

Actonall Activation

The Actonall series of chemicals are designed as an alternative to concentrated liquid acids used for activation prior to plating; Actonall is much safer to handle and store. The Actonall chemicals are used for activation of difficult to plate metals and provide improved oxide and smut removal for maximum adhesion and deposit quality. The Actonall chemicals do not decompose and can be stored for long periods without degrading or loss of effectiveness.

Actonall-210

Actonall-210 is a dry acid salt used to replace concentrated sulfuric acid. It also contains special activators and surfactants. It is a free-flowing powder that is non-dusting and free rinsing during use.

Actonall-65

Actonall-65 is a dry acid salt that provides an extra bite on hard to activate metals. Actonall-65 is useful for removing silicate films from parts to prevent pits, haze and spotting. It is non-fuming and used with Actonall-210 to replace more dangerous mineral acids like hydrofluoric, fluoboric and nitric.

Equipment

Conventional acid proof equipment should be used with the Actonall products. Tanks should be lined with PVC, polyethylene, polypropylene and in some cases stainless steel. Do not use fiberglass or lead lined tanks. A ventilation system should be used with all Actonall solutions. Heaters should be made of Teflon, titanium or 316 stainless steel; do not use quartz heaters or lead coils.

Zero Discharge Recovery

Actonall-210 and Actonall-65 solutions are compatible with our ZERO Discharge Recovery systems. These products do not form RP products that are detrimental to chemical recycling and reuse.

Waste Disposal

A spent bath will require neutralization with an alkali, such as sodium hydroxide or an alkaline cleaner that also needs disposal. The local authority should be consulted for regulations on suspended solids and dissolved metals. Follow all environmental directives for disposal of these solutions.

Immersion Activation

The Actonall activators are used on a wide variety of metals prior to plating to replace liquid acids. These applications include base metal activation, oxide and scale removal. The concentrations, immersion time and temperature are dependent upon the metal and its condition. Once established, the bath should be maintained by periodic analysis.

The operating conditions can be varied depending upon the metal being treated and its surface condition. Concentration, time and temperature are all related. As an example, a lower concentration can be used with a higher temperature or a longer time, etc.

A temperature of 140 F. is selected for most applications as this provides relatively short dip times and sufficient evaporation so that Zero Discharge Recovery can be used. Other operating temperatures are shown where needed for that application. Plating Resources, Inc. can make specific recommendations based upon your needs.

General Conditions

<u>Item</u>	<u>Optimum</u>	<u>Range</u>
Temperature	140 F (unless otherwise shown)	70-160 F.
Time	1-5 minutes, typical	10 seconds-10 minutes.
Agitation	Air or solution pumping	(through a manifold)
Filtration	Yes, for best quality	Not needed in all operations

Following are various recommendations for immersion only applications (i.e.: without current):

Steel Alloys – Light Oxide

<u>Item</u>	<u>Optimum</u>	<u>Range</u>
Actonall-210	12 oz./gallon	4 - 32

Steel Alloys – Heavy Oxide or Scale

<u>Item</u>	<u>Optimum</u>	<u>Range</u>
Actonall-210	12 oz./gallon	4 - 32
Actonall-65	2.5 oz./gallon	1 - 4

Leaded Steel Alloys

<u>Item</u>	<u>Optimum</u>	<u>Range</u>
Actonall-210	12 oz./gallon	10 - 14
Actonall-65	4 oz./gal.	3 - 5

Cast Iron (removes silica)

<u>Item</u>	<u>Optimum</u>	<u>Range</u>
Actonall-210	12 oz./gallon	8 - 16
Actonall-65	6 oz./gallon	2 - 10

Aluminum

<u>Item</u>	<u>Optimum</u>	<u>Range</u>
Actonall-210	24 oz./gallon	16 - 32
Actonall-65	7 oz./gallon	2 - 12

(activates difficult to plate aluminum)

Copper & Brass – Scale Removal

<u>Item</u>	<u>Optimum</u>	<u>Range</u>
Actonall-210	10 oz./gallon	8 - 16
Actonall-65	2 oz./gallon	1 - 3

(reduce or eliminate the Actonall-65 if there is no scale)

Carbide, Tungsten Carbide, FerroTic, Stellite and Nitrided surfaces.

<u>Item</u>	<u>Optimum</u>	<u>Range</u>
Actonall-210	16 oz./gallon	12 - 24
Actonall-65	1.5 oz./gal.	1 – 2 oz./gal.
Temperature	80 F.	70 – 90 F.

