SOCOSURF TCS / SOCOSURF PACS

CHROMIUM VI FREE CONVERSION AND SEALING

Technical Data Sheet

Approvals and conformities

<table>
<thead>
<tr>
<th>Company</th>
<th>Approval/Sealing Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOMBARDIER</td>
<td>BAPS 160 -020 Conversion</td>
</tr>
<tr>
<td>COLLINS AEROSPACE</td>
<td>LGPS 1109 Sealing after TSA anodizing</td>
</tr>
<tr>
<td>COLLINS RATIER FIGEAC</td>
<td>FN 177 Sealing after TFSAA anodizing</td>
</tr>
<tr>
<td>DASSAULT AVIATION</td>
<td>DGQT 0.4.2.0449 Sealing after TFSAA anodizing</td>
</tr>
<tr>
<td>LIEBHERR AEROSPACE</td>
<td>MFT 0538 Conversion / MFT 0536 Sealing after TFSAA anodizing</td>
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</tbody>
</table>

Cr(III) based aluminium surface treatment solution for chemical conversion & sealing after anodizing. High level of corrosion resistance on 2XXX & 7XXX series aluminium alloys.

SOCOSURF TCS and SOCOSURF PACS are an alternative process to Chromium VI for conversion treatments and for sealing after anodizing. On aluminium alloys, the corrosion protection provided is comparable to that of hexavalent chromium (Cr(VI)).

USES

SOCOSURF TCS and SOCOSURF PACS can be used for:

- conversion and sealing after anodizing on aluminium to obtain corrosion resistance, or to promote paint adhesion.
- local touch-ups on aluminium alloys.

The process consists of 2 successive baths:

1. SOCOSURF TCS is used:
   - for conversion, to form an iridescent protection layer on the surface of the part, or
   - for sealing after anodizing (OAS, TSA, BSA, etc.).

   It is a trivalent chromium (Cr(III)) based solution.

2. SOCOSURF PACS is a post-treatment used to reinforce the conversion or sealed anodized
The process can be used for local touch-ups (refer to the "Socosurf TCS Socosurf PACS touch-up annex").

**Process performance**

**Chemical conversion**

- Corrosion resistance on 2XXX and 7XXX series alloys: > 168h SST
- Electrical conductivity: meets the requirements of MIL-DTL-81706B Type II Class 3, before and after salt spray on Al 6061 T6.
- Layer weight: >108 mg/m², 1.08 mg/dm², 10 mg/ft².
- Paint adhesion: grade 0/grade 0 and 1 (ISO 2409) after conversion (before /after 14 days water immersion).

Process performances are constant and reproducible.

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**DIRECTIONS FOR USE**

**1/ BATH SET-UP**

SOCOSURF TCS and SOCOSURF PACS are concentrated products. The pH is adjusted during set-up. The bath set-up parameters are identical for both the conversion and sealing process. The Technical Guide (supplied on request) details the bath monitoring requirements.

**SOCOSURF TCS bath**

**Recommended parameters:**

- 31 - 41% (v/v) SOCOSURF TCS + demineralized water
- pH: between 3.8 and 4. Measure the pH when the bath is at operating temperature (35 - 45°C (95 – 113°F)).

**Bath set-up procedure:**

- Fill the bottom of the tank with demineralized water, add the required quantity of SOCOSURF TCS, top with water up to the optimal fill level and stir.
- To increase the pH, adjust with ammonia diluted to 5%*. To decrease the pH, adjust with sulfuric acid diluted to 5%*.

*Concentrations should be adjusted in accordance with the size of the tank and the pH differential.

**SOCOSURF PACS bath**

**Recommended parameters:**

- 8-12% (v/v) SOCOSURF PACS + 5-7% (v/v) of 35% Technical Grade Hydrogen Peroxide + demineralized water.
- pH: between 4.2 and 5.3.

**Bath set-up procedure:**

- Fill the bottom of the tank with demineralised water, add the required quantity of...
SOCOSURF PACS and hydrogen peroxide, top with water up to the optimal fill level and stir.

- To increase the pH, adjust with ammonia diluted to 5%. To decrease the pH, adjust with nitric acid diluted to 5%.

*Concentrations should be adjusted in accordance with the size of the tank and the pH differential.

