EN/FM
SAFETY CABINETS COMPARISON

EC+SAFE
www.ecosafesa.com

February 2020 edition

REGULATIONS

For security reasons you have to store your flammable or explosive products in a safety cabinet. No matter your business branch or the degree of flammability of your products, they have to be stored in a safety cabinet in case of fire in order to delay the risk of explosion.

There are 2 major norms currently in place:

EN 14470-1

The new European norm came into effect in October 2004 and concerns the storage of flammable products in laboratories. It also only concerns the safety cabinets which internal volume is equivalent or less than 1m³ or less. To be certified the cabinets have to be 15, 30, 60 or 90 minutes fire resistant.

FM 6050

The American Factory Mutual standard 6050, defines the required criteria for a safety cabinet suitable for the storage of flammable chemicals. The requirements of this standard are based on the experience, research and testing on based on the NFPA 30 fire code. To be certified cabinets have to be 10 minutes fire resistant.

FM testing

678°C

10 mins

EN testing

950°C

15, 30,60 or 90 mins
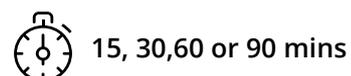
TESTING PROCEDURE

EN 14470-1

Ecosafe products are built according to the most stringent quality insurance criteria, which we guarantee by issuing a quality certificate. Our ranges 3030, 760+ & 790+ have been tested and approved according to the EN 14470-1 norm. All Ecosafe flammable cabinets have succeeded a fire test according to EN 14770-1 (2004) or EN 14470-2 (2006) norms. These tests were conducted by an outside laboratory accredited by COFRAC.

The cabinet is placed into an oven and after 90 minutes at an external temperature of more than 1050°C (ISO 834 norm) and the inside temperature will not exceed 180°C in order to guarantee a perfect protection:
· The chemicals are safely stored and away from any direct contact with a source of fire
· That avoids any situation which could accelerate/ increase fire
· That allows people to escape and the rescue to safely intervene to extinguish fire

Safety Cabinets must have air inlet and outlet as well as a thermo-fuse which seals off the ventilation system in case of fire. These could be used to connect a forced ventilation system. The air change must be at least 10 times the volume of the safety cabinet (doors closed).

The cabinet is placed in the oven for the fire test according to EN standard. Flames will be ignited around the cabinet to simulate fire.

Setup of sensors within the cabinet
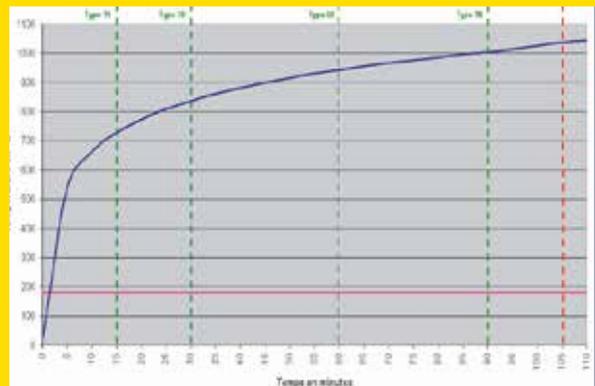
ISO 834-1 fire test curve

