by Anti Rust Land
Total Anti Rust & Corrosion Solution

# Zerust® Axxaclean™ 3048

## How to Apply Axxaclean® 3048 for Maximum Effectiveness



Zerust® Axxaclean® 3048 heavy-duty and tarnish remover saves the user time, money, and labor costs. The results are cleaner parts, in less time with less hassle. It cleans parts so they can be used immediately or allows user to take advantage of the built-in temporary flash corrosion protection. Zerust® Axxaclean® 3048 comes in Immersion and Brush-On versions to suit any job.

### Required Safety Gear

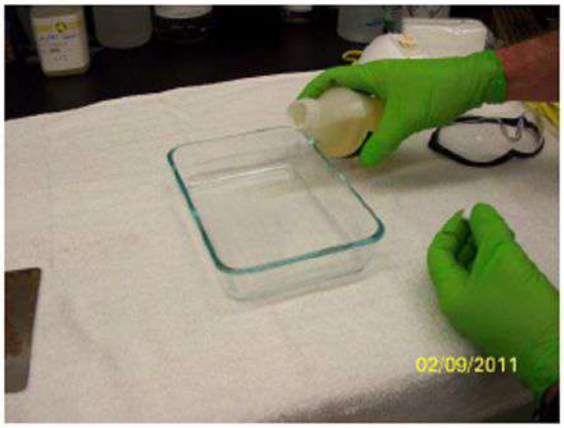
- Clean rubber gloves
- Face shield
- Protective clothing/apron

### Recommended Rust Removal Equipment

- Wire brush
- Paint brush
- Heavy-duty scour pad for non-machined surfaces
- Clean rag
- Water (deionized water preferred)
- Micro-abrasive sponge for machined surfaces

## RUST REMOVAL USING AXXACLEAN® 3048 IMMERSION VERSION

1.

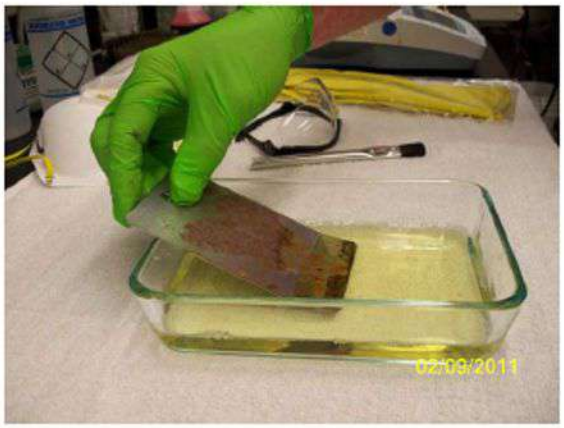



- Put on safety gear.
- Pour ample Axxaclean® 3048 Immersion product into a suitable glass or plastic container/bath (do not use metal). Use enough product to cover the rusty part completely.
- Work in an environment where the ambient temperature is above 50˚F (10 ˚C) for maximum effectiveness. Alternatively, the bath can be heated to accelerate the rate of rust removal.

2.


- Remove loose rust scale with wire brush before dipping the rusty part into the Axxaclean® 3048.

3.




- Ensure that **fresh** Axxaclean® 3048 product is continuously in contact with the rusty surfaces to ensure effective chemical reaction with the rust.
- This can be done by moving the rusty part continuously through the Axxaclean® 3048 or by agitating the Axxaclean® 3048 by stirring or using a circulation pump.
- Do not allow flat surfaces to remain in contact with tank/container bottom as this will prevent rust removal. Flip/rotate metal part frequently.
- Continue these actions for 5 to 15 minutes depending on the level of the rust.

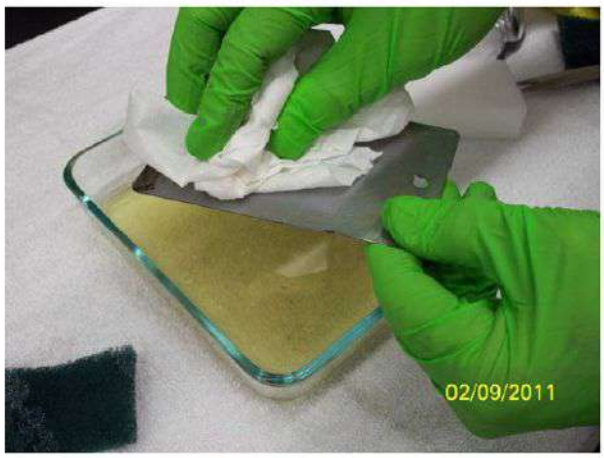
4.


