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## Choosing a safe efficient blow gun

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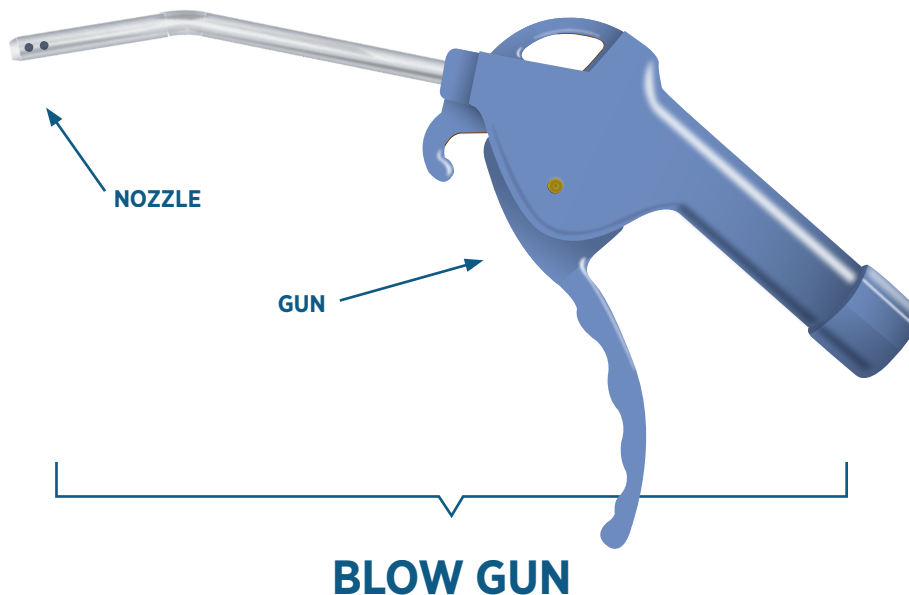
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# CHOOSING A SAFE, EFFICIENT BLOW GUN

## TECHNICAL GUIDE RF-867



## 1 WHAT IS A BLOW GUN?

A blow gun consists of a nozzle, or tip, installed on a compressed air gun or line. On an air gun, the nozzle serves as a quick and efficient tool for light cleaning, drying and blowing off of parts or work areas. On an air line, it can be used to blow out parts or waste, or to dry out parts in an automated manufacturing process.

This technical guide covers the use and features of different blow nozzles installed on air guns.<sup>1</sup>

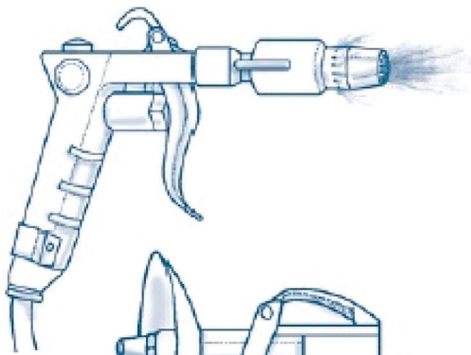
## 2 WHAT ARE THE HAZARDS OF USING A BLOW GUN?

- 1. Noise** made by blasts of compressed air can reach very high levels. It can cause occupational hearing loss, make communicating difficult and increase the risk of accidents.
- 2. Particles** projected into the air or contained in compressed air can cause irritation, sores or infections if they get into your eyes or penetrate your skin.
- 3. If compressed air** gets into your body through your mouth, nose, ear or skin, it can cause serious injury, such as a ruptured esophagus or eardrum, sudden, permanent hearing loss or even a pulmonary embolism.

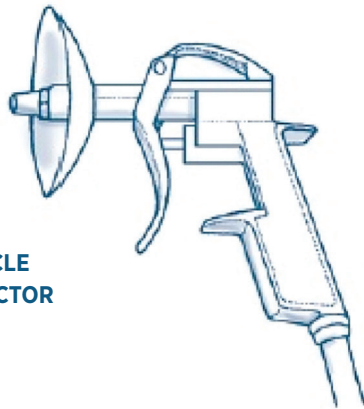
<sup>1</sup> All features apply to properly installed nozzles in good condition.

**TWO TYPES OF SHIELDS, INSTALLED NEAR THE NOZZLE MOUTH, CAN PROTECT AGAINST FLYING PARTICLES.**

#### COMPRESSED-AIR SHIELD



#### PARTICLE DEFLECTOR



## 3

# WHAT IS A SAFE BLOW GUN?

Section 326 of the *Regulation respecting occupational health and safety* stipulates that the pressure of compressed air used for cleaning shall be less than 200 kPa. A blow gun is said to be “safe” when the air pressure measured at the nozzle, when the nozzle is blocked, or dead-ended, does not exceed 200 kPa. This pressure limit helps to reduce the risk of particles or air getting through the skin.

**To meet this requirement, you can:**

- ▶ Use a blow gun that lets air escape through other openings when the end is blocked
- ▶ Install a valve upstream that limits pressure on the air line to less than 200 kPa
- ▶ Use an air gun with an integrated pressure regulator that limits outlet pressure to less than 200 kPa at all times

### Caution!

**Safe does not mean without danger.** Even use of a “safe” blow gun involves hazards from flying particles and very high noise levels. Personal protective equipment, such as safety goggles with side shields, gloves, face shields and hearing protection, is still required.

To reduce noise, choose one of the quieter models available on the market. One model may be a lot less noisy than another, but still provide the same thrust.

To protect yourself against flying particles, you can use a blow gun that creates an air shield or install a protective shield (deflector) that keeps particles from flying back toward you (see illustration at left).

