

# NS Cylinder Spray Adhesive - User's Guide

Technical Manual

November 2017

## NS Cylinder Spray Adhesives

Is a full line of industrial-grade bulk spray adhesives, prepackaged in convenient, portable, and no-maintenance aerosol cylinders.

### Manual Content:

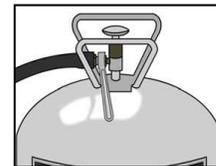
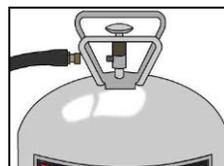
1. Equipment Set Up
2. Application Temperature
3. Surface Preparation
4. Handling/Application Information
  - Directions for Use
  - Spraying Adhesive
    - Spray Distance
    - Spray Angle
    - Application Speed
  - Adjusting Spray Pattern
  - Changing Nozzles
  - Coverage
  - Dry Time
  - Open Time – Bonding Range
  - Bonding
5. Shut Down
6. Storage
7. Cylinder Changeover
8. Cylinder Disposal/Return
9. Cylinder Sizes
10. Equipment List (Part Numbers & UPC Numbers)

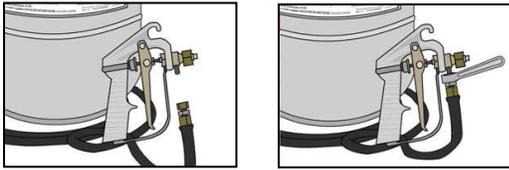


**Precaution: Before performing any task, wear appropriate Personal Protective Equipment (PPE). Consult product Safety Data Sheet for PPE recommendations.**

## 1. Equipment Set Up

<sup>1</sup>Attach the larger flare fitting end of the hose to the spray applicator and <sup>2</sup>tighten the nut securely. <sup>3</sup>Check to see that the applicator gun trigger stop/adjusting nut is fully locked against the trigger. <sup>4</sup>Attach the other end of the hose, the smaller flare fitting, to the cylinder valve and <sup>5</sup>tighten securely.





Figures 1-5: Proper set up procedure for a cylinder adhesive.

## 2. Application Temperature

For best results, the temperature of the adhesive and the surfaces being bonded should be between 60°-80°F (16°-27°C). Temperatures outside this range may affect bonding range and sprayability.

## 3. Surface Preparation

For best results, all surfaces to be bonded must be clean, dry and free from dirt, dust, oil, loose paint, wax or grease, etc.

## 4. Handling/Application Information

### Directions for Use:

1. Slowly open the cylinder valve and inspect the connections for any leaks. Tighten if needed.
2. Fully open the valve.
3. Unscrew the trigger stop/adjusting nut away from the trigger 3-4 turns and spray a test pattern. For more adhesive output, continue to screw the nut away from the trigger. For less adhesive output, screw the nut back towards the trigger.
4. Hold the applicator 3-10 inches away from the surfaces to be sprayed and apply a uniform coat of adhesive. (The smaller the spray pattern chosen in step 3 the closer the applicator gun will need to be to the surface and vice versa for larger patterns.)
5. Apply 1-3 even coats of adhesive. (This will depend on the needed coverage for the bonding application.)
6. Allow adhesive to dry until tacky and then apply sufficient pressure to ensure complete contact.

**Note:** Wear disposable nitrile gloves to test for tackiness by gently touching the adhesive with your knuckle. If the adhesive transfers to your gloves, it is too wet. If the adhesive is aggressively tacky and does not transfer to your gloves, it is ready to bond. If the adhesive is dry or only has a very light tack it is too dry and another coat of adhesive should be applied to at least one of the surfaces.

### Spraying Adhesive

Spray patterns will vary depending on product due to variations in formulations and cylinder pressure. Ambient temperatures may also have an effect. Higher temperatures may increase solubility of the adhesive and create greater pressure in the cylinder causing an increase in spray width. Colder temperatures will typically cause a decrease in the cylinders pressure resulting in smaller spray widths. See figures 6-13 below for information on spray technique.

**Spray Distance:** Unscrew the trigger stop/adjusting nut away from the trigger 3-4 turns and spray a test pattern. The best distance is where the pattern is the widest. For more adhesive output and a wider spray pattern, continue to unscrew the nut away from the trigger. For less output and smaller spray pattern, screw the adjusting nut back towards the trigger. Hold the applicator 3-10 inches away from the surfaces to be sprayed and apply a uniform coat of adhesive. The smaller the spray pattern the closer the applicator gun will need to be to the surface.