- Polish with a heavy-duty scour pad to accelerate the removal of rust. Non-machined surfaces. Micro-abrasive for machined surfaces.
- Repeat immersing the part and polishing away dissolved rust until desired result is attained.

5.


- Rinse cleaned surface with water. Rinsing with deionized water is recommended. Care should be taken with porous metals such as cast iron or sintered metal parts. **Rinse and dry thoroughly.**
- Dry **thoroughly** using convection hot air (preferred method). Alternately, blow-dry using oil-free compressed air or wipe dry excess water with **clean** rag.

6.




- Axxaclean® 3048 contains a built-in rust preventative that will protect the cleaned metal surface against flash corrosion for up to 2 weeks indoors under good to moderate climatic conditions. If outdoors under shelter, it is best to apply additional corrosion protection measures such as rust protectants (RP's) or VCI packaging.

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## RUST REMOVAL USING AXXACLEAN® 3048 BRUSH-ON VERSION

1.


- Put on safety gear.
- Pour ample Axxaclean® 3048 Brush-On version product into a suitable glass or plastic container. (do not use metal)
- Work in an environment where the ambient temperature is above 50˚F (10 ˚C) for maximum effectiveness.

2.

- Remove loose rust scale with wire brush before treating the part with Axxaclean® 3048. For highly polished surfaces or light rust do not use brush.

3.


- Apply a **generous amount** of Axxaclean® 3048 onto surface with a clean paint brush. For larger flat surfaces a sponge paint roller brush can be used.

4.


- Ensure that **fresh** Axxaclean® 3048 product is continuously in contact with the rusty surfaces to ensure effective chemical reaction with the rust.
- This can be done by continuously moving the brush in a circular motion over the Axxaclean® 3048 coated surfaces.
- Brush-on more Axxaclean® 3048 if the product appears brown. Axxaclean® 3048 will lift up the rust, making the product appear brownish as rust is being removed.
- Continue these actions for 5 to 15 minutes depending on the level of the rust.

5.


- Polish with a heavy-duty scour pad to accelerate the removal of rust. Machined use non-machined surfaces.
- Repeat applying fresh product and polishing away dissolved rust until desired result is attained.

6.


- Rinse cleaned surface with water. Rinsing with deionized water is recommended.
- Dry **thoroughly** using convection hot air (preferred method). Alternately, blow-dry using oil-free compressed air or wipe dry excess water with **clean** rag.

7.


- Axxaclean® 3048 contains a built-in rust preventative that will protect the cleaned metal surface against flash corrosion for up to 2 weeks indoors under good to moderate climatic conditions. If outdoors under shelter, it is best to apply additional corrosion protection measures such as rust protectants (RP's) or VCI packaging.

