

TOPRING



COMPRESSED AIR HAZARDS

Understand the risks. Implement the right solutions.

CLEANING WITH COMPRESSED AIR
NOISE
ACCIDENTAL START-UPS
OVERPRESSURE
HOSE WHIP
WORKSTATION ERGONOMICS
CONDENSATE MANAGEMENT



CLEANING WITH COMPRESSED AIR: A COMMON TASK WITH SERIOUS HAZARDS



HAZARDS

- > Eye injuries
- > Skin punctures
- > Respiratory problems
- > Hearing damage
- > Blocked blood vessel
- > Skin tearing
- > Subcutaneous air bubbles
- > Air embolism
- > Cardiovascular injury



The law prohibits directing compressed air from a blow gun at a person, including yourself. Using a blow gun to clean the body or clothing is therefore strictly prohibited — even though this practice remains far too common.

Blowing with compressed air also disperses contaminants into the air, increasing exposure risks. In addition, airborne particles can cause injuries; using a protective shield and safety glasses is therefore recommended.

A blow gun is considered safe when the dead-end pressure does not exceed 30 PSI and it is equipped with a pressure-relief nozzle or a shut-off mechanism in the event of blockage.

Refer to the requirements of your local jurisdiction (e.g., CNESST, OSHA) or the Canadian Centre for Occupational Health and Safety (CCOHS) for more information on the safe use of compressed air.



PRACTICAL SOLUTIONS

EQUIPMENT CLEANING BY AIR BLOWING

Safety blow guns (S60)



EQUIPMENT CLEANING BY VACUUMING

Gun-type or drum-type vacuum cleaners (S67)



CLOTHING CLEANING BY VACUUMING

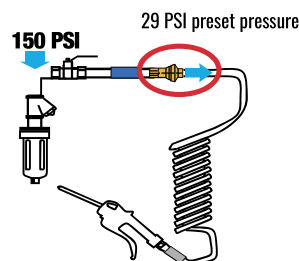
Personal cleaning unit (S66)



29 PSI PRESET PRESSURE REGULATOR (S62)

When the blow gun is not equipped with an integrated safety device, the air supply itself can be controlled directly.

- ✓ Maintain a safe pressure
- ✓ Prevent overpressure
- ✓ Reduce air consumption



NOISE: AN INVISIBLE HAZARD WITH PERMANENT CONSEQUENCES

Noise in industrial environments is everywhere... and often underestimated. Yet prolonged exposure can cause **irreversible hearing damage** without immediate warning signs.

Certain compressed air applications — such as blow guns or air exhausts — can quickly exceed safe noise levels.



REGULATIONS

In Canada, the occupational noise exposure limit is generally set at **85 dB over an 8-hour period**. Above this limit, employers must implement measures to protect workers, including the use of hearing protection.

However, some experts recommend taking action **as early as 75 dB to 82 dB** to help prevent long-term effects.

HAZARDS

- > Permanent hearing loss
- > Reduced concentration and alertness
- > Cumulative exposure (noise levels compound rather than simply add up)
- > Misleading perception of "continuous" noise



**PROLONGED EXPOSURE TO NOISE CAUSES
IRREVERSIBLE HEARING DAMAGE.**

PRACTICAL SOLUTIONS

NOISE REDUCTION AT THE SOURCE (PRIORITY)

Pneumatic mufflers (S86)



Low-noise blow guns < 85 dB (S60)



Air amplifiers and air knives (S68)



Cold air guns with integrated silencer (S68)



ACCIDENTAL START-UPS: AN UNPREDICTABLE HAZARD

An unexpected repressurization of a compressed air system can cause a tool or piece of equipment to start suddenly during servicing or maintenance, exposing workers to serious injury risks.

Even when the air supply is disconnected, compressed air can remain trapped inside the system. This residual pressure does not release on its own and may cause equipment to move unexpectedly when a worker believes the installation is safe.



REGULATIONS

In Canada, CSA Z460 governs the control of hazardous energy and outlines the requirements for lockout and other energy isolation methods.

It is important to consult the regulations in effect in your province to determine the requirements applicable to your situation.

In the United States, lockout is governed by OSHA standard 1910.147.



HAZARDS

- > Unexpected start-up of a tool or piece of equipment
- > Presence of invisible residual pressure
- > Injuries during servicing or maintenance
- > Increased risks when working on an isolated system

A SHUT DOWN SYSTEM IS NOT NECESSARILY SAFE.

PRACTICAL SOLUTIONS

EQUIPMENT LOCKOUT

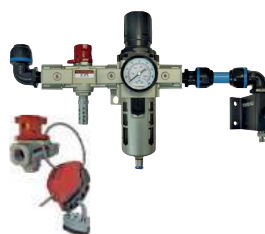
Ball valves with locking handle (S07, 08 and 65)



Exhaust lockout valves with locking handle (S08 and 65)



Lockable shut-off and exhaust valves for filter, regulator and lubricator units (S50, 51 and 52)

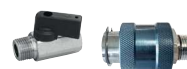


SAFE ISOLATION OF THE SYSTEM

Soft start valves (S51)



Slide valves and miniature ball valves (S65)



Pneumatic piloted valves for remote access (S08)



ELIMINATION OF RESIDUAL PRESSURE

In-line preset pressure regulators with automatic pressure relief (S62)



OVERPRESSURE: A SILENT HAZARD WITH MAJOR CONSEQUENCES

Overpressure occurs when system pressure exceeds the actual requirements of tools and equipment.

