

**Technical data sheet and product guideline**

**T-PRO20**

**Anti-tarnish chemical passivation for oxidization resistance (1:20)**



**Color coordinates**



L
a
b
c

**Product form**

Form	<b>Liquid</b>
Material color	<b>White</b>
Storage time	<b>18 months</b>
Format	<b>Concentrated</b>
Chemical type	<b>Acidic</b>
Volume	<b>1 liter</b>

**Operating data**

	Range	Optimal
Voltage (V)	<b>3.5 - 4.5 (electrolytic way)</b>	<b>4.5 (electrolytic way)</b>
Working temperature (°C)	<b>60-66</b>	<b>63</b>
Exposure time (sec)	<b>300-1200</b>	<b>600</b>
pH	<b>5-7</b>	<b>6-7</b>
Anode/cathode ratio	<b>n/a</b>	<b>n/a</b>
Anode type	<b>n/a</b>	
Agitation	<b>Moderate</b>	

**CONCENTRAZIONIMETALLO**

<b>metallo</b>	<b>metallointervallo</b>	<b>metalloottimale</b>
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**Deposit data**

Thickness (um)	<b>0,001-0,010</b>
Appearance	<b>Totally transparent</b>
Color	<b>Transparent</b>

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### Preparation

To get optimum results, once the ready-to-use solution has been prepared better to follow step by step the procedure here below reported:

1. Electrolytic degreasing
2. Rinse
3. Acid neutralization
4. Rinse
5. **STANDARD USAGE:** Immersion in T-PRO for 10 minutes (with moderate agitation)

**ELECTROLYTIC USAGE:** Immersion in T-PRO with T-SALT conducting salts (previously dissolved in) for 5-6 minutes (with moderate agitation) at about 3.5 - 4.5 V

6. Rinse in hot water (70-75° C)(\*)
7. Rinse with demineralized water
8. Dry with hot air (avoid drying systems that could remove the passivation)

(\*) In case of items with complicated designs, liquid residuals can be removed more efficiently by rinsing in very hot water (85° C).

To prepare the ready-to-use T-PRO solution add the 1 liter solution of T-PRO20 in 19 liters of deionized water. The concentrate solution should be of a waxy consistency if stored at low temperature. As consequence, a slightly heat may help in getting a more fluid solution thus making easier to pour it inside the working tank.

Switch on the exhaust system and start to mix the concentrated form with deionized water until getting an almost homogeneous solution.

**Standard Use:** For optimum results the solution must be in a transparent state. Heat up to 62-63° C. The solution becomes transparent in the range 60-66° C: higher or lower temperatures will make the solution turbid.

**Electrolytic use:** In case of electrolytic usage through direct current application, add 2.5 g of T-SALT conducting salts per liter of ready-to use solution and wait their complete dissolution. Then heat up at the same temperature of the standard usage and apply a voltage using a DC power-rectifier in the range of 3.5 - 4.5 V for 5-6 minutes.

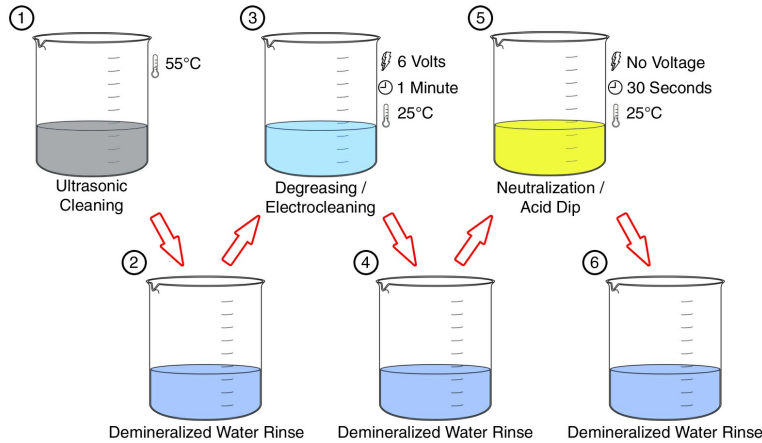
### Equipment

For a correct use of this product you are advised to use PVC, polypropylene or PYREX glass tanks provided with thermostat-controlled heaters. Do not use stainless steel or iron tanks.

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### Additional hints

#### PASSIVATION REMOVAL

To remove the passivation, simply degrease the pieces by means of alkaline cathode degreasing. Better results are obtained with the addition of a few grams of cyanide per liter.

#### EFFECTIVENESS OF THE SURFACE PROTECTION

The formation of the initial monolayer deposits within seconds or minutes. After the initial monolayer has formed, the layer still contains defects and is not fully ordered. Over time (hours to days), the layer comes to a more uniform and stable configuration.

#### REPLACING THE PASSIVATION SOLUTION

In case of reduction of the volume due to water evaporation, solution has to be replenished by demineralized water. T-PRO20 concentrate should be added to the solution if the effectiveness of the passivating solution becomes weaker. Effectiveness of the solution can be checked by submitting the pieces to a TAA test. Another important indicator can be represented by the level of the surface hydrophobicity. A properly working solution should give a surface with low water adherence, where water drops slip away easily.

#### STORAGE AND STABILITY

Store at temperatures below 30°C. Avoid direct sunlight. In the closed package the solution is stable for about 18 months. When open, it is recommended to use it within 6 months. A color change from white to yellow may be sometimes observed during the storage, even in a sealed new bottle. This change in color doesn't affect the properties of the product.