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Instruction Guide SPRAY APPLICATION OF CIM

CIM Urethanes

CIM coatings are cold, liquid-applied elastomeric coatings that rapidly cure and are seamless, abrasion, corrosion, and chemical resistant. CIM urethane can be spray applied utilizing properly configured air assisted airless spray equipment and plural component spray equipment.

Spraying Basics For Air Assisted Airless Spray Configurations

CIM products have been successfully spray applied for more than 30 years. CIM urethanes are two component, cold liquid applied systems that cure by polymerization. CIM is a relatively high viscosity coating (5,000 cps) that rapidly becomes more viscous (e.g. more difficult to pump) due to the polymerization reaction. CIM can be applied using air-assisted airless spray equipment with large diameter hoses that essentially is a low pressure, high volume approach. CIM should not be sprayed utilizing conventional spray equipment nor with standard airless spray equipment.

If an alternative (to the recommended) spray configuration is to be considered, it should adhere to the following design principles:

- Flow rates must be at least 2 gallons per minute throughout the spray period. This will require that both the lines and pump be adequately sized. We recommend that all fluid fittings and hoses be 3/4 inch or greater.
- Fluid pressure is an important consideration as material viscosity increases over time, and becomes more difficult to pump. The pump must be capable of generating a minimum of 500 psi at the gun.
- An adequate air supply (minimum 125 cfm) must be available at the pump and atomizing air line. The air supplied to the pump and gun **MUST** be dry. An inline oil/water extractor must be installed on the air supply line as close to the pump as possible.

Crew Size:

Maximum efficiency is achieved with a crew size of at least five people:

- One person mixing material.
- One person controlling pump.
- One person using spray gun.
- Two people to move staging, material, equipment and monitor environmental conditions.

Large projects or high production rates may require more personnel.

Application Rates:

Properly equipped contractors routinely spray over 10,000 square feet per day (at 55 dry mils). Production rates will vary depending upon specific job site requirements such as scaffolding needs and environmental conditions.

Recommended Equipment:

Use a hopper fed cart mounted pump for maximum efficiency. Pole guns are recommended to minimize fatigue.

Spray Pumps:

Binks® Spray System consisting of:

- (1) Binks® Comet 4L 8:1 (41-6670).
- (1) Double regulator tree small air control (41-11459).
- (1) 10 gallon hopper with one (1) inch outlet and fittings.*
- (1) Binks® model 7E2 with 45SS x 3/8F nozzle and tip.
- 100 cfm oil/water extractor (HAF-503).
- 50 feet of 3/4 inch diameter fluid hose (1,250 psi working pressure).
- 50 feet 3/8 inch diameter air hose (200 psi working pressure).

*Hopper and connections to pump intake must be made separately

Graco® Spray System consisting of:

- (1) Graco® 10:1 ratio president pump with double regulator tree (944088)
- (1) Graco® mastic gun (204,000) with 3/8 inch slotted tip (167-331).
- 100 cfm oil/water extractor
- 50 feet 3/4 inch diameter fluid hose (1,250 psi working pressure)
- 50 feet 3/8-inch diameter air hose

Compressor:

The recommended minimum air supply is 125 cfm at 100 psi. The air compressor supply line to the spray pump must be 1-inch in diameter or greater. Any air pressure fluctuation greater than 5 psi at the pump during pump operation is unacceptable and is an indication that the diameter of the air supply link is too small or the distance to the compressor is too great. The compressor should be equipped with an oil/water separator, located as close to the spray pump as possible (e.g., place separator at end of air supply line to pump).

Use a separate regulator and shut off valve for the pump and atomizing air.

Ancillary Equipment and Supplies:

- Electric power source (generator) for mixing
- Extension cords
- 1/2 inch electric drill
- 8 inch mud mixer
- CIM Mixing Timer (3-minute)
- CIM Mixing Jig
- Hudson sprayer

- Clean 5-gallon pails
- Mineral spirits and Xylene
- Plastic sheeting
- Masking tape
- Miscellaneous hand tools; trowels, scrapers, utility knives, grinders, shovels, brooms etc...

Safety Equipment:

For worker protection the following safety equipment must be available:

- Impervious rubber gloves
- Disposable Tyvek suits
- Rubber boots
- Spray hoods
- Half-mask respirators fitted with organic vapor cartridges with HEPA filters
- Safety glasses or goggles
- Soap and water
- Hand cleaner
- Supply of rags
- Squeeze bottle filled with eye wash
- Portable fire extinguisher
- First aid kit

Operating Instructions:

CIM urethanes are catalyzed and therefore require special health and safety considerations during spray operations. Before initiating a spray project, all personnel shall read and understand all applicable material safety data sheets.

