



# Product Bulletin

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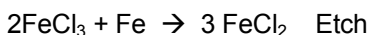
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## HALLTRONIC R 629

2707017  
10/23/07

### SODIUM CHLORATE USAGE DATA FOR FERRIC CHLORIDE

#### CHEMICAL REACTIONS



Therefore: 1 mole of iron etched requires ½ mole of NaClO<sub>3</sub> and 3 moles of HCl for regeneration

1 mole of Fe = 55.847 grams

1 mole of NaClO<sub>3</sub> = 106.44 grams

1 mole HCl = 36.46 grams

1 pound of Iron = 454 grams = 8.13 moles and requires 4.06 moles (= 432.1 grams = 0.95 lbs.) NaClO<sub>3</sub> and 24.39 moles (= 889.3 grams = 1.96lbs.) HCl for regeneration.

**HALLTRONIC R 629** solution contains 629 grams/liter NaClO<sub>3</sub> or 5.25 lbs./gallon

Industrial grade HCl (Muriatic Acid) is 30 % HCl and contains 344.7 gm/1HCl or 2.87 lbs/gal.

Therefore: 1 pound of iron etched requires -

0.18 gallons of **HALLTRONIC R 629**

and

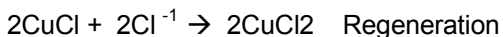
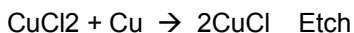
0.68 gallons of Muriatic acid (30% HCl) for regeneration

The numbers given above are for an ideal reaction with 100% efficiency. Actual usage will probably be 10% to 20% higher depending on temperature, type of alloy, etc.

## HALLTRONIC R 629

### SODIUM CHLORATE USAGE DATA FOR CUPRIC CHLORIDE

#### CHEMICAL REACTIONS



Therefore: 1 mole of copper etched requires 1/3 mole of NaClO<sub>3</sub> and 2 mole of HCl for regeneration

1 mole of Cu = 63.546 grams

1 mole of NaClO<sub>3</sub> = 106.44 grams

1 mole HCl = 36.46 grams

1 pound of copper = 454 grams = 7.14 moles and requires 2.38 moles (= 253.5 grams = 0.56 lbs.) NaClO<sub>3</sub> and 14.29 moles (= 521.0 grams = 1.15lbs.) HCl for regeneration.

**HALLTRONIC R 629** solution contains 629 grams/liter NaClO<sub>3</sub> or 4.00 lbs./gallon

Industrial grade HCl (Muriatic Acid) is 30 % HCl and contains 344.7 gm/1HCl or 2.87 lbs/gal.

Therefore: 1 pound of copper etched requires -

0.11 gallons of **HALLTRONIC R 629**

and

0.40 gallons of Muriatic acid (30% HCl) for regeneration

The numbers given above are for an ideal reaction with 100% efficiency. Actual usage will probably be 10% to 20% higher depending on temperature, type of alloy, etc.

#### WARRANTY

THE QUALITY OF THIS PRODUCT IS GUARANTEED ON SHIPMENT FROM OUR PLANT. IF THE USE RECOMMENDATIONS ARE FOLLOWED, DESIRED RESULTS WILL BE OBTAINED. SINCE THE USE OF OUR PRODUCTS IS BEYOND OUR CONTROL, NO GUARANTEE EXPRESSED OR IMPLIED IS MADE AS TO THE EFFECTS OF SUCH USE, OR THE RESULTS TO BE OBTAINED.