

# TECHNICAL DATA SHEET

## CORAL ECO-TREAT NPLF AMBIENT NON-PHOSPHATE PRE-PAINT TREATMENT

CORAL ECO-TREAT NPLF is an acidic liquid concentrate used to produce a conversion coating on aluminum, iron, and zinc-based alloys.

### Applications

The pretreatment process does not contain chromates or phosphates to achieve excellent corrosion resistance. It is operated at ambient or low temperatures. The controlled solution of CORAL ECO-TREAT NPLF is rinsed or can be dried in place to form an excellent base for bonding paint and enhancing resistance to corrosion. This process can be used in an immersion or spray process.

### Typical Process

1. Clean in an acceptable alkaline or acid cleaner as permitted by the processing equipment and required by the soil condition.
2. Overflowing water rinse. Must be very thorough and overflowed at a rate to promote adequate dilution of cleaning residues.
3. Treat metal with CORAL ECO-TREAT NPLF.
4. Overflowing water rinse.
5. Final seal rinse (optional)

**Note:** Some lines may allow for a deoxidizer step after cleaning aluminum, or a laser oxide pickle for steel to produce superior adhesion and corrosion resistance. CORAL ECO-TREAT NPLF can be operated as a react-in-place treatment in the final stage using parameters prescribed by the Coral Chemical Laboratory.

### Equipment

Processing tanks, piping, pumps, and heat transfer surfaces constructed of 304-stainless steel will provide satisfactory service. If the operating pH of the bath is maintained less than 3.8 pH, then stainless steel or acid resistant plastic construction should be used. We recommend that all spray nozzles (Full Cone or Flooding) be made of 316-series stainless steel or CPVC.

### Benefits

- Treatment for aluminum, iron & zinc alloys
- Contains no phosphate
- Energy saving operation
- Excellent corrosion resistance

### Physical Properties

PROPERTY	TYPICAL VALUE	UNIT
Appearance	Liquid, clear, colorless	
Density	8.62	lbs/gal

### Operating Conditions

PROPERTY	TYPICAL VALUE	UNIT
Concentration	0.5 to 2.0	% by volume
Temperature	Ambient - 120	°F
Time:		
Spray	30 - 60	seconds
Immersion	45 - 90	
Optimum pH Range:		
Galvanized Steel	2.5-3.5	
Aluminum	2.5-3.5	
Steel or Iron	3.8-4.8	



# CORAL ECO-TREAT NPLF

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### Solution Control

CORAL ECO-TREAT NPLF is most appropriately controlled using the colorimetric determination of zirconium content and pH. The titration procedure below is for those who don't have a colorimeter and need to verify that enough CORAL ECO-TREAT NPLF was added to the tank. After metal is processed the titration procedure is not an accurate method for determining the concentration.

#### Titration Procedure: Initial Charge Concentration

##### Materials required:

- 50 milliliter plastic graduated cylinder
- 250 milliliter plastic Erlenmeyer flask
- 25 ml burette assembly
- 0.04% BromoCresol Green (LIN-003)
- 0.1N Sodium Hydroxide (LTS-008)

##### Procedure

This procedure should be implemented to determine the bath concentration only upon initial charge before pH adjustment.

1. Measure a 50 ml sample from the CORAL ECO-TREAT NPLF tank.
2. Place sample in a 250 ml Erlenmeyer flask or other appropriate titrating vessel.
3. Add 10 drops of 0.04% BromoCresol Green (LIN-003) to the flask. The sample will turn yellow.
4. Titrate with 0.1N Sodium Hydroxide (LTS-008) until the sample color changes from yellow to green.
5. Record the mls of 0.1N Sodium Hydroxide (LTS-008) required as the Free Acid points.

The concentration of CORAL ECO-TREAT NPLF can be determined by multiplying the Free Acid value [mls of 0.1N Sodium Hydroxide (LTS-008)] by the product factor, 0.39.

