



Air Nozzles and Jets



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Engineered Air Nozzles and Jets reduce noise levels and air costs.

"Go Green" by upgrading your blowoff, cooling and drying operation to the award-winning Super Air Nozzles!



What Are Air Nozzles and Jets?

A simple solution to reduce excessive air consumption and noise levels on compressed air blowoff operations. EXAIR Air Nozzles and Jets produce outlet flows up to 25 times compressed air consumption using a small amount of compressed air as the power source. Many power companies now provide attractive rebates to plants who switch to engineered Super Air Nozzles!

Why Air Nozzles and Jets?

Air savings, compared to open copper tubes or pipes commonly used for blowoff, can be as high as 80%. Less compressed air means less noise. The typical noise level reduction is 10 dBA. All EXAIR Air Nozzles and Jets meet Occupational Safety and Health Administration (OSHA) maximum dead end pressure and sound level exposure requirements and carry the CE mark.

An open 1/4" (6mm) copper tube, by contrast, ejects pure compressed air at up to 40 SCFM (1,133 SLPM), the entire output of a 10 horsepower compressor. Annual energy cost can exceed \$1,000 per year. Noise levels in excess of 100 dBA are commonly produced. When supply pressure exceeds 30 PSIG (2 BAR), an open pipe, tube or drilled holes violates OSHA static pressure requirements.



Flexible Stay Set Hoses™ are ideal where frequent repositioning of air nozzles is required.



This PEEK material Atto Super Air Nozzle was chosen because of its non-marring quality for a blowoff application on a sensitive lens.

Applications

- Part cleaning
- Chip removal
- Part drying
- Liquid blowoff
- Part cooling
- Material conveying
- Part ejection
- Fiber conveying
- Air assist

Advantages

- Reduced compressed air cost
- 10 dBA average noise reduction
- Conserve compressed air
- Improved blowoff performance
- Compact
- Improved safety
- Meets OSHA noise level requirements
- Meets OSHA pressure requirements
- Improved production

Safe And Efficient Use Of Compressed Air

The inefficient use of compressed air for blowoff applications may create problems due to the energy costs, noise level and potential danger to personnel who are exposed to high pressure air. Open air pipes, copper tubes and drilled pipes are a few of the common abusers. They consume tremendous amounts of energy and often produce noise levels over 100 dBA.

Open Air Pipe or Copper Tube



Turbulent compressed air blasts straight out of the pipe or tube. It not only wastes huge amounts of compressed air but also violates OSHA noise and dead end pressure requirements.

Reduce Energy Costs

The best way to cut energy costs is through proper maintenance and use of the compressed air system. Leaks and dirty filters require maintenance on a regular basis. Energy savings can also be realized when replacing outdated compressor motors and controls with high efficiency models that often pay for themselves in a short period of time.

The most important factor to dramatically boost efficiency is proper use. Using engineered products like EXAIR's Super Air Nozzles can cut operating costs since they use only a fraction of the compressed air of typical blowoffs. In addition, all of the Air Nozzles and Jets shown in this catalog can be cycled on and off with an instantaneous response. EXAIR's EFC (shown on page 7) is an electronic flow control that limits compressed air use by turning on the air only when a part is present.

Reduce Noise Levels

High noise levels are a common problem for many plants. Compressed air noise often exceeds OSHA noise level exposure requirements, resulting in hearing loss to those working in close proximity. Noisy blowoffs at 80 PSIG (5.5 BAR) that produce noise levels of 100 dBA can be reduced to only 74 dBA when using a Super Air Nozzle. At that pressure, it is still possible to obtain hard-hitting force without the high noise.

OSHA Maximum Allowable Noise Exposure

Hours per day (constant noise)	8	7	4	3	2	1	0.5
Sound level dBA	90	91	95	97	100	105	110

OSHA Standard 29 CFR - 1910.95 (a)

Eliminate Harmful Dead End Pressures

Air can be dangerous when the outlet pressure of a hole, hose or copper tube is higher than 30 PSIG (2 BAR). In the event the opening is blocked by a hand or other body part, air may enter the bloodstream through the skin, resulting in a serious injury. All of the Air Nozzles and Jets manufactured by EXAIR have been designed for safety. All are safe to be supplied with higher pressure compressed air and meet OSHA Standard 29 CFR 1910.242(b).

Air Consumption of Open Tube And Pipe

Pressure Supply		Air Consumption of Homemade Blowoffs						
PSIG	BAR		Copper Tube			Open Pipe		
			1/4"	5/16"	3/8"	1/8"	1/4"	3/8"
80	5.5	SCFM	33	58	87	70	140	240
		SLPM	934	1,641	2,462	1,981	3,962	6,792

Air Nozzles
& Jets

Saving Money and Compressed Air

The table above shows the air consumption for typical homemade blowoffs. The pages that follow give the air consumption and other data on EXAIR's Air Nozzles and Jets.

