

Partition SM60

Metal coatings and mineral wool core



The SM60 partition is designed for Ultra-Clean rooms that must be kept completely free of micro-biological contamination.

This partition consists of non combustible modular panels of thickness 60 mm 2.36", made of time-stable materials and no emitting particles.

The SM60 partition, providing smooth surfaces easy to clean, is airtight and insulating.

Design

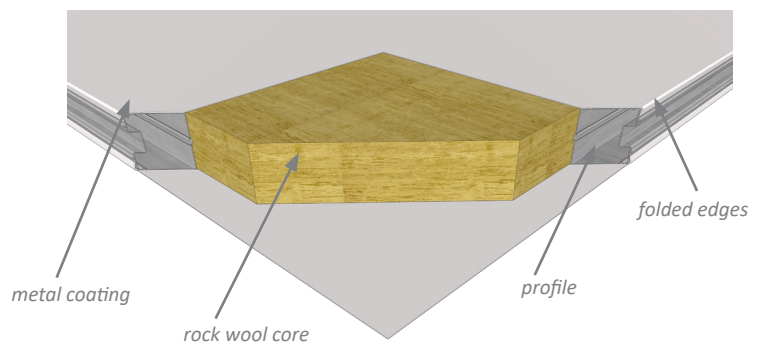
Core

Hydrophobic rock wool plates

Density : 80 kg/m³ (partition) 4.99 lb/ft³

Fire class according to EN 13501-1: A1

Glue : bi-components Polyurethane



Facings

Supports	Coatings according to NF EN 10169	Thicknesses (in mm)			Class according to XP P 34-301
		0,5 0.02"	0,6*0.02"	0,8 0.03"	
Steel sheet S280 GD, hot-dip galvanised Z225 (225g/m ² of zinc on the 2 faces) or similar	coated with polyester 25 µm lacquer	0,5 0.02"	0,6*0.02"	0,8 0.03"	IIIa
	coated with PVDF 35 µm lacquer	0,6			IVb
	coated with PVC 120 µm	0,6			Vc
	coated with a complex of polyester lacquer and PET film of total thickness 55 µm	0,6			Vc
Smooth stainless steel sheet of slight 304 or 316 L	polished S4	0,6	0,8		Not applicable
	coated with a PVC + PET film of total thickness 130 µm	0,6			

* standard facing

Standard colour : iceberg white (close to RAL 9010)

NB: on request, the two facings can be of different materials on inside and outside faces (aspect, colour and/or thickness)

Panel profiles

Metallic profile for passage of cables.

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Technical characteristics

Vertical panel

Thickness	60 mm 2.36"	
Widths	0,20 m 0.65'; 0,25 m 0.82'; 0,35 m 1.15'; 0,55 m 1.80'; 0,80 m 2.62'; 1,00 m 3.28	1,20 m 3.94'
Maxi. lengths	4 m 13.12'	6 m 19.68'
Thermal conductivity coefficient	$\lambda = 0,041 \text{ W/m} \cdot ^\circ\text{C}$ 0.023 Btu.ft/h.ft ² .°F	
Thermal transmission coefficient	$U_c = 0,612 \text{ W/m}^2 \cdot ^\circ\text{C}$ 0.109 Btu/h.ft ² .°F	
R-value	1,6	
Acceptable resisting to buckling	$\geq 210 \text{ kPa}$ 30.46 PSI (2,1 daN/cm ² 30.45 lbf/sp.in)	
Weight	17 kg/m ² 3.48 lbs/sq.ft (2 faces 0,6 mm 0.02")	
Tightness in whole partition with silicon joint	$Q_s \leq 0,0027 \text{ m}^3/\text{h} \cdot \text{m}^2$ 0.0088 ft ³ /h.ft ² under $\Delta P = 50 \text{ Pa}$ 0.007 PSI	

Maximum acceptable loads in partition

Bending resistance, panels on 2 supports

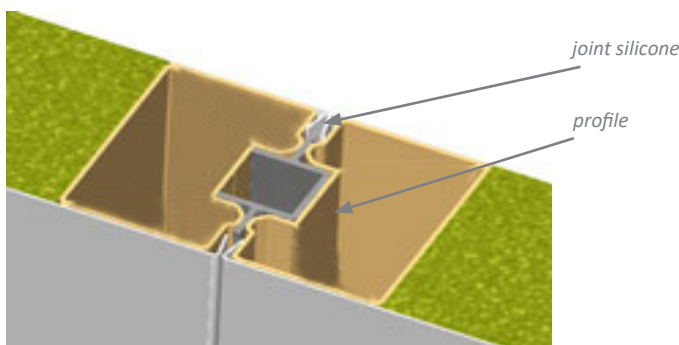
Partition height (m)	2,50 8.20'	3,00 9.84'	3,50 11.48'	4,00 13.12'	$\geq 4,50$ 14.76'
q (daN/m ²)	75 15.67 lbf/ft ²	55 11.49 lbf/ft ²	42 8.78 lbf/ft ²	30 6.27 lbf/ft ²	20 4.18 lbf/ft ²

Installation

Assembly

Profiles integrated in the thickness of SM panels, allow the assembly of panels and the passage of cables. The system uses an aluminium key profile that is inserted into the full length grooves both sides of wall panels.

A special feature without the link profile allows this partition to become removable panel by panel, thanks to stainless steel clips.



Assembly between panels



Tightness

- Silicon sealant (quality-label SNJF ; complies with FDA 21 CFR 175.105)
- Polymer MS caulk

Partition SM60

Metal coatings and mineral wool core



GSP-0203-E/C

Reports and approvals

Fire reaction:

Euroclass = A2-s1,d0

Flame spread index (ASTM E84-01) = Class 1

Class 0 (BS 476 part 6&7)

Flame spread (BS 476 part 7) = Class 1

Fire spread index (BS 476 part 6) = 0,7

FM Global approval: FM Approvals (standard 4880) = Class 1

UL approval (cable routing) Safety E471046

Consult the data n°0112 «Reports and approvals».

Airtight double flush glazing

GSP-0220-F/B



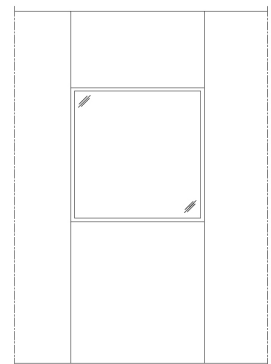
Glazings are monobloc elements of thickness 60 mm 2.36" made of two laminated glasses mounted flush on a black aluminium profile with tightness on the periphery.

They can be incorporated into walls (SI, SM, ST, SL) on site.

Application

These glazings can be used in premises where the relative humidity not exceeded 75% and with a temperature between +10°C 50°F and + 40 °C 104°F.

The use of 100 mm 3.94" wide mullions increases the glazed surface (SI, SM range).



Glazing between 2 panels
(SI/SM/ST/SL)

Characteristics

Glazings are bi-glasses made of black (RAL 9005) aluminium profile on which is bonded 2 laminated glasses 44.2 (according to the standard NF EN14449) with 2 peripheral inserts (containing molecular riddle or dryer).

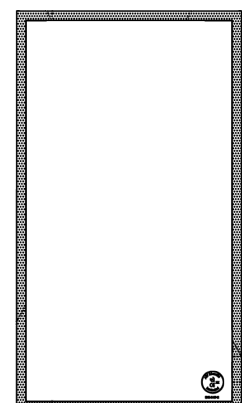
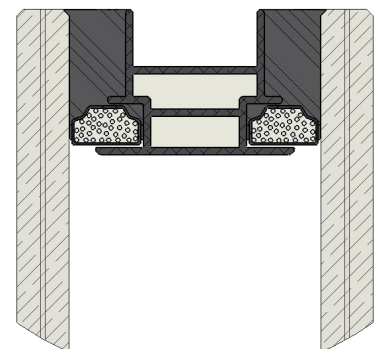
A silicon joint is extruded between glasses and aluminium profile in order to ensure the tightness, leaving the black (RAL 9005) peripheral aluminium profile visible. This profile enables the assembly between panels or glazings.