Each component is designed to operate at a specific pressure. Exceeding this limit can compromise the safety, performance, and service life of the installation.



REGULATORY FRAMEWORK

Equipment must be used according to the pressure ratings recommended by the manufacturer.

Pressure relief valves for tanks and compressors are designed to protect the system against overpressure. They are factory preset and automatically release air when the maximum pressure is reached.

Valves are manufactured in accordance with ASME Section VIII standards, and several models carry a Canadian Registration Number (CRN).

**EXCESSIVE PRESSURE DOES NOT
MAKE A SYSTEM MORE EFFICIENT
— IT MAKES IT MORE VULNERABLE.**



ESSENTIAL BEST PRACTICES

- ✓ Never exceed the pressure recommended by the manufacturer
- ✓ Adjust pressure according to equipment requirements
- ✓ Test safety relief valves annually by manually forcing them open
- ✓ If no annual test is performed: replace valves after 5 years
- ✓ If an annual test is performed: replace valves every 10 years



HAZARDS

- > Explosion of tanks or equipment
- > Premature wear of tools and components
- > Quality issues with finished products
- > Projection of parts

PRACTICAL SOLUTIONS

SYSTEM OVERPRESSURE PROTECTION

Compressor tank
check valves (S09)



Pressure relief valves
(S09)



SYSTEM PRESSURE CONTROL

Pressure
regulators
(S50, 51 and 52)



PRESSURE STABILIZATION AT POINT OF USE

In-line regulators
or at the tool
(S62 and 85)



HOSE WHIP: A SUDDEN AND VIOLENT HAZARD

When a pressurized hose becomes disconnected or ruptures, compressed air escapes uncontrollably.

The hose can then whip violently, moving at very high speed — up to **150 km/h** — and strike anything in its path.

POSSIBLE CONSEQUENCES

- > Serious injuries to nearby workers
- > Damage to production parts
- > Dust and debris lifted from the ground
- > Dispersion of airborne particles

WHY THESE INCIDENTS OCCUR

- > Hoses left on the ground or exposed to equipment traffic
- > Premature wear caused by friction or pulling
- > Sudden disconnection when the hose retracts into a reel
- > Incompatibility between couplers and plugs



PRACTICAL SOLUTIONS

AIR SUPPLY SHUT-OFF USING AIR FUSES

Inline installation: air fuses installed between the supply point and the hose (S58)



Integrated solution: hose reels equipped with an integrated air fuse (S79)



Select the air fuse according to the technical data sheet and with the assistance of a Topping technical advisor.



Always perform a real-world test before commissioning the system.

HOSE RETRACTION SPEED CONTROL

Hose reels equipped with a slow retraction system (S79)





A SIMPLE COUPLER CAN BECOME AN UNCONTROLLED PROJECTILE.

REGULATORY REFERENCES



"Any flexible hose with an inside diameter greater than 1/2 inch must be equipped with a safety device at the air supply source or at the point of connection to reduce pressure in the event of hose failure."
— OSHA 1926.302 (b)(7)

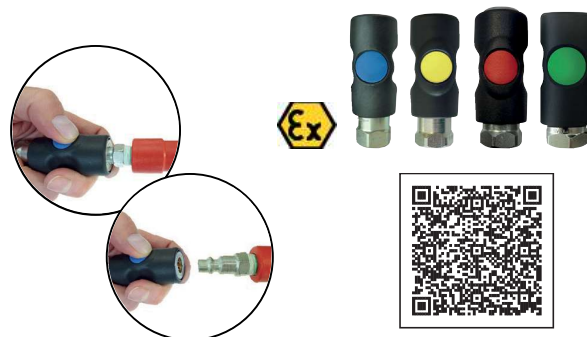
"When the failure of a hose or plastic tubing creates a whip hazard, it shall be restrained or shielded by suitable means, or a safety device shall be installed."
— ISO 4414 (5.4.5.11.1)

SAFE DISCONNECTION USING ZERO-PRESSURE COUPLERS

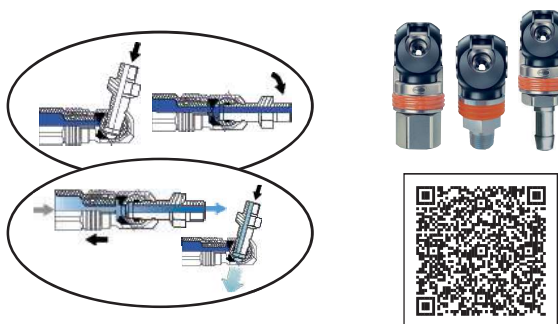
TOPQUIK two-step zero-pressure quick couplers (S20, 21, 22, 27 and 31)



