

Safe storage of flammables? The workplace without a fire resistant Safety Storage Cabinet



Dangers, risks and your disadvantages ...

Transport/working time

- Increased risk when transporting hazardous materials internally from the centralised storage room for hazardous material to the workplace
- Hazardous material which is used at the workplace is not always brought back to the storage place
- Precious working time is lost when bringing and taking dangerous material
- Containers and bottles have to be looked/searched for when they are stored chaotically and in an unstructured manner



Dangers, lack of fire protection

- The quantity which is actually needed per day and which is allowed to store can easily be exceeded
- Hidden stocks of hazardous material are set up and contribute to an uncontrollable blaze. Protection of staff and fire fighters in case of a fire can no longer be ensured



Inappropriate/Faulty storage and its consequences

- You are in breach with applicable regulations and laws
- In case of damage the insurance cover is lost
- The proprietor is personally liable for property and damage to persons
- In the event of an accident the risk of loss of production cannot be calculated/foreseen
- Long term loss of the suppliers' reputation with its customers

Safe storage of hazardous materials! The workplace with a fire resistant Safety Storage Cabinet



Safety, protection and your advantages...

Transportation/Working hours

- Minimizing internal transport of hazardous material from the storage room to the workplace
- All hazardous materials for the daily use can be stored safely directly at the workplace
- Efficient use of working time as there is no need to go long ways every day just to bring flammables in and out from the central storage room
- Quick access to the bottles and containers as they are clearly arranged

Maximum safety for the user

- Just the minimum quantities which are needed for a certain job are in use at the workplace. All other hazardous materials are stored safely in the fire resistant cabinet.
- Maximum fire protection due to the centralized storage of all flammables at the workplace in a fire resistant safety storage cabinet (**Type 90 – EN 14470-1**).
- Explosive atmospheres are avoided when hazardous material is stored in safety storage cabinets which are technically ventilated.



Type 90 safety cabinets in accordance with EN 14470-1...

- Provide the highest degree of safety for human beings and the environment
- Give maximum safety to your investment
- Guarantee highest fire protection available today
- Prevents explosions
- Prevent an existing fire from spreading
- Provides sufficient time for the staff to safely leave the building and for the fire fighters to rescue people from the building and to extinguish the fire

What must a Safety Storage Cabinet be able to do?

The primary protection for which a **Safety Storage Cabinet** is intended is to shield stored, hazardous materials from a temperature rise of more than 180 K in the event of fire for the defined period of time.

- » avoid explosions that accelerate the fire
- » adequate time for personnel to escape
- » adequate time for rescue services/fire service for fire-fighting and rescue missions

What happens if 180 K is exceeded?

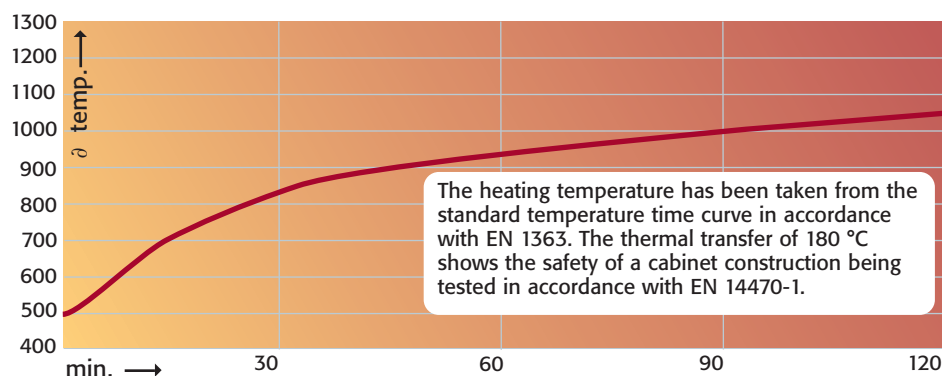
Combustion may begin if the temperature rise inside the Safety Storage Cabinet exceeds 180 K. From this value up, the majority of chemicals reach their ignition temperature: they explode.

Fire is the same in all parts of the world!

Whether in London or Lisbon, a fire has

the same properties and temperatures. The temperature curve shows that after only 5 minutes a fire has reached a temperature of 576 °C.

After 30 minutes, 842 °C has been reached, and after 90 minutes the flames are at more than 1000 °C.