(some may need vapor or glass bead blasting first)

Magnesium

<u>Item</u>	<u>Optimum</u>	<u>Range</u>
Actonall-210	12 oz./gallon	4 - 32
Actonall-65	3 oz./gallon	2 - 5
Time	1.5 minutes	1 – 2

Titanium

<u>Item</u>	<u>Optimum</u>	<u>Range</u>
Actonall-210	16 oz./gallon	12 - 20
Actonall-65	3 oz./gallon	2 - 5
Temperature	80 F.	70 – 90 F.
Time	1.5 minutes	1 – 2 minutes

Stainless Steel, # 200, 300 & 400 series

<u>Item</u>	<u>Optimum</u>	<u>Range</u>
Actonall-210	18 oz./gallon	12 - 24
Actonall-65	8 oz./gal.	4 - 12

Nickel Activation Prior To Chrome Plating

<u>Item</u>	<u>Optimum</u>	<u>Range</u>
Actonall-210	12 oz./gallon	10-20
Temperature	110 F.	80-140 F.
Dip Time	60 seconds.	20-90 seconds

This is much better than a chromic acid dip for removing absorbed nickel brightener and RP products that cause white patches and limit coverage in chrome deposits.

See Electrolytic Activation below for severe cases.

Electrolytic Activation

The following is used to remove stubborn scale. Carbon anodes are preferred, but CP lead (not alloy) anodes can be used, but only for cathodic (direct) current. Do not use lead anodes for either anodic (reverse) or periodic reverse current. With carbon anodes, either anodic, cathodic or periodic reverse current can be used depending upon the situation and the metal being processed.

General Conditions (time is as required)

<u>Item</u>	<u>Optimum</u>	<u>Range</u>
Actonall-210	16 oz./gallon	8 - 32
Temperature	90 F.	70 – 110 F.
Electrode ratio	2:1 (anode:cathode)	
Anodes	Carbon or CP lead (see above)	
Current density	0.5 ASI	0.3 – 0.7 ASI

Following are specific recommendations for various applications:

Nickel Activation Prior To Chrome Plating (for severe cases)

<u>Item</u>	<u>Optimum</u>	<u>Range</u>
Actonall-210	16 oz./gallon	8 – 24 oz./gal.
Temperature	110 F.	80 – 140 F.
Dip Time	60 seconds.	30 – 120 seconds
Current Direction:	Anodic	
Anodes	Carbon only	
Current density	0.25 ASI	0.07 – 0.42 ASI

Hastelloy C, Inconel, Monel, 17-4 PH Stainless & Other High Nickel Alloys

<u>Item</u>	<u>Optimum</u>	<u>Range</u>
Actonall-210	16 oz./gallon	12 - 24
Actonall-65	2 oz./gal.	1 - 4
Temperature	80 F.	70 – 90 F.
Electrode ratio	2:1 (anode:cathode)	
Anodes	Carbon or lead	
Current Direction	Parts are cathodic only	
Current density	0.5 ASI	0.35 – 0.69 ASI
Time	1 minute	1/2 - 2 minutes

(in some cases, this application can also be done by immersion only)

High Strength Steels (sliver removal & polishing)

<u>Item</u>	<u>Optimum</u>	<u>Range</u>
Actonall-210	16 oz./gallon	12 - 20
Temperature	90 F.	70 – 110 F.
Current Direction	Parts are anodic	
Electrode ratio	2:1 (anode:cathode)	
Anodes	Carbon only (see above)	
Current density	0.5 ASI	0.35 – 0.69 ASI
Time	1 minute	0.5 – 1.5 minutes

Monel

<u>Item</u>	<u>Optimum</u>	<u>Range</u>
Actonall-210	16 oz./gallon	12 - 20
Temperature	90 F.	70 – 110 F.
Current Direction	Parts are cathodic only	
Electrode ratio	2:1 (anode:cathode)	
Anodes	Carbon or lead	
Current density	0.5 ASI	0.35 – 0.69 ASI
Time	10 seconds only	

Bath Make-Up

The following procedure is recommended. Always use caution when making up an acidic solution. Fill the tank 2/3 full with water; turn off the heaters and turn on the ventilation and agitation systems. Then dissolve the Actonall compound(s) while using caution to avoid splashes. Then, fill to the operating volume with water and agitate thoroughly until all chemicals are dissolved.

Caution

These are all industrial chemicals and must be handled carefully and in accordance with the directives provided in the individual SDS forms. Read and understand the SDS on all of these chemicals before handling or using. Ensure that all regulatory standards are followed and limit personal exposure as required for Cr(VI) by OSHA.

Avoid personal contact with these chemicals, avoid splashing and avoid breathing any fumes released during operation. Do not inhale any dust, mist or vapors from these chemicals. Do not allow these products to contact the skin or eyes. In case of contact, flush immediately with large amounts of fresh water and seek immediate medical attention.

Wear protective clothing such as aprons, gloves, face masks and respirators. Be sure that adequate eyewashes and emergency showers are available nearby before handling or using any of these chemicals.

Designated work clothing should be worn while using these chemicals and the worker(s) should thoroughly shower and change into fresh-clean street clothing before going home. Decontaminate all work clothing before reuse.

The user is responsible for administrating all worker safety directives, providing adequate work clothing, personal protection, limiting personal exposure, providing any required clean-up, decontamination and any needed medical attention.