric acid
- No disposal restrictions
- Non-corrosive on most metals • 100% biodegradable
- FDA approved "GRAS"
- Non-DOT regulated • non skin irritant
- An excellent replacement choice when faced with excess alum usage. Phix I® is well suited to replace the majority of alum usage where 1 lb of Phix I® will replace 2.5 to 3 lbs of aluminum

### TYPICAL PHYSICAL PROPERTIES:

Appearance and Color	Clear
Initial Freeze Point	-16°F (-26.7°C)
Odor	Mild Soapy Odor
Solubility in Water	100%
Flashpoint	None
Specific Gravity	1.15 ± .04
Biodegradability	100%



### DIRECTIONS FOR USE:

Phix I® is a functional replacement for all sulfuric acid systems and can be used to maintain pH levels in any fluid system. Add to fluid or water to lower pH as needed.

### STORAGE AND HANDLING:

Phix® I has a storage life of better than one year. Keep container closed when not in use. As with all chemical products and materials, take care as to where you store them. Safety glasses are suggested for use when handling this product. No special gloves or protective equipment are required when handling this product.

When pumping this product, it is strongly recommended to use manufacturer approved hose couplings or fittings. DO NOT USE ALUMINUM FITTINGS, 316 Stainless Steel, polypropylene, polyethylene are recommended.

### PACKAGING:

Phix I® is shipped in 275g totes or bulk tanker trucks from the manufacturing facility. Smaller packaging quantities are available upon request.

### METAL CORROSION TEST:

Corrosion Rates of Phix I on brass, copper, chrome, mild steel, and stainless steel.

Applicable Standard:

NACE Standard TMO169-76; Laboratory Corrosion Testing of Metals for the Process Industries. A weighed metal specimen is immersed in the sample solution of Phix I for 24 hours (28 hours for mild steel) @55°C. After immersion, the metal specimen is chemically cleaned to remove any corrosion products. The corrosion rate is calculated assuming that all weight loss is due to general corrosion and not to localized corrosion.

The corrosion rate expressed as millimeters per year (mmpy) is:

$$\text{mmpy} = \text{wt loss} \times 87.6 \div \text{area} \div \text{time} \div \text{metal density}$$

where weight loss is in mg, area in cm<sup>2</sup> of metal surface exposed, and time is hours exposed.

Alloy	Observations	Corrosion Rate (mmpy)
Brass (CDA260)	No discoloration or pitting	<<0.0001
Chrome (F-9A182)	No discoloration or pitting	<<0.0001
Copper (CDA110)	No discoloration or pitting	<<0.0001
Mild Steel (C 1020)	No discoloration or pitting	1.39
Stainless Steel (316L)	Discoloration was localized to two areas about 1mm x 2mm in size (the total area of the metal coupon is 929mm <sup>2</sup> ). The remaining area of the coupon showed no discoloration or pitting	0.00018

(According to OSHA and DOT, a product is not corrosive if it does not exceed 6.25 mmpy at a test temperature of 55° C when tested in accordance with NACE Standard TM0169-76)

Recommendations given in this data sheet are based on tests believed to be reliable. However, the use of the information is beyond the control of Heartland Energy Group, Ltd., and no guarantee, expressed or implied is made to the results obtained if not used in accordance with directions or established safe practice. The buyer must assume all responsibility, including injury or damage from the misuse of the product as such, or in combination with other materials. This bulletin is not to be taken as a license to operate under or recommendation to infringe any patent.