A decompression valve can be set on glazings send by plane or mounted at more than an altitude of 1100 m 3609'.

Weight 47 kg/m² 9.63 lb/f²
Coefficient U 2,66 W/m².k



EN14449-2



Standard dimensions

Height (B) x Width (A) (mm)

798 x 798 2.62' x 2.62'

998 x 798 3.27' x 2.62'

1198 x 798 3.94' x 2.62'

998 x 998 3.27' x 3.27'

1198 x 998 3.94' x 3.27'

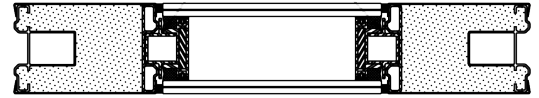
1198 x 1198 3.94' x 3.94'

Other dimensions on request.

Airtight double flush glazing

Installation

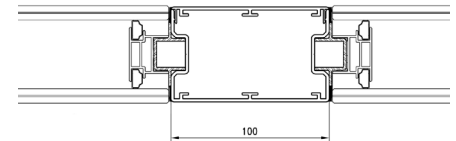
Glazings are incorporated on site into SI, SM, ST or SL walls or between panels, spandrel and impost. A silicon joint assures the tightness between juxtaposed flush elements.



Mullion between glazings

Using mullions enables to increase the glazing surface.

The lacquered aluminium profiles are put between glazings in order to keep the partition rigidity. They can be used for the cable passage.



Variant with integrated blind only for glazings with thickness 60 mm 2.36''

For glazings of thickness 60 mm 2.36'', it is possible to integrate white Venetian blinds, manuals or automatics, and adjustable.

In manual control with rod or thin cord.

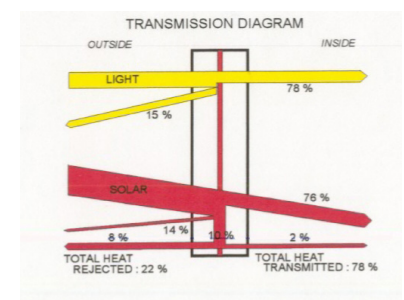
In automatic, control with remote control or button.



Glazed with inactinic film

Colored safelight films absorb light radiation between 300 and 570 nanometers in particular ultra violet radiation. They are used for protection against light and UV in production and control workshops, for example, for sensitive electronic equipment.

Up to 4 films can be stacked to obtain the performance required. The films are inserted between the glass during the manufacturing process of the glass. To be study case by case.



Mullion between glazings

GSP-0215-E/B



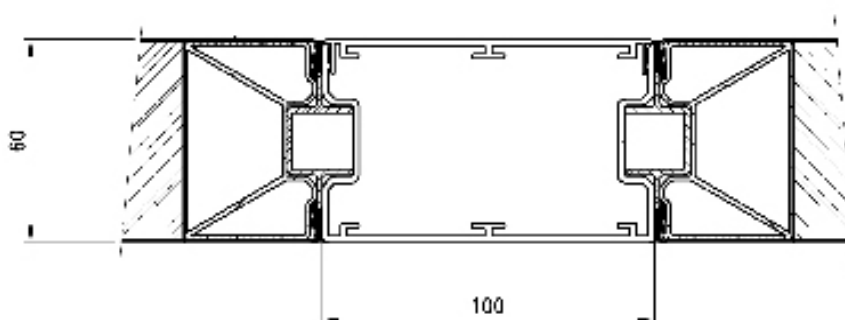
Positioned between two glazings, the mullion allows to stiffen the partition. It can be installed in a partition of thickness 60 mm 2.36" made of Ultra-Clean line panels.

Conception

Cover and support in lacquered aluminium, width 100 mm 3.94", thickness 60 mm 2.36".

Basis length of 4 m 13.12' with specific adaptation piece at bottom for assembly on adjustable belt.

It also allows the passage of cables or other fluid.





The electrical raceway enables the passage of cables and accessories gathering between two panels of thickness 60 mm 2.36" from the Ultra-Clean line.



Description

The support and the cover are in lacquered aluminium, of width 100 mm 3.93", of thickness 60 mm 2.36", of basis length of 4 m 13.12" with a flat T-bracket for the mounting on adjustable belt.

As the cover is fixed last, the cables can be set up after the partition mounting.

All is totally recessed in the partition thickness and is flush on the two sides without visible fixings.

Technical characteristics

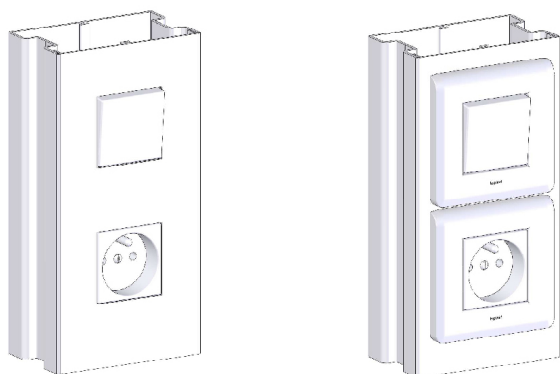
The removable cover enables to integrate different electrical accessories on semi-flush or flush way.

- power socket, RJ45,...
- switch
- push button, lights,...
- signal lamps

The electrical race way could be divided strong current-weak current.

Openings, only on one part of the cover, are possible in factory or on site.

Installation is the same as mullion mounting.

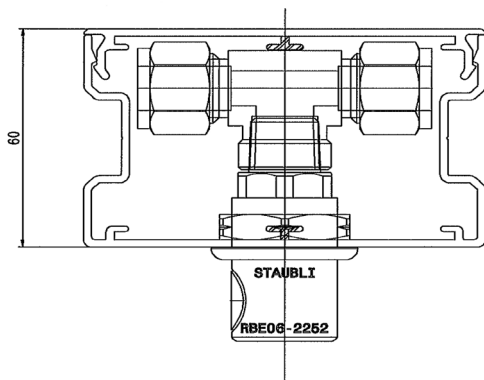


Option - Equipment set on factory

Electrical accessories are usually not provided with the race way, however, it is possible to prepare in factory pre equipped raceways, where accessories and wiring are integrated and sealed.

NB : these raceways can be used for passage of different fluids (air, gas, ...)

example of installation



Double flush door sheet leaf 60

Flush frame for panels of thickness 60 mm 2.36", aluminium honey comb or mineral wool core GSP-0224-E/B



Service door with flush door frame on the 2 sides of the partition.
The leaf, double flush, consists in aluminium honeycomb or mineral wool core bonded between 2 metallic facings.

Technical characteristics

Leaf

- 1 or 2 leaves thickness 60 mm 2.36"
- sandwich structure
- aluminium honey comb or mineral wool core and aluminium structure profiles
- smooth galvanised steel sheet 8/10th 0.031" welded mechanical and painted with epoxy-polyester powder, heat-cured, iceberg white coloured (close to RAL 9010), options : colours according to the chart (GSP-1208)

Door frame

- one-piece double flush frame for panels of thickness 60 mm 2.36"
- lacquered aluminium frame, heat-cured epoxy-polyester powder coating

Options

- stainless steel door frame
- lifting impost 630 2.07', 730 2.39' or 830 2.72' mm for door 2040 x 1660 mm 6.69' x 5.44' and 2040 x 2060 mm 6.69' x 6.76'

Left or right opening.

