

The EN 14470-2 for gas cylinder cabinets

Maximum safety in the storage, provision and withdrawal of gas cylinders in indoor areas

Due to the positive pressure and the contents (corrosive, toxic, inflammable, fire accelerating), gas cylinders represent a hazard potential. It is therefore usually recommended to store gas cylinders in outdoor areas. In practice this is often not possible or is associated with very high costs. With the publishing of the new European standard for gas cylinder cabinets, EN 14470-2, an economical and flexible option for the installation of gas cylinders in indoor areas is now available that offers a level of safety comparable to that of outdoor storage.

Consequences of the EN in Europe

Fire resistance is classified into 4 classes from G15 up to G90 (fire resistance of 15 up to 90 minutes).

Each type of cabinet and each cabinet size has to be type tested in a furnace. In case dimensional variation exceeds the tolerance, the cabinet has to be retested again. Tests can only be executed by an authorised material testing institute. Cabinets must be tested in a furnace as free-standing single cabinets.

In the new EN 14470-2 it is demanded to deliver with the cabinet the declaration of conformity or certificates of conformity.

Complete approval documentation by asecos includes for each safety storage cabinet:

- A test report of an authorised material testing institute stating/proving the successfully passed fire test.
(Important: only the test report of an approved material testing institute is evidence for a successfully passed fire test!)
- Test certificate by independent testing organisation
- Declaration of CE conformity by the manufacturer

This means

- Use in accordance with regulations
- Safety for the user

- Clear identification of approval documents with the model of safety storage cabinet

Former DIN 12925-2 Safety storage cabinets for gas cylinders

Due to the changes and considerably stricter test requirements, safety storage cabinets in accordance with DIN 12925-2, do no longer comply with the increased safety standard of EN 14470-2. With the publication of EN 14470-2 and a transitional period of 6 months, DIN 12925-2 was replaced.

All manufacturers of safety storage cabinets had to adapt their cabinet models to the new requirements of construction and each cabinet model has to pass the test with the conditions of EN 14470-2.

The user is required by the EN to be supplied with complete approval documentation when obtaining safety storage cabinets.

Why type G90?

The classification type 90 for safety cabinets for the storage of flammable liquids has been established for many years in Germany as the state of the art.

This did not change even after the publication of DIN EN 14470-1.

Due to the absence until now of a 90-minute classification for gas cylinder cabinets, plant operators have so far had different safety levels for the storage of flammable liquids and gas cylinders. Nevertheless the demand for uniform protection concepts can increasingly be felt. In the past a standard for gas cylinder cabinets existed only in Germany. Here, the interior surfaces of the cabinet had to be protected for 20 minutes against heating up by more than 50 °K.

Due to the consistent pursuit of a 4-class strategy, also in the standardisation work for EN 14470-2, the operator now has the

possibility to select the same safety level for the storage and installation of gas cylinders as he has selected for the storage of flammable liquids.

This is more than understandable. The danger posed by gas cylinders is with certainty at least comparable to that of flammable liquids. Gases can escape due to excessive heating of the cylinder and the connected valves and this alone can have devastating consequences. Even stronger heating up can ultimately lead to the explosion of the gas cylinder. Such a gas cylinder explosion generally has an extremely destructive effect.

What makes the new G90 cabinets so safe?

The most critical part of a gas cylinder is its valve. It is therefore protected against damage during cylinder transport by a special screw cap. However, this protection no longer exists when cylinders are connected for drawing off compressed gases. In order to be able to ensure that the valve is not damaged or heated up too strongly in the case of fire (existing seals can be damaged and gas could leak out uncontrolled and ignite or even lead to a dangerous explosion), particular importance was placed on this in the new European standard for gas cylinder cabinets.

EN 14470-2 therefore specifies that additional temperature measuring points are to be attached to the cylinder valve holder during the tests. The measured rises in temperature may not exceed 50 °K over the entire testing period (90 minutes), whilst temperatures of over 1000° C already prevail in the inspection room. This extreme tightening of the regulations guarantees that gas cylinders stored in safety cabinets of type G90 do not represent a hazard to employees and rescue services for more than 1,5 hours, even in the case of a full blaze.

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Facts and Consequences

Essential	EN 14470-2
Range of applications	Safety cabinets for the storage of gas cylinders with a total volume of max 220 liters in laboratories, for free standing single cabinets, for cabinets fixed at walls or those on castors.
Definition of aim of protection	Provision of enough time, in the event of fire, for personnel to leave the room and sufficient time for fire service personnel to enter the workplace before the gas cylinders become hazardous.
Denomination of fire resistance changed to	G
Classification expanded from one to four classes (time measured for temperature increase T at the bottle valve bracket by 50 K)	Type G90 Type G60 Type G30 Type G15
Testing conditions	<p>The fire resistance of the cabinet has to be proven by an independent authorised testing institute.</p> <p>During the fire test the cabinet being tested must be positioned with its rear wall at least 100 mm from the fire chamber wall. The entire cabinet (side walls, door top as well as rear wall) must be exposed to the same heating conditions.</p> <p>Changes in dimensions without new test are limited to a reduction of one dimension: - height and width by max. 100 mm - depth by max 150 mm Safety cabinets with a larger reduction of dimension or with 2 changes in dimensions have to be newly tested according to EN 14470-2</p> <p>The distance between interior ceiling of the cabinet and the highest point of the gas cylinder valve shall not exceed 175 mm.</p> <p>One stainless steel tube, dia 10 mm as well as an electric cable (3x 1,5 mm²) are lead through the cabinet ceiling.</p> <p>The length of stainless steel tube fixed at the gas cylinder bottle shall not exceed 500 mm when leaving the cabinet.</p>
Information to be delivered	Detailed instruction manual as well as declaration of conformity from the manufacturer or certificate of conformity of a testing institute.