

RIAG Pass 442

Trivalent black chromate passivation on zinc-nickel layers

The **RIAG Pass 442** is a new trivalent black chromate process that produces a greyish-dark to black colour finish on zinc-nickel plated surfaces. The coating so obtained provides high corrosion resistance **without the presence of hexavalent chrome and cobalt**.

The **RIAG Pass 442** additive is supplied in an easy to use liquid concentrate.

Make up

	Range	Optimum
RIAG Pass 442 Additive (density = 1.19 g/mL)	200 mL/L	200 mL/L
Temperature	18 – 22 °C	20 °C
pH	1 – 2	1.3

Procedure for a make up of 100 litres

Put 60 L water in the process tank. Add 20 L **RIAG Pass 442 Additive** and all the sediments of the bottom of the packaging. Adjust the pH with diluted nitric acid (or increase with a 10 % solution of sodium hydroxide) and top the volume up to 100 litres. Mix well. Now the bath is ready for operation.

Operating conditions

Temperature:	18 – 22 °C (room temperature)
Time:	45 – 180 sec.
pH-Value:	1 – 2 (optimum 1.3). Frequent control is recommended.
Agitation:	Air or parts movement, high agitation and/or movement necessary
Fume extraction:	Recommended
Equipment:	Mild steel tank with polypropylene lining
Heating:	Glass or teflon tube heaters
Pre dip activation:	This will decrease the corrosion resistance and therefore is not recommended.
Post treatment	We highly recommend our RIAG post treatment for enhanced corrosion protection and optical reasons

Process sequence

1. Zinc-nickel plating
2. Water rinse
3. Water rinse
4. **RIAG Pass 442**
5. Drag Out
6. DI water rinse
7. **RIAG Seal *** * different options possible
8. Dry

Replenishment

RIAG Pass 442 Additive is added on the basis of analysis.

Effluent control

The **RIAG Pass 442** chromate conversion coating solution is acidic and contains trivalent chromium salts. Spent solution has to be treated and discharged according to local wastewater laws.

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.

Liability

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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 ₂ O 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 10 mL Hydrogen peroxide and boil the solution for 30 – 40 min. It is very important to evaporate excessive H ₂ O 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 2 mL starch solution and titrate until the blue colour disappears.
Calculation	mL/L RIAG Pass 442 Additive = Consumption in mL x 6.6