Tightness

Closed profile sealant, 10 mm 0.39" trimming at the bottom of the door.

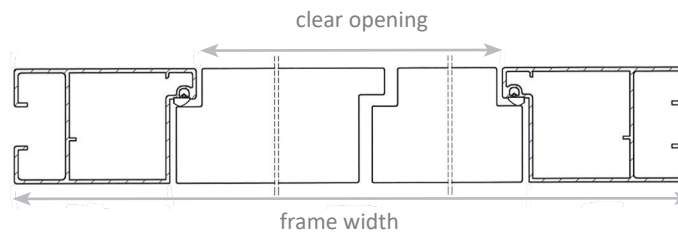
	standards equipment	options	see data N°	
doors with 1 or 2 leaves	adjustable white lacquered aluminium hinges	adjustable stainless steel finishing aluminium hinges	GSP-0902-E/B	
		stainless steel hinges (no adjustable)		
	white PVC handle with cylinder-type safety lock (single keyway)	coloured PVC handle with european profile lock (single keyway)	GSP-0901-E/B	
		stainless steel handle with european profile lock (single keyway)		
		white PVC pull handle (without lock) with push plate		
		stainless steel pull handle (without lock) with push plate		
	stamped stainless steel strike			
	doors with 1 or 2 leaves		panic push bar	GSP-0903-E/B
			floor gasket	GSP-0906-E/B
			sweeper gasket	
			door stop	GSP-0905-E/B
			wall mounting door closer	GSP-0904-E/B
			double flush vision panel 640 x 350 mm 2.10' x 1.15', 800 x 500 mm 2.62' x 1.64', 1000 x 500 mm 3.28' x 1.64'	GSP-0920-E/B
			grey PVC kick plate, height 850 mm 2.79' on 1 or 2 faces	GSP-0911-E/B
stainless steel sheet kick plate, height 850 mm 2.79' on 1 or 2 faces			GSP-0912-E/B	
recessed magnetic lock			GSP-0914-E/B to GSP-0919-E/B	
airlock management				
doors with 2 leaves	lever bolt top and bottom on half fixed leaf		GSP-0907-E/B	
		closing selector	GSP-0904-E/B	

Double flush door sheet leaf 60

Flush frame for panels of thickness 60 mm 2.36", aluminium honey comb or mineral wool core

GSP-0224-E/B

Dimensions



(mm)	designation H x W	clear opening H x W	door frame H x W	designation H x W	clear opening H x W	door frame H x W	designation H x W	clear opening H x W	door frame H x W
1 leaf	2040 x 630 80" x 25"	2039 x 609 80" x 24"	2135 x 801 84" x 31"	2240 x 630 88" x 25"	2239 x 609 88" x 24"	2335 x 801 92" x 31"			
	2040 x 830 80" x 33"	2039 x 809 80" x 32"	2135 x 1001 84" x 39"	2240 x 830 88" x 33"	2239 x 809 88" x 32"	2335 x 1001 92" x 39"			
	2040 x 930 80" x 37"	2039 x 909 80" x 36"	2135 x 1101 84" x 43"	2240 x 930 88" x 37"	2239 x 909 88" x 36"	2335 x 1101 92" x 43"	2440 x 930 96" x 37"	2439 x 909 96" x 36"	2535 x 1101 99" x 43"
	2040 x 1030 80" x 41"	2039 x 1009 80" x 40"	2135 x 1201 84" x 47"	2240 x 1030 88" x 41"	2239 x 1009 88" x 40"	2335 x 1201 92" x 47"	2440 x 1030 96" x 41"	2439 x 1009 96" x 40"	2535 x 1201 99" x 47"
	2040 x 1130 80" x 45"	2039 x 1109 80" x 44"	2135 x 1301 84" x 51"						
2 leaves	2040 x 1260 80" x 50"	2039 x 1244 80" x 49"	2135 x 1436 84" x 56"	2240 x 1260 88" x 50"	2239 x 1244 88" x 49"	2335 x 1436 92" x 56"			
	2040 x 1460 80" x 58"	2039 x 1444 80" x 57"	2135 x 1636 84" x 64"						
	2040 x 1660 80" x 65"	2039 x 1644 80" x 65"	2135 x 1836 84" x 72"	2240 x 1660 88" x 65"	2239 x 1644 88" x 65"	2335 x 1836 92" x 72"	2440 x 1660 96" x 65"	2439 x 1644 96" x 65"	2535 x 1836 99" x 72"
	2040 x 1860 80" x 73"	2039 x 1844 80" x 73"	2135 x 2036 84" x 80"						
	2040 x 2060 80" x 81"	2039 x 2044 80" x 80"	2135 x 2236 84" x 88"	2240 x 2060 88" x 81"	2239 x 2044 88" x 80"	2335 x 2236 92" x 88"	2440 x 2060 96" x 81"	2439 x 2044 96" x 80"	2535 x 2236 99" x 88"

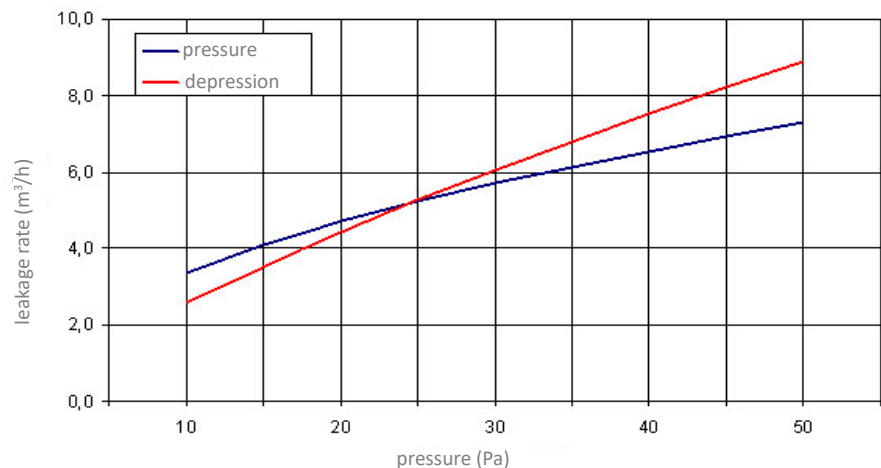
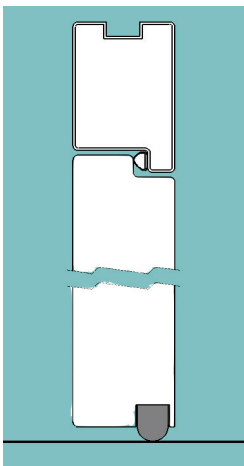
Permeability

Nota :

- a door is under pressure when the action of the air tends to stick the leaf on the door frame
- a door is in vacuum when the action of the air tends to spread the leaf of the door frame

Air leakage rate for single leaf hinged door with floor gasket

The permeability of the double flush doors with floor gasket is note in report n°2612115 made by CETIAT.



Single flush door sheet leaf 40 mm 1.57''

Flush door frame for panel thickness 60 mm 2.36'', aluminium honey comb or mineral wool core

GSP-0221-E/B



Service door with flush door frame on the 2 sides on the partition. The leaf, flush on one side of the frame, consists in aluminium honeycomb or mineral wool core bonded between 2 metallic facings.