**Equipment and recommendations:**

- Gently agitate the SOCOSURF TCS and SOCOSURF PACS baths. Avoid bubbles and turbulence. Recirculation is recommended.
- Use dedicated tanks made from PVC/PVDC/PP/INOX 316L stainless steel for the SOCOSURF TCS bath and PVC/PVDC/PP for the SOCOSURF PACS bath.
- The heating coil protectors must be made of Teflon or PVDF.
- SOCOSURF TCS bath: Filtration is recommended (0.1 to 2 renewals / hour depending on the size of the tank. Pore size < 25μm).
- SOCOSURF PACS bath: A bath cooling system is recommended when outside temperatures are high to keep the bath temperature below 30°C (86°F).
- Use demineralized water for setting up the bath and rinsing.

pH value (at 25°C / 77°F): 5.0 to 7.0
Total dry residue (mg/L): < 20
Conductivity (μS/cm): < 20

**2 / SURFACE PREPARATION BEFORE CONVERSION AND ANODIZING, AND BATH OPERATING PARAMETERS**

Degrease the surface using SOCOCLEAN A3432 degreaser, and then deoxidize the surface using SOCOSURF A1858 /A1806 deoxidizer (see technical data sheets).

Care should be taken at each stage of the surface preparation and conversion process to ensure the best results are obtained.

- Preparation and treatment range for chemical conversion
Preparation and treatment range for sealing anodic layers

- The treated surfaces should be rinsed after each stage, ideally with demineralized water. This process should be adjusted to suit the configuration of the surface treatment line and its load.

Bath operating parameters for SOCOSURF TCS and SOCOSURF PACS

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Chemical conversion treatment</th>
<th>Sealing anodic layers</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOCOSURF TCS</td>
<td>SOCOCLEAN A3432 Rinse*</td>
<td>SOCOSURF TCS Rinse*</td>
</tr>
<tr>
<td>SOCOSURF TCS</td>
<td>SOCOCLEAN A3432 Rinse*</td>
<td>SOCOSURF PACS Rinse*</td>
</tr>
</tbody>
</table>

* The treated surfaces should be rinsed after each stage, ideally with demineralized water. This process should be adjusted to suit the configuration of the surface treatment line and its load.
### Concentration and pH

<table>
<thead>
<tr>
<th>Concentration and pH</th>
<th>SOCOSURF TCS</th>
<th>SOCOSURF PACS</th>
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</thead>
<tbody>
<tr>
<td>Maintain in accordance with the technical guide</td>
<td>Maintain in accordance with the technical guide</td>
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### Recommended immersion time

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<tr>
<th>Recommended immersion time</th>
<th>SOCOSURF TCS</th>
<th>SOCOSURF PACS</th>
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</table>
| between 5 and 15 minutes (ideally 10 minutes on 2024 T3 laminate). | Thin layer = 10 to 40 min
Thick layer >10 m = 3 to 10 min |

### Temperature

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<tr>
<th>Temperature</th>
<th>SOCOSURF TCS</th>
<th>SOCOSURF PACS</th>
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</thead>
</table>
| 35 - 45°C (ideally 40°C)
(95°- 113°F (ideally 104°F)) | 35 - 45°C (ideally 40°C)
(95°- 113°F (ideally 104°F)) |

### Recommendation

<table>
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<tr>
<th>Recommendation</th>
<th>SOCOSURF TCS</th>
<th>SOCOSURF PACS</th>
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<tbody>
<tr>
<td>No agitation or very low level of agitation during the treatment</td>
<td>No agitation or very low level of agitation during the treatment</td>
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</table>

**3/ BATH MAINTENANCE**

Baths should be monitored to ensure the best performance. The bath monitoring process is detailed in the control test document.

Products required for bath maintenance:

- SOCOSURF TCS
- SOCOSURF TCSADD1
- SOCOSURF PACS
- 35% Technical Grade Hydrogen Peroxide
- 5% Ammonia Solution
- 5% Sulphuric Acid Solution
- 5% Nitric Acid Solution

**TECHNICAL CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Technical Characteristics</th>
<th>SOCOSURF TCS</th>
<th>SOCOSURF TCSADD1</th>
<th>SOCOSURF PACS</th>
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</thead>
<tbody>
<tr>
<td>Specific gravity</td>
<td>&gt;1</td>
<td>&gt;1</td>
<td>&gt;1</td>
</tr>
<tr>
<td>Appearance</td>
<td>green liquid</td>
<td>green liquid</td>
<td>colourless liquid</td>
</tr>
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</table>

**PRECAUTIONS FOR USE AND STORAGE**

SOCOSURF TCS and SOCOSURF PACS must be stored in a frost-free environment. For more information about the product dangers, please consult the safety data sheet in accordance with local regulation.

This technical data sheet replaces and cancels the previous one.
The above details have been compiled to the best of our knowledge. They have, however, an indicative value only and we therefore make no warranties and assume no liability in connection with any use of this information, particularly if a third party’s rights are affected by the use of our products. The above information has been compiled based upon tests carried out by SOCOMORE. All data is subject to change as Socomore deems appropriate. The data given is not intended to substitute for any testing you must conduct in order to determine the suitability of the product for your particular purposes. Please check your local legislation applicable to the use of this product. Should you need any further information please contact us.