Approvals and conformities

BOMBARDIER	BAPS 160-020 Conversion | BAPS 160-040 Conversion, Electrically conductive
COLLINS AEROSPACE	LGPS 1109 Sealing after TSA anodizing
COLLINS RATIER FIGEAC	FN 177 Sealing after TFSAA anodizing | FN 138 Conversion
DASSAULT AVIATION	DGQT 0.4.2.0449 Sealing after TFSAA anodizing
LEONARDO AIRCRAFT	NTA 73557 (Sealing after TSA anodizing) | NTA 72278 (Conversion)
LEONARDO HELICOPTERS	AWPS015T (Conversion)
LIEBHERR AEROSPACE	MFT 0538 Conversion / MFT 0536 Sealing after TFSAA anodizing
SAFRAN	Pr-1045 (retouche) | Pr-1110 (conversion) | Pr-1040 / Pr-1040-30 / Pr-1040-32 / Pr-1040-33 / Pr-1040-34 (sealing)
SAFRAN AEROSYSTEM	STD P 4615 (conversion) & 4612 (sealing)
SAFRAN HELICOPTER ENGINES (formerly TURBOMECA)	CCT 608 (conversion) & CCT 508 (sealing)
SAFRAN VENTILATION SYSTEM	ITG4617011248 (conversion)
SPIRIT AEROSYSTEMS	PSPEC4620 Chemical Conversion Treatment for Aluminum Alloys / PSPEC4640 Conductive Chemical Conversion Treatment for Aluminum Alloys
THALES GLOBAL SERVICES	64003429-024

SOCOSURF TCS and SOCOSURF PACS is a two-tank trivalent chrome Cr(III) surface treatment process that provides corrosion resistance and adhesion promotion on aluminum alloys. Its universal chemistry performs both chemical conversion and anodization sealing. It offers consistent performance comparable to that of hexavalent chromium surface treatments, without hexavalent chrome.

The **SOCOSURF TCS** is a trivalent chromium (Cr(III)) solution, and the Socosurf PACS is a post-treatment solution that reinforces the TCS coating.

As a chemical conversion, **SOCOSURF TCS/SOCOSURF PACS** forms an iridescent coating on the surface that meets the requirements of MIL-DTL-81706 Type II, Class 1A and 3, Form I on 2024, 6061 and 7075 alloys.

- The coating weight is above 108 mg/m^2 (10 mg/ft^2).
- Paint adhesion meets ASTM D3359 grade 5B (ISO 2409 grade 0) after 14-day water immersion.
- The coating is electrically conductive *before and after* neutral salt spray (NSS) exposure.
- Socosurf PACS ensures *consistent* NSS corrosion resistance above 168 hours on Al 2024-T3.

As a seal after anodizing, the **SOCOSURF TCS/SOCOSURF PACS** process impregnates trivalent chromium (Cr(III)) in the anodization and seals it within. It has been tested with TSA, BSA, CAA, TFSAA, and SAA.

SOCOSURF TCS and **SOCOSURF PACS** offer a robust chemistry:

- Can be applied by spray, immersion, and brush.
- Useable for touch-ups.
- Effective chemical conversion on 2000, 6000, and 7000 series aluminum.
- Drop-in replacement for hexavalent chromium chemical conversion *and* sealing processes, and does not require users to change their existing degreasing and deoxidation processes.
- Performs chemical conversion and sealed anodizations under the same operating parameters.
- VOC and odor-free.

A ready to use colored version is available for touch-up applications. Please refer to SOCOSURF TCS COLORED and SOCOSURF PACS RTU technical data sheet.

DIRECTIONS FOR USE

1/ TANK SET-UP

General Information

- Operating parameters are identical when used as a chemical conversion and an anodizing seal.
- **SOCOSURF TCS** and **SOCOSURF PACS** are concentrated products and need to be diluted.
- Deionized or demineralized water is recommended for make-up and rinsing. If such a water source is not available, seek to use *clean water* with the following qualities:
  - pH between 5.0 - 7.0 at 25°C (77°F)
  - Total dry residue < 20 mg/L
  - Conductivity < 20 µS/cm
- Before applying SOCOSURF TCS and SOCOSURF PACS, tanks and equipment must be clean.

SOCOSURF TCS Tank

- Fill the bottom 20% of the tank with clean water. Add 31-41% (v/v) **SOCOSURF TCS**.
- Top up with clean water to the operating level. Turn on heat and agitation.
- Once the tank is at the operating temperature of 35 - 45°C (95 - 113°F), measure pH. The pH should fall between 3.8 and 4.0 when measured at the operating temperature.
  - To increase the pH, add 5%$_{v/v}$* ammonium hydroxide.
  - To decrease the pH, add 5%$_{v/v}$* sulfuric acid.

Concentration can be adjusted relative to the size of the tank.

SOCOSURF PACS Tank *(contact SOCOMORE to put in place the tank cleaning method)*

- Fill the bottom 20% of the tank with clean water.
- Add 8-12% (v/v) **SOCOSURF PACS**.
- Add technical grade, stabilized hydrogen peroxide.
    - 5-7% (v/v) if using 35% hydrogen peroxide
    - 6-8% (v/v) if using 30% hydrogen peroxide
- Top up with clean water to the operating level. Turn on agitation.
- Once homogenized, measure pH. The pH should fall between 4.2 and 5.3.
    - To increase the pH, add $5\%_{v/v}$* ammonium hydroxide.
    - To decrease the pH, add $5\%_{v/v}$* nitric acid.