Technical characteristics

Leaf

- 1 or 2 leaves of thickness 40 mm 1.57''
- sandwich structure
- aluminium honey comb or mineral wool core and aluminium structure profiles
- facings :
 - smooth galvanised steel sheet 6/10th 0.02'' and heat-cured epoxy-polyester powder paint, (colour according to the chart)
 - or stainless steel sheet 304 polished S4
- mono component polyurethane glue
- option : compact high pressure laminated leaf

Door frame

- one piece flush frame for panels of thickness 60 mm 2.36''
- lacquered aluminium frame, heat-cured epoxy-polyester powder paint
- option : stainless steel frame

Tightness

Sealant on 3 sides and 10 mm 0.39'' trimming at the bottom of the door.

Left or right opening.

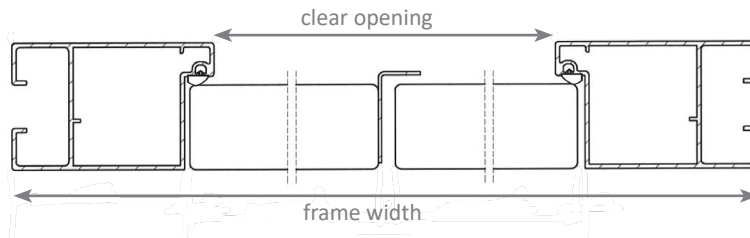
	standards equipment	options	see data N°	
doors with 1 or 2 leaves	adjustable white lacquered aluminium hinges	adjustable stainless steel finishing aluminium hinges	GSP-0902-E/B	
		stainless steel hinges (no adjustable)		
	white PVC handle with cylinder-type safety lock (single keyway)	coloured PVC handle with european profile lock (single keyway)	GSP-0901-E/B	
		stainless steel handle with european profile lock (single keyway)		
		white PVC pull handle (without lock) with push plate		
		stainless steel pull handle (without lock) with push plate		
	stamped stainless steel strike			
	doors with 1 or 2 leaves		panic push bar	GSP-0903-E/B
			floor gasket	GSP-0906-E/B
			sweeper gasket	
			door stop	GSP-0905-E/B
			wall mounting door closer	GSP-0904-E/B
			double flush vision panel 640 x 350 mm 2.1' x 1.15', 800 x 500 mm 2.6' x 1.6', 1000 x 500 mm 3.3' x 1.6'	GSP-0920-E/B
grey PVC kick plate, height 850 mm 2.8' on 1 or 2 faces			GSP-0911-E/B	
stainless steel sheet kick plate, height 850 mm 2.8' on 1 or 2 faces			GSP-0912-E/B	
closure detection contact			GSP-0914-E/B to GSP-0919-E/B	
airlock management (wall mounting magnetic lock with back plate)				
doors with 2 leaves	lever bolt top and bottom on half fixed leaf		GSP-0907-E/B	
		closing selector	GSP-0904-E/B	

Single flush door sheet leaf 40 mm 1.57''

Flush door frame for panel thickness 60 mm 2.36'', aluminium honey comb or mineral wool core

GSP-0221-E/B

Dimensions



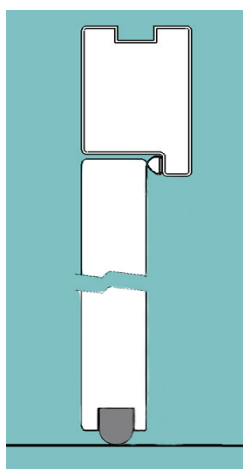
(mm)	designation H x W	clear opening H x W	door frame H x W	designation H x W	clear opening H x W	door frame H x W	designation H x W	clear opening H x W	door frame H x W
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	2040 x 1860 80'' x 73''	2039 x 1844 80'' x 73''	2135 x 2036 84'' x 80''						
	2040 x 2060 80'' x 81''	2039 x 2044 80'' x 80''	2135 x 2236 84'' x 88''	2240 x 2060 88'' x 81''	2239 x 2044 88'' x 80''	2335 x 2236 92'' x 88''	2440 x 2060 96'' x 81''	2439 x 2044 96'' x 80''	2535 x 2236 99'' x 88''

Permeability

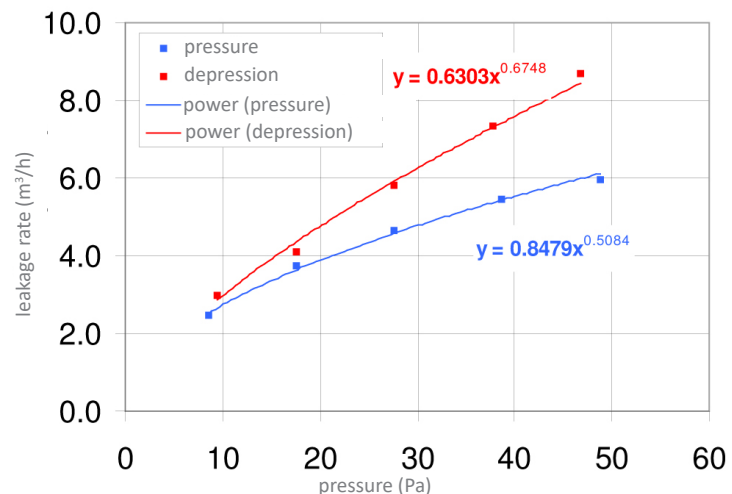
Nota :

- a door is under pressure when the action of the air tends to stick the leaf on the door frame
- a door is in vacuum when the action of the air tends to spread the leaf of the door frame

Air leakage rate for single leaf hinged door with floor gasket



Dagard service door 40 mm 1.57'', single leaf with floor gasket, measures in pressure and depression



Example of air leakage rate of a door in m³/h according to a pressure :
 the value read in m³/h/m is multiplied by the perimeter of the door (2 x (HL + LL))
 ex. door 2,04 x 0,93 m Pressure at 20 Pa
 Permeability 4 x (2 x (2,04 + 0,93)) = 23,76 m³/h

Tight sliding door

Flush frame for panels of thickness 60 mm 2.36", leaf 40 mm 1.57" aluminium honey comb core



Sliding door with flush frame on one side of the partition.
The leaf consists in aluminium honeycomb core bonded between 2 metallic facings.
Sliding system with ramps and tightness on the 4 sides.
Door easy to clean for an use in all clean rooms.

Technical characteristics

Leaf

- 1 leaf of thickness 40 mm 1.57"
- sandwich structure with a reinforced frame integrated
- aluminium honey comb core
- facing (colour according to the chart) : smooth galvanised steel sheet 6/10th and painted with epoxy-polyester powder, heat-cured.
- mono component polyurethane glue

Option :

- door with 2 leaves
- automatism

Door frame

- one-piece frame for panels of thickness 60 mm 2.36"
- galvanised steel Z225 frame, heat-cured epoxy-polyester powder coating.

Left or right opening.

