



# Safety cabin

- » Protect human life against hazards at refineries and other sensitive areas
- » Complete cabin protected against blast, gas, fire and smoke
- » Equipped with an air-cleaning and HVAC system



## Safety cabin



### **Development of the companies Stefatos S.A., Greece and SÄLZER, Germany**

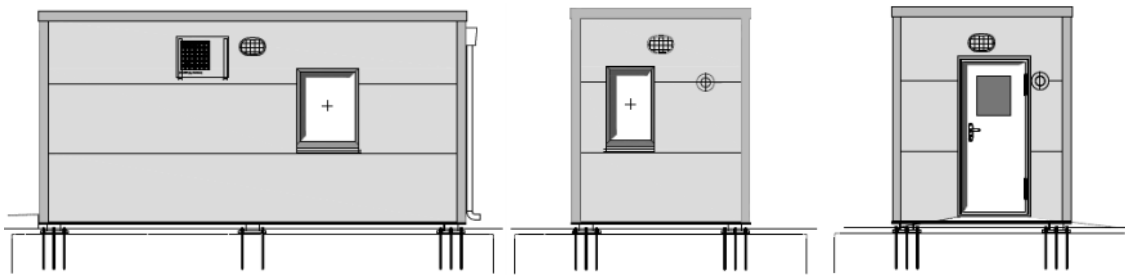
The safety cabin is developed and produced by the companies Stefatos and SÄLZER. It is designed to offer protection for workers after an petro-chemical accidents until the rescue teams arrived. The safety cabin is applicable at refineries, chemical plants, ammunition factories and many other sensitive areas.

The complete safety cabin is blast resistant and is equipped with ventilation equipment, gas filter and explosion protection valves to protect the people inside against gases, blast and smoke.

The cabin can be built anywhere on site. All components are approved according the ATEX-standards. The safety cabin is completely assembled and is ready-to use.

The standard size is 2,554 x 6,188 x 3,000 mm. In this standard size up to 10 people will find protection. Smaller or larger sizes are possible.

# Construction produced by SÄLZER



Standard design of the safety cabin.

The security cabin, designed as self-supporting frame construction is completely produced by SÄLZER. The complete cabin incl. roof, floor, walls, door and windows is blast resistant up to 700 mbar / 20 msec (higher security requirements are possible)

Brief description	
<b>Basic construction</b>	self-supporting frame construction, steel sections standard size: 2,554 x 6,188 x 3,000 mm
<b>Blast resistance</b>	external walls, roof, windows and door 700 mbar / 20 msec.
<b>Foundation</b>	reinforced concrete (done by others)
<b>Roof construction</b>	disconnected ceiling tiles from coated chipboard (acoustical ceiling), insertion according the security level, thermal insulated, Alwitra EVALON waterproofing membranes
<b>Wall construction</b>	plasterboard painted, steel frames, insertion according security level, hoesch thermal insulation panel RAL
<b>Floor construction</b>	steel substructure in accordance to the static calculation, thermal insulated, 25 mm fermacell fibreboard, dry flooring, PVC floor covering Armstrong rock dust mid NCS S4005-Y50R
<b>Windows</b>	3 fixed aluminum windows window sizes: 1,500 x 1,100 mm and 1,000 x 1,100 mm thermal insulation: approx. 1.6 W/m <sup>2</sup> K painted RAL 7016
<b>Door</b>	glazed steel door size: 1,010 x 2,100 mm, glass vision 500 x 700 mm with security locking mechanism, top mounted door closer and security handle set made of stainless steel. thermal insulation: approx. 2.2 W/m <sup>2</sup> K painted RAL 7016
<b>Option</b>	protection against forced entry, ballistic attacks, fire and smoke
<b>Remarks</b>	standard design described, other sizes, security levels and designs, paintings are possible.



Glazed steel door with integrated top mounted door closer.