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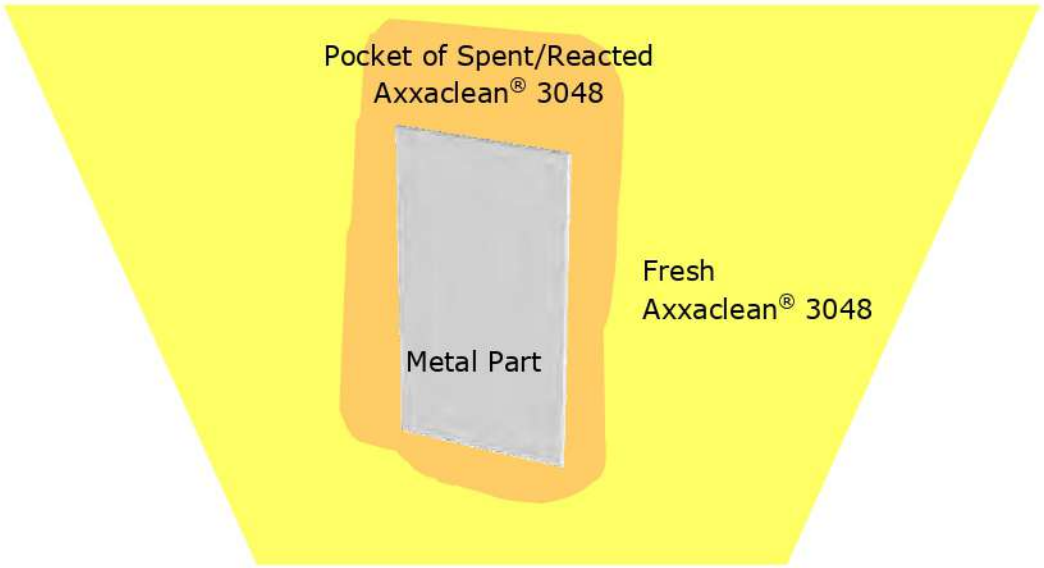
## BEST PRACTICES FOR USING AXXACLEAN® 3048 RUST REMOVERS

1. If applying Axxaclean® 3048 on vertical surfaces use Brush-On version only.
2. Three things affect the speed of rust removal; contact with fresh chemistry, temperature of the solution, and impingement or mechanical abrasion/polishing of rust being treated.

    - Fresh Chemistry: If the part stays static in the Axxaclean® 3048 solution, a pocket of spent chemistry will form and the rust removal process will greatly slow down.
        - TIP: Move part and/or the Axxaclean® 3048 fluid so fresh chemistry is constantly in contact with surface.
    - Temperature: Apply at 50°F/10°C or above.
        - TIP: Axxaclean® 3048 can be gently heated to enable the rust-removing chemical reaction to happen faster. If product is used below recommended temperature, for every 10°F lower in temperature the process with take twice as long. Do not heat above 150°F/65°C.
    - Polishing Treated Surface: Dissolution rate of rust is enhanced through mechanical abrasion.
        - TIP: Use a heavy-duty scour pad for non-machined surfaces and a foam melamine sponge for machined surfaces.




Be sure to agitate part and/or solution to prevent a pocket of spent solution from forming and slowing down the rate of rust removal.

## How to Build a Process Tank for Fast Rust Removal on Large Parts

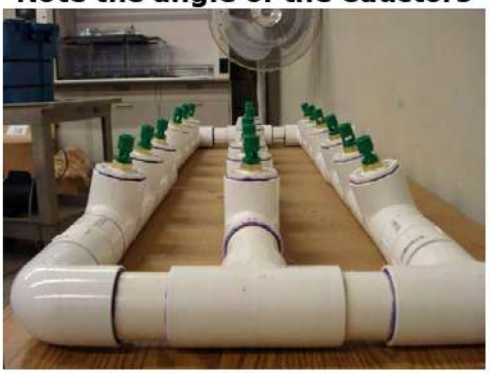
An inexpensive tank can be made using parts from the local hardware store. The principles can be applied to any size tank.

1. Start with a large heavy-duty plastic storage tote from a hardware store or big box store. Inexpensive roto-molded or fabricated plastic tanks can also be used.
2. Add a pump and PVC piping manifolds (see photos below) to form a circulation loop throughout the tank.
    a. The pump should be sized/rated for a minimum of 5 – 8 volume turnovers per hour. Example: if the tank volume is 100 liters (26.5 gal), the pump should be rated for 500 – 800 liters/hour (132 – 211 gal/hr).
    b. 2x side mounted manifolds and 1 bottom manifold provide uniform sparging and impingement on part surfaces.
3. Fit the manifold piping with eductor nozzles. Eductor nozzles are designed to circulate a large volume of liquid in a tank using a pump of a relatively smaller capacity. These nozzles dramatically increase the total volume of liquid delivered to the parts surface. The pressurized liquid quickly displaces the boundary layer of reacted Axxaclean®3 with fresh, highly active chemistry and dramatically increases the rust removal rate.
    a. Eductor nozzles can be purchased from a number of manufacturers, i.e. Filter Pump Industries(http://www.filterpump.com/index.php?main_page=product_info&products_id=105 ), Serfilco (http://www.serfilco.com/pdfs/liturature/O-1660.pdf), or Northeast Controls (http://www.1877eductors.com/plastic_tank_eductors.html)
    b. Mini-Eductor nozzles are available from Spraying Systems Co. (www.spray.com). See attached brochure below). These were used in the NTIC Lab tank.
    **c. Important: Eductor manifolds must be completely submerged under liquid**
4. OPTIONAL: Add simple fish tank heaters with built-in thermostat controls to heat the solution and speed rust removal. Do not heat above 150°F/65°C.

