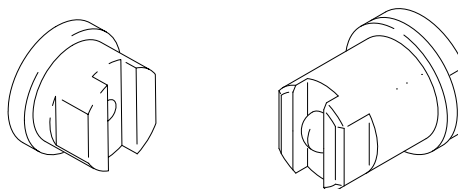




## TUNGSTEN CARBIDE

# “Silver” and “Contractor” Flat Spray Tips

**WARNING**

Use extreme caution when cleaning or changing spray tips. If the spray tip clogs while spraying, engage the gun safety latch immediately. ALWAYS follow the **PRESSURE RELIEF PROCEDURE**, right, and then remove the spray tip to clean it.

NEVER wipe off build-up around the spray tip until the pressure is fully relieved and the trigger safety latch is engaged.

ALWAYS have the tip guard in place on the spray gun when spraying.

**Medical Alert—Airless Spray Wounds**

If any fluid appears to penetrate your skin, get **EMERGENCY MEDICAL CARE AT ONCE. DO NOT TREAT AS A SIMPLE CUT.** Tell the doctor exactly what fluid was injected.

**Note to Physician:** Injection in the skin is a traumatic injury. It is important to treat the injury surgically as soon as possible. **Do not delay treatment to research toxicity.** Toxicity is a concern with some exotic coatings injected directly into the blood stream. Consultation with a plastic surgeon or reconstructive hand surgeon may be advisable.

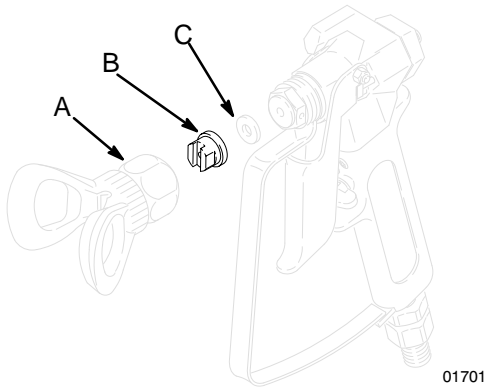
**Pressure Relief Procedure**

To reduce the risk of serious bodily injury, including fluid injection, always follow this procedure when installing, cleaning or changing spray tips.

1. Engage the trigger safety latch.
2. Shut off the power supply to the pump and close any bleed-type master air valves.
3. Disengage the trigger safety latch. Hold a metal part of the gun firmly to the side of a grounded metal pail, and trigger the gun to relieve pressure.
4. Engage the trigger safety latch.
5. Open the pressure drain valve (required in system), having a container ready to catch the drainage. Leave the valve open until you are ready to spray again.

***If you suspect that the spray tip or hose is completely clogged, or that pressure has not been fully relieved after following the steps above, VERY SLOWLY loosen the tip guard retaining nut or hose end coupling to relieve pressure gradually, then loosen completely. Now clear the tip or hose.***

# Installation



2. Flush and prime the sprayer before installing the spray tip, and then follow the **Pressure Relief Procedure**, page 1.
3. Install the tip (B) in the tip guard (A), and then install a gasket (C). Screw the assembly firmly onto the gun, and then use a wrench to finish tightening it.

**NOTE:** Failure to install a gasket will result in leaking.

1. Select the appropriate tip for your application. See pages 4, 6 and 7.

4. Test and adjust your spray pattern on cardboard or paper before regular spraying.

# Troubleshooting

## To Avoid Tip Clogging

1. Strain all material before spraying.
2. Remove the tip and clean it in a compatible solvent at least twice daily and during any lengthy interruption in spraying. Blow dry with air after cleaning. See page 3.

## To Prolong Tip Life

Use only enough fluid pressure needed to produce the desired atomization and pattern. Try using a larger tip instead of increasing pressure to improve pattern.

