

# TENARISPRO

## Technical chart

Last revision

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READY TO USE HIGH RESIST. PASSIVATING SOLUTION FOR

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### Product description

**TENARISPRO** represents the new borderline in the field of passivating solutions for silver, gold, brass and bronze.

**TENARISPRO** effectively protects items against tarnish, due to a superior surface protection. Internal laboratory tests observed that silver pieces treated with **TENARISPRO** do not tarnish when exposed to hydrogen sulfide vapors for more than 65 hours (Thioacetamide test).

In addition, **TENARISPRO**:

- Works by dipping. No galvanic equipment is required
- Easy to use
- Does not interact with the substrate
- Possesses low toxicity and is not dangerous to the environment (does not contain chromium)
- Can be easily removed from the surface

### Recommended applications

**TENARISPRO** is a ready-to-use passivating solution that has been studied in order to increase the resistance of silver items against tarnish. **TENARISPRO** deposits an extremely thin organic coating at the surface of the pieces; this coating is strong enough to protect the metal surface from environmental chemicals, but at the same time is completely invisible, does not alter the surface color or reflectivity and cannot be detected by touch. **TENARISPRO** is easy and fast to use, since it doesn't require any specific equipment for plating. Similarly to the other passivating solutions, **TENARISPRO** possesses low resistance to wearing and scratching. It is therefore particularly recommended for the protection of finished pieces during the storage in the stockhouse or in the shop window.

### Operating data

	Range	Optimum
Immersion time [min]	5-20	10
Dipping temperature [°C]	60-66	63
Rinsing temperature [°C]	70-85	75-85
pH	4-10	7



TAA test after 65 hours

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## Additional informations

### 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.

### Procedure

- Fill your vessel with TENARISPRO. Switch on the suction.
- Heat up to 62-63°C. Solution becomes clear in the range 60-66°C. Higher or lower temperature will make the solution turbid.

### TREATMENT OF THE SILVER PLATED PIECES

The operating cycle for pieces that have just been silver-plated is very simple; after the silver-plating bath, proceed as follows:

1. Recovery/Rinsing
2. Washing
3. Acid neutralisation (use NEUT1 neutralizing solution)
4. Washing
5. Immersion in TENARISPRO for 10 minutes (with moderate stirring)
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)

### TREATMENT OF OXIDISED AND/OR SULFURATED PIECES

To passivate oxidized items, proceed as follows:

1. Cathodic electrolytic degreasing (\*\*)
2. Washing
3. Acid neutralisation
4. Washing
5. Immersion in TENARISPRO for 10 minutes (with moderate stirring)
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 better removed by rinsing in very hot water (85°C).

(\*\*) If you are dealing with Argentium alloys, never use electrolytic degreasing. Use only neutral pH detergents (7-9) by simple dipping or by ultrasonic bath. Optimal cleaning results may be achieved by using the LEGOR CLEANING KIT system.

### 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 even and stable configuration.

### PASSIVATION REMOVAL

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

### REPLACING THE PASSIVATION SOLUTION

In case of reduction of the volume due to water evaporation, solution has to be replenished by demineralized water. TENARISPRO 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 sulfuration test. Another important indicator can be represented by the level of the surface hydrophobicity. A properly working solution should give a low-wettable surface, 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.

### PACKAGING

TENARISPRO is available as a ready-to-use solution in 5 liters PET-HD tanks.