Photos of NTIC Lab Tank:

**Side manifolds with mini educators installed**

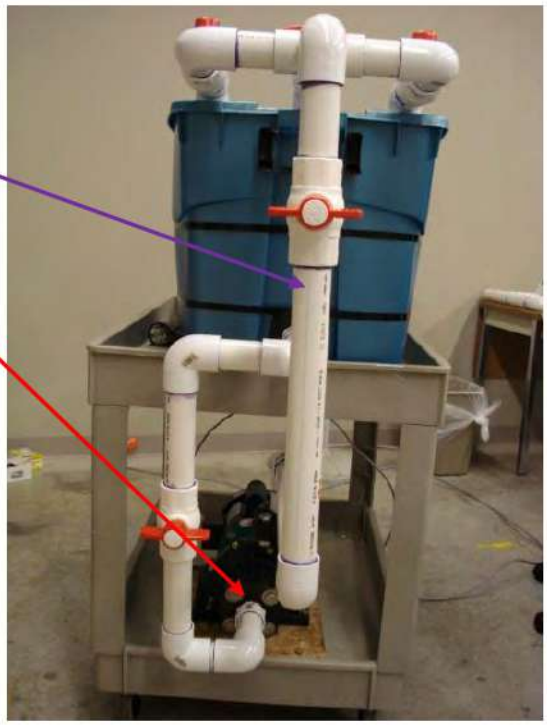
**Note the angle of the eductors**



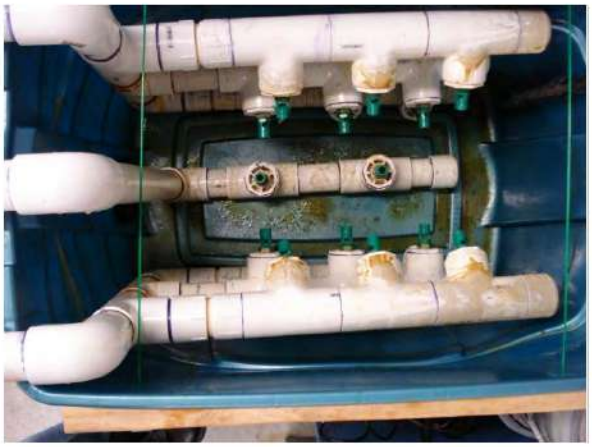
**Inlet Manifolds from Pump (with Ball Valves)**

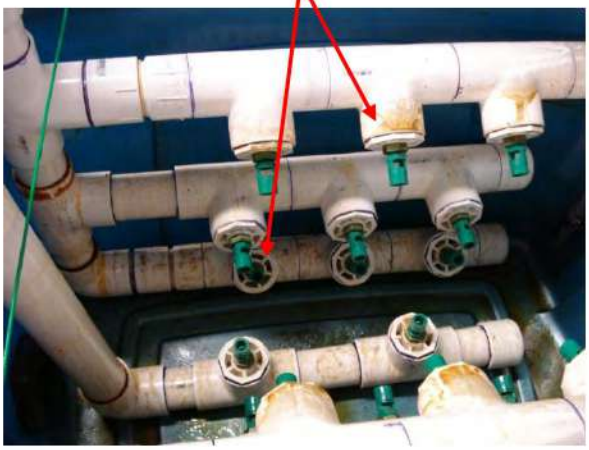
**Bottom manifold without mini eductors**