Tightness

- airtight peripheral joint on the 4 sides

Sliding system:

The manual system consists in a track fixed directly on the frame with integrated ramps and butts.
Aluminium track cover, easy to clean and designed to receive, without modification, an automatism.
White colour close to RAL 9010.

	standards equipment	options	see data N°
door with 1 leaf	aluminium pull handle outside recessed pull handle inside	stainless steel pull handle (without lock) on external side	GSP-0908-E/A
	anodized aluminium track with lacquered aluminium cover track		
	bottom door guides		
		double flush vision panel 640 x 350 mm 2.1' x 1.15', 800 x 500 mm 2.6' x 1.6', 1000 x 500 mm 3.3' x 1.6'	GSP-0920-E/A
		grey PVC kick plate, height 850 mm 2.8' on 1 or 2 faces	GSP-0911-E/B
		stainless steel sheet kick plate, height 850 mm 2.8' on 1 or 2 faces	GSP-0912-E/B
		automatism	GSP-0910-E/A
		electric bolt	GSP-0913-E/A

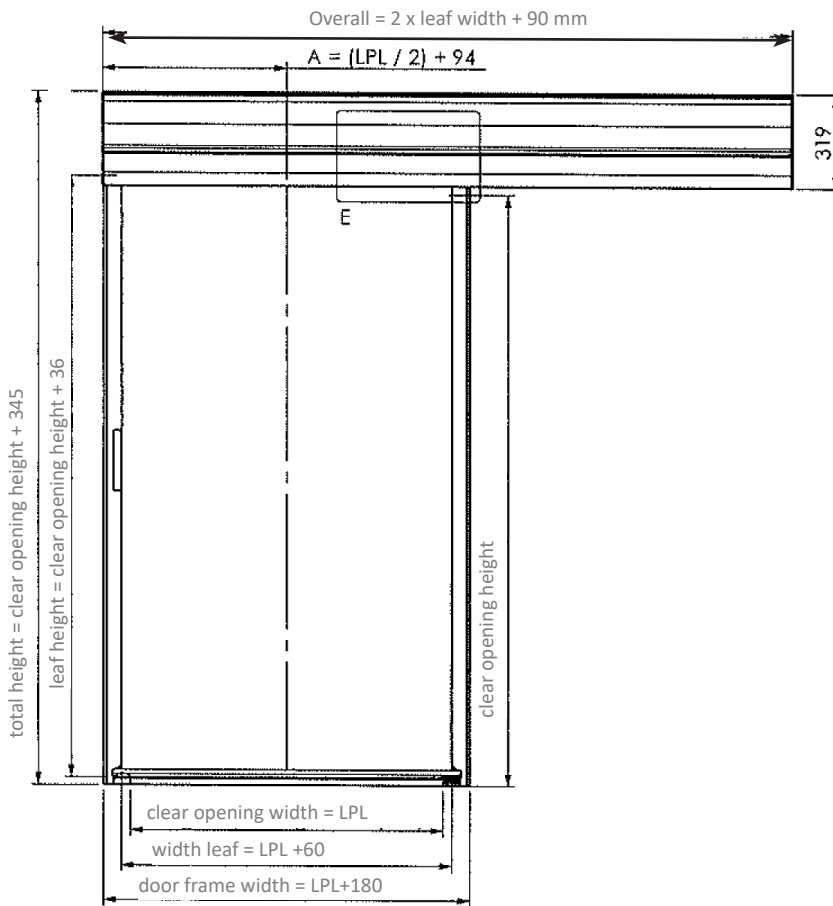
Tight sliding door

Flush frame for panels of thickness 60 mm 2.36", leaf 40 mm 1.57" aluminium honey comb core

GSP-0228-E/B

Dimensions

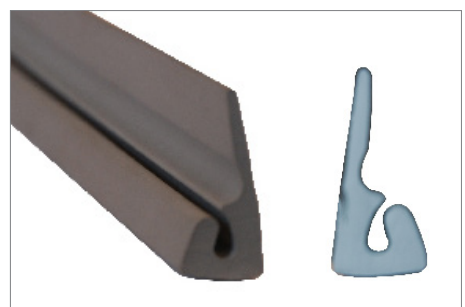
(mm)	clear opening H x W	overall H x W	clear opening H x W	overall H x W	clear opening H x W	overall H x W
1 leaf	2000 x 950 78" x 37"	2345 x 2118 92" x 83"	2200 x 950 86" x 37"	2545 x 2118 100" x 83"	2400 x 950 94" x 37"	2745 x 2118 108" x 83"
	2000 x 1200 78" x 47"	2345 x 2618 92" x 103"	2200 x 1200 86" x 47"	2545 x 2618 100" x 103"	2400 x 1200 94" x 47"	2745 x 2618 108" x 103"
	2000 x 1400 78" x 55"	2345 x 3018 92" x 119"	2200 x 1400 86" x 55"	2545 x 3018 100" x 119"	2400 x 1400 94" x 55"	2745 x 3018 108" x 119"
	2000 x 1600 78" x 63"	2345 x 3418 92" x 134"	2200 x 1600 86" x 63"	2545 x 3418 100" x 134"	2400 x 1600 94" x 63"	2745 x 3418 108" x 134"
	2000 x 1800 78" x 70"	2345 x 3818 92" x 150"	2200 x 1800 86" x 70"	2545 x 3818 100" x 150"	2400 x 1800 94" x 70"	2745 x 3818 108" x 150"
	2000 x 2000 78" x 78"	2345 x 4218 92" x 166"	2200 x 2000 86" x 78"	2545 x 4218 100" x 166"	2400 x 2000 94" x 78"	2745 x 4218 108" x 166"



bottom guides easily washable



Thin and easy to clean rail cover



gasket easily washable

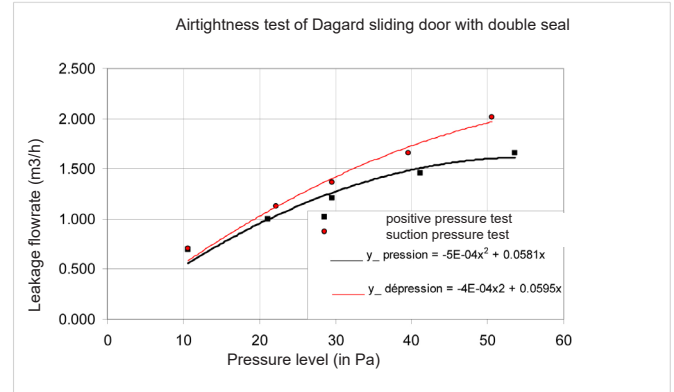
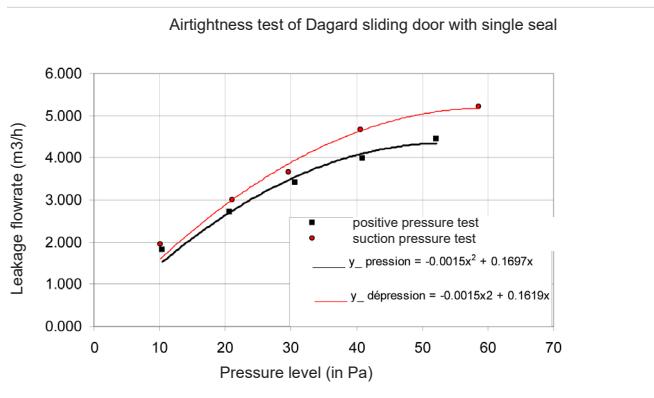
Tight sliding door

Flush frame for panels of thickness 60 mm 2.36", leaf 40 mm 1.57" aluminium honey comb core

Permeability

The air permeability of the sliding doors has been measured and recorded in CETIAT test report N°1014119.

Permeability of a sliding door in m³/h depending on pressure or depression.



Nota :

- a door is under pressure when the action of the air tends to stick the leaf on the door frame
- a door is in vacuum when the action of the air tends to spread the leaf of the door frame

Use recommendation

Automatic tight sliding doors don't comply the CO48 regulation, requiring an automatic opening, in case of lack of power, by an independent mechanical solution.

We propose as, an option, an opening by safety battery.

The connections of SI, SM, ST, SL, SA panels between themselves, with the floor or with the ceiling are adapted to the environment cleaning and decontamination restrictions the more strict.

