Working with compressed gas

Canadian Centre for Occupational Health and safety

www.ccohs.ca
Cylinder safety devices

• Safety- or Pressure-relief valves
  – Part of cylinder. Valve opens if cylinder pressure exceeds safety limit. Gas released until pressure drops to safety limit

• Rupture discs
  – Burst at certain pressure, releasing gas. Cannot be reclosed

• Fusible plugs
  – Temperature, not pressure, activates it. Used when heat could initiate explosive chemical reaction.

*Not all cylinders have safety device. Toxic gas ones don’t. When involved in fire, area must be evacuated
Substitution

• Contact chemical supplier to find out about substitutes
• E.g. propylene, propane can be substituted for acetylene as fuel gas for cutting and welding
What to do when receiving cylinders

• Inspect. Ensure they are undamaged, properly labelled.
• Check if giving off odors, visible fumes or hissing sound
• Check if cylinder was last tested within the required time (usually 5 or 10 years, some as low as 3 or as long as 12 yrs)
• Check if cylinder labels are intact, match other markings on cylinder
What to do when receiving cylinders (cont’d)

• Leave valve cap secure until to be used
• Inspect valve by looking through ports in the valve cap
• Do not accept dirty, rusted or damaged valves and fixtures
How to transport cylinders

• Always transport with valve caps in place
• Pulling cylinders by valve caps, rolling them on sides or dragging or sliding can cause damage
• Rolling on their bottom edge (“milk churning”) maybe acceptable for short distances
How to transport cylinders (cont’d)

• Never lift with magnets or chain or wire rope slings
• Transport with specially built hand carts
• Transport device should have way of securing cylinders
Storage

- Well-ventilated and dry
- Fire-resistant, supply with suitable firefighting equipment (e.g. sprinklers)
- Away from electrical circuits and ignition sources (e.g. sparks, flames, hot surfaces)
- Labeled with suitable warning signs
- Store full cylinders separately from empty ones
Storage Temperature

• Store in dry, cool areas, out of direct sunlight, away from steam pipes, boilers or other heat sources

• Follow supplier’s recommendations. To prevent pressure buildup, keep temperature below 125F (52C), but above -20F (-29C).
Using and discharging cylinders

• Remove dirt or rust. Grit, dirt, oil, or dirty water can cause gas leaks
• Never open a damaged valve
• Do not lubricate cylinder valves, fittings, regulator threads, or apply jointing compounds and tape. Use only lubricants and sealants recommended by supplier
Using and discharging cylinders (cont’d)

• Open valves slowly. Rapid opening result in rapid compression of gas in high pressure passages leading to the seats
  – Lead to temperatures high enough to burn out the regulator and valve seats

• Close cylinder valve when not in use. Do not stop flow by only backing off the regulator