Lace Spray Adhesives form an elliptical pattern and should be sprayed at the patterns<sup>6</sup>widest point.

Pebble Spray Adhesives form more of a continuous triangular pattern that gets larger as you continue to move the applicator from the surface being sprayed.

Mist Spray Adhesives also have the more triangular pattern, like the pebble, but will have considerably more overspray.

<sup>7</sup>Spraying from too close may cause an excess of adhesive to be deposited creating a wet film or puddling. <sup>8</sup>Spraying from too far away may cause a “cobwebbing” of the adhesive and many open areas that have no adhesive coverage at all.

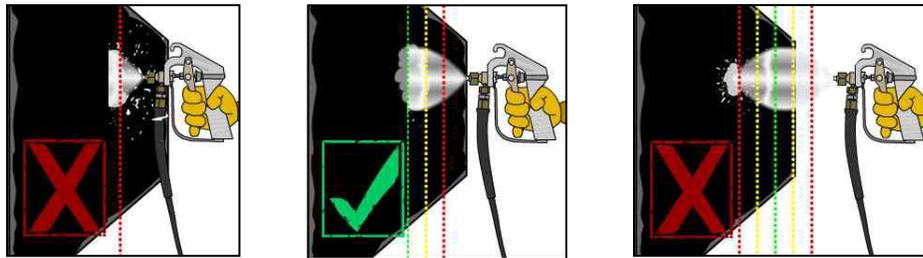
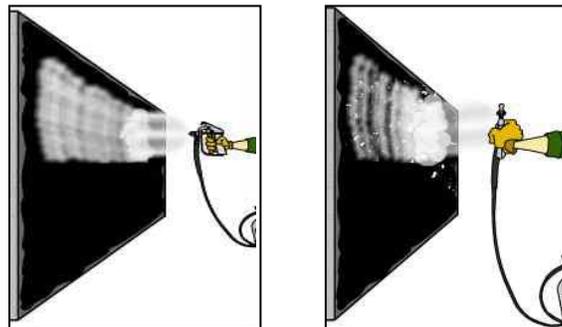


Figure 6-8: Determining proper distance from substrate when spraying with a cylinder spray adhesive.

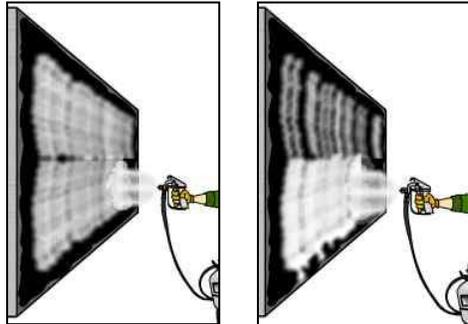
Spray Angle: For best results, <sup>9</sup>maintain a 90° angle, between the surface and the applicator gun. This is done by moving the applicator parallel to the spray surface and keeping the wrist in a fixed position, moving at a constant rate. <sup>10</sup>Poor coverage with inconsistent bond strength may be seen if the wrist is turned, as the spray distance (see notes above) will constantly be changing.



Figures 9-10: For best results when spraying, maintain a 90° angle between the surface and the applicator gun.

Application Speed: <sup>11</sup>Maintaining a constant speed that is delivering between 80-90% adhesive coverage per pass is optimal. Applications requiring more adhesive should be achieved with multiple coats not heavier coats.

- <sup>12</sup>Spraying too fast may result in inadequate adhesive coverage.
- <sup>12</sup>Spraying too slow may cause an excessive amount of adhesive to be deposited creating a wet film or puddling.



Figures 11-12: Maintain a constant speed while spraying that is delivering between 80-90% adhesive coverage.