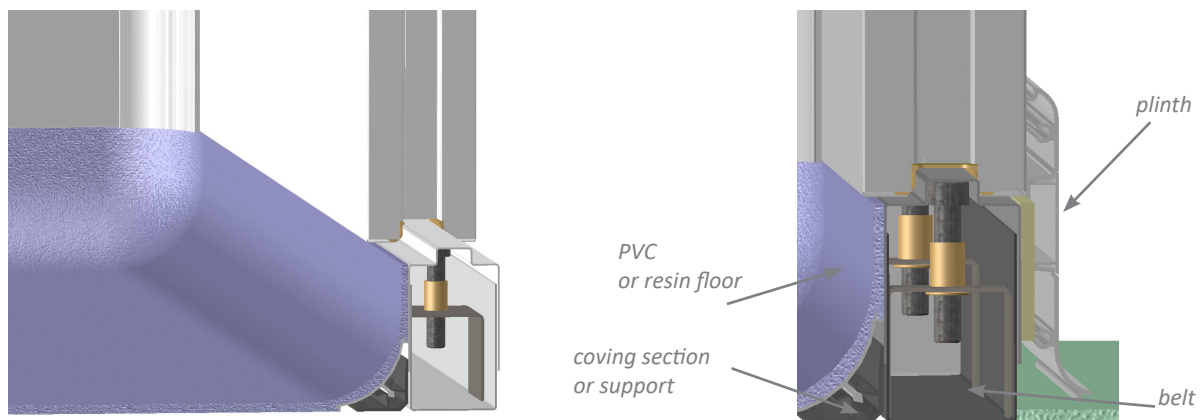
Link with floor

By means of an adjustable metallic belt

The adjustable metallic belt enables the level to be adjusted while providing for a 5 mm 0.02" undercut here and there to enable the floor to be flush with the partition.

A coving profile fillet is available as an option to provide support for floor upsweeps (PVC or resin). On the outside face, a plinth can be installed.

Dimensions : 80 (-10 +30) x 50 mm 3.15" (-0.39"+1.18") x 1.97"

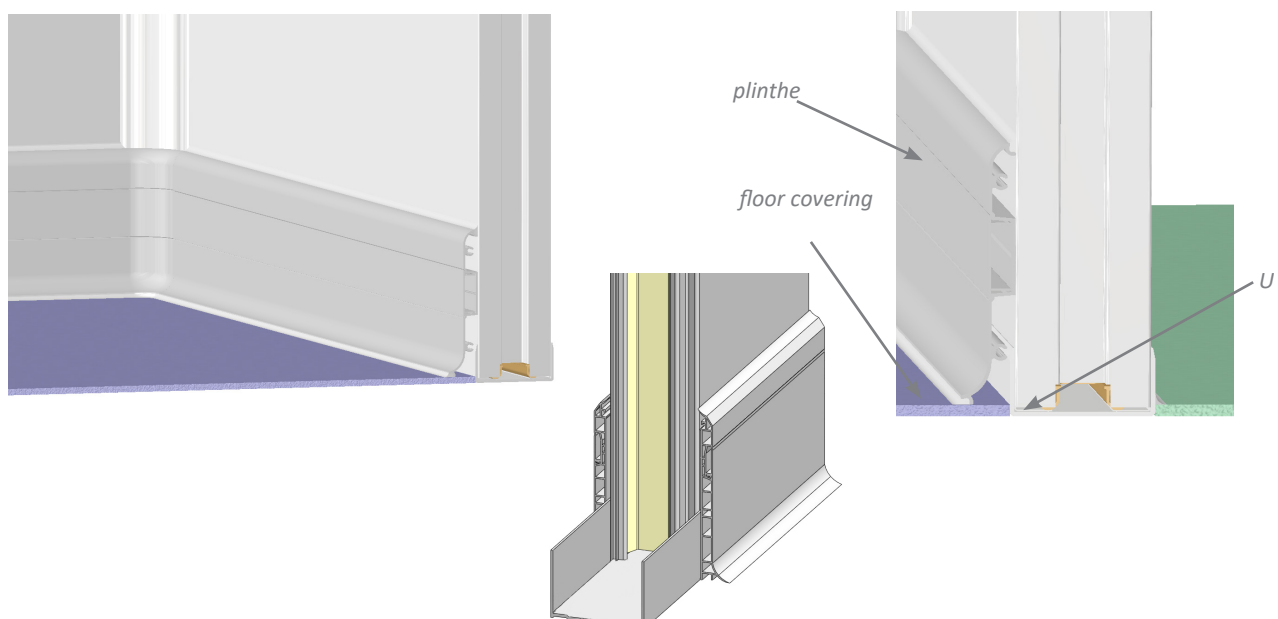


By U-shaped piece

Partition can be linked to the floor with a lacquered aluminium or PVC U-profile, 60 mm 2.36".

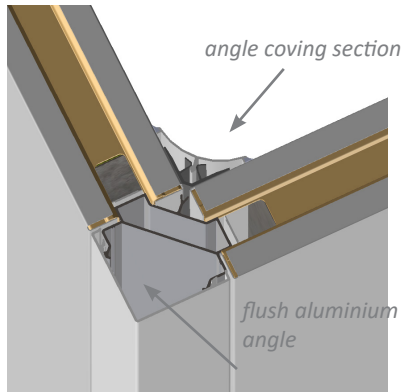
A plinth on one side or on each side of the partition ensures the finish.

Principle: Installation of U-profile on finished floor.

