

Zerust® Axxaclean® 2048

HOW TO APPLY AXXACLEAN® 2048 FOR MAXIMUM EFFECTIVENESS



Zerust® Axxaclean® 2048 rust and tarnish remover saves the user time, money, labor, and disposal 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 rust protection. Zerust® Axxaclean® 2048 comes in Immersion, Spray-On, and Brush-On versions to suit any job.

REQUIRED SAFETY GEAR



- Clean rubber gloves
- Safety glasses or goggles
- Face mask (recommended but not necessary)

RECOMMENDED RUST REMOVAL EQUIPMENT



For medium rust removal:

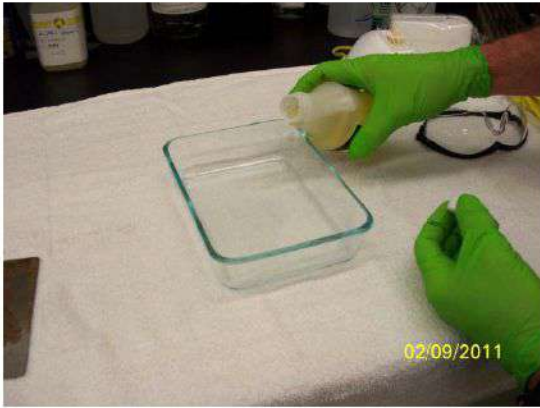
- Wire brush
- Paint brush
- Heavy-duty scour pad
- Clean rag
- Water (deionized water preferred)

For light rust removal:

- Paint brush
- Heavy-duty scour pad or foam melamine sponge "dirt eraser"
- Clean rag
- Water (deionized water preferred)

RUST REMOVAL USING AXXACLEAN® 2048 IMMERSION VERSION

1.



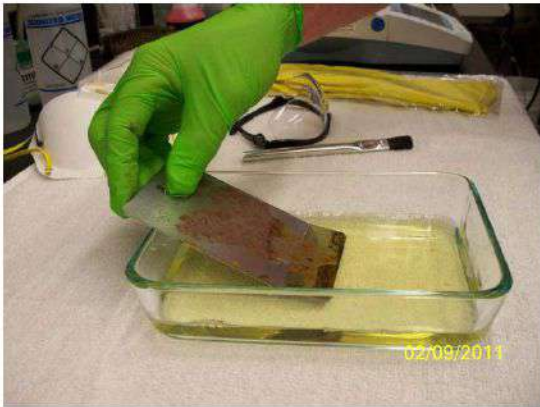
- Put on safety gear.
- Pour ample Axxaclean® 2048 Immersion Version product into a suitable glass or plastic container/bath (do not use metal). Use enough product to cover the rusty part completely.
- Work in an environment where the ambient temperature is above 50°F (10 °C) for maximum effectiveness. Alternatively, the bath can be heated to accelerate the rate of rust removal.

2.



- If necessary, remove loose rust scale with wire brush before dipping the rusty part into the Axxaclean® 2048.
- If applying Axxaclean® 2048 onto vertical surfaces, use Spray-On or Brush-On versions only.

3.



- Ensure that **fresh** Axxaclean® 2048 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® 2048 or by agitating the Axxaclean® 2048 by stirring or using a circulation pump.
- Expose as much surface area as possible to the Axxaclean® 2048 by propping-up or flipping the metal part frequently.
- Continue these actions for 5 to 15 minutes depending on the level of the rust.

4.



- Use heavy-duty scour pad (for rough surfaces) or foam melamine sponge (for smooth polished surfaces) to accelerate the removal of rust.
- Repeat immersing the part and polishing away dissolved rust until desired result is attained.

5.



- Rinse cleaned surface with water whenever possible (preferably with deionized water).
- Dry **thoroughly** using convection hot air (preferred method). Alternately, blow-dry using oil-free compressed air or wipe dry excess water with **clean** rag.
- If rinsing with water is not possible, wipe part surface with a clean rag. Pay special attention to remove excess Axxaclean® 2048 pooling in holes and recesses on the metal part.

6.



- Axxaclean® 2048 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.

1.



- Put on safety gear.
- Pour ample Axxaclean® 2048 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.



- If necessary, remove loose rust scale with wire brush before treating the part with Axxaclean® 2048. For highly polished surfaces or light rust do not use brush.

3.



- Apply a **generous amount** of Axxaclean® 2048 onto surface with a clean paint brush or rag. For larger flat surfaces a sponge paint roller brush can be used.