**Pump delivery and return**

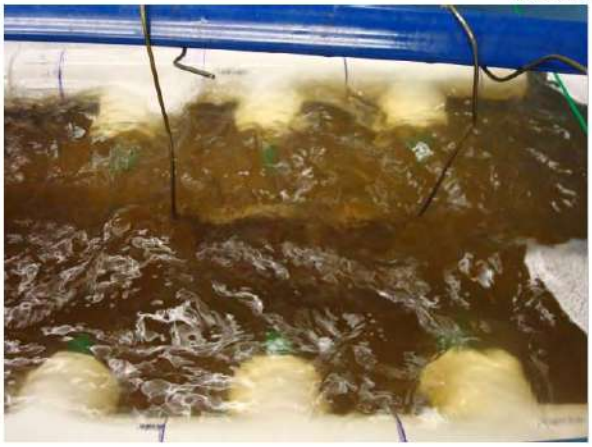


**Top view of tank showing installed eductor manifolds.** **Note the angle for these manifolds**





**Tank in operation**



## CONTACT INFORMATION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# Mini-Eductor Tank Mixing Nozzle


## Specifications

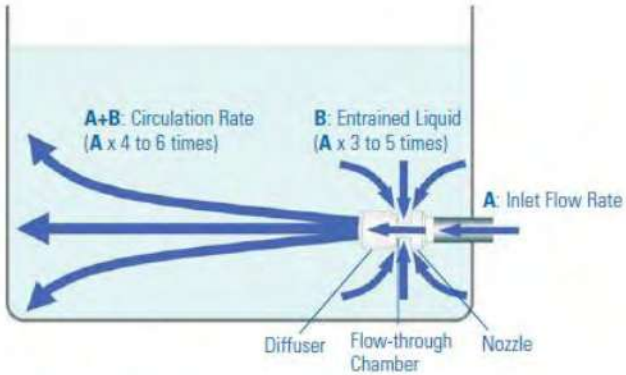
| |
|---|
| Materials: Polypropylene. PVDF and other similar materials optional |
| Inlet Connection: 1/4" pipe thread |
| Dimensions: 1-5/8" L x 11/16" outside dia. (40 mm L x 17 mm outside dia.) |

**New compact design** maximizes liquid circulation and agitation

## Benefits

- More efficient design pulls 3 to 5 times more solution into the flow-through chamber
- Circulation is 6 times greater than using pipe holes or agitation with air
- Flow-through chamber minimizes clogging
- Compact design simplifies mounting and is ideal for small tanks
- Color-coded by flow size for quick identification*

* Color coding available for polypropylene material only




## How the Mini-Eductor Works

Pressurized liquid is pumped through the Mini Eductor's nozzle and then diffuser. Between the nozzle and diffuser is a flow-through chamber that is open to the surrounding liquid. As liquid exits the diffuser at high velocity, surrounding solution is entrained into the flow-through chamber. This combination of pumped flow and pulled flow significantly increases circulation.

## Typical Applications


Agitating tank solutions


Cleaning circuit boards

Paint booth pre-treatment tanks
Preventing sedimentation
Etching tanks
Plating tanks