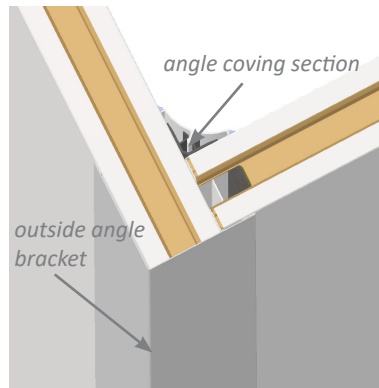


Junctions between vertical panels

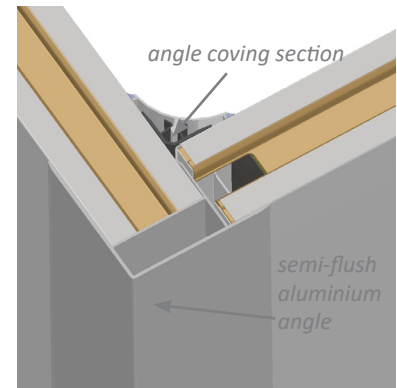
Junction at coving profile



With a flush angle post

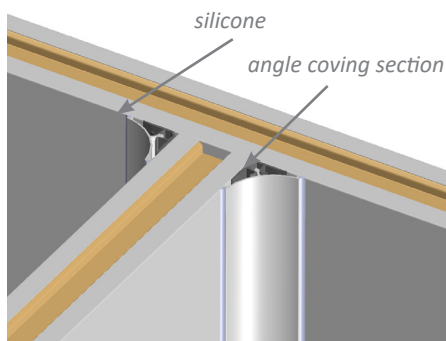


With a complement profile

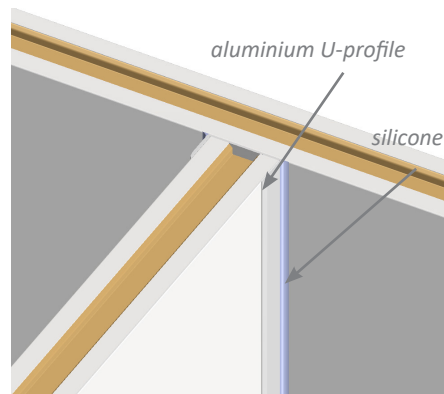


With semi-flush angle post

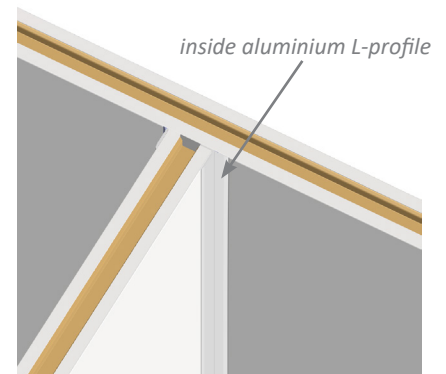
Junction in partition



With PVC, aluminium, or stainless steel angle coving section

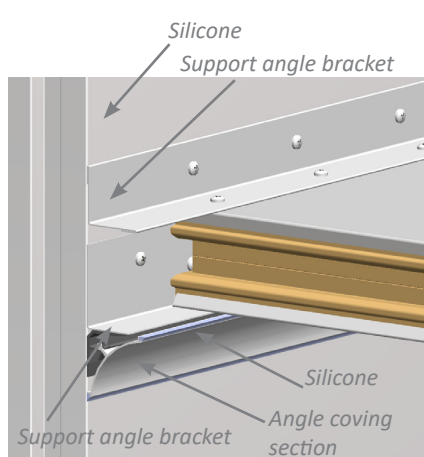


With aluminium U-profile

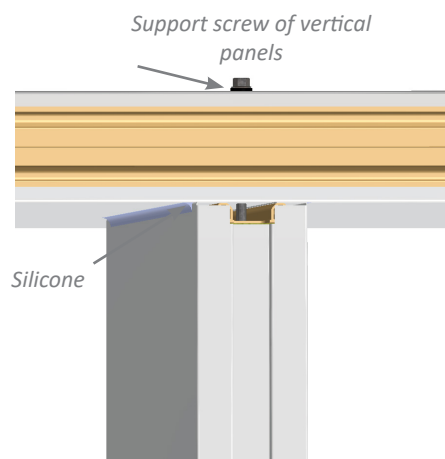


With aluminium L-profile

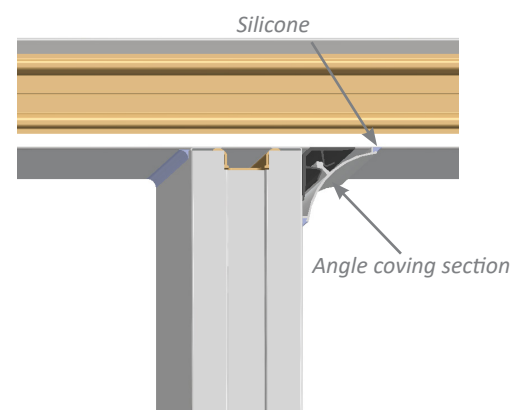
Junctions between ceilings and partitions



Junction ceiling to partition with load-bearing support on partition



Partition under ceiling junction by direct screwing



Partition under ceiling junction with fixing by angle coving section

Technical panel



The technical panel is a specific panel with a hollow core allowing a vertical passage for fluids and wiring.

Technical characteristics

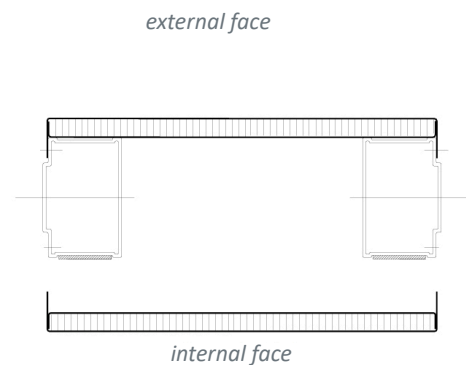
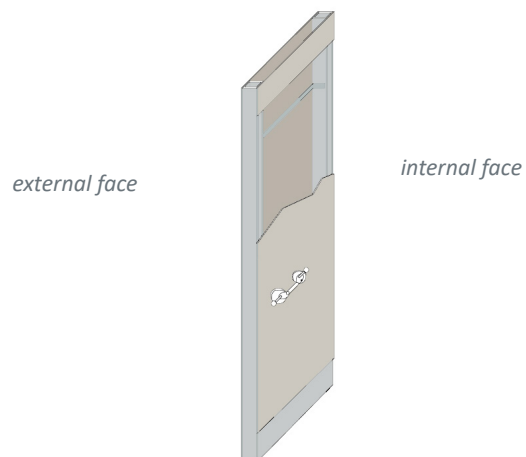
The technical panel consists of two 6 mm 0.236" thick panels assembled in a rigid frame. It is flush mounted on partitions of Ultra-Clean line.

One of the two sides is held in place by two magnetic strips and can be easily dismantled using suction cups as a removable cover. This cover can be divided up into several superposed elements.

Width 400 mm 15.75"

Available area 350 x 45 mm 13.78" x 1.77" over the entire height

Heights 2400 mm 7.87', 3000 mm 9.84', 4000 mm 13.12'

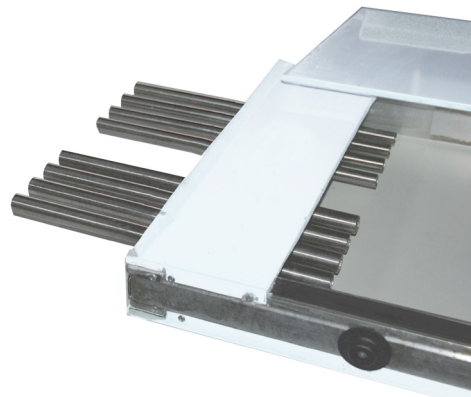
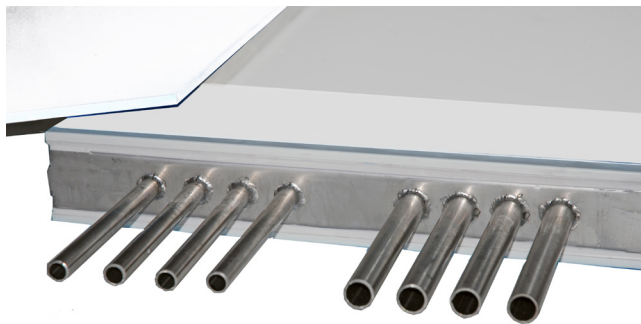


Note

Technical panels can be customized in factory for fluid inlets and outlets in sealed manner.

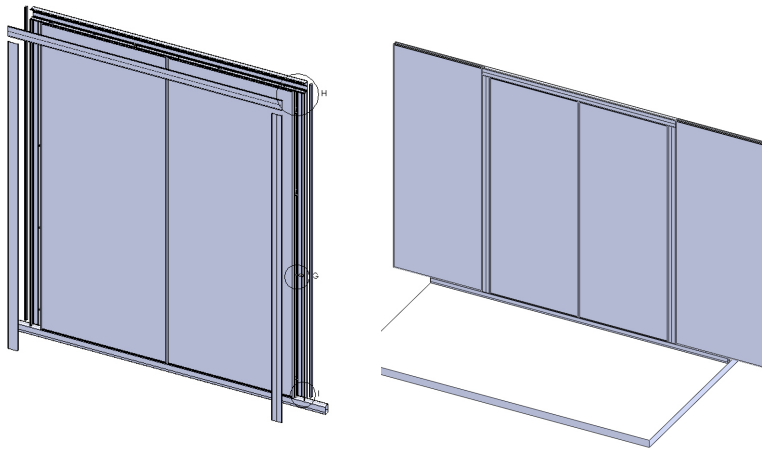
Example of adaptation:

Stainless steel welded pipes at top end of the technical panel for cables passage and ulterior sealing.