EN VS FM : COMPARISON TABLE

Specifications	FM/ yellow cabinets	EN 14470-1 Type 30mins	EN 14470-1 Type 60mins	EN 14470-1 Type 90mins
Manufacturer	US and CHINESE	Ecosafe	Ecosafe	Ecosafe
Fire Testing	10 minutes at 678°C	30 minutes at 842°C	60 minutes at 945°C	90 minutes at 1006°C
Range	Manufacturer specific	3030	760+	790+
Construction	Double wall steel, with grid on the ventilation to stop flames but not the heating, not all models are equipped with self closing feature	38mm insulation made out of High Pressure Laminate (HPL) with thermal expanding seal, self closing device of the doors and the ventilation system	62mm insulation : 1 layer of steel on the outside, 1, layer of HPL, 1 layer of proprietary insulation, and a 2nd HPL panel in the inside with expanding seal, self closing device of the doors and the ventilation system	62mm insulation : 1 layer of steel on the outside, 1, layer of HPL, 1 layer of proprietary insulation, and a 2nd HPL panel in the inside with expanding seal, self closing device of the doors and the ventilation system.
Venting	Inlet and outlet (50mm) with flame arrester	Inlet and outlet (100mm) thermofuse equipped closing vents with flame arrester	Inlet and outlet (100mm) thermofuse equipped closing vents With flame arrester	Inlet and outlet (100mm) thermofuse equipped closing vents With flame arrester
Shelves and retention	Liquid tight containment at the bottom, shelf but without retention	Adjustable retention shelf + retention tank on the bottom (easy to clean)	Adjustable retention shelf + retention tank on the bottom (easy to clean)	Adjustable retention shelf + retention tank on the bottom (easy to clean)
Certification	FM 6050	EN 14470-1 + FM 6050	EN 14470-1 + FM 6050	EN 14470-1 + FM 6050
Safety level	**Average**	**Good**	**Very good**	**Excellent**
Advantages	Cheap price	Good quality / price ratio, possible to have models with glazed doors	Best in class safety properties	Best in class safety properties
Disadvantages	Steel has limited insulation capabilities (limited fire resistance in time and temperature), steel is target to rusting Thermic bridges between outside and inside of the cabinet	Marketing effort is needed to make end-user understand HPL is appropriate insulation	Use of high-end materials implies higher manufacturing costs	Use of high-end materials implies higher manufacturing costs

WHICH CABINET TO CHOOSE ?

| Flash point [1]	Degree of flammability	Exemple of products	Recommended safety cabinet	
			In industrial field	In laboratories
Higher than 55°C	Little flammable	Fuel, gas, oil	Range 3030	Range 3030
Between 21°C and 55°C	Flammable	Oil of turpentine, white spirit	Range 3030	Range 3030
Between 0°C and 21°C	Easily flammable	Ethanol, Methanol	Range 760+ or 790+	Range 760+ or 790+
Under 0°C	Extremely flammable	Acetone, Ether	Range 790+	Range 790+
Gas cylinders model B2, B5, B11 and B50			Range 7630BG	Range 7630BG

[1] *Flash point : Lowest temperature at which a liquid could form gas/ air mixtures able to burn with an ignition source*

Range 3030 - Model 3035UE

Range 790+ - Model 795+
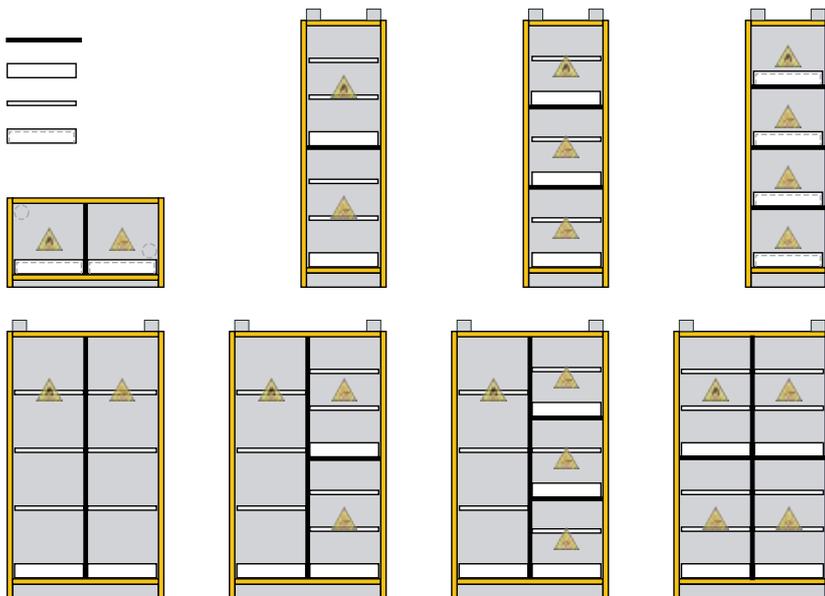
Sketches of the different multirisk models from range 3030.M

Range 790+ - Model 798+E