

PURPOSE	REMOVAL OF	ALKALINE CLEANERS	%	pH	Temp deg	Duration Hrs.
Loose Rust	DEFOAMERS	POLY PHOSPHATE(shmp)	1-4%	5.5 to 7.0		days
Hydrophobic		SURFACTANT	80-100 ppm			
		PHOSPHONATE(HEDP)	5.00%	7-8		
Loosening Biomass	DISPERSANT	DETERGENT			8 50-70	8-20 hrs.
Oil & Grease	FLUSHING	ANTI FOAM				
		NaOH	50-100 ppm		Ambient to	6 hrs
Dislodge Silt	BIODISPERSANT	CuSO4 for Wood			60 deg.C	
		SURFACTANT				
		ALGAECIDE				
	POLYMER CLEANING	BIOCIDE (QUAT.)	60 ppm.			
Biological Growth.	OXYDISING BIOCIDE	BCDMH or TTCA or ClO2			ditto	2-6 hrs
	NON OXY.BIOCIDE	GLUTER/ISO THIAZOLINE				
Scale Iron oxide, Carbonate Phosphate Silicate, Iron Copper Al Cu	INHIBITED ACID CLEAN. HCL.	RODINE 213(SP) ACID	5-10%		ditto	
		ABF				
		DIETHYLTHIO UREA				
	SULPHAMIC ACID	ABF	3-6%		ditto	4-8 hrs.
		CuSO4 for Wood				
	NEUTRALIZATION	SODA ASH or NaOH	1-2%	pH>8	ditto	2-4 hrs.
magnetite coat pre filming	PASSIVATION	ANODIC/CATHODIC INHIBITORS		5.5-7.0	ditto	4-6 hrs.
		AZOLE				
magnetite coat pre filming		POLY PHOSPHATE	300-600 ppm	6.5-7.0	ditto	
		ZINC	30-60 ppm			
		AZOLE				
	GENERAL CLEANINGS INITIALLY					
mill scale	FLUSHING	INHIBITED ACID Hcl		6-6.2 for S.S.		days
	low pH Cleanings with acid	H3PO4				
S.S.		H2SO4	<30 ppm			
	high pH Cleanings with	PHOSPHATE(shmp)	40-50 ppm	7.5-8.0		days
		PHOSPHONATE(HEDP)	80-100 ppm			
	PASSIVATION	CAUSTIC				
		SURFACTANT				
	SHOCK Chlorination		50-60 ppm			30 min.

PURPOSE REMOVAL OF	PRE/POST	CHEMICAL CLEANINGS		CST SYSTEM				
		ALKALINE CLEANERS	CHEMICALS	% OR ppm	pH	Temp. DEG.C.	Duration Hrs.	yes for System Metallurgy
Loose Rust	<u>DEFOAMERS</u>	Poly Phosphate	1-4%	5.5-7.0	50-70 deg.	8-20hrs		
Hydrophobic Material		Phosphonate(HEDP)		5% or				
Veg.Oils & Fats	PetroleumOils/Greas	Surfactant	80-100 ppm	7.0-8.0				
Loose Biomass	<u>DISPERSANT</u>	<u>Sodium Phosphate +NaOH</u>						
Oil & Grease		<u>DETERGENT</u>	50-100		Ambient	6hrs		Al
	<u>FLUSHING</u>	Anti Foam	ppm		to 60 deg.			
Dislodge Silt	<u>BIODISPERSANT</u>	Caustic						
		<u>SURFACTANT</u>						
		Algaecide						
	<u>POLYMER CLEANING</u>	Biocide (QUAT)	60 ppm					
Biological growth	<u>OXY. BIOCIDE</u>	shock treatment				2-6 hrs.		
		BCDMH			ditto			
		TTCA			60 deg.			
		Chlorine Di Oxide						
	<u>NON.OXY.BIOCIDE</u>	GLUTAR or ISOTHIA						
Scales	<u>INHIBITED ACID CLEANERS</u>							
Iron Oxide	<u>HCl</u>		5-10%		ditto	4-8hrs	C.I.	Al.(Al2O3)
Carbonate	Rodine 213 (Sp)1%	<u>ABF.</u>			60 deg.		C.S.	Cu,Aus.Steel.
Phosphate		<u>Diethyl thio Urea.</u>					12%Cr.Steel	CaSO4,Org.
CopperOxide	<u>SULPHAMIC</u>		3-6%			4-6 hrs		
Carbonates		<u>ABF.</u>						
Silicate		CuSO4 for wood.						
Sulphate	<u>CITRIC ACID</u>	<u>MONO.AMMONIUM CITRATE</u>		3% 3.5-4.0	80 deg.	6 hrs.	C.S.C.I.	Cu alloys
Fe.Oxides,Fe3O4	<u>INHIBITED ACID</u>	Rodine-(92)		0.10%			Alloy steel	Al alloys
NiOxide								



Zn.Oxide Cu.Oxides	PRE/POST.	CHEMICAL CLEANINGS	CTS SYSTEM				Silica Cu & CuO Cu2O
		Ammonium Citrate + Oxydising agent		9.5			
	<u>NEUTRALIZATION</u>	Soda Ash Caustic Soda.	1-2%	pH >8		2-4 hrs	
	<u>PASSIVATION</u>	ANODIC/CATHODIC INHIBITORS		5.5-7.0		4-6 hrs.	
Copper	Magnetite Coat pre/post filming	AZOLE FOR COPPER					
		Polyphosphate	300-600 ppm	5-7.0	ditto		
		Zinc.	30-60 ppm		60 deg.		
		Azole					
	<u>Sulphuric acid</u>						C.S.Cu alloy Aus.St.,Al.

PURPOSE REMOVAL OF	<u>GENERAL/INITIAL</u>	<u>CHEMICAL CLEANINGS</u>	<u>CST SYSTEM</u>		Temp. DEG.C.	Duration Hrs.	yes for System Metallurgy	no for System Metallurgy
		CHEMICALS	% OR ppm	pH				
	<u>FLUSHING</u>	WATER				24 Hrs.		
Mill Scales, Fe3O4 general cleanings	<u>Low pH cleanings</u> <u>water</u>	INHIBITED ACID H2SO4	END TURBIDITY <30ppm	6-6.2			ALL C.S.	
		H3PO4					ALL	
		HCl				3 days		

FOULANTS

High pH Cleanings

Phosphonate(HEDP)5 percent

80-100 ppm 7.5-8.0

DEPOSITS

water

Phosphate(SHMP)5 percent

40-50 ppm PO4

PASSIVATION

Caustic

Surfactant

20-30 ppm

24 hrs.

END TSS 30 ppm

7 days.

Shock Chlorination

50-60 ppm

30 mts.

residual Cl2

daily

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Solvents and Conditions of Use	HCl	HF	HAF	Ammoniated EDTA	CA (Citrates)	
					Ammonium	Sodium
Typical Use Concentration, %	5-6	1-2	3-6	4-6	2-6	2-6
Typical Use Temperature, °F (°C)	150-160 (66-71)	150 (66)	200 (93)	Iron: 180-200 (82-93) or 265-300 (129-149) Copper: <150 (66)	Iron: 180-200 (82-93) or 240-275 (116-135) Copper: <150 (66)	Iron: 180-200 (82-93) Copper: <150 (66)
Contact Time, Hours - Poor Circulation	4-6	Minimal	12-24	12-48	12-48	12-48
-Good Circulation	N.R.	Minimal	6-12	6-24	6-24	6-24