**Example:** Concentration (% v/v) = ml 0.1N Sodium Hydroxide (LTS-008) x 0.39

0.01 M EDTA (MLS)	FREE ACID, MLS
0.5	1.3
1.0	2.6
1.5	3.9
2.0	5.2
2.5	6.4
3.0	7.8

#### Concentration Determination For Zirconium

##### Materials required:

- Qty 1 - Colorimeter, Hach 528 nm (LAB-301-267)
- Qty 2 - Pipet, Pipomatic, 10 ml (LAB-230-100)
- Qty 2 - Pipet, Pipomatic, 1 ml (LAB-230-101)
- Qty 2 - Plastic Beakers, 100 ml (LAB-105-100)
- Xylenol Orange (LRS-205)
- Syringe Filters (LAB-FPS-100)
- 0.1N Sulfuric acid (LTS-009-GL)

**IMPORTANT: The HACH colorimeter must first be calibrated by Coral Chemical Company to perform this method.**



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### Procedure:

1. Filter approximately 10 ml of the CORAL ECO-TREAT NPLF bath through the syringe filter.
2. Pipet 20 ml of 0.1N Sulfuric Acid to two clean, dry plastic mixing cups. This can be accomplished with two additions from the 10 ml Pipomatic to each cup.
3. With the 1 ml Pipomatic, deliver 0.5 ml (500  $\mu$ L) of Xylenol Orange to each mixing cup.
4. With a separate 1 ml Pipomatic, pipet 0.1 ml (100  $\mu$ L) of the filtered bath, from step #1, to only one of the plastic mixing cups. Swirl to mix each cup then allow each to develop color for 5 minutes.
5. Turn on the colorimeter and be sure the arrow on screen top is set to **Channel 1 (see Note #1)**.
6. After the 5 minute reaction period, pour the cup with only Xylenol Orange into a clean colorimeter vial. This is the zeroing vial.
7. Insert the zeroing vial mentioned above in the cell holder, place the cap over the cell holder, and press the blue **ZERO/SCROLL** button.
8. Pour the cup with the filtered bath and Xylenol Orange into a second clean, dry colorimeter vial.
9. Remove the zeroing vial from the colorimeter, replace with the second vial, place the cap over the cell holder, and press the green READ/ENTER button.

**This reading represents the full concentration of Zr present in the bath in ppm.**

**Maintain A Zirconium Level Greater Than 100 Ppm**

### Notes

- (1) If the colorimeter is not set on Channel 1, Press top center MENU button>SEL will appear>Press the green READ/ENTER button> Arrow will change channels>Press the top center MENU button again to load Channel 1
- (2) Colorimeters with wavelengths close to 528 $\mu$ m can be used. The colorimeter needs to be calibrated by Coral. The test procedure is the same.

### Operating Notes And Guidelines

1. Proper maintenance of the treatment bath is necessary to provide consistent quality and results.
2. Periodic decants or regular tank dumps are required to reduce or remove iron from the bath. The frequency is related to the surface area processed, to the volume of treatment solution and to operating pH. As soluble iron accumulates in the treatment bath, the conductivity will increase falsely representing the actual bath concentration.
3. After the first charging of CORAL ECO-TREAT NPLF, it is advised to perform regular bath analysis to determine active components and iron content. This data is used to determine the bath life and proper solution maintenance for a particular line.
4. Iron levels should be tested for and if the iron level is greater than the zirconium level in ppm's; decant a portion of the operating bath and increase the concentration of CORAL ECO-TREAT NPLF.

### Control and Replenishment

The amount of CORAL ECO-TREAT NPLF required will vary from line to line, but in general, 1.5 quarts (~1500 ml) of CORAL ECO-TREAT NPLF will raise the Free Acid by one point (1.0 ml) for every 100 gallons of solution. Regular timed or continuous additions of CORAL ECO-TREAT NPLF when production is running with zirconium determination for concentration and adjustments to pH as needed will help provide optimum results for the system.

#### pH Control for Iron and Steel

When iron and steel are processed, the pH of this product should be maintained between 4.0 and 4.8 pH. Make additions to maintain the pH and conductivity level.



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### Precautionary Information

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Consult the product Safety Data Sheet for all safety and handling information prior to using this product.

### Waste Disposal After Use

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Check your state, local and federal regulations on waste disposal to insure compliance before disposing of any Coral product. Consult Coral if you are not sure how to treat this product for waste disposal.

### Health, Safety and Handling

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Please consult the Safety Data Sheet (SDS) for information on storage, safe handling and disposal. The conditions or methods of handling, storage, use and disposal of the product are beyond our reasonable control - we assume no liability for any ineffectiveness of the product or any injury or damage, arising out of or in connection with these conditions.

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