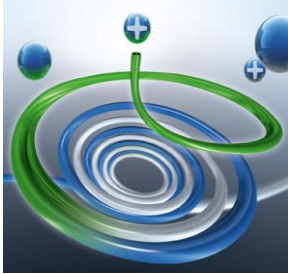


# HARDWALL 3 SUPER

Low Temperature Seal  
 Product of Italtelco S.R.L.



## Description

The Hardwall 3 Super low temperature sealing process allows sealing of anodic oxide layers on aluminium and its alloys to be carried out at temperatures in the range 28°-32°C. The result is a perfect quality seal suitable for outdoor corrosion resistance including industrial and marine environments according to European (EURAS- QUALANOD approval 1990) and international standards.

## Chemical & Physical Properties

• <b>Appearance:</b>	Green Powder
• <b>Specific Gravity:</b>	N/A
• <b>Flammability :</b>	Non Flammable
• <b>Solubility in Water:</b>	20 g/litre
• <b>pH 1%:</b>	Approx 5

## Advantages, Application & Method Of Use

### + Advantages:

- Vastly reduced energy consumption compared with traditional sealing processes.
- Immersion times are reduced by 70-80%.
- No bloom residue on sealed product.
- No heating problems during shut down periods (Holidays, Maintenance).
- Quality of seal is superior to traditional processes.

### + Tests Passed:

- UNI3397 - 63 / ISO 2932 / ISO 2931/ ISO 3210 / ISO 2143 / DIN 54004 / DIN 50947 / DIN 50018
- ASTM B117 MIL-STD-810C.
- ASTM B117-73; B-380-65, B-287, B-268-68, NX41-002.
- All tests in salt-spray, acetic salt, cass test, ISO 9770, sulphur dioxide (Kesternich). Outdoor exposure tests according to Qualanod.
- Hardwall 3 Super sealing meets Military regulations MIL-A-8625 C according to ASTM B117 MIL-STD - 810 C. Documentation with approval by Military Authorities is available.

# HARDWALL 3 SUPER

Low Temperature Seal  
Product of Italtelco S.R.L.

## ⊕ Operating Conditions:

- Hardwall 3 Super (Low Temperature): 5g/l
- Minimum Temperature: 25°C
- Maximum Temperature: 32°C
- Optimum Temperature Range: 28°-32°C
- Immersion Times (approx):
  - 5 micron - 4 minutes
  - 10 micron - 8 minutes
  - 15 micron -12 minutes
  - >20 micron: 1 minute per micron
- pH Range: 5.5 - 6.5

⚠ Note: Higher temperatures and longer immersion times can cause the formation of bloom on the sealed product. Whilst this is not harmful its removal will involve wiping the work piece with oil.

## ⊕ Preparation of new Hardwall 3 Super low temperature seal bath:

1. Fill the tank with deionised water and heat to 30°-35°C
2. Pre-mix Hardwall 3 Super product by completely dispersing small quantities in a separate container. Then add to the tank (5 g/l).
3. Agitate the tank solution with air for 15 to 20 hours or until the Hardwall 3 Super product is thoroughly mixed and dissolved.
4. Adjust the pH to within the range 5.5 - 6.5. Use Acetic Acid or Formic Acid to decrease the pH.
5. Add the content of the plastic bottle (Miscela Additive supplied separately) into the tank distributing the liquid along the tank. Use 1 litre bottle of Miscela Additive per carton of Hardwall 3 Super.

⚠ Note: Use of diluted Sulphuric Acid or diluted Caustic Soda for pH adjustment, whilst not harmful in small quantities, is not recommended for frequent additions (Sulphates and Sodium Salts may cause a bloom after sealing especially on the upper surfaces of profiles)

The tank is ready for operation.

## ⊕ Consumption:

- Given recommended working conditions consumption including a medium drag-out should be 2.5 grams of Hardwall 3 Super per square metre of anodised aluminium surface.

## ⊕ Control of Hardwall 3 Super low temperature seal bath:

Hardwall 3 Super Concentration:

### Reagents Required:

- EDTA 0.01M
- MUREXIDE indicator (mix 99 g of sodium chloride with 1g of pure murexide)
- BUFFER SOLUTION pH = 10 (dissolve 350 ml of concentrated ammonia plus 54 g of ammonium chloride in one litre of distilled water)

# HARDWALL 3 SUPER

Low Temperature Seal  
Product of Italtelco S.R.L.

## Method:

1. Measure 10 ml of bath solution, pour into 300 ml flask.
2. Add 50 ml of distilled water.
3. Add 5 ml of buffer solution (pH 10).
4. Add a small amount of murexide indicator.
5. Titrate with EDTA 0.01M until the colour turns violet.
6. Record this as A.

## Calculation:

- $A \times 0.195 = \text{g/l of Hardwall 3 Super.}$
- Concentration must be 5 g/l of Hardwall 3 Super.

## pH of the Solution:

1. Measure pH of the neat solution using a pH meter, calibrated using pH 4.0 and 7.0 buffers.
2. pH range must be maintained 5.5 - 6.5

## To adjust pH:

1. pH HIGH: Add acetic or formic acid.
2. pH LOW : Add ammonia.