4.



- Ensure that **fresh** Axxaclean® 2048 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/rag in a circular motion over the Axxaclean® 2048 coated surfaces.
- Brush-on more Axxaclean® 2048 if the product appears brown. Axxaclean® 2048 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.



- Use heavy-duty scour pad (for rough surfaces) or foam melamine sponge (for smooth polished surfaces) to accelerate the removal of rust.
- Repeat applying fresh product and polishing away dissolved rust until desired result is attained.

6.



- Rinse cleaned surface with water whenever possible. (preferably with deionized water).
- Dry **thoroughly** using convection hot air (preferred method). Alternately, blow-dry using oil-free compressed air or wipe dry excess water with **clean** rag.
- If rinsing with water is not possible, wipe part surface with clean rag. Pay special attention to remove excess Axxaclean® 2048 pooling in holes and recesses on the metal part.

7.



- Axxaclean® 2048 contains 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.

RUST REMOVAL USING AXXACLEAN® 2048 SPRAY-ON VERSION

1.



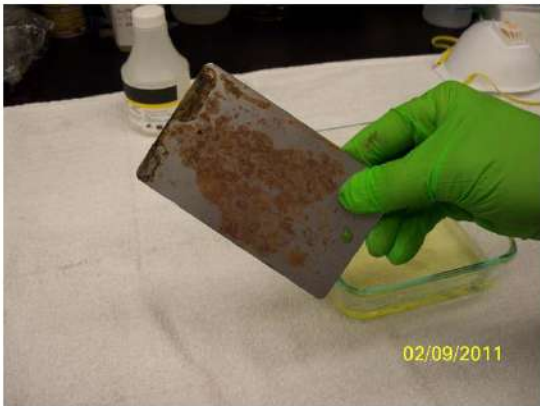
- Put on safety gear.
- Attach sprayer head onto Axxaclean® 2048 Spray-On product bottle.
- Work in an environment where the ambient temperature is above 50°F (10 °C) for maximum effectiveness.

2.



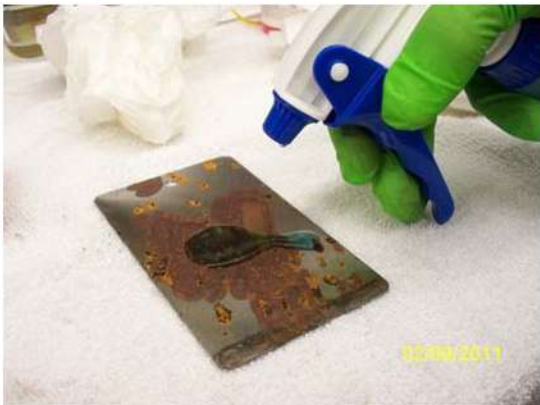
- Prime and test sprayer to ensure that it is functioning correctly.

3.



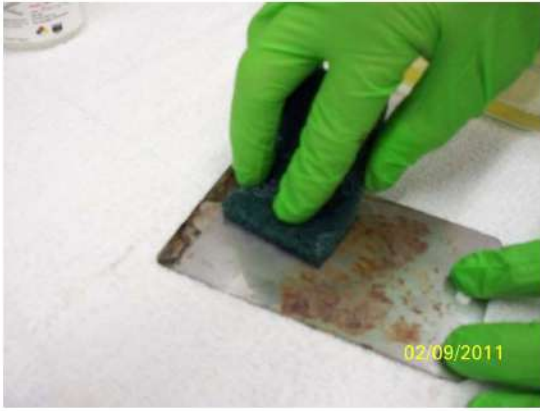
- If necessary, remove loose rust scale with wire brush before treating the part with Axxaclean® 2048. For highly polished surfaces or light rust do not use brush.

4.



- Apply a **generous amount** of Axxaclean® 2048 onto the rusty surface.

5.



- Use heavy duty scour pad (for rough surfaces) or foam melamine sponge (for smooth polish surfaces) to accelerate the removal of rust.
- Ensure that **fresh** Axxaclean® 2048 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 pad/sponge in circular motion over the Axxaclean® 2048 coated surfaces.
- Spray on more Axxaclean® 2048 if the product appears brown. Axxaclean® 2048 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.

6.



- Repeat applying fresh product and polishing away dissolved rust until desired result is attained.

7.