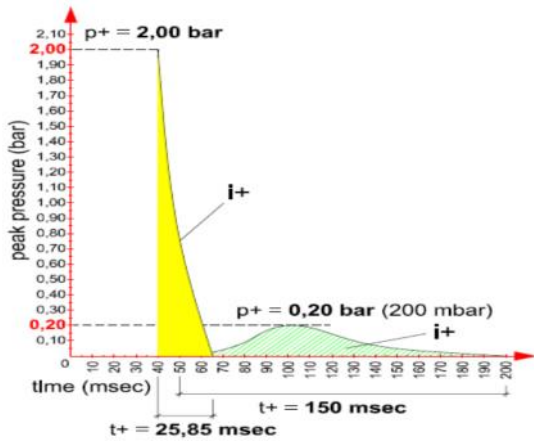
In the standard design 3 aluminium windows are installed.

## Description of the HVAC etc, done by Mr Stefatos



# Blast - classification

## Gas-air-mixture



For testing the effects from pressure waves which were caused by gas-air-mixtures special test methods must be applied. As it is seen in the pressure curves the gas-air-mixtures (green curve) causes a lower peak pressure than an explosion with TNT (yellow curve) but the pressure duration was much longer. These various pressure curves cause different requirements for the construction of the products. SÄLZER developed and tested for both scenarios special windows, doors and facades.

### Yellow curve:

**Typical shock wave of an explosion with TNT**, the pressure increases immediately and rapidly to the peak pressure, and then it drops off almost linearly back to the ambient pressure.

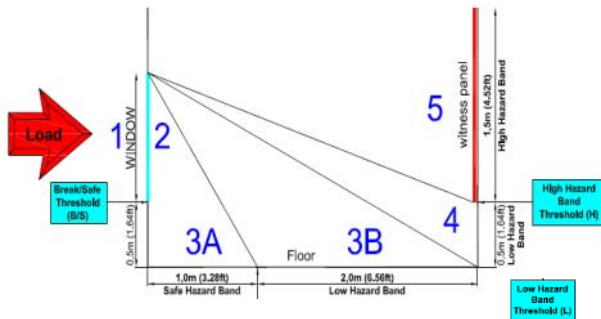
### Green curve:

**Typical shock wave of a petro-chemical explosion**, the pressure increases rather continuously up to the maximum pressure. The pressure drops in the same way. The duration of the pressure ( $t+ = 150$  msec) is much longer as a pressure which was caused by an explosion of a e.g.500 kg bomb ( $t+ = 25.85$  msec.).

## GSA-TS01-2003 guideline

The GSA guideline does not determine any loading pressure, explosion pressure, impulse, duration of the pressure these are specified by the customer. The guideline divides the result of the explosion into **exposure classes and protection classes**. The ISO 16933 uses die same classification.

### Risk matrix



### SÄLZER recommend class GSA2

Level GSA2: The glazing has been damaged by the shock wave, but **no dangerous splinters flew inside**. Occupants can escape unharmed and e.g. react quickly in measuring stations and substations to prevent further damage.

### GSA-TS01-2003 | ISO 16933 - classification

GSA	ISO	description	exposure classes	protection classes
1	A	Glazing does not break. No visible damage to glazing or frame.	none	very high
2	B	Glazing cracks but is retained by the frame. Dusting or very small fragments near sill or on floor acceptable.	none	very high
3a	C	Glazing cracks. Fragments enter space and land on floor not further than 1.006 mm from the window.	very low	high
3b	D	Glazing cracks. Fragments enter space and land on floor not further than 3.048 mm from the window.	low	high
4	E	Glazing cracks. Fragments enter space and land on floor and impact a vertical witness panel at a distance of no more than 3.048 mm from the window at a height no greater than 610 mm above the floor.	medium	medium
5	F	Glazing cracks and the window system fails catastrophically. Fragments enter space impacting a vertical witness panel at a distance of no more than 3.048 mm from the window at a height greater than 610 mm above the floor.	high	low

### Test reports

All tests are certified by accredited test institutes, independently from the standard or the customer requirements.

