Product Bulletin
Product Name: Halltronic R 629
Product Code: 2707017
Revision Date: January 19, 2024

Halltronic R 629

Features & Benefits

High purity	Consistent performance; No side reactions
High concentration	Smaller storage footprint
Liquid	Ready to use; Less material handling

Operating Conditions

Sodium Chlorate Usage Data for Ferric Chloride Solutions

Chemical Reactions

$2FeCl_3 + Fe \rightarrow 3\ FeCl_2$ Etch

$3FeCl_2 + 3\ Cl^{-1} \rightarrow 3\ FeCl_3$ Regeneration

$NaClO_3 + 6HCl \rightarrow NaCl + 6Cl^{-1} + 3H_2O$ Oxidation of HCl to Chlorine and Water

Therefore: 1 mole of iron etched requires ½ mole of $NaClO_3$ and 3 moles of HCl for regeneration

1 mole of Fe = 55.847 grams
1 mole of $NaClO_3$ = 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 lb) $NaClO_3$ and 24.39 moles (= 889.3 grams = 1.96lb) HC1 for regeneration.

Halltronic R 629 solution contains 629 grams/L $NaClO_3$ or 5.25 lb/Gal

Industrial grade HCl (Muriatic Acid) is 30% HCl and contains 344.7 g/1 HCl or 2.87 lb/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.

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