Concentration can be adjusted relative to the size of the tank.

2/ EQUIPMENT RECOMMENDATIONS

SOCOSURF TCS Tank

- Gently agitate by recirculation before use to maintain an homogeneous temperature. Avoid splashing and turbulence. Turn off agitation during treatment.
- PVC, PVDC, PVDF, PTFE, PP, and 316L stainless steel are suitable construction materials. Other materials require evaluation.
- The heating elements must be coated with Teflon or PVDF.
- Filtration (<25µm) at a rate of 0.1 to 2 recirculations/hour is recommended for high throughput tanks to remove particles.

SOCOSURF PACS Tank

- Gently agitate by recirculation before use and during the treatment. Avoid splashing and turbulence.
- PVC, PVDC, PVDF, PTFE, and PP are suitable construction materials. Other materials require evaluation.
- To reduce hydrogen peroxide consumption:
    - Cover the tank with a lid when not in use.
    - Reduce the tank temperature with a cooling system if necessary to not exceed 30°C.
    - Avoid any turbulence, do not use agitation by air.
    - Minimize agitation before and during treatment.
    - Optional : Filtration (<25µm) at a rate of 0.1 to 2 recirculations/hour is recommended for high throughput tanks to remove particles.

Rinse Stages

- The **SOCOSURF TCS** and **SOCOSURF PACS** tanks each require their own dedicated rinse stage.
    - Rinsing can be accomplished by spray or immersion, or a combination thereof. A two-stage rinse where the second rinse stage is clean water is recommended.

3/ PROCESS AND OPERATING PARAMETERS

The surface preparation *before* the **SOCOSURF TCS/SOCOSURF PACS** treatment is critical to the performance of the treatment. The Socosurf TCS/Socosurf PACS treatment must be

performed on a perfectly clean surface *in sequence* with the surface preparation. In **general**, the typical process is shown below. Always refer to the OEM engineering documentation.

As a chemical conversion process	As a sealing process
1. Degrease (**SOCOCLEAN A3432**, 10-30 min) 2. Rinse *3. Alkaline etch (optional)* *4. Rinse* 5. Deoxidize (**SOCOSURF A1858/A1806**, 1-10 min) 6. Rinse 7. **SOCOSURF TCS** 8. Rinse 9. **SOCOSURF PACS** 10. Rinse 11. Dry if needed (temperature < 60°C / 140°F)	1. Degrease (**SOCOCLEAN A3432**, 10-30 min) 2. Rinse *3. Alkaline etch (optional)* *4. Rinse* 5. Deoxidize (**SOCOSURF A1858/A1806**, 1-10 min) 6. Rinse 7. Anodize (TSA, BSA, CAA, SAA, etc.) 8. Rinse 9. **SOCOSURF TCS** 10. Rinse 11. **SOCOSURF PACS** 12. Rinse 13. Dry if needed (temperature < 60°C / 140°F)

Reference operating parameters are: *(contact SOCOMORE to put in place the tank cleaning method)*

SOCOSURF TCS		
	Chemical Conversion	**Sealing**
Concentration	31 - 41%$_{v/v}$	
pH	3.8 - 4.0, *measured at operating temperature*	
Immersion Time	10 ± 5 min	Anodic layer < 10 µm: 10-40 min Anodic layer 10 µm: 3-10 min
Temperature	40 ± 5°C (104 ± 9°F)	
SOCOSURF PACS		
Concentration	8 - 12%$_{v/v}$	
Hydrogen Peroxide Concentration	5 - 7%$_{v/v}$ when using 35% peroxide 6 - 8%$_{v/v}$ when using 30% peroxide	
pH	4.2 - 5.3	
Immersion Time	3 - 10 minutes	
Temperature	15 - 30°C (59 - 86°F)	

*These are Socomore's validated and recommended operating para*meters. Larger operating windows are available in the bath maintenance procedure. *Always use* **SOCOSURF TCS/SOCOSURF PACS** *according to the engineering documents governing your process.*

4/ TANK MAINTENANCE

Tanks must be monitored in order to maintain performance. The tank control tests are defined in a separate document available on request.

Products required for tank maintenance:

- **SOCOSURF TCS**
- **SOCOSURF TCSADD1**
- **SOCOSURF PACS**
- 30-35% technical grade, stabilized hydrogen peroxide, impurity < 30 ppm Phosphorus.
- Ammonium hydroxide solution, dilute 5-10%
- Sulphuric acid solution, dilute 5-10%

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- Nitric acid solution, dilute 5-10%

A bath monitoring protocol is available on request from our teams.

TECHNICAL CHARACTERISTICS

SOCOSURF TCS, **SOCOSURF TCSADD1**, and **SOCOSURF PACS** are free of volatile organic compounds and do not emit any odors.

	Socosurf TCS	Socosurf PACS	Socosurf TCSADD1
Appearance	green liquid	colorless liquid	green liquid
Specific Gravity	~1	~1	~1
Shelf Life from DOM	24 months	24 months	24 months

PRECAUTIONS FOR USE AND STORAGE

SOCOSURF TCS, **SOCOSURF TCSADD1**, and **SOCOSURF PACS** must be stored above freezing temperature.

For more information regarding the danger of the product, please consult the product safety data sheet according to local regulation.
For professional use only.

This technical data sheet replaces and cancels the previous one.