Oakite® PC 10

Liquid inhibitor for sulfuric acid pickling solutions; prevents overpickling of steel to save acid and metal.

PRIMARY APPLICATION

Oakite PC 10 is a liquid material designed to inhibit sulfuric acid pickling solutions from attacking sound metal. By decreasing the iron build-up in the pickling bath, Oakite PC 10 reduces acid consumption by as much as 30% to 40%. By preventing overpickling, metal loss is reduced and the life of the acid bath is prolonged. Added to either hot or cold, batch or continuous sulfuric acid pickling solutions, Oakite PC 10 produces a controlled foam blanket which reduces fumes. Additionally, it assures better rinsing.

CHEMICAL CHARACTERISTICS

- chemical composition ........................................ surfactants and inhibitors in an acid medium
- physical form .................................................. as received: dark-brown liquid
- odor ............................................................... concentrated: pleasant, sharp
- specific gravity .............................................. 1.458 at 20°C (68°F)
- bulk density ................................................... 1458 g/l (12.1 lb/gal)
- viscosity ....................................................... 77 cps, Brookfield Spindle 1, 60 rpm
- flash point ..................................................... 75°C (167°F), Tag Closed Cup
- foaming tendency ............................................ high
- recommended diluent ...................................... none, added full strength to sulfuric acid pickling solutions
- maximum solubility ....................................... 1.0% by volume in acid solutions
- behavior in hard water ..................................... not applicable
- rinsability ...................................................... good
- biodegradable surfactants ................................ yes
- phosphate-free .............................................. no
- normal working concentrations .......................... 0.25% to 1.0% by weight of the concentrated acid in solution
- normal working temperatures ............................ 16° to 82°C (60° to 180°F)
- pH ................................................................. concentrated: 1.0
- as used: assumes pH of pickling solution
- effect of prolonged boiling ................................. none
The effect of working solutions on metals ................. rate of metal loss from one-hour immersion in Oakite PC 10, at 1.0% by weight of 10% by volume sulfuric acid, 74°C (165°F), projected for one year, is as follows:

<table>
<thead>
<tr>
<th>metal (alloy)</th>
<th>mm/yr</th>
<th>in/yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>steel (1010)</td>
<td>0.28</td>
<td>0.011</td>
</tr>
<tr>
<td>stainless steel (316)</td>
<td>0.03</td>
<td>0.001</td>
</tr>
<tr>
<td>stainless steel (403)</td>
<td>2.31</td>
<td>0.091</td>
</tr>
<tr>
<td>copper</td>
<td>0.00</td>
<td>0.000</td>
</tr>
<tr>
<td>brass</td>
<td>0.00</td>
<td>0.000</td>
</tr>
<tr>
<td>aluminum (1100)</td>
<td>1.09</td>
<td>0.043</td>
</tr>
</tbody>
</table>

attacks zinc and magnesium

APPLICATION PROCEDURE

The pickling solution is prepared by adding the concentrated sulfuric acid to cold water at 5 to 10% by volume. Oakite PC 10 is added to the diluted acid (either hot or cold) at 0.25 to 1.0% by weight of the concentrated acid in solution, and agitated.

The table below indicates the concentrations required to prepare a 3785-liter (1000-gallon) pickling solution:

The 66° Baumè Concentrated Sulfuric Acid:

<table>
<thead>
<tr>
<th>% acid by weight</th>
<th>water</th>
<th>acid</th>
<th>1/2 liters (pints) of Oakite PC 10 required for addition by weight of</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>kl</td>
<td>(gal)</td>
<td>0.2%</td>
</tr>
<tr>
<td>1%</td>
<td>3.78</td>
<td>(994.2)</td>
<td>22.0</td>
</tr>
<tr>
<td>2%</td>
<td>3.75</td>
<td>(988.4)</td>
<td>44.1</td>
</tr>
<tr>
<td>5%</td>
<td>3.68</td>
<td>(971.0)</td>
<td>110.2</td>
</tr>
<tr>
<td>10%</td>
<td>3.55</td>
<td>(942.0)</td>
<td>218.4</td>
</tr>
</tbody>
</table>

For 60° Baumè Concentrated Sulfuric Acid:

<table>
<thead>
<tr>
<th>% acid by weight</th>
<th>water</th>
<th>acid</th>
<th>1/2 liters (pints) of Oakite PC 10 required for addition by weight of</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>kl</td>
<td>(gal)</td>
<td>0.2%</td>
</tr>
<tr>
<td>1%</td>
<td>3.77</td>
<td>(992.4)</td>
<td>28.9</td>
</tr>
<tr>
<td>2%</td>
<td>3.74</td>
<td>(984.8)</td>
<td>57.8</td>
</tr>
<tr>
<td>5%</td>
<td>3.66</td>
<td>(962.0)</td>
<td>144.4</td>
</tr>
<tr>
<td>10%</td>
<td>3.51</td>
<td>(924.0)</td>
<td>288.8</td>
</tr>
</tbody>
</table>

Solution Control: Concentrations are titrated using Gardotest Procedure 93.
Sample Size: 10 mls
Factor: 0.078

EQUIPMENT

The Chemetall Oakite Chemical Metering Pump can be used to automatically maintain the make up chemical requirement of this product. If predilution is required, the Chemetall Oakite water driven Proportioners can be used to automatically feed the premixed solution of this product to the process tank. Please contact the Chemetall Oakite Process Equipment and Engineering Department for specific recommendations.
NOTES ON USE  (See Material Safety Data Sheet)

Keep away from heat, sparks, open flame and strong oxidants.

Never add water or solutions to the product.

Avoid contact or mixing with chlorine-releasing materials.

When iron salts reach 9 to 10% (determined with Titration Procedure 20), Oakite PC 10 loses its ability to prevent attack on steel. At this point, spent solution should be discarded.

When phosphating, electroplating or tinning of steel will follow the pickling process, the inhibiting film should be removed and the surface neutralized with a short rinse in an Oakite Rustripper® solution.

Safety and Handling Precautions:  Oakite PC 10 is a highly acidic material containing phosphoric acid. It is a combustible mixture. Direct contact causes burns of eyes and skin. Harmful if swallowed or inhaled. Avoid contact with eyes, skin and clothing. Wear rubber gloves, safety goggles or face shield and suitable protective clothing when handling. Wash thoroughly after handling. Avoid breathing vapors and mist. Use only with adequate ventilation. Do not take internally.

First Aid in Case of Contact:  For eyes, immediately flush with plenty of water for at least 15 minutes; get medical attention.  For skin, immediately flush with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash them before reuse. If inhaled, remove from exposure. If swallowed, wash out mouth thoroughly with water. Give several glasses of water or milk to drink. Do not induce vomiting. Contact a physician immediately.

KEEP OUT OF REACH OF CHILDREN

DISPOSAL

Dispose of according to all federal, state and local regulations.

SHIPMENT

May be shipped by any common carrier. Freight classification is “Compound Cleaning Liquid, (Phosphoric Acid, mixture), 8, NA1760 PG III". Product Code No. 4750.
STORAGE

Store at moderate temperatures out of direct sunlight and away from heat. Keep container tightly closed when not in use. Before opening, relieve any pressure build-up by loosening closure slowly. Keep from freezing.

- Effect of high temperature storage: combustible mixture
- Effect of low temperature storage: none at -9°C (15°F)
- Effect of aging: none

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