#### Adjusting Spray Pattern:

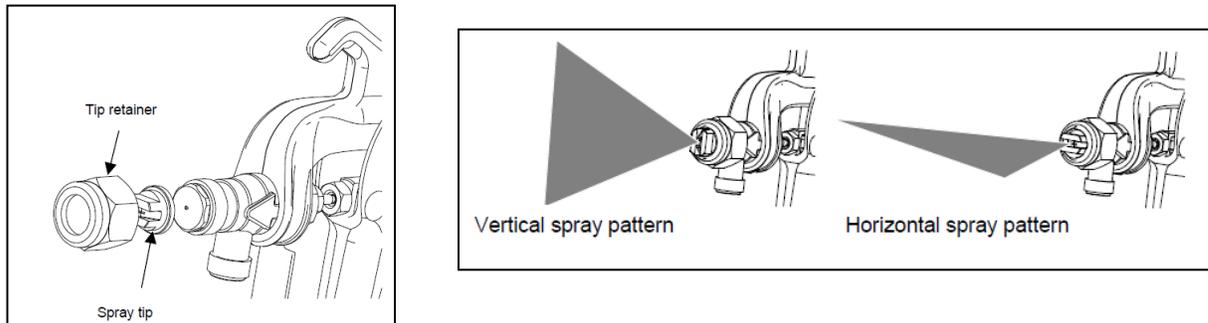
- Adhesive formula cannot be adjusted in the cylinder system.
- Trigger Stop/Adjusting Nut can be adjusted to dial the spray pattern width from a range dependent upon the selected spray tip - smaller pattern (opened a little), larger pattern (continued further opening in the counter clockwise direction).
- Spray distance, spray angle and application speed can and should be adjusted for optimal spray pattern. See notes above on spray distance, spray angle and application speed.
- Surface to be bonded should be understood. The porosity, soak-in properties, and surface texture may warrant spraying from a distance that is typically not optimal. Example: It is possible that spraying from a further distance could allow for more adhesive to sit up higher on the surface of a rough substrate.
- Spray Tip selection should be based on the application needs. Most of the spray tips have a number associated with them, for example: 9501, 4001, 250050. The first two numbers represent a spray angle and the rest of the numbers represent an orifice size. A QSS tip is a much higher output tip and should only be used with a few of our products. Different adhesives may have different capabilities.
- Most cylinders are to be used with a standard output applicator gun. However, certain products (refer to product TDS), with a higher internal pressure, are to be sprayed using a reduced output applicator gun, denoted as “H-gun” for “high pressure”. (See section 10 below.)
- For application of certain products (refer to product TDS) at high volume and wide widths, the Cylinder Adhesive Applicator High Output with QSS Tip is available. (See section 10 below.)

Table 1: Spray pattern width estimates by spray tip size. These numbers should be considered representative only.

Tip	250050	4001	650050	6501	9501	QSS
Spray Width Range	1 – 3”	2 – 6”	3 – 8”	3 – 8”	5 – 12”	5 – 15”

Changing Nozzles: To change tips, <sup>14</sup>unscrew the tip retainer completely, remove the tip and replace with the alternate tip. <sup>15</sup>Adjust the orientation for the desired pattern direction and retighten the retainer nut. 1

Note - <sup>16</sup>Trigger stop/adjusting nut should always be fully screwed forward against the trigger to prevent accidental discharge of adhesive material when making spray tip adjustments.



Figures 14-15: Method for changing spray tips or orienting vertical/horizontal spray patterns.

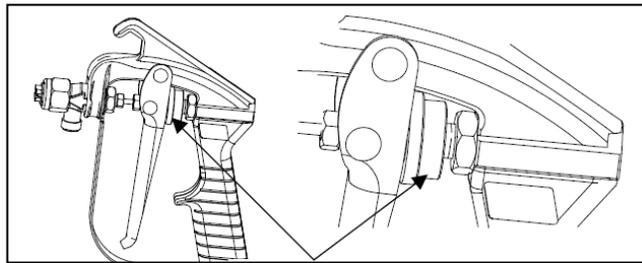


Figure 16: Trigger stop should always be fully closed when changing or modifying spray tips.

**Coverage:** Coverage yield is dependent on spray technique. Coverage for light weight bonding may be 0.5–1.0 grams (of dried adhesive) per square foot but more typically 2.0-3.0 grams per square feet is needed. Coverage yield can be estimated by multiplying the net weight (grams) of adhesive by the percent solids in the adhesive and then dividing by the intended coverage to be used.

**Dry Time:** This is the time needed after applying the adhesive before a bond should be made.

**Note:** Wear disposable nitrile gloves to test for tackiness by gently touching the adhesive with your knuckle. If the adhesive transfers to your gloves, it is too wet. If the adhesive is tacky and does not transfer to your gloves, it is ready to bond. If the adhesive is dry or only has a very light tack it is too dry and another coat of adhesive should be applied to at least one of the surfaces.

**Open Time – Bonding Range:** This is the time immediately following the dry time and extending until the adhesive has very little to no tack. This can be tested using the above noted knuckle test. Different products have different Open Times and the individual products Technical Data Sheet should be referenced.

**Bonding:** Substrates should be joined during the adhesives Open Time. Applying sufficient and uniform pressure is very important for ensuring strong and lasting bonds.

