

# LESSONS LEARNED

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**Title: Gas Cylinders - Big or Small, Secure Them All!**

Gas cylinders must be secured to prevent falling due to accidental contact, vibration, or earthquake. Cylinders must be secured in one of the following ways:

- By a non-combustible, two-point restraint system (e.g. chains) that secures the cylinder at the top and bottom one-third portions. Exception: Cylinders less than 1 m (3 ft) tall require only one restraining point (a mid-cylinder location is best).
- By a non-combustible rack, framework, cabinet, approved non-combustible strapping device, secured cylinder cart, or other assembly that prevents the cylinder from falling.

Non-combustible restraints are necessary to prevent cylinders from falling in the event of a fire. While readily available webbing-style strapping systems may appear to be a good selection for securing cylinders, many of these systems are constructed of combustible materials (e.g. nylon) and would not meet the non-combustibility requirement. See attached photos for examples of acceptable and unacceptable cylinder securing systems for different types/sizes of cylinders.

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# Securing Your Cylinder Photographs- Examples

## Acceptable Securing Options



Upper and lower chains



A rack system



Secured behind bars in a fume hood



One chain for small cylinders



One chain securing to a rack for small cylinder



One chain for small cylinders. Straps for back-up



A fully enclosed cage



A rack system



Cylinder chained to cart and cart chained to secure structure

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# Securing Your Cylinder Photographs- Examples

## Unacceptable Securing Options



Unsecured lying on shelf



Combustible strap only and questionable "clamp"



Unsecured



Combustible strap only



Not upright or properly secured



Unsecured (cart not secured)



Center cylinder has only combustible straps