riag Oberflächentechnik AG · Postfach 169 · CH-9545 Wängi TG

09.10.2023

riag Pass 445

Trivalent thick layer passivation with high corrosion resistance

The **riag Pass 445** is a new trivalent chromate process that produces a greenish finish on zinc plated surfaces. The coating has a high stability while tempered at 200 °C/ 1 hour in terms of loss of brightness or colour. The coating obtained provides corrosion resistance **without the presence of hexavalent chrome.**

The **riag Pass 445** is supplied as an easy to use liquid concentrate.

Make up

	Barrel	Rack
riag Pass 445 Additive (density = 1.14 g/mL)	120 – 150 mL/L	140 – 160 mL/L
pH	1.8 – 2.2	1.8 – 2.2
Temperature	20 – 50 °C	20 – 50 °C
Time	30 – 60 s	30 – 60 s

The higher the concentration and temperature of the solution, the lower will be the immersion time.

Procedure for a make up of 100 litres

Take 50 L DI water in the process tank. Add the **riag Pass 445 Additive** and adjust the volume to 100 litres. Mix well. Adjust the pH with diluted nitric acid (or increase with a 10 % solution of sodium bicarbonate) and temperature of the operating bath to specified values. Now the bath is ready for operation.

Safety considerations

Protective gear such as face shields and gloves should be worn during bath make up and operation. Chemicals shall not be stored below 10 °C.

Operating conditions

Temperature:	20 – 50 °C (optimum 40 °C)
Time:	30 – 60 s
pH-Value:	1.8 – 2.2 Frequent control is recommended.
Agitation:	Air or parts movement Do not use lead as weight for air blowing tubes!
Fume extraction:	Recommended
Equipment:	Mild steel tank with polypropylene lining
Heating:	Not required or Teflon tube heaters
Pre dip activation:	This will improve the **riag Pass 445** bath life as well as the adhesion and corrosion resistance. The tank make up is 0.3 – 1.0 % nitric acid. Frequent tank changes are necessary for uniform production quality.
Hints:	The content of Iron must not exceed 500 mg/L, the content of Zinc 15 g/L.

Effluent control

The **riag Pass 445** chromate conversion coating solution is acidic and contains trivalent chromium salts. Spent solution has to be treated and discharged according to local waste water laws.

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riag Oberflächentechnik AG
Murgstrasse 19a
CH-9545 Wängi
T +41 (0)52 369 70 70
F +41 (0)52 369 70 79
riag.ch
info@riag.ch

Analysis

Sample preparation

Take the sample at a homogeneously mixed position and let it cool down to room temperature. If turbid, allow to settle and decant or filter.

Chromium (III)

Reagents	10 % Sodium hydroxide 30 % Hydrogen peroxide (H_2O_2) Hydrochloric acid conc. Potassium iodide 0.1 mol/L sodium thiosulphate 1 % starch solution (freshly prepared)	
Process		Pipette
	10 mL	passivation bath into a
	250 mL	Erlenmeyer flask, add
	50 mL	DI water and sodium hydroxide to a pH-value of about 10 (colour change), then add
	0.5 mL	Hydrogen peroxide and boil the solution for 30 – 40 min. It is very important to evaporate excessive H_2O_2 (boil and reduce until shortly before crystallisation) Cool the solution, add DI water up to
	100 mL	and acidify with hydrochloric acid (colour change from yellow to orange), add
	1 g	potassium iodide, titrate with 0.1 mol/L sodium thiosulphate until the solution is only slightly yellowish, then add
	Some mL	starch solution and titrate on until the blue colour disappears.
Calculation	mL/L **riag Pass 445 Additive** = Consumption in mL x 9.0	