Time t/h	Furnace temp. t/°C	Time t/h	Furnace temp. t/°C
0	20	30	842
5	576	45	902
10	678	60	945
15	738	90	1006
20	781	120	1049

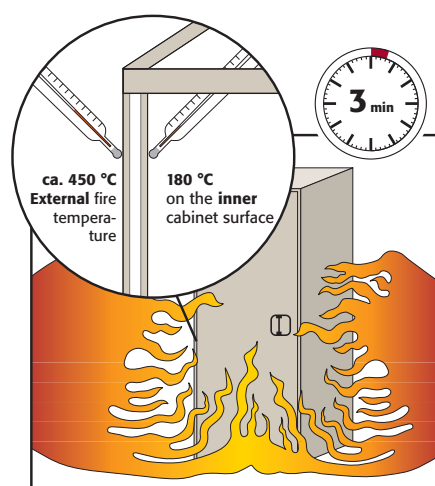
A comparison of the fire resistance of cabinet constructions

How long do hazardous materials in a cabinet remain safe? The graphs clearly illustrate the differences: a **double-wall steel cabinet** provides no more than **three minutes of protection** before the interior has heated to 180 °C.

A **Type 30 EN Safety Storage Cabinet** as supplied by asecos provides **30 minutes of protection** before the interior has heated to 180 °C. **10-times more safety** in the event of fire compared with a double-wall steel cabinet.

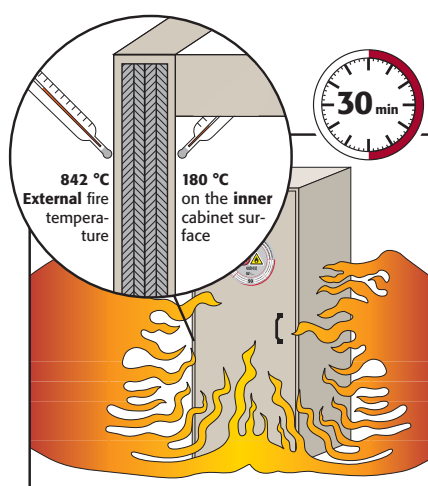
Highest safety is reached with a **Type 90 EN Safety Storage Cabinet** as supplied by asecos. These cabinets provide **90 minutes of protection** before the interior has heated to 180 °C. **30-times more safety** in the event of fire. Enough time for rescue and fire-fighting services to take action.

1 Double wall steel cabinet



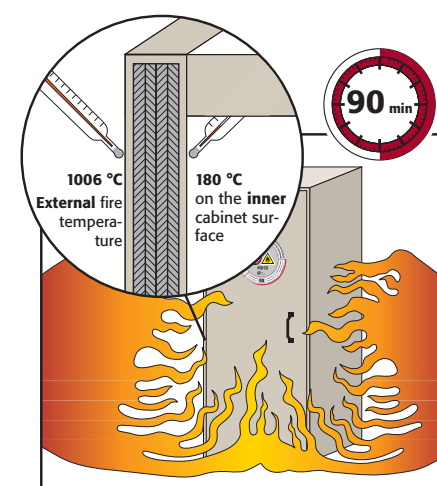
1 3 minutes: danger!

2 Type 30 EN Safety Cabinet



2 30 minutes: safety!

3 Type 90 EN Safety Cabinet



3 90 minutes: maximum safety

- » **Single wall or double wall steel cabinets** without any fire protection measures do not fulfill any requirements of the EN 14470-1.
- » **30 minutes of fire resistance** provide the basic protection for rescue services and personnel in the event of fire.
- » **90 minutes of fire resistance** means optimum quality and therefore the highest possible safety for people and the environment.
- » Cabinets meeting EN 14470-1 give your investment maximum security.

Safety Features - EN Safety Storage Cabinets

The special construction of asecos Safety Storage Cabinets guarantees the requested fire resistant types in



accordance with EN 14470-1. asecos stands for the highest quality and safety in the event of fire.

Special Fire Resistant Plates and Insulation

Special fire resistant plates mounted in various combinations offer guaranteed protection against external fire for a defined period of time. Even over 90 minutes at an external temperature of 1000 °C you can rest assured that the temperature rise inside the cabinet will not exceed 180 °C. This result is measured at 13 air and inner surface points during the furnace test.



The primary protection offered by a Safety Storage Cabinet:
protecting hazardous materials from a temperature rise of more than 180 K in the event of fire for the defined period of time.

