

Checklist SurTec 680 Chromiting

What are the demands for the chromiting process?

Where are the limits?

STANDARD-WORKING CONDITIONS AND RANGES

The standard working conditions are at 12.5 Vol% concentration, 60 °C, 60 s and pH 1.8. Specifically for plant and parts these values have to be adjusted in the scope of the area.

1. Temperature

60 °C is the optimal temperature at the surface of the part (object temperature).

Cold, thick-walled parts need a higher bath temperature. A good electrolyte exchange has to be provided in plating barrels (lift the barrel intermediate); here, a higher object temperature is recommended.

With higher temperatures, the immersion time should be reduced. Otherwise the Chromiting will become too aggressive.

2. Concentration

Variations should be avoided; a cycle sloping automatic dosage is necessary for a good process safety. Too low concentrations must be avoided; higher concentrations do not interfere.

3. pH-Value

The theoretically optimal pH-value is 1.9. The Chromiting speed drastically decreases with a pH-value of more than 2.0. In practice, the pH-value can increase to 2.0 and can then be regulated to 1.8.

Low pH-values accelerate the zinc increase and therefore reduce the service life.

4. Time of immersion

60 s is a reasonable time. It can be useful to increase the immersion time to 90 s in barrel process. Longer immersion times worsen the corrosion protection. The higher the temperature being used the shorter the time of immersion may be necessary sometimes.

UNDER COATINGS

1. Kinds of the Zinc- und Zinicalloy layer

All mainly zinc containing surfaces can be chromited. On acid zinc the layer looks brightest, on zinc/nickel darkest. Using zinc/nickel, the temperature has to be risen to 70 °C without shortening the immersion time.

The immersion in a hot process solution is a tough quality test. If red rust extraordinary fast occurs there may be a formation of cracks or spangles. Therefore, acid zinc mostly is easy and cyanide zinc often is not easy to chromite.

2. Minimum Layer Thickness

SurTec 680 Chromiting approx. clears off 1 μm of zinc. Chromiting badly tolerates the contact with iron. Therefore the corrosion protection drastically decreases with a layer thickness below 5 μm (pores!) as well as in presence of uncovered areas (e.g. folding). A post treatment is necessary at least in an aqueous corrosion protection as SurTec 534.

PLANT CONDITIONS

1. Quantity of rinsing

A cascade with three rinse steps is optimal. Here, a complete rinse water feedback can be installed easily minimizing the loss of chemicals due to drag out. Long times of exemption are to be avoided (salts dry up due to high object temperatures). Spray nozzles above the tank are useful in rack application, and necessary. with < 3 rinse steps To avoid rinse spots in rack application, it is helpful to use the stabilizer SurTec 550 in a last, separated rinse.

2. Heating

The necessary heating power for a complete system of chromiting bath and triple cascade can be calculated interactively in a simulation (<http://www.SurTec.com/Chromitierung.html>) specifically for a users demands. Glass, PTFE and titanium are suitable materials, stainless steel and iron are not suited.

3. Convection

A good convection has to be guaranteed, as it is worked with relatively high concentrated solutions. Air injection in rack application is very sensible, however, small bubbles (champaign-like) are preferable to big bubbles (whirlpool-like). In plating barrels at least one intermediate lift should be planned.

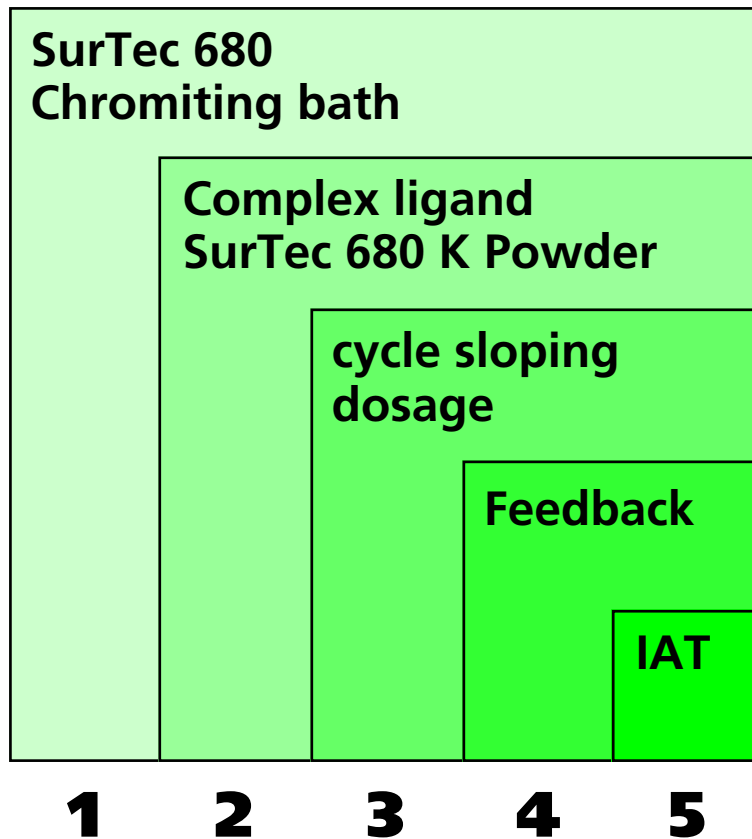
PROCESS CONTROL

1. Elimination of impurity metals

Zinc enriches due to the process and has to be precipitated with SurTec 680 K. Iron can sometimes increase very fast due to dissolving parts being dropped into the bath. A good bath care (well closing barrel lids, adjusted drillings in barrels, good rack suspension, good air injection, fast removal of fallen parts) is necessary; the iron inhibitor SurTec 660 A lowers the dissolution of iron. Once dissolved, iron can only be removed by an installed ion exchange SurTec 680 IAT.

2. Keeping the conditions constant

An automatic cycle slope dosage of Chromiting concentrate, frequent pH-measurement and correction, regularly (if necessary once per hour) dosage of SurTec 680 K and thermostatic control allow constant production quality.



Chromiting in 5 one another complementing steps:

- 1** the bath itself (isolated tanks, heating, Chromiting concentrate)
- 2** in continuous operation SurTec 680 K Salt for zinc precipitation
- 3** cycle sloping dosage for keeping constant concentration
- 4** rinse water feedback to increase the process stability and the economy
- 5** Ion exchange SurTec 680 IAT to remove iron and other impurity metals