**The derivation and projection of test results is limited and only possible by submitting many test results of realistic tests.**

# Fire & smoke protection

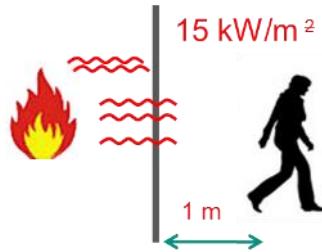
The fire resistance of our products is tested and classified according to the European standards DIN EN 1363-1, 1363-2, 1634-1 in connection with DIN EN 14600 and 13501-2.

## Classification according to DIN EN 13501-2



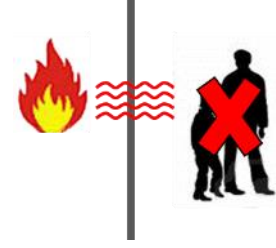
**EI30<sup>1)</sup>, EI45<sup>1)</sup>**

Protection against fire, heated gas and smoke.  
**Thermal insulation.** EI30 = 30 minutes and EI45 = 45 minutes fire protection.



**EW60**

Protection against fire, heated gas and smoke.  
Reduced passage of heat radiation.



**E30, E60**

Protection against fire, heated gas and smoke. Passage of heat radiation.

### Fire: Classification according to EN 13501-2

performance criteria	duration in minutes								
E	15	20	30	45	60	90	120	180	240
EI <sub>1</sub> *	15	20	30	45	60	90	120	180	240
EI <sub>2</sub> *	15	20	30	45	60	90	120	180	240
EW	-	20	30	-	60	-	-	-	-

\*EI<sub>1</sub> ≤ 140° max punctual < 180° \*\*EI<sub>2</sub> ≤ 140° max punctual < 360°

**DIN EN 13501-2** replaces the familiar classification according to **DIN 4102**, in which fire doors are classified in the classes **T30 – 180**. The former **T30** corresponds e.g. to the today's **EI30 (30 minutes fire protection)**. The class **EI45** is insert additionally in the revised classification standard.

SÄLZER doors are tested from both doors sides, thus provide protection against fire on both sides, at the corridor and room side.

### Smoke: Classification according to EN 13501-2

<b>S<sub>a</sub></b>	one test: ambient temperature
<b>S<sub>m</sub>   S<sub>200</sub></b>	two tests: ambient temperature and test with 200°C

## Smoke protection

Smoke inhalation is the major cause of death associated with the outbreak of a fire therefore fire doors should always be subjected to a smoke protection test. The test is performed in accordance with **DIN EN 1643-1**. The result is divided into 2 classes **S<sub>a</sub>** and **S<sub>m</sub>**. The class **S<sub>m</sub>** is also often referred as **S<sub>200</sub>**.



## Mechanical durability

A fire and smoke protection door is always tested concerning their mechanical durability. They must protect against fire and smoke e.g. even after 200,000 opening-closing cycles. After successful examination the doors are classified according to the European norm **DIN EN 14600**. C5 being the highest class with 200,000 completed cycles.

## Further tests according to:

British-Standard 476 Part 22.

# The Companies

## Stefatos s.a. | Greece

Description done by Mr Stefatos

# SÄLZER | Germany

Over 40 years SÄLZER has led the industry in development and technology of explosion, bullet, forced entry, fire and smoke resistant building components.

If electronic or mechanic security products - the complete product range around the building security is integrated in SYSTEM SÄLZER®: started with the protection of access roads e. g. by drop arm barriers, guard houses, doors, windows, facades up to access control.

SÄLZER products are subjected to stringent internal and external tests. The products are available in all security levels and comply with the highest quality criteria specified in worldwide standards like DIN EN, BS and UL.



Certified according to:  
DIN EN ISO 9001:2008.



Certified according ECO-SYS (Occupational safety to BS OHSAS 18001 / Environmental protection to ISO 14001).



Perimeter security.



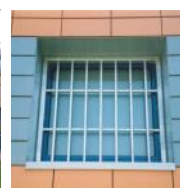
Guard houses & security entrances.



Doors & gates in steel and aluminum.



Windows & facades.



Grills & louvers .



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