**To make conversion easier, in this document we have taken 200 kPa to be equivalent to 30 psi.**

# 4

## CHOOSING A BLOW GUN

**AN EXPLANATORY VIDEO WILL SOON BE AVAILABLE ON THE IRSST WEBSITE. IT WILL SHOW THE VARIOUS TYPES OF BLOW GUNS, HIGHLIGHT THEIR DIFFERENCES AND HELP YOU MAKE AN INFORMED DECISION ABOUT WHICH ONE TO CHOOSE.**

Cost and thrust are often the two key points in choosing a blow gun. You do not always need maximum thrust. For some jobs, blowing power should take a back seat to precision.

The table *Choosing a nozzle* sets out the main features of each model and the jobs each is suited for. You can also refer to the *Répertoire des silencieux, soufflettes et pistolets aspirateurs*, which is far more exhaustive.

- ▶ [\*Répertoire des silencieux, soufflettes et pistolets aspirateurs\*](#) [directory of compressed-air mufflers, blow guns and vacuum guns] (IRSST)

If no data are available on the blow gun you are thinking of buying, the information provided by the manufacturer can be useful. Ask if you can try the gun out before you buy.

Here are some other publications containing information on choosing and using a blow gun.

- ▶ An explanatory video will soon be available on the IRSST website.
- ▶ [\*Réduire les risques reliés à l'utilisation du jet d'air comprimé\*](#) [reducing the risks associated with using compressed air] (ASPHME)
- ▶ [\*Cleaning with Compressed Air\*](#) (PRÉVENTEX)
- ▶ [\*Équipements et outils pneumatiques: Dangers et mesures de prévention #75\*](#) [compressed-air equipment and tools: hazards and safety precautions] (APSAM)

**Take the time to choose a blow gun that is:**

- ▶ **SAFE**
- ▶ **RIGHT FOR THE JOB**
- ▶ **AS QUIET AS POSSIBLE**

# 5

## CHOOSING A NOZZLE

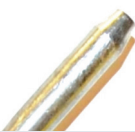

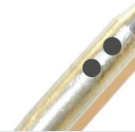



1. Determine what job you have to do.
2. Choose the nozzle best suited to the job, taking into account the noise it will make and the thrust you'll need.

In this table:

- ▶ a **low noise** level means below 80 dBA
- ▶ a **moderate noise** level means between 80 dBA and 84 dBA
- ▶ a **high noise** level means 85 dBA or higher

Thrust<sup>1</sup> (in grams) can be

- ▶ low – less than 300 g
- ▶ moderate – from 300 g to 599 g
- ▶ high – 600 g or higher

TYPES OF NOZZLES					
Straight	Star-shaped coanda	Safe straight	Flat	High-flow coanda	Venturi
					
Simplest form of nozzle. Dead-end pressure is equal to upstream pressure of delivery line. <b>Caution:</b> <i>Must be used with a regulator preset to 200 kPa.</i>	Central cone with several side openings. Air flows through these openings.	Similar to straight nozzle, but tube has one or more side openings, or with a built-in pressure regulator.	Useful for blowing air over large surfaces or creating an air curtain.	Larger-diameter central cone with several side openings. Amplifies air flow.	Large-diameter nozzle with large-diameter side openings. Uses less compressed air.
LOW	LOW	MODERATE	MODERATE	MODERATE TO HIGH	HIGH
LOW	MODERATE	LOW TO MODERATE	MODERATE	MODERATE	LOW
++	+++	++	+	+	+
++	++	++	+	+++	++
+	+	+	+++	+	++
+	++	+	+	+++	++
++	+++	++ 1/2			

Results taken from R. Oddo, C. Simard and A. Noureddine (2012) *Mise à jour du répertoire des silencieux, soufflettes et pistolets aspirateurs*, IRSST, R-612, 54 pages.

Each type of nozzle has its own features. Noise levels can vary, depending on the job and the work method. During testing, air pressure was 620.5 kPa (90 psi).

Blowing was done out in the open, free of any obstacles.

<sup>1</sup> Refers to pressure exerted by air on a 20 cm diameter disk at a distance of 8 cm.

## 6

# ALTERNATIVES TO BLOW GUNS

### Vacuum gun

To prevent particles from being thrown and made airborne, **compressed-air vacuum guns** offer an alternative to blow guns. They can be used to clean surfaces and parts by sucking up dust. They are also an efficient way to remove dust from clothing.

### Brush

Blow guns are not designed for **in-depth cleaning**, such as removing grease or oil from a mechanical part. Using a brush is safer and more effective.

### Any other cleaning method

The *Regulation respecting occupational health and safety* states that the upkeep of the work premises of an establishment shall be ensured through vacuuming, wet mopping or any other method that controls and reduces to a maximum the stirring up of dust (s. 17). The use of compressed air is one of the hazards that must be controlled in the workplace. The regulation therefore gives priority to the use of a wet mop or an industrial vacuum for cleaning workplaces.

### REGULATION RESPECTING OCCUPATIONAL HEALTH AND SAFETY – A REMINDER

- ▶ Any establishment the operation of which is likely to emit noise at the auditory level of workers shall be operated [...] so that the noise measured at any work station does not exceed the standards [...] for any time period indicated therein (s. 130).
- ▶ Hand tools and portable power tools shall be appropriate for the job for which they are intended and be used solely for the purposes for which they were designed (s. 227).
- ▶ It is prohibited to clean a person with compressed air (s. 325).
- ▶ The pressure of compressed air used for the cleaning of a machine or piece of equipment shall be less than 200 kPa, unless the cleaning is carried out in an enclosure specially designed for abrasive air blasting and equipped with a vacuum system (s. 326).



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