## Fluoride Concentration:

1. Measure free fluoride in the solution using a fluoride selective probe and pH meter. (See full method described in the STAB F63 product profile).
2. Free fluoride must be maintained in the range 300-800ppm. (500-800ppm preferred).
3. Fluoride is maintained by normal additions of Hardwall 3 Super, but occasional additions may be necessary if it drops below 500ppm.

## To adjust free fluoride:

1. In order to increase FLUORIDE content use STAB F63 which avoids fluctuation of pH which occurs after addition of other sources of fluorides.
2. Addition of 1 litre Stab F63 per 1000 litres of bath, increases free fluoride by approx 75 ppm.
3. Avoid making fluoride additions while the bath is operating.

## Optional Post Sealing Treatment:

### Accelerated Ageing:

- For completion of the low temperature impregnation process a period of exposure to humidity is advisable. This can be achieved by immersion of the sealed work in a hot water bath at 60°C.
- This procedure facilitates handling and control of test pieces and must be considered an essential part of the process.

# HARDWALL 3 SUPER

Low Temperature Seal  
Product of Italtelco S.R.L.

- A second stage can be carried out in a nickel sulphate solution ( $\text{NiSO}_4 \cdot 7 \text{H}_2\text{O}$ ) of 5 - 10 g/l concentration at a temperature of 60°- 65°C for 0.8 - 1.2 minutes per micron.
- A thorough rinsing in cold water after HARDWALL 3 SUPER seal and before hot water rinse immersion is essential.
- An additional advantage of this post treatment is the reduced crazing effect of the anodic layer.

## Quality Control:

- With this sealing process (including the hot water immersion after low temperature sealing) the sealed work can be tested in the same way as conventionally sealed work.
- The appropriate tests are:
- Dye spot test according to ISO 2143
- Immersion test according to ISO 3210
- The acceptable levels of quality are as specified in sections 2.3.3.1. and 2.3.3.2. respectively of the 1988 QUALANOD specification.

## Seal Testing:

- Material sealed in condition detailed in this technical information can be tested after 2-3 hours ageing time.
- If conditions vary from these specified additional ageing time will be required before tests can be carried out.
- As a laboratory test the sealed material can be rapidly aged by heating to 50°C for 15 minutes (for example by means of a hair dryer) the test can then be carried out. Alternatively a small laboratory oven can be used.

## Sealing after colouring with organic dyes:

- After organic colouring it is necessary to pre-seal the work in a nickel acetate solution. This prevents leaching of dye into the seal solution.
  - Nickel Acetate 10g/l
  - Temperature 60°C
  - pH minimum 5.5
  - pH maximum 6.5
  - Immersion time 10 minutes
- Thorough rinsing is necessary prior to this pre-seal and again prior to low temperature sealing.
- The recommended procedure is: Organic colouring.
- Cold rinse.
- Pre-seal (nickel acetate at 10g/l) Cold rinse.
- Rinse D.I. or good quality water.
- Continue as per standard low temperature seal procedure.

# HARDWALL 3 SUPER

Low Temperature Seal  
Product of Italtelco S.R.L.

## Comments:

- A stainless steel or P.V.C. lined steel tank is recommended.
- The life of the bath can be considered unlimited if demineralized water is used in the rinse prior, and to maintain the bath.
- A bloom free product is guaranteed.
- Weekly analysis of the solution as detailed in this technical note is necessary.
- It will be necessary to filter the solution if Ca or Mg ions are present or other polluting substances have been introduced.
- A minimum delay between anodising/colouring and sealing is recommended.
- Rinsing after Hardwall 3 Super sealing is advisable (the same rinse tank used prior to sealing can be used).

## Precautions

- Refer to Hazard Identification as per Safety Data Sheet.

## Safety, Transport & Storage Information

Please refer to Safety Data Sheet.

## Packaging

Available in 20kg Powder, 1 kg liquid Additive.

1 bottle of Miscela Additive is supplied with each carton and it is recommended that this is added to the seal tank solution when a new HARDWALL 3 SUPER carton is opened.

For plants where the use of a carton of Hardwall 3 Super may take more than 2 weeks, it is better to add the Miscela Additive over the life of the carton, approx 1 part to 20 parts of powder.

Containers non-returnable.

### **IMPORTANT: FOR DETAILED INFORMATION ABOUT THIS PRODUCT PLEASE REFER TO SAFETY DATA SHEET.**

*The product information contained in this document is to the best of our knowledge and non-binding. Our statements relating to possible uses of the product do not constitute a guarantee that such uses are appropriate in a particular user's case or that such uses do not infringe the patents or proprietary rights of any third party. We assume no risk or liability whatever in connection with any particular use, if not expressly confirmed by us in writing. Therefore Chemetall grants no warranty and does not accept any liability in connection with this product information or its use. Except where noted otherwise, all registered trademarks are owned by Chemetall or its affiliated companies. The reproduction of any or all of the information contained in this document is expressly forbidden without Chemetall's prior written consent.*