# Mini-Eductor Tank Mixing Nozzle

## Performance Data — US Units

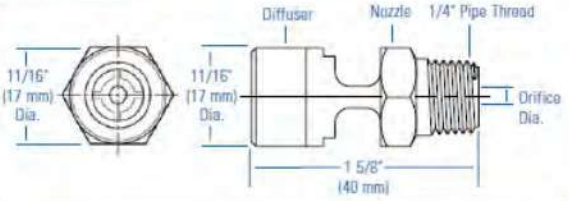
| Nozzle No. | Color Code* | Orifice Dia. | Flow Rate (gpm) | Inlet Liquid Pressure (psi) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 50 |
| 46550-1/4ME-1.5-PP | Orange | .059" | Inlet Flow Rate | .31 | .38 | .43 | .49 | .53 | .57 | .61 | .68 |
| | | | Circulation Rate | 1.9 | 2.4 | 2.7 | 3.1 | 3.4 | 3.6 | 3.9 | 4.4 |
| | | | Effective Flow Field** (inches) | 3 | 4 | 5 | 6 | 7 | 7.5 | 9 | 12 |
| 46550-1/4ME-2.0-PP | Green | .079" | Inlet Flow Rate | .56 | .69 | .79 | .89 | .97 | 1.0 | 1.1 | 1.2 |
| | | | Circulation Rate | 2.7 | 3.3 | 3.8 | 4.3 | 4.7 | 5.0 | 5.4 | 6.0 |
| | | | Effective Flow Field** (inches) | 5 | 9 | 10 | 10.5 | 12 | 15 | 16 | 17 |
| 46550-1/4ME-2.5-PP | Blue | .098" | Inlet Flow Rate | .86 | 1.1 | 1.2 | 1.4 | 1.5 | 1.7 | 1.8 | 2.0 |
| | | | Circulation Rate | 3.2 | 4.0 | 4.7 | 5.3 | 5.9 | 6.4 | 6.9 | 7.8 |
| | | | Effective Flow Field** (inches) | 8 | 10 | 11 | 12 | 15 | 16 | 17 | 21 |
| 46550-1/4ME-3.0-PP | White | .118" | Inlet Flow Rate | 1.3 | 1.6 | 1.8 | 2.0 | 2.2 | 2.4 | 2.6 | 2.9 |
| | | | Circulation Rate | 4.7 | 5.8 | 6.7 | 7.5 | 8.2 | 8.9 | 9.5 | 10.7 |
| | | | Effective Flow Field** (inches) | 11 | 13 | 16 | 17 | 20 | 22 | 22 | 24 |

## Performance Data — Metric Units

| Nozzle No. | Color Code* | Orifice Dia. | Flow Rate (l/min) | Inlet Liquid Pressure (bar) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 0.5 | 1.0 | 1.5 | 2.0 | 2.5 | 3.0 | 3.5 | 4.0 |
| 46550-1/4ME-1.5-PP | Orange | 1.5 mm | Inlet Flow Rate | 1.0 | 1.4 | 1.7 | 2.0 | 2.2 | 2.4 | 2.6 | 2.8 |
| | | | Circulation Rate | 6.2 | 8.8 | 10.8 | 12.5 | 14.0 | 15.4 | 16.7 | 17.8 |
| | | | Effective Flow Field** (cm) | 7.6 | 10.2 | 12.7 | 15.2 | 17.8 | 19.1 | 22.9 | 30.5 |
| 46550-1/4ME-2.0-PP | Green | 2.0 mm | Inlet Flow Rate | 1.8 | 2.6 | 3.1 | 3.6 | 4.0 | 4.4 | 4.8 | 5.1 |
| | | | Circulation Rate | 8.6 | 12.3 | 15.0 | 17.2 | 19.4 | 21.3 | 23.1 | 24.6 |
| | | | Effective Flow Field** (cm) | 12.7 | 22.9 | 25.4 | 26.7 | 30.5 | 38.1 | 40.6 | 43.2 |
| 46550-1/4ME-2.5-PP | Blue | 2.5 mm | Inlet Flow Rate | 2.7 | 4.0 | 4.9 | 5.7 | 6.4 | 7.0 | 7.5 | 8.2 |
| | | | Circulation Rate | 9.9 | 15.2 | 19.1 | 22.1 | 24.7 | 27.3 | 29.5 | 32.3 |
| | | | Effective Flow Field** (cm) | 20.3 | 25.4 | 27.9 | 30.5 | 38.1 | 40.6 | 43.2 | 53.3 |
| 46550-1/4ME-3.0-PP | White | 3.0 mm | Inlet Flow Rate | 4.2 | 5.8 | 7.1 | 8.3 | 9.3 | 10.2 | 11.0 | 11.7 |
| | | | Circulation Rate | 15.3 | 21.6 | 26.4 | 30.7 | 34.5 | 37.7 | 40.7 | 43.6 |
| | | | Effective Flow Field** (cm) | 27.9 | 33.0 | 40.6 | 43.2 | 50.8 | 55.9 | 55.9 | 61.0 |

* Color coding available for polypropylene material only  ** Effective Flow Field is defined as 1 foot (30 cm) of flow per second

## Dimensions




## Ordering Information

46550 — 1/4 — ME — 1.5 — PP

| Model No. | Connection Size | Mini-Eductor Designation | Nozzle Size | Material |
|---|---|---|---|---|

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