1. For start-up, connect compressor supply hose to the inlet side of the oil/water separator. Connect another hose from the outlet of the oil/water separator to the inlet side of the regulator tree.
2. Connect the 3/4 inch fluid line to pump outlet and the 3/8 inch air line to the ball valve on the outlet side of the atomizing air regulator.
3. Connect other end of hoses to spray gun and tighten fittings.
4. Pour 1-2 gallons of mineral spirits into hopper. Place strainer bag (e.g., multi layers of cheese cloth) over gun outlet and place gun in hopper. Leave fluid valve open.
5. Start compressor and slowly open valve from compressor to supply hose. Check for air leaks.
6. Slowly open ball valve to air motor and adjust regulator to read 10-15 psi. The pump should be cycling slowly. Keep atomizing air ball valve closed.
7. Mineral spirits should be flowing out of gun within 30 seconds. If not, fluid hose may be plugged. Replace if necessary.
8. Re-circulate mineral spirits for 1 minute or so. Strainer bag may catch "snakes" of material and other debris from inside hose. Remove strainer bag and debris. Subsequently purge mineral spirits into clean pail for use later.
9. Close ball valve to air motor.
10. Prepare 5-gallon container of CIM per manufacturer's instructions.
11. Pour 5-gallon unit into hopper. Set pail on hopper until empty. Start mixing another 5-gallon unit

of CIM.

12. Open gun valve. Set air motor regulator at 30 psi. Slowly open ball valve to air motor.
13. Purge any remaining mineral spirits into a pail (do not spray onto surface to be coated).
14. Once mineral spirits are purged, CIM will begin to exit the spray tip. Set atomizing air regulator for 20-30 psi. Open ball valve to atomizing air.
15. Observe spray pattern and adjust atomizing air/fluid pressure as required to achieve desired affect/pattern.
16. Hopper should be emptied in 3-5 minutes maximum. If it takes longer than five (5) minutes to spray a pail of CIM, there is something wrong with the spray unit setup. Correct problem before mixing and spraying more CIM.
17. Once hopper is completely empty, pour second pail of CIM into hopper and continue. Do not add fresh CIM to older CIM still in the hopper.
18. After several pails have been sprayed, build up in the fluid line may occur. This is typically indicated by having to increase the air motor regulator pressure setting each time a new pail is sprayed in order to maintain the 3 to 4 minute per pail spray interval. If you are unable to pump five gallons of material in three to four minutes, immediately flush the system.
19. Once it is time to flush the system, pour one (1) to two (2) gallons of mineral spirits into the hopper (instead of a new unit of CIM) and continue spraying CIM material remaining in the line. As mineral spirits rich material exits the spray tip, **IMMEDIATELY** close the air motor ball valve and reduce the atomizing air pressure to one (1) to three (3) psi. Place the spray gun into the hopper, reduce the air motor pressure to 10-15 psi, open the air motor air valve to restart the pump and recirculate for one (1) minute. Pump dirty mineral spirits into a pail for disposal. Add one to two (1-2) gallons of fresh mineral spirits into hopper and recirculate for one (1) to five (5) minutes. Purge mineral spirits into separate pail (to be used as primary flush next time). Spraying of CIM may now resume.
20. When finished, flush system until clean, wipe down, hoses, hopper and gun. Leave small amount of mineral spirits in hopper outlet hose. Purge any remaining mineral spirits from fluid hose and tape ends closed.

Spray Coating Characteristics:

CIM is not paint. CIM does not spray like paint. Does not act like paint. When sprayed, CIM could be described as a splatter coat. No well-defined spray pattern is developed, although the fan tip does produce a better pattern than the round tip. Typical coating thickness is 60 mils and on horizontal surfaces unlimited film build can be achieved in a single coat, if required. On vertical surfaces, at least two 30 mil coats may be required to achieve a 60 mil thickness of CIM 800, 1000 and 1061. CIM 1000 Trowel Grade cannot be sprayed with the air assisted airless spray configuration.

Runs and sags are inherent in the coating but can be minimized by back-rolling with a phenolic core, short nap roller. Back-rolling also helps maintain a more uniform coating thickness.

In cold weather conditions (<50°F), thinner coats may be necessary in order to minimize runs and sags on vertical surfaces. Maintaining premix/activator material at 60°F or greater just prior to spraying aids in mixing and will aid in minimizing runs and sags. See Cold Weather Application Guide IG-11.

