

Spray Tip Sizes and Product Usage

Spray tip orifice size is a key item to pay attention to when applying Carlisle HVAC sprayable products, whether you are spraying Spray-Seal™, RS-100 or RE-500. It is always important to follow the manufacturer's instruction and utilize the minimum (or larger) spray orifice size recommended. The particle size within the sprayable duct sealant is key to the manufacturer choosing a tip size. The maximum particle size seen within the product will set the minimum recommended tip size. With the airless sprayers being used in the HVAC industry to apply sprayable duct sealants typically rated up to 3300 PSI, the sprayer can force the sprayable product through an orifice smaller than the minimum recommended size. In addition to clogging, using a smaller orifice size can shear the components within the sprayable sealant being applied, which can lead to product failure.

First, we will break down what information is in the naming convention on spray tips. Spray tips will typically be referred to as a three-digit number. This three-digit number contains the width of the spray pattern and the actual orifice size the product is being sprayed through.

The first digit multiplied by two is the actual spray pattern width you will see with the gun held 12" from the surface you are spraying. For example, a 111 spray tip will have a 2"-wide fan pattern, whereas a 511 spray tip will have a 10"-wide fan pattern. The width of the fan pattern you choose depends on where you are sealing the duct system.

Exterior

If you are sealing the exterior of a duct system you will want to use a narrow fan pattern. This is because you are required to seal the transverse joints, longitudinal seams and duct wall penetrations. Using a narrow fan pattern tip will allow for good control with minimal overspray and in turn minimizes the amount of product required to seal the duct system.

Interior

If you are sealing the interior of a duct system you will want to use a wide fan pattern. This is because you need to coat the entire surface of the duct system, which will catch your transverse joints, longitudinal seams and any duct wall penetrations. The wider fan pattern tip will allow the applicator to cover the larger open areas of the duct quickly and give a uniform coating throughout the entire duct system.

In many cases, the fan pattern width is based on preference of the applicator and what they are most comfortable with.



The last two digits in the three-digit spray tip number is the orifice size in thousandths of an inch. Therefore, a 111 tip has an 11-thousandths orifice size in the spray tip, while a 121 tip has a 21-thousandths orifice size in the spray tip. The orifice size in the spray tip determines the amount of product you will spray. This is defined in gallons of product per minute flowing through the orifice. The chart below shows the flow rate by orifice size. The applicator can use this flow rate in conjunction with the sprayable product packaging size to determine the length of time the product can be sprayed before the container is emptied.

- An 11-thousandths orifice supplies the sprayable product at a rate of 0.12 gallons per minute. With a 5-gallon pail of product, the applicator could spray for almost 42 consecutive minutes.
- A 21-thousandths orifice supplies the sprayable product at a rate of 0.47 gallons per minute. With a 5-gallon pail of product the applicator could spray for almost 11 consecutive minutes.

Controlling the amount of product applied is directly tied to the orifice size. In the example shown, using the 21-thousandths orifice, the applicator would use approximately four times the amount of product compared to the 11-thousandths orifice, because the product is spraying out four times faster. This is where the appropriate combination of product usage, application speed, and job quality meet. Controlling the product application speed will allow you to perform a higher quality job with a better first sealing of the system while also minimizing product cure time and speeding up the job.

Orifice Size – inches (thousandths)

Fan Size	0.01	0.009	0.011	0.013	0.015	0.017	0.019	0.021	0.023	0.025	0.027	0.029	0.031	0.033	0.035
2-4		109	111	113	115		119	121							
4-6	207	209	211	213	215	217	219	221	223	225					235
6-8	307	309	311	313	315	317	319	321	323	325	327		331		
8-10		409	411	413	415	417	419	421	423	425	427	429		433	435
10-12		509	511	513	515	517	519	521	523	525	527	529	531	533	535
12-14		609	611	613	615	617	619	621	623	625	627	629	631	633	635
14-16								721	723	725		729			735
16-18					815	817	819	821			827		831	833	835
18-20						917									935
Flow Rate (gpm)		0.09	0.12	0.18	0.24	0.31	0.38	0.47	0.57	0.67	0.77	0.9	1.03	1.17	1.31



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