- » avoid explosions that accelerate the fire
- » adequate time for personnel to escape
- » adequate time for rescue services/fire service for fire-fighting and rescue missions



Insulation package of a Type 90 EN Safety Storage Cabinet in its original condition and after being exposed to fire in a furnace test according to EN 14470-1

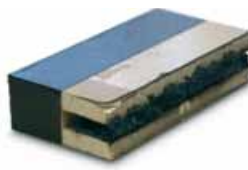
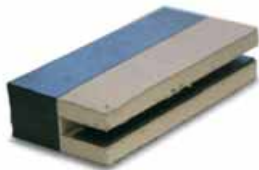


Seal at normal conditions



Seal expanding on exposure to fire

Intumescent strip
heated up and expanding to more than 20 times of its original thickness.



Total sealing of gaps in the cabinet with expanding intumescent strips.
Highest fire protection of EN Safety Storage Cabinets.

Fusible links for safe operation of EN Cabinets and maximum protection



Door open arrest system



These fusible links with a defined and tested melting point are used with

- door open arrest systems
- drawer systems
- and inlet /extraction air valves.



Fusible link (thermal release) for drawers



Doors and drawers in tall cabinets

Doors that are standing open and drawers that are pulled out during regular work shall be **closed securely** in the event of fire - **at a temperature of max. 50 °C (doors and drawers).**

Drawers in underbench cabinets

Drawers that are pulled out during regular work shall be **closed securely** in the event of fire - **at a temperature of max. 50 °C.**



Inlet/extraction air valves

The inlet and extraction air valves close securely in the event of fire - **at a temperature of max. 70 °C.**

EN 14470-1 - European Standard for Safety Storage Cabinets

The European Standard EN 14470-1 was implemented in April 2004 and has since been published as a national standard in many European countries as the Netherlands, France, Spain, UK, Italy etc.

Since the 1st of January 2005 the former German Standard DIN 12925-1 can no longer be taken into consideration for testing Safety Storage Cabinets.

Test and construction requirements, compared to the DIN 12925-1, have become stricter and in some details stated more precisely.

The following points describe the basics and main safety, test and construction requirements.

The range of applications

- The standard specifies the performance required of the design and fire resistance of safety storage cabinets used for storing flammable liquids in working areas.

The principal safety requirements

- Minimisation of the fire risk associated with the storage of flammable materials.
- Protection of the contents of the cabinet in the event of fire for a known (and tested) period of time.
- Minimisation of the fumes released to the working environment.
- Retention of any possible leakage within the cabinet.
- 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 building before the stored materials turn a small, fire into an uncontrollable blaze.

Fire protection

- In the event of a fire the cabinet must ensure that, over a period of time defined by the manufacturer (but in any event at least 15 minutes), its contents do not present an additional risk that the fire will spread.

Doors

- The cabinet doors must close entirely, starting from any position (closing time max. 20 seconds).
- Immobilising equipment fitted must release the locked doors at a temperature of 50 (-10) °C.
- Avoiding risk of injury: the closing force of the doors must not exceed 100 N.
- One-handed operation must be possible, and the doors must close entirely even if open and locked.

Side and rear walls

- The side and rear walls of the cabinet must have the same thickness and comparable structures.

Air inlet and outlet openings

- The cabinets must have openings for air inlet and outlet (for connection of the cabinet to an exhaust system).
- The ventilation openings must close automatically at a temperature of 70 °C.

Storage locations (shelves or drawers)

- Storage surfaces must be able to support the loading specified by the manufacturer over the period of the test in the furnace. Design evidence of the load-carrying capacity of shelves and drawers in the event of fire based on EN 1365 (fire resistance tests for self-supporting components).

Spill containment sump

- The spill containment sump must retain its ability to function after the fire resistance test. This is to be checked visually by filling the spill containment sump with water.

Fire resistance

- Must be investigated by tests on a design sample.
- The fire resistant cabinet is exposed to flames in a suitable furnace.
- The doors, walls and ceiling of the cabinet being tested must be exposed to the same heating conditions.
- Cabinets must be tested as free-standing single cabinets. The example being tested must be positioned with its rear wall at least 100 mm from the furnace wall (see graphic p. 81).
- The flame exposure is carried out in accordance with the standard temperature curve of BS EN 1363-1 (5.1.1).
- The temperature rise is measured inside the cabinet.
- The cabinet must then be classed as type 15, 30, 60 or 90, according to the time that has elapsed before the temperature rose by 180 K.

Conclusion

The standards that have been used up to now do not even come close to the realistic and necessary requirements for testing the fire resistance of a safety storage cabinet. The new EN 14470-1 has now ultimately defined clear, binding and realistic requirements for safety storage cabinets for flammable liquids.