Problem	Cause	Solution
Bad spray pattern	Tip is dirty	Clean as described above or replace
Rough spray pattern	Tip is worn	Replace tip
Fluid is spitting from tip	Tip is chipped near orifice	Replace tip
No orifice	Tip is worn	Replace tip
Significant pressure drop at gun, and poor spray pattern	The main fluid filter or inline fluid filter (if used) is clogged	Clean or replace filter elements
Spray pattern for a fine finish tip is irregular	Paint has dried between the pre-orifice component and carbide tip	Clean tip as described

# Standard Tip Maintenance

## If the Tip Clogs While Spraying

1. Follow the **Pressure Relief Procedure** on page 1.
2. Remove the tip and soak it in clean solvent. Use a fine bristled brush (Graco P/N 101-891 and 101-892) to remove paint particles.
3. If necessary, apply air to the front of the tip using an air blow gun to blow out the obstruction, or tap the back of the tip against a flat surface to jar it out.

4. If the tip is still clogged, insert a fine pin, such as a safety pin, into the rear of the tip. **Do not to use a pin that is too large for the orifice.** Rotate the pin to dislodge the obstruction. Use the pin to carefully scrape any dried paint from the fan width in front. Blow out the tip with compressed air.

### WARNING

When using compressed air to clear a clogged tip, limit the air pressure to 30 psi (2.1) bar and wear appropriate eye protection.

# Fine Finish “FF” Tip Maintenance

## If the Tip Clogs While Spraying

1. Follow the **Pressure Relief Procedure** on page 1.
2. Remove the tip and put it in clean solvent. If soaking doesn't dissolve the obstruction, continue with Step 3.
3. Apply air to the front of the tip using an air blow gun to blow out the obstruction, or tap the back of the tip against a flat surface to jar it out.

### WARNING

When using compressed air to clear a clogged tip, limit the air pressure to 30 psi (2.1) bar and wear appropriate eye protection.

4. If the tip is still clogged, disassemble and clean it as instructed below.

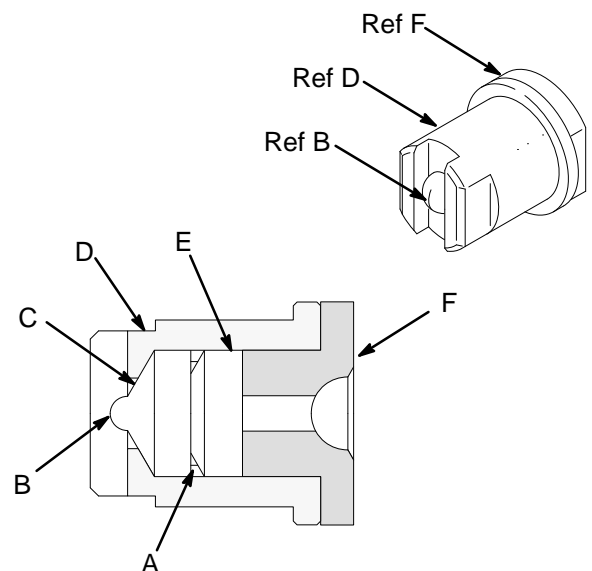
## Disassemble and Clean

**NOTE:** Disassemble and clean each tip separately to avoid mixing parts of different size tips.

1. Hold the tip housing (D) with one wrench and unscrew the tip retainer (F) using a 1/2" open end wrench.
2. Disassemble the tip.
3. Soak the parts in a clean compatible solvent. Then scrub with a fine bristled brush to remove paint particles (Graco P/N 101-891 and 101-892).
4. Check the tip orifice (B). If it is clogged, try clearing it by blowing air through the front of the insert using an air blow gun.

## Reassemble

1. Place the V-slotted orifice (B) in the tip housing (D).
2. Push the flat side of the gasket (A) into the tip housing (D) and against the flat back side of the V-slotted orifice (B).
3. Push the rear insert (E) into the body and against the gasket.
4. Align the V-slot of the front orifice (B) with the slot in the tip housing (D). Replace the tip retainer (F) and tighten snugly into place. **DO NOT OVERTIGHTEN.** The PTFE gasket (A) requires only moderate tension to seal effectively.

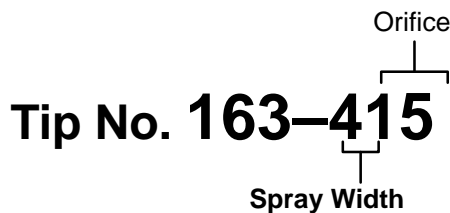


# How to Select a Spray Tip

## Spray Tip Dimensions Determine Capability

Selecting the proper spray tip is one of the most important parts of airless spraying. The tip determines the application rate and spray fan width. The tip part number gives valuable information about its capability.

