

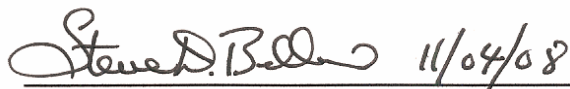
**SPECIFICATION FOR NITRIC ACID PASSIVATION
TREATMENT FOR AUSTENITIC TYPE STAINLESS STEEL**

Process No. CELCO 1005

Revision B

Dated: October 23, 2008

Reviewed and approved for adequacy prior to issue by:


Steve D. Bellesine, President 11/04/08


Randy Moore, Vice President 11/04/08

CELCO Quality Manual and Procedures Revision Notes

Revision A: Dated – May 16, 1997

Para 2.3.1 – Added to read: “Structural and Small Components – Where size and volume permits, the parts immersed in a solution, containing 25-45% by volume of nitric acid (NH₃). An addition of Hydro Fluoric acid (HF) may be used as an activator of solution. Parts shall be processed for a minimum of 30 minutes at a temperature range between 70-90 degrees F (21-32 degrees C).

Para 2.3.2 – Added to read: “Large Vessels and Structure – Due to high volume of components it will be permissible to use either a surface flooding procedure, which constantly floods the surface with the same strength of solution as described in paragraph 2.3.1. This process exposed the surface to the same fluid at a constant rate and also washes the surface simultaneously pr a paste solution which is a gel material that adheres to the surface and passivates the material at a slower rate.

Para 6 – Removed Applicable Specifications and Standards List.

Revision B: Dated – October23, 2008

Add approval signatures and dates.

Para 2.3.2 – Revise to read: Large Vessels and Structure – Due to high volume of component it will be permissible to use either a surface flooding procedure, which constantly floods the surface with the same strength of solution as described in paragraph 2.3.1. This process exposes the surface to the same fluid at a rate and also washes the surface simultaneously. An alternate process that could be used is a Pickle & Passivation Gel applied through a spray or with a brush of compatible material. This gel consists of a mixture of Nitric & (HF) along with a gel carrier that is designed to allow the product to adhere to the surface for an extended duration until rinsed. Gel materials may need to be applied for a duration of 15 to 60 minutes or as required for adequate results before rinsing. Initial chemical can be removed by wiping or rinsing as described in section 2.4.

1. SCOPE –

This specification covers the treatment, guidance and precautions for cleaning and descaling austenitic (300 series) stainless steel parts, components, equipment and systems using nitric acid (HNO₃) solutions.

2. REQUIREMENTS –

2.1 Material – Commercial quality chemicals and reagents used for descaling and passivation shall be used where possible.

2.2 Pretreatment – The surface of the parts shall be free of oil, grease, rust, scale and other foreign matter and shall have no harmful effect on material properties.

2.3 Passivation treatment – The parts shall be completely immersed in a solution containing 25 – 45 percent by volume of nitric acid (HNO₃) 42 degrees Baume'.* An additive of Hydro Fluoric acid (HF) may be used as an activator of the solution.*** Parts shall be processed for a minimum of 30 minutes at a temperature range between 70-90 degrees F (21-32 degrees C).*

Para 2.3.1 – “Structural and Small Components – Where size and volume permits, the parts will be immersed in a solution, containing 25 – 45% by volume of nitric acid (HNO₃). An addition of Hydro Fluoric acid (HF) may be used as an activator of solution. Parts shall be processed for a minimum of 30 minutes at a temperature range between 70-90 degrees F (21-32 degrees C).

Para 2.3.2 – Large Vessels and Structure – Due to high volume of component it will be permissible to use either a surface flooding procedure, which constantly floods the surface with the same strength of solution as described in paragraph 2.3.1. This process exposes the surface to the same fluid at a constant rate and also washes the surface simultaneously. An alternate process that could be used is a Pickle & Passivation Gel applied through a spray or with a brush of compatible material. This gel consists of a mixture of Nitric & (HF) along with a gel carrier that is designed to allow the product to adhere to the surface for an extended duration until rinsed. Gel materials may need to be applied for a duration of 15 to 60 minutes or as required for adequate results before rinsing. Initial chemical can be removed by wiping or rinsing as described in section 2.4.

2.4 Water rinse – Immediately after removal from the passivation solution, the parts shall be thoroughly rinsed in cold potable water.

2.4.1 Second water rinse – Immediately after the first water rinse, the parts shall be thoroughly rinsed with a second potable water rinse.

2.4.2 De-ionized water rinse – The parts shall be thoroughly rinsed with de-ionized water to remove residual halogens from the parts.

2.5 Finish – The passivated parts shall exhibit a chemically clean surface and shall not show any pitting, etching or frosting. A slight discoloration is allowed.

3. TESTING**

3.1 The passivated parts shall be tested by using a potassium ferricyanide – nitric acid solution. The solution shall be sprayed on a sample piece of each batch and shall show no staining after 30 seconds of exposure to the solution. Each test shall be recorded and shall be filed with the inspection report to the customer.

4. PREPARATION FOR DELIVERY

4.1 The passivated parts shall be packaged in a manner which shall afford protection of the part from excess exposure during transit.

5. CERTIFICATION

5.1 A letter of certification shall be transmitted to the customer indicating the passivation procedure and the dates which the passivation was performed.