From now on, only invest in safety storage cabinets that fulfil all requirements of EN 14470-1.

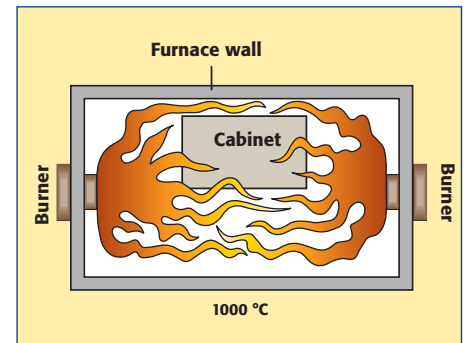
The entire asecos range of fire resistant safety storage cabinets are certified in accordance with EN 14470. Insist on your copy of the test certificate today!

EN 14470-1 Essential Requirements

EN 14470-1	Essential requirements
Safety requirements	Primarily, EN 14470-1 covers the following major safety requirements: » Minimising the fire risks associated with storing flammable substances and protecting the cabinet's contents in the event of fire for a known (tested) minimum length of time (fire rating). » Minimising the amount of vapour released into the working environment. » Retention of accidental spillage within the cabinet. » For the first time fire fighters are also taken into consideration in the definition of target of protection, since the standard takes into account time both for personnel to leave the room and for fire fighters to enter the workplace before the flammable stored materials may turn into an uncontrollable blaze.
Fire resistance	» Testing in a suitable fire chamber as a free-standing single cabinet. » The entire cabinet must be exposed to the same heating conditions. » Flame exposure according to standard temperature curve of EN 1363-1 (5.1.1). » The temperature rise is measured inside the cabinet (measuring points on surfaces and in the air). » The cabinet must then be classified as Type 15, 30, 60 or 90. This is the time measured before the temperature rises more than 180 K at any measuring location.
Doors	» Must close completely, starting from any position (closing time max. 20 seconds). » Immobilising equipment fitted must release the locked doors at a temperature of 50 (-10) °C.
Fresh and extraction air inlet	» The cabinets must have air inlet and outlet openings. » The ventilation openings must close automatically at a temperature of 70 °C.
Shelves and drawers	» The shelves or drawers must be able to support the loading specified by the manufacturer over the period of the test in the fire chamber.
Spill containment sump	» The spill containment sump must retain its ability to function after the fire resistance test. » Visual check (filling spill containment sump with water).
Information to be supplied	» Operating manual including e.g. information about maximum load capacities of shelves and the cabinet itself, sump capacity, recommendations for regular inspections and maintenance, the supplier's declaration of conformity or certificates of conformity from an authorised material testing institute.
Marking and labelling	» Advice that the doors must remain closed after every use. » Appropriate signs 'Caution: risk of fire' and 'Fire: open light and smoking forbidden' according to ISO 3864. » The fire resistance according to EN 14470-1 specified in minutes. » Name and/or trademark of the manufacturer. » Model number and year of manufacturing.

Your decision – safety

- Type 15** – Some people like risk –
Do you?
- Type 30** – 30 minutes are enough –
if the fire service is based nearby
- Type 60** – That is 1 hour, after all –
still not enough?
- Type 90** – *The state of the art of maximum fire protection for people and buildings*



Furnace test according to EN 14470-1



EN Safety Storage Cabinet tested in a furnace

Full approval documentation asecos cabinets - quality with the stamp of excellence



Safety in the event of fire

Each cabinet model has been successfully tested (by an independent material testing institute) in a furnace.

DIN EN

Safety in the event of fire

Each cabinet has a type-tested fire resistance in accordance with EN 14470-1. Documented in the testing certificates of an independent material testing institute.



Safety in daily use

Each cabinet has been successfully tested in accordance with stated safety requirements. Documented in the testing certificates by independent testing organisations.



External monitoring

The production of these safety cabinets is subject to voluntary, permanent monitoring by an authorised, independent material testing institute. This means that the cabinets are regularly retested in a furnace.

asecos - Standard for safety and quality



1 Testing certificates of an authorized material testing institut for each cabinet. Approved fire resistance in accordance with EN 14470-1.

2 Verification for all cabinet models on observing the Equipment and Product Safety Law. Documented in the testing certificates by independent testing organisations.



3 CE approval certificates for each cabinet model. Verification that all relevant European guidelines are observed.

4 Quality Management in accordance to DIN EN ISO 9001. asecos quality from the quotation to the delivery.