**Orifice Size** determines how many gallons per minute can be atomized through the airless spray tip. The last two digits of the part number tell the Orifice Size in thousandths of an inch. In this example, the orifice is .015" (0.381 mm)



**Spray Width** is based on spraying 12 in. (305 mm) from the surface. Double the fourth digit of the tip part number to determine the approximate minimum Spray Width in inches. Add two inches to that number for maximum width. In this example, this tip size produces a 8–10" (203 – 254 mm) spray pattern at 12" (305 mm) from the surface.

## General Tip Selection Information

This is a general guideline to help you select a tip. Your Graco distributor should be your final source of information, however. He can recommend a tip based on his experience with an application like yours, or he can help you conduct a test.

1. Determine the maximum flow rate of your spray system. Your spray system (sprayer or pump and power source) must be sized adequately to support the flow rate of the tip you select.
2. Determine the material(s) to be sprayed and the desired flow rate. If your pump is supporting more than one gun, add together the flow rate needed for each gun.

3. Determine the required orifice size on the tip chart. If the total maximum flow rate(s) is compatible with your spray system, select the desired fan width and then order the tip number given in the adjacent column.

## General Tip Recommendations

The following tips give good results with the most commonly used architectural and maintenance coatings. For the best results spraying on flat surfaces, an 8–10" or 10–12" (203 – 254 or 254 – 305 mm) spray fan width is recommended.

See pages 6 and 7 for the complete selection of airless spray tips.

Low Viscosity Material	Orifice Size In Inch (mm)	Silver Tip Number	Contr. Tip Number	Fan Width 12" (305 mm) from Spray Tip In Inch (mm)
Lacquer Varnish Enamel Shellac Primers Etc.	.011" (.280)	163-311 163-411 163-511	269-311 269-411 269-511	6-8" (152-203) 8-10" (203-254) 10-12" (254-305)
	.013" (.330)	163-313 163-413 163-513	269-313 269-413 269-513	6-8" (152-203) 8-10" (203-254) 10-12" (254-305)
	.015" (.381)	163-315 163-415 163-515	269-315 269-415 269-515	6-8" (152-203) 8-10" (203-254) 10-12" (254-305)

With the above tips use a 100 mesh filter screen

Medium Heavy Viscosity Material	Orifice Size In inch (mm)	Silver Tip Number	Contr. Tip Number	Fan Width 12" (305 mm) from Spray Tip In inch (mm)
Vinyls Acrylics Latex, Alkyds Oil Base Ext. Stain Etc.	.017" (.432)	163-317 163-417 163-517	269-317 269-417 269-517	6-8" (152-203) 8-10" (203-254) 10-12" (254-305)
	.019" (.483)	163-319 163-419 163-519	269-319 269-419 269-519	6-8" (152-203) 8-10" (203-254) 10-12" (254-305)

With the above tips use a 60 mesh filter screen

# Tip Record

It may be helpful to keep a chart of the various tips you use to help make your future selections easier.

Type of Spray System	Material Sprayed	Tips Used	Flow Rate			Surface Finish		
			Good	Low	High	Good	Fair	Poor