Trouble Shooting Guide

Problem	Possible Cause	Remedy
No/low fluid pressure at gun	Inadequate air supply	<ul style="list-style-type: none"> • Increase compressor size.
	Plugged fluid line or tip	<ul style="list-style-type: none"> • Increase air supply line size (1" minimum). • Plugged oil/water extractor filters. • Flush lines and guns with mineral spirits. • Replace or remove and clean tip.
	Material too viscous	<ul style="list-style-type: none"> • Increase fluid line diameter or decrease fluid line length. • In cold weather, heat material to 60°F minimum. • Begin to spray activated material within 1 minute of completion of mixing.
		<ul style="list-style-type: none"> • Ensure 5-gallon pail is sprayed in under 3 minutes (~2 gpm)
No/low atomizing air pressure	Packings are worn	<ul style="list-style-type: none"> • Replace packings
	Air mixing cap plugged with material	<ul style="list-style-type: none"> • Remove mix cap and clean. • Open atomizing air valves before fluid valves.
Pump stalls	Fluid valve at gun off while air supply to motor on.	<ul style="list-style-type: none"> • Open fluid valve at gun
Sprayed material foams	Clog or plugging in fluid line	<ul style="list-style-type: none"> • Flush fluid line and gun with mineral spirits.
	Moisture contamination	<ul style="list-style-type: none"> • Ensure oil/moisture extractors are in line and properly placed. • Check and replace filters if required. • Ensure pail lids contain no standing water when removing.
Fluid leaking around pump shaft	Worn or loose packings	<ul style="list-style-type: none"> • Tighten packing nut located in wet cup • Replace packings if necessary.

Spraying Basics for Plural Component Spray Equipment:

CIM products can be successfully sprayed with a properly configured variable ratio plural component spray system. The advantages of a plural component spray system include:

- Plural component pump can spray CIM 1000 Trowel Grade. Thicknesses of 80 + wet mils can be achieved in a single coat on vertical and overhead surfaces.
- Eliminates the need to manually mix CIM materials
- Creates a true airless pattern to limit runs and sags.
- Allows for efficient overhead spray application.
- Reduces amount of waste solvent needed to clean pump compared to an air assisted airless setup.
- Variable ratio can be used to spray all CIM elastomeric products except CIM 800.

- Reduce required crew size compared to air assisted airless spray system.

Crew Size:

Maximum efficiency is achieved with a crew size of at least three people:

- One person controlling pump.
- One person at the spray gun.
- One person tending lines.

Application Rates:

Properly equipped contractors routinely spray over 15,000 square feet per day. Production rates will vary depending upon specific job site requirements.

Recommended Equipment:

Graco Xtreme Mix Spray System consisting of:

- Graco Xtreme Mix 360 (233-857) equipped with the items listed below:
 - o Graco Viscon HP Heaters on “A” and “B” materials
 - o Graco 50ft Water Jacketed Heated Hose 7250 psi, _” X 3/8”
 - o Viscon I heater and diaphragm pump to heat and circulate water in hoses
 - o Re-circ lines from Remote Mix Manifold back to tanks
 - o Pass thru manifold at dose valves
 - o Graco XTR gun with 523 HD Rac tip (gun without screen)
 - o Graco Quick-Set Remote Mix Manifold with .032” restrictor on CIM Activator side
 - o Quick-Set mix hose, (4) 6ft _” whip hosed with (3) double 5” mixers.

Properly configured spray units can be purchased through;

EnDiSys
Attn: Dennis Dingman
14329 Northdale Boulevard
Rogers, MN 55374
763-428-5075 Ph
763-428-5078 Fax
www.endisys.com

Ancillary Equipment and Supplies

- Air Supply- 185 CFM @ 100psi
- Electrical Power- 50 amps @ 240 VAC
- Hudson sprayer
- Clean 5 gallons pails
- Mineral spirits (for clean-up and to flush whip hose and gun)
- Dioctyl Phalate (to flush activator lines)
- Plastic sheeting (to protect areas from overspray)

Safety Equipment:

For worker protection the following safety equipment must be available:

- Impervious rubber gloves
- Disposable Tyvek suits
- Rubber boots
- Spray hoods
- Half-mask respirators fitted with organic vapor cartridges with HEPA filters
- Safety glasses or goggles
- Soap and water
- Hand cleaner
- Supply of rags
- Squeeze bottle filled with eye wash
- Portable fire extinguisher
- First aid kit

Operating Parameters;

Dynamic Fluid Pressure -	3500 psi
Mix Manifold "A" Side Restrictor	None
Mix Manifold "B" Side Restrictor	.032"
Static Mixers w/ disposable elements	(3) double 5" – 12 element
"A Premix" Temp	130°F – 140°F
"B Activator" Temp	100°F-110°F

Consult Graco literature for proper application and troubleshooting instructions.