

MIL 8625 Sealing Compliance

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TECHEVON LLC

METAL FINISHING SOLUTIONS

General Anodize Process Review: Mil 8625 Sealing to compliance

DRAFT

Examples of Mil Spec Parts



Mil 8625 is the most common referenced specification for anodized aluminum in North America. There are 3 types of coatings for the Mil 8625 Spec:

- Type I - Chromic acid anodizing
 - Dyed or un-dyed
 - Used for best fatigue resistance and pre-paint
- Type II: Conventional Sulfuric Acid
 - Class 1 clear
 - Class 2 dyed
 - Used for protection, aesthetics, non-conductivity
- Type IIB: Thin Sulfuric Acid Anodizing
 - For use as a non-chromate alternative for Type I and IB coatings
- Type III: Hard Coat
 - Abrasion Resistance

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For sealing the following specification details are provided:

Mil 8625 version F, Sept 10, 1993, Amendment 1, Sept 15, 2003 states “Type I, IB, IC, II, IIB, shall be completely sealed unless otherwise specified... in accordance with 3.8.1.1 or 3.8.1.2 as applicable. If wetting agents are used, they shall be of the non-ionic type.”

Therefore anodizers using a mid temperature seals are in **non-compliance** to Mil 8625 because mid temperature seal chemistry uses anionic surfactants to manage smut and film.

What does non compliance mean to an anodizer?

- This seal surfactant issue has become a problem for anodizers who are audited for compliance to the Mil 8625 F certification. There are reports of companies losing NADAAC accreditation until the company is confirmed as compliant.

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Reliant/Clariant 8625 Letter 9/23/2015

We have attached several alternative sealing processes that we feel meet all the requirements.

1. ASL powder or Anodal AS pwd./liq. >200F (High Temp Nickel Acetate Seal)
Will only last a few weeks
2. ASL powder or Anodal AS pwd./liq. >170°F for 5 minutes, followed by boiling DI water with Anodal SH-1
Will need to change the water frequently
Seal will last longer than Method #1
3. Anodal CS-3, CS-2N or CS-2Liq. 85°F for 10 min. then a hot water dip (Nickel Fluoride Cold Seal),
Will last a long time
Use a carbon filter on the seal tank to filter out the dye
4. Boiling Water with Anodal SH-1 (Hot Water Seal)

Anodal Seal ASL Powder TDS



PRECAUTION:

The use of *Anodal Seal ASL* will not cause field service yellowing of properly formed anodic coatings. It is important that the anodizing conditions be kept within normal limits however, especially as to temperature and current density. If a faint residue is observed after the seal treatment, a slightly acidic final rinse is recommended. The service life of the bath depends on the operating conditions and the efficiency of rinsing prior to sealing. Filtration will extend the life of the bath considerably. *Anodal OL powder* can be added to the bath to delay the onset of seal smut.



Anodal OL TDS

Anodal OL Powder is an additive for high temperature water, or nickel acetate seal formulations, which prevents the formation of seal smut. Unlike many other dispersants, Anodal OL will not cause field service yellowing of properly formed anodic coatings.

PHYSICAL PROPERTIES:

Appearance: Yellow to light tan powder
Chemical class: Anionic surfactant



Mil 8625 Non-ionic Surfactant in Seals

Mil 8625 is the most common referenced specification for anodized aluminum in North America. Anodizers using a mid temperature seal are in violation of Mil 8625 because mid temperature seal chemistry uses anionic and/or cationic surfactants to eliminate smut. Anodizers using mid temperature seals need to change to alternative chemistry to avoid non-compliance. This includes nickel and non-nickel(magnesium) mid temp products. Furthermore, even the traditional hot Nickel seals also use anionic surfactants and so they are also not an option.

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This seal surfactant issue has become a problem for anodizers who are audited for compliance to the Mil 8625 certification. There are reports of companies losing NADCAP accreditation until the company is confirmed in compliance.

Techevon has two several sealing methods that properly seal the anodic coating to give a well sealed part with no smut that is in compliance with Mil 8625. The use of a nickel pre seal product followed by a hot water seal with compliant additives is acceptable.

Pre Seal – Step One

Techevon Colorfix Liquid – is a liquid nickel pre seal chemistry that contains organics and proprietary ingredients to fix dyed work in the pore without bleeding. This gives the enhanced protection of depositing nickel over the organic dye which improves light fastness.

Techevon Cold Seal LB – is a liquid cold seal chemistry to provide the complete cold seal protection with fluoride. The nickel aluminum fluoride complex plugs the pore and offers great seal protection. The Techevon Cold Seal LB is specially formulated to reduce bleeding of organic dyes in the seal solution.

Final Seal – Step Two

Techevon Seal HWA – is a liquid hot water additive to eliminate smut formation in the second stage of the sealing process. The Techevon Seal HWA may also be used as a stand alone single stage sealing method that is in compliance with Mil 8625.