# Spray Tip Charts

## Silver Fine-Finish Spray Tips 3000 psi (207 bar) MAXIMUM WORKING PRESSURE

ORIFICE <i>inch</i> <i>(mm)</i>	.008 (.203)	.010 (.254)	.012 (.305)	.014 (.356)	.016 (.406)	.018 (.457)	.020 (.508)	.022 (.559)	.024 (.610)	.026 (.660)	.028 (.711)	.030 (.762)	.032 (.813)
FAN WIDTH <i>inch</i> <i>(mm)</i>	When ordering these tips, use the prefix <b>163-</b> before the three digit number below.												
2-4 (51-102)	108	110											
4-6 (102-152)	208	210	212	214	216	218			224				232
6-8 (152-203)		310	312	314	316	318	320	322	324				432
8-10 (203-254)	408	410	412	414	416	418	420		424	426	428	430	
10-12 (254-305)		510	512	514	516	518	520	522	524	526	528	530	
12-14 (305-356)		610	612	614	616	618	620	622	624	626	628		
14-16 (356-406)			712	714	716	718				726			
16-18 (406-457)				814	816	818	820	822	824	826	828		832
18-20 (457-508)				914		918		922	924	926			
Flow Rate <i>gpm</i> <i>(lpm)</i>	.069 (.26)	.11 (.41)	.15 (.59)	.21 (.79)	.27 (1.04)	.35 (1.32)	.43 (1.63)	.52 (1.97)	.62 (2.34)	.73 (2.75)	.84 (3.19)	.97 (3.66)	1.1 (4.16)

## Contractor Spray Tips 5000 psi (235 bar) MAXIMUM WORKING PRESSURE

ORIFICE <i>inch</i> <i>(mm)</i>	.011 (.280)	.013 (.330)	.015 (.381)	.017 (.432)	.019 (.483)	.021 (.533)	.023 (.584)	.025 (.635)	.027 (.686)	.031 (.787)	.035 (.889)
FAN WIDTH <i>inch</i> <i>(mm)</i>	When ordering these tips, use the prefix <b>269-</b> before the three digit number below.										
4-6 (102-152)	211	213	215	217	219						
6-8 (152-203)	311	313	315	317	319						
8-10 (203-254)	411	413	415	417	419	421					
10-12 (254-305)	511	513	515	517	519	521	523	525	527	531	
12-14 (305-356)		613	615	617	619	621	623		627	631	635
14-16 (356-406)			715	717		721					
16-18 (406-457)			815		819	821				831	
Flow Rate <i>gpm</i> <i>(lpm)</i>	.13 (.49)	.18 (.69)	.24 (.91)	.31 (1.17)	.39 (1.47)	.47 (1.79)	.57 (2.15)	.67 (2.54)	.78 (2.96)	1.03 (3.9)	1.31 (4.98)

NOTE: Flow rate is established with water at 2000 psi (138 bar) at the tip. Spray pattern width is measured at 12 in. (305 mm) from the nozzle to the work surface and is based on paint with a viscosity of 20 sec. #4 Zahn cup, spraying at 1600 psi (110 bar). Pattern width will vary with different viscosities and pressure.

# Spray Tip Charts

Standard Silver Spray Tips 5000 psi (345 bar) MAXIMUM WORKING PRESSURE

ORIFICE <i>inch</i> <i>mm</i>	.007 (.178)	.009 (.228)	.011 (.280)	.013 (.330)	.015 (.381)	.017 (.432)	.019 (.483)	.021 (.533)	.023 (.584)	.025 (.635)	.027 (.686)	.029 (.737)	.031 (.787)	.033 (.838)	.035 (.889)	.037 (.940)	.039 (.991)	.041 (1.04)	.043 (1.09)
FAN WIDTH <i>inch</i> (mm)	When ordering these tips, use the prefix <b>163</b> – before the three digit number below.																		
2–4 (51–102)	107	109	111	113	115	117	119	121											
4–6 (102–152)	207	209	211	213	215	217	219	221	223	225	227	229	231	233	235		239		
6–8 (152–203)	307	309	311	313	315	317	319	321	323	325	327	329	331	333	335	337	339	341	343
8–10 (203–254)	407	409	411	413	415	417	419	421	423	425	427	429	431	433	435	437	439	441	443
10–12 (254–305)		509	511	513	515	517	519	521	523	525	527	529	531	533	535	537	539	541	543
12–14 (305–356)		609	611	613	615	617	619	621	623	625	627	629	631	633	635	637	639	641	643
14–16 (356–406)			711	713	715	717	719	721	723	725	727	729	731	733	735	737	739	741	743
16–18 (406–457)				813	815	817	819	821	823	825	827	829	831	833	835	837	839	841	843
18–20 (406–508)						917	919	921	923	925	927	929	931	933	935		939		943
Flow <i>gpm</i> Rate ( <i>lpm</i> )	.053 (.20)	.087 (.33)	.13 (.49)	.18 (.69)	.24 (.91)	.31 (1.17)	.39 (1.47)	.47 (1.79)	.57 (2.15)	.67 (2.54)	.78 (2.96)	.90 (3.42)	1.03 (3.90)	1.17 (4.42)	1.31 (4.98)	1.47 (5.56)	1.63 (6.18)	1.80 (6.83)	1.99 (7.51)