## 5. Shut Down

Shut the trigger stop/adjusting nut all the way to the trigger lock position (Figure 16). The cylinder valve can be either left open or closed. An open valve is best for minimizing potential for drying adhesive in the hose. A closed valve is best for protecting against inadvertent connection leaks. Another option would be to shut off the valve and then purge the remaining adhesive in the hose to completely empty the hose before shutting the trigger stop/adjusting nut all the way.

## 6. Storage

The units can be stored in the Shut Down modes referenced above or, if for longer periods of time, shut down with removal of the hose. To take the hose off, shut off the valve and then purge the remaining adhesive in the hose out to completely empty the hose. It is a good idea to shake the hose while purging the hose (particularly with 60CA, 94CA, 94ET). Once empty, slowly loosen the connection of the hose and cylinder by turning the wrench counter clockwise until it comes off. Replace the original valve cap onto the cylinder. The hose should be cleaned with a solvent to make sure any adhesive residue remaining on the walls of the hose does not settle and clog.

## 7. Cylinder Changeover

When cylinders are near empty, the adhesive spray will start to spit and sputter indicating it is time to change to a new cylinder. To change cylinders, use the long term storage technique mentioned above to get the hose off the old cylinder. Immediately attach the hose onto the new cylinder by connecting the flare fitting to the cylinder valve and tightening securely. Slowly open the cylinder valve and inspect the connections for leaks. Tighten if needed. Fully open the valve.

## 8. Cylinder Disposal/Return

For disposable cylinders, mini and large, *use extreme caution*. Empty cylinder completely. Puncture the friable disc on the cylinder using a non-spark producing tool. Dispose of the scrap metal in accordance with local regulations.

For returnable cylinders, intermediate and jumbo, follow the four step process per the label on the cylinder:

1. Collect 1 or more empty Intermediate or Jumbo cylinders.
2. Prepare the 3M stock number (62-xxxx-xxxxx), quantity being returned, pickup address, contact name, and phone number.
3. Call the number on the cylinder (1-877-262-6079) and speak directly to an empty cylinder return specialist.
4. The empty cylinder return specialist will collect information and arrange the pickup.



## 9. Cylinder Sizes

Not all products are available in every size. Check with sales or distribution for specific size availability.



Size	Width (inches)	Height (inches)	Empty Weight (pounds)
<b>Mini</b>	7.5	15	3.7
<b>Large</b>	12.2	17.6	10.8
<b>Intermediate</b>	15	47	75
<b>Jumbo*</b>	24	45	225

\*Jumbo has pallet legs attached that are 29 inches wide with 9 inch center block

## 10. Equipment List

	3M™ Cylinder Spray Adhesive Applicators and Accessories	3M ID Numbers	UPC Numbers
Applicators	Cylinder Adhesive Applicator w/ 9501 tip	62-9880-9930-5	00-048011-61706-0
	Cylinder Adhesive Applicator H Reduced Output w/ 4001 tip	62-9880-9950-3	00-051115-25039-2
	Cylinder Adhesive Applicator High Output w/ QSS tip	62-9880-9960-2	00-051111-07329-2
	Cylinder Adhesive Applicator EX w/ 18" Extension and 9501 tip	62-9880-9940-4	00-051115-25779-7
Hoses	Cylinder Adhesive 6' Hose	62-9880-0006-3	00-051115-25036-1
	Cylinder Adhesive 12' Hose	62-9880-0012-1	00-048011-61988-0
	Cylinder Adhesive 25' Hose	62-9880-0025-3	00-048011-61989-7
	Cylinder Adhesive 50' Hose	62-9880-0050-1	00-051115-25782-7
Tips	Cylinder Adhesive 250050 Spray Tip	62-9880-8133-7	00-051115-25780-3
	Cylinder Spray Adhesive 4001 Spray Tip	62-9880-4001-0	00-048011-61990-3
	Cylinder Spray Adhesive 650050 Spray Tip	62-9880-8173-3	00-051115-25781-0
	Cylinder Spray Adhesive 6501 Spray Tip	62-9880-6501-7	00-048011-61991-0
	Cylinder Spray Adhesive 9501 Spray Tip	62-9880-9501-4	00-048011-61707-7
Fittings	Cylinder Adhesive QSS Spray Tip	62-9880-8148-5	00-048011-61993-4
	Cylinder Adhesive T-Fitting	62-9880-8348-1	00-048011-61987-3
	Cylinder Adhesive Hose Swivel	62-9880-7948-9	00-048011-61992-7

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Address with the business team or Lab/Tech/PRL the question from another review re: the “Knuckle test”

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