- Rinse cleaned surface with water whenever possible. (preferably with deionized water).
- Dry **thoroughly** using convection hot air (preferred method). Alternately, blow-dry using oil-free compressed air or wipe dry excess water with **clean** rag.
- If rinsing with water is not possible, wipe part surface with clean rag. Pay special attention to remove excess Axxaclean® 2048 pooling in holes and recesses on the metal part.

8.



- Axxaclean® 2048 contains 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.

BEST PRACTICES FOR USING AXXACLEAN® 2048 RUST REMOVERS

1. If applying Axxaclean® 2048 on vertical surfaces use Spray-On or Brush-On versions only.
2. A number of factors affect the speed of rust removal:-
 - Concentration of Axxaclean® 2048
 - Contact and dwell time with fresh chemistry
 - Temperature of the solution
 - Temperature of the part
 - Impingement or mechanical abrasion/polishing of rust being treated
 - Age of the rust
 - Oxidation state of the rust/oxide
- Fresh Chemistry: If the part is immobile in the Axxaclean® 2048 solution or the 2048 solution is not circulated, a pocket of spent chemistry will form and the rust removal process will greatly slow down.
 - TIP: Move part and/or the Axxaclean® 2048 fluid so fresh chemistry is constantly in contact with surface.
- Temperature: Apply at 50°F/10°C or above.
 - TIP: Axxaclean® 2048 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 will 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 scouring pad for medium rust and a foam melamine sponge for light rust to quickly polish away rust. Note: Use only foam melamine sponge on 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® 2048 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/literture/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.

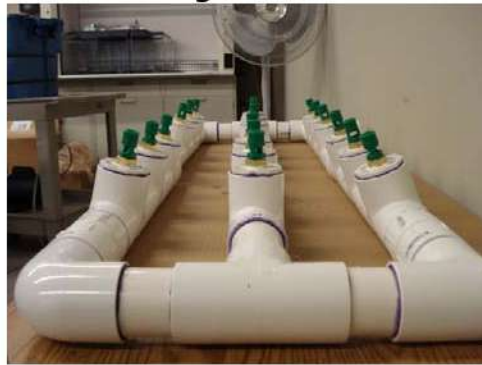
c. Important: Eductor manifolds must be completely submerged under liquid
4. OPTIONAL: Add simple fish tank heaters with built-in thermostat controls to heat the solution and speed rust removal. Do not heat above 150°F/65°C.

Photos of NTIC Lab Tank:

Side manifolds with mini educators installed



Note the angle of the eductors



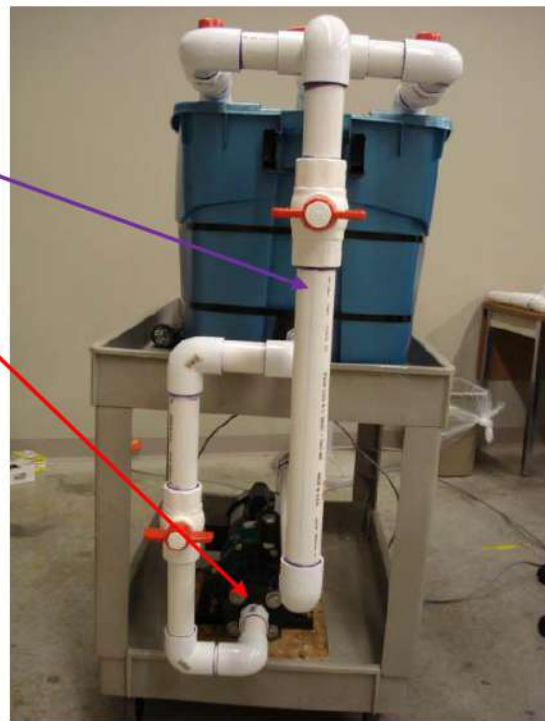
Inlet Manifolds from Pump (with Ball Valves)