Consider the following example where a Model 1102 Mini Super Air Nozzle replaces an 1/8" open pipe. The compressed air savings is easy to calculate and proves to be dramatic. Payout for Air Nozzles and Jets, including filter and installation cost is measured in weeks - not years, as is the case for other cost reduction equipment. Based on a 40 hour work week, 52 weeks a year.

Example:

- Existing blowoff is 1/8" open pipe at 80 PSIG (5.5 BAR) supply. Air consumption, from the table above, is 70 SCFM (1,981 SLPM).
- Use a 1/8 FNPT Model 1102 Mini Super Air Nozzle also at 80 PSIG (5.5 BAR) supply. Air consumption, from the table on page 54, is 10 SCFM (283 SLPM).
- Compressed air saved = 70 - 10 = 60 SCFM (1,981 - 283 = 1,698 SLPM)
- For this example, the blowoff is continuous. If the duty cycle was 20%, then air saved would be 60 x .2 = 12 SCFM (1,698 x .2 = 340 SLPM).
- Most large plants know their cost per 1,000 standard cubic feet of compressed air (10,000 standard liters). If you don't know your actual cost per 1,000 SCF, \$0.25 is a reasonable average to use. (Cost per 10,000 standard liters is approximately \$0.089.)
- Dollars saved per hour = SCFM saved x 60 minutes x cost/1,000 SCF (SLPM saved x 60 min x cost/10,000 SL) = 60 x 60 x \$0.25/1,000 (= 1,698 x 60 x \$0.089/10,000) = **\$0.90/hour**
= **\$0.90/hr. is \$36.00/week and**
= **\$1,872.00/year savings for One nozzle!**

How Air Nozzles Work



Air Nozzles use the Coanda effect to amplify compressed airflow up to 25 times or more. As illustrated on the left, compressed air (black arrows) is ejected through a series of nozzles on the outer perimeter. As the air travels along the outer wall of the nozzle, surrounding air (blue arrows) is entrained into the stream. The airstream that results is a high volume, high velocity blast of air **at minimal consumption**. The air is always ejected so it can vent safely, **well below OSHA dead end pressure requirements**, should the nozzle end be blocked.

Selecting The Right Air Nozzle

EXAIR manufactures a wide selection of Air Nozzles and Jets, which are divided into two groups. The first group includes Air Nozzles and Jets that deliver force up to 22 ounces (624 grams) and are suitable for most applications. The second group includes Air Nozzles that produce high force up to 23 lbs (10.43 kg) where additional reach and force are required.

- **Type 303 Stainless Steel-** high temperatures and corrosive environments. Max temp 800°F (426°C)
- **Type 316 Stainless Steel-** high temperatures, corrosive environments, and mechanical wear. Max temp 1000°F (538°C)
- **Brass-** general purpose applications. Max temp 400°F (204°C)
- **Zinc aluminum alloy-** general purpose applications. Max temp 250°F (121°C)
- **PEEK-** replaces metals in harsh environments. Offers chemical resistance, non-marring. Max temp 320°F (160°C)

Air Nozzles And Jets Comparison (sorted by compressed air consumption at 80 PSIG (5.5 BAR))