ORIFICE <i>inch</i> (mm)	.045 (1.14)	.047 (1.19)	.049 (1.24)	.051 (1.29)	.053 (1.35)	.055 (1.40)	.057 (1.45)	.059 (1.50)	.061 (1.55)	.063 (1.60)	.065 (1.65)	.067 (1.70)	.069 (1.75)	.071 (1.80)	.073 (1.85)	.075 (1.90)	.077 (1.95)	.079 (2.00)	.081 (2.06)
FAN WIDTH <i>inch</i> (mm)	When ordering these tips, use the prefix <b>163</b> – before the three digit number below.																		
2–4 (51–102)																			
4–6 (102–152)																			
6–8 (152–203)	345	347	349	351		355	357	359											
8–10 (203–254)	445	447	449	451		455	457	459	461	463	465	467	469	471	473	475	477	479	481
10–12 (254–305)	545	547	549	551	553	555	557	559	561	563	565	567	569	571	573	575			
12–14 (305–356)	645	647	649	651		655	657	659	661	663	665	667	669	671		675			
14–16 (356–406)		747	749	751	753	755	757	759	761	763	765	767		771					
16–18 (406–457)	845	847	849	851					861	863	865	867		871					
18–20 (457–508)																			
Flow <i>gpm</i> Rate ( <i>lpm</i> )	2.17 (8.23)	2.37 (8.98)	2.58 (9.76)	2.79 (10.6)	3.02 (11.4)	3.25 (12.3)	3.49 (13.2)	3.74 (14.1)	3.99 (15.1)	4.26 (16.1)	4.53 (17.2)	4.82 (18.2)	5.11 (19.3)	5.41 (20.5)	5.72 (21.7)	6.04 (22.9)	6.36 (24.1)	6.70 (25.4)	7.04 (26.7)

# The Graco Warranty and Disclaimers

## WARRANTY

Graco warrants all equipment manufactured by it and bearing its name to be free from defects in material and workmanship on the date of sale by an authorized Graco distributor to the original purchaser for use. As purchaser's sole remedy for breach of this warranty, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment proven defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

This warranty does not cover, and Graco shall not be liable for, any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-Graco component parts. Nor shall Graco be liable for malfunction, damage or wear caused by the incompatibility with Graco equipment of structures, accessories, equipment or materials not supplied by Graco, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Graco.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Graco distributor for verification of the claim. If the claimed defect is verified, Graco will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor and transportation.

## DISCLAIMERS AND LIMITATIONS

The terms of this warranty constitute purchaser's sole and exclusive remedy and are in lieu of any other warranties (express or implied), **including warranty of merchantability or warranty of fitness for a particular purpose**, and of any non-contractual liabilities, including product liabilities, based on negligence or strict liability. Every form of liability for direct, special or consequential damages or loss is expressly excluded and denied. In no case shall Graco's liability exceed the amount of the purchase price. Any action for breach of warranty must be brought within two (2) years of the date of sale.

## EQUIPMENT NOT COVERED BY GRACO WARRANTY

Graco makes no warranty, and disclaims all implied **warranties of merchantability and fitness for a particular purpose**, with respect to accessories, equipment, materials, or components sold but not manufactured by Graco. These items sold, but not manufactured by Graco (such as electric motor, switches, hose, etc.) are subject to the warranty, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

# Manual Change Summary

This manual has been changed to remove information on the 205-085 the Silver Round Pattern Spray Tip, which is obsolete.

**Sales Offices:** Atlanta, Chicago, Dallas, Detroit, Los Angeles, Mt. Arlington (N.J.)  
**Foreign Offices:** Canada; England; Korea; Switzerland; France; Germany; Hong Kong; Japan

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