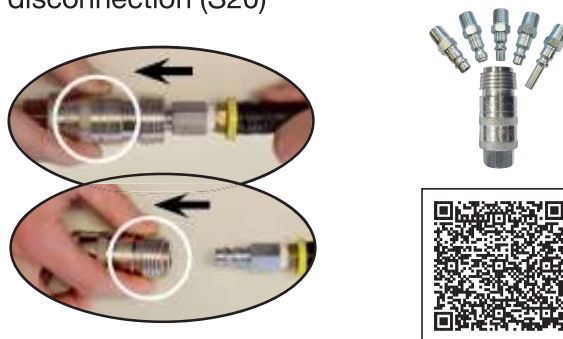
TOPQUIK S1 single-push zero-pressure quick couplers (S20, 21, 22, 23, 25 and 31)



TOPQUIK SC two-step zero-pressure quick couplers for safe connection and disconnection (S20, 21, 22, 23 and 31)



UNISAFE two-step zero-pressure quick couplers for safe connection and disconnection (S20)



WORKSTATION ERGONOMICS: SAFETY AND PERFORMANCE IN EVERYDAY WORK

A poorly designed workstation can lead to fatigue, discomfort, and injuries.

Ergonomics is not a hazard in itself, but an essential prevention tool.

A well-designed work environment helps reduce the risk of accidents while improving safety, productivity, and operational quality.

POSSIBLE CONSEQUENCES

- Fatigue and discomfort caused by repetitive motions
- Musculoskeletal disorders (MSDs)
- Risk of falls and accidents (e.g., hoses on the floor)
- Reduced productivity and quality
- Increased errors and work stoppages

PRACTICAL SOLUTIONS

IMPROVED TOOL HANDLING

- ✓ Better tool handling improves performance while making work easier.

Coiled hoses with swivel fittings (S11, 14, 17 and 19)



Snubber hoses to reduce vibration (S62)



Swivel fittings and plugs (S62)



REDUCED PHYSICAL EFFORT

- ✓ Better tool handling improves performance while making work easier.

Automatic rewind hose reels (S79)



Blow guns with ergonomic handle — full-hand activation (S60)



Amplified air jet blow guns with inline handle and auxiliary grip (S60)



Amplified air jet blow guns with shoulder-carry handle and auxiliary grip (S60)



**AN ERGONOMIC WORKSTATION
IMPROVES NOT ONLY SAFETY,
BUT ALSO DAY-TO-DAY EFFICIENCY.**



TOOL SUPPORT AND WEIGHT RELIEF

- ✓ By supporting and relieving the weight of tools, you reduce fatigue and unnecessary movements while keeping tools within easy reach for faster, safer, and more efficient work.

Tool balancers (S64)



TRIP HAZARD PREVENTION AND HOSE MANAGEMENT

- ✓ By keeping hoses off the floor, you reduce the risk of falls, protect your equipment, and improve workstation efficiency.

Hose reels (S79)



ESSENTIAL BEST PRACTICES

- ✓ Keep work areas clear (no hoses on the floor)
- ✓ Use lightweight, well-balanced tools suited to the application
- ✓ Limit repetitive and awkward postures
- ✓ Ensure good freedom of movement (avoid pulling and twisting)
- ✓ Keep tools within easy reach
- ✓ Use support solutions (hose reels, tool balancers)
- ✓ Regularly inspect hoses and couplers for wear and tear



CONDENSATE: A HAZARD FOR EQUIPMENT AND THE ENVIRONMENT



Compressed air naturally contains moisture. When air is compressed, this moisture condenses into water inside the system. In lubricated compressor systems, oil and various network contaminants are also carried into the condensate.

These condensates (a mixture of water, oil, and impurities) can lead to equipment failure, contaminate the system, and promote bacterial growth.

Improper condensate management can also have significant environmental impacts and expose businesses to regulatory penalties.

HAZARDS

- > Failure of pneumatic equipment
- > Contamination of the compressed air system
- > Bacterial growth
- > Environmental risks and regulatory non-compliance



REGULATIONS

Condensate from compressed air systems contains oil and contaminants. It must not be discharged directly into the environment.

The **Canadian Council of Ministers of the Environment (CCME)** recommends a maximum concentration of **15 mg/L** of oil and grease in discharged water.

Failure to comply with these requirements may result in fines and significant decontamination costs.

PRACTICAL SOLUTIONS

CONDENSATE TREATMENT BY WATER-OIL SEPARATION



Water-oil separators (S57)

- ✓ Oil separation from contaminants
- ✓ Discharge compliant with environmental regulations
- ✓ Filter media replacement indicator



**PROPER CONDENSATE
TREATMENT PROTECTS
BOTH EQUIPMENT AND THE
ENVIRONMENT.**



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- ✓ OHS compliance
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