Model	Material	Description	Inlet	Air Consumption		Force		Sound Level dBA	More Details
				SCFM	SLPM	Ozs	Grams		
1108SS	Stainless Steel - Type 316	Atto Super Air Nozzle	M4 x 0.5	2.5	71	2.0*	57	58	p. 55
1108-PEEK	PEEK (Plastic)	Atto Super Air Nozzle	M4 x 0.5	2.5	71	2.0*	57	58	p. 55
1108SS-NPT	Stainless Steel - Type 316	Atto Super Air Nozzle	1/8 MNPT	2.5	71	2.0*	57	58	p. 55
1108-PEEK-NPT	PEEK (Plastic)	Atto Super Air Nozzle	1/8 MNPT	2.5	71	2.0*	57	58	p. 55
1109SS	Stainless Steel - Type 316	Pico Super Air Nozzle	M5 x 0.5	4.9	139	5.0*	142	68	p. 55
1109-PEEK	PEEK (Plastic)	Pico Super Air Nozzle	M5 x 0.5	4.9	139	5.0*	142	68	p. 55
1109SS-NPT	Stainless Steel - Type 316	Pico Super Air Nozzle	1/8 MNPT	4.9	139	5.0*	142	68	p. 55
1109-PEEK-NPT	PEEK (Plastic)	Pico Super Air Nozzle	1/8 MNPT	4.9	139	5.0*	142	68	p. 55
1110SS	Stainless Steel - Type 316	Nano Super Air Nozzle	M6 x 0.75	8.3	235	8.1*	230	75	p. 55
1110-PEEK	PEEK (Plastic)	Nano Super Air Nozzle	M6 x 0.75	8.3	235	8.1*	230	75	p. 55
1110SS-NPT	Stainless Steel - Type 316	Nano Super Air Nozzle	1/8 MNPT	8.3	235	8.1*	230	75	p. 55
1110-PEEK-NPT	PEEK (Plastic)	Nano Super Air Nozzle	1/8 MNPT	8.3	235	8.1*	230	75	p. 55
1001	Brass	Safety Air Nozzle	1/8 FNPT	10	283	9*	255	78	p. 60
1102	Zinc Aluminum alloy	Mini Super Air Nozzle	1/8 FNPT	10	283	9*	255	71	p. 56
1102-PEEK	PEEK (Plastic)	Mini Super Air Nozzle	1/8 FNPT	10	283	9*	255	71	p. 56
1102SS	Stainless Steel - Type 316	Mini Super Air Nozzle	1/8 FNPT	10	283	9*	255	71	p. 56
1103	Zinc Aluminum alloy	Mini Super Air Nozzle	1/8 MNPT	10	283	9*	255	71	p. 56
1103SS	Stainless Steel - Type 316	Mini Super Air Nozzle	1/8 MNPT	10	283	9*	255	71	p. 56
1126	Zinc Aluminum alloy	1" Flat Super Air Nozzle	1/8 FNPT	10.5	297	9.8†	278	75	p. 57
1126SS	Stainless Steel - Type 316	1" Flat Super Air Nozzle	1/8 FNPT	10.5	297	9.8†	278	75	p. 57
1010SS	Stainless Steel - Type 303	Micro Air Nozzle	1/8 MNPT	13	368	12*	340	80	p. 55
1009	Aluminum	Adjustable Air Nozzle	1/8 MNPT	13	368	12**	340	79	p. 60
1009SS	Stainless Steel - Type 303	Adjustable Air Nozzle	1/8 MNPT	13	368	12**	340	79	p. 60
1100	Zinc Aluminum alloy	Super Air Nozzle	1/4 FNPT	14	396	13*	369	74	p. 56
1100-PEEK	PEEK (Plastic)	Super Air Nozzle	1/4 FNPT	14	396	13*	369	74	p. 56
1100SS	Stainless Steel - Type 316	Super Air Nozzle	1/4 FNPT	14	396	13*	369	74	p. 56
1101	Zinc Aluminum alloy	Super Air Nozzle	1/4 MNPT	14	396	13*	369	74	p. 56
1101SS	Stainless Steel - Type 316	Super Air Nozzle	1/4 MNPT	14	396	13*	369	74	p. 56
1002	Brass	Safety Air Nozzle	1/4 FNPT	17	481	16*	454	80	p. 60
1002SS	Stainless Steel - Type 303	Safety Air Nozzle	1/4 FNPT	17	481	16*	454	80	p. 60
1003	Brass	Safety Air Nozzle	3/8 FNPT	18	509	18*	510	83	p. 60
6019	Brass	Adjustable Air Jet	1/8 MNPT	18	509	16***	454	83	p. 61
6019SS	Stainless Steel - Type 303	Adjustable Air Jet	1/8 MNPT	18	509	16***	454	83	p. 61
6013	Brass	High Velocity Air Jet	1/8 MNPT	22	622	20†	567	82	p. 61
6013SS	Stainless Steel - Type 303	High Velocity Air Jet	1/8 MNPT	22	622	20†	567	82	p. 61
1122	Zinc Aluminum alloy	2" Flat Super Air Nozzle	1/4 FNPT	22	622	22†	624	77	p. 57
1122SS	Stainless Steel - Type 316	2" Flat Super Air Nozzle	1/4 FNPT	22	622	22†	624	77	p. 57
1144	Zinc Aluminum/Steel	2" Super Air Scraper	1/4 FNPT	22	622	22†	624	77	p. 57
1004SS	Stainless Steel - Type 316	Back Blow Air Nozzle	M4 x 0.5	4.5	127	NA	NA	75	p. 59
1006SS	Stainless Steel - Type 316	Back Blow Air Nozzle	1/4 FNPT	22	622	NA	NA	80	p. 59

For High Force Air Nozzles, see page 63.

* Force measured at 12" (305mm) from target.

** Force measured at 12" (305mm) from target with a .008" (0.20mm) factory setting.

*** Force measured at 12" (305mm) from target with a .006" (0.15mm) factory setting.

All sound levels measured at 3 feet (914mm).

All measurements taken at 80 PSIG (5.5 BAR).

† Force measured at 12" (305mm) from target with a .015" (0.38mm) shim installed.

FNPT = NPT Female
MNPT = NPT Male.