Bottom manifold without mini educators

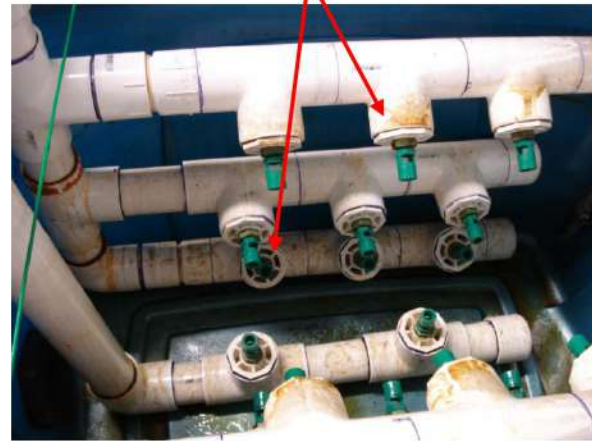
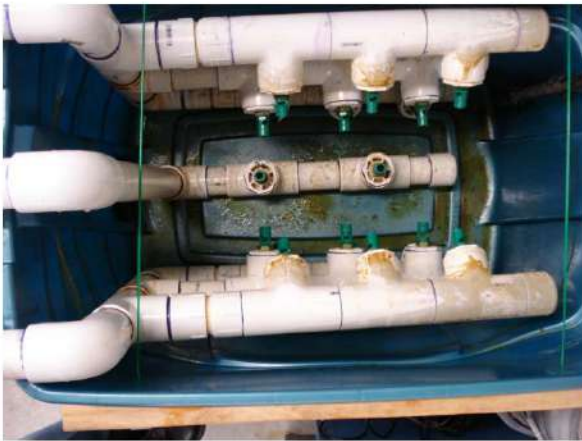


Pump delivery and return

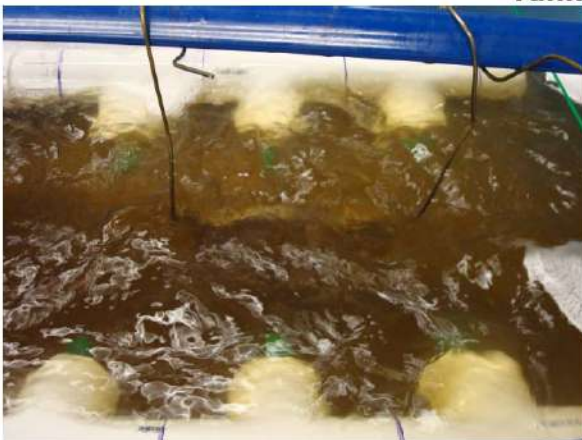


Top view of tank showing installed eductor manifolds.

Note the angle for these manifolds



Tank in operation



CONTACT INFORMATION



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Mini-Eductor Tank Mixing Nozzle



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*

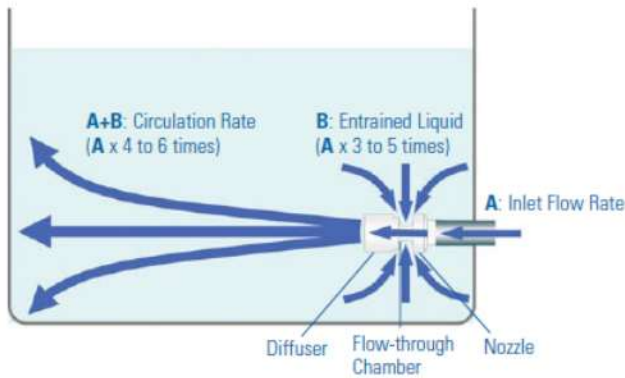
* Color coding available for polypropylene material only

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.)



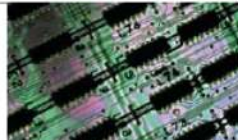
How the Mini-Eductor Works

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

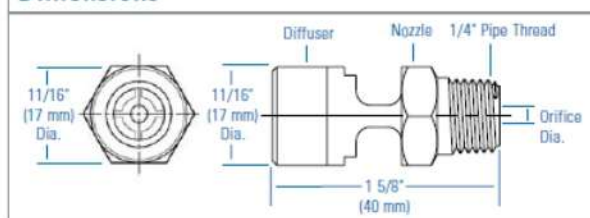
Nozzle No.	Color Code*	Orifice Dia.	Flow Rate (gpm)	Inlet Liquid Pressure (psi)							
				10	15	20	25	30	35	40	50
46550-1/4ME-1.5-PP	Orange	.059"	Inlet Flow Rate	.31	.38	.43	.49	.53	.57	.61	.68
			Circulation Rate	1.9	2.4	2.7	3.1	3.4	3.6	3.9	4.4
			Effective Flow Field** (inches)	3	4	5	6	7	7.5	9	12
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

iSpray Specify and order standard nozzles
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Spraying Systems Co.
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Spray Nozzles



Spray Control



Spray Analysis



Spray Fabrication

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Tel: 1.800.95.SPRAY Intl. Tel: 1.630.665.5000

Fax: 1.888.95.SPRAY Intl. Fax: 1.630.260.0842

www.spray.com



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