Mullion for removable area

GSP-0214-E/B



The technical panel allows to realise a removable zone in a 60 mm 2.36" thick partition made with panel of Ultra-Clean line.

The removable area is useful for set up machines in construction phase and facilitate the maintenance or the future evolution of the process.

Design

The removable mullion consists of aluminium profiles.

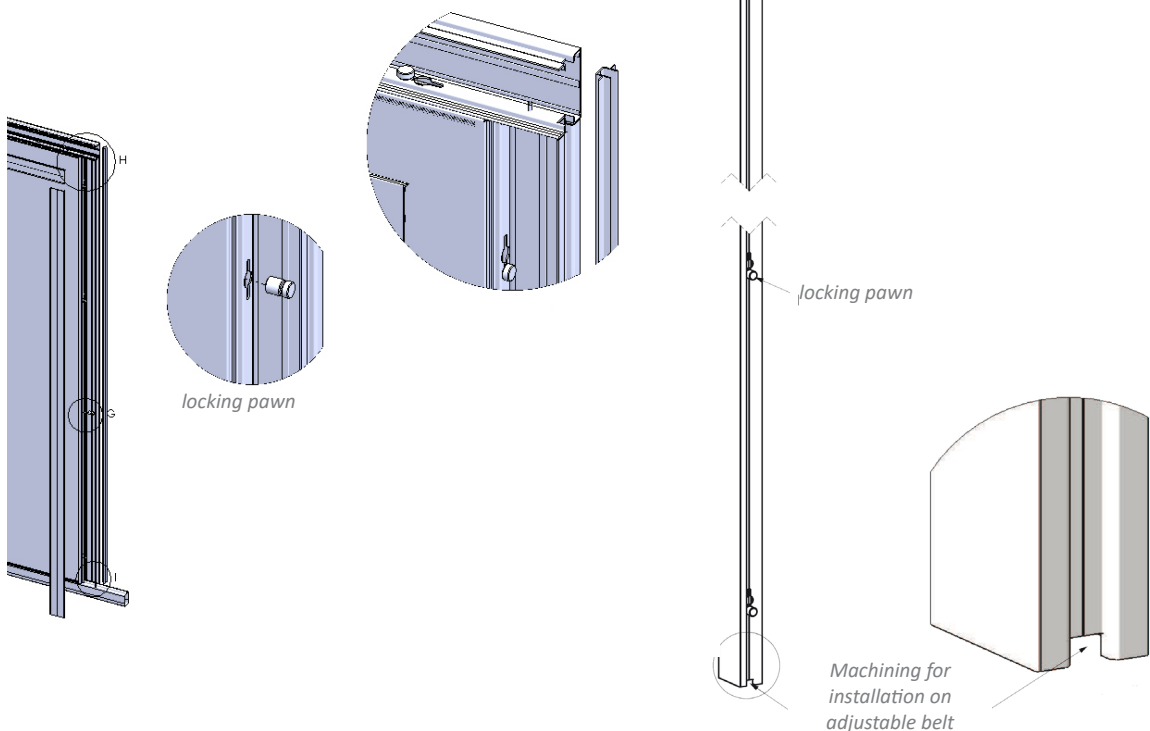
It can be used on adjustable metal belt or in U-profile for a removable area of one or several panels.

It consists of :

- a profile
- a cover
- a locking pawl

Dimensions :

- width 100 mm 3.94"
- thickness 60 mm 2.36"
- length 4 m 13.12'





The air extract duct consists of an aluminium honeycomb structure and lacquered steel sheet with a hollow core. It enables the air extraction of the premise in the panel thickness.

Line

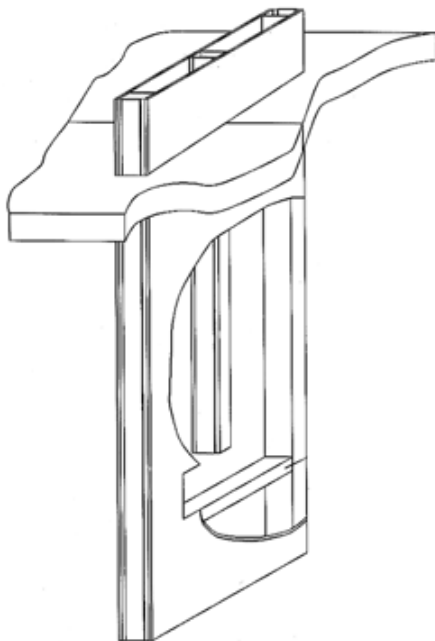
The air extract duct is available in the following dimensions width 40 cm 15.7" and 80 cm 31.5", length until 4 m 13.12' in increments of 10 cm 3.9".

With a thickness of 60 mm 2.36", it adapts panels of Ultra-Clean line.

Air extraction performance features

- maxi flow rate of 700 m³/h 24 720 ft³/h for an air speed of about 5 m/s in a duct of width 80 cm 2.62'.

- maxi flow rate of 350 m³/h 12 360 ft³/h for an air speed of about 5 m/s in a duct of width 40 cm 1.31'.



Ceiling SM60

Metal coatings and mineral wool core



The ceiling SM60 is designed for Ultra-Clean rooms that must be kept completely free of micro-biological contamination.

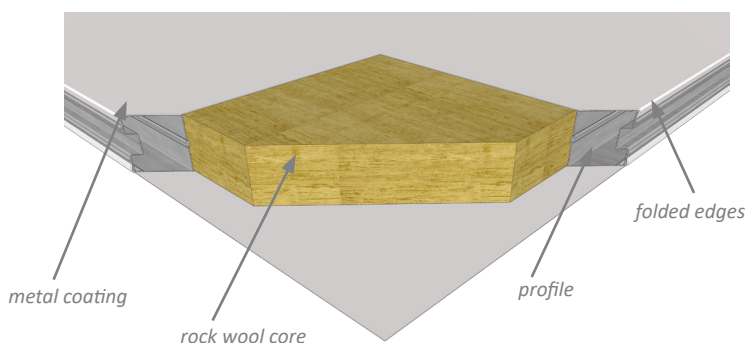
This ceiling consists of non combustible modular panels of thickness 60 mm 2.36", made of time-stable materials and no emitting particles. The SM60 ceiling, providing smooth surfaces easy to clean, is airtight and insulating.

Design

Core

Hydrophobic rock wool plates
 Density: 100 kg/m³ (ceiling) 6.24 lb/ft³
 Fire class according to EN 13501-1: A1

Glue : bi-components Polyurethane



Facings

Supports	Coatings according to NF EN 10169	Thicknesses (in mm)			Class according to XP P 34-301
Steel sheet S280 GD, hot-dip galvanised Z225 (225g/m ² of zinc on the 2 faces) or similar	coated with polyester 25 µm lacquer	0,5 0.02"	0,6*0.02"	0,8 0.03"	IIIa
	coated with PVDF 35 µm lacquer	0,6			IVb
	coated with PVC 120 µm	0,6			Vc
	coated with a complex of polyester lacquer and PET film of total thickness 55 µm	0,6			Vc
Smooth stainless steel sheet of slight 304 or 316 L	polished S4	0,6	0,8		Not applicable
	coated with a PVC + PET film of total thickness 130 µm	0,6			

* standard facing

Standard colour : iceberg white (close to RAL 9010)

NB: on request, the two facings can be of different materials on inside and outside faces (aspect, colour and/or thickness)

Panel profiles

Metallic profile for passage of cables.

Ceiling SM60

Metal coatings and mineral wool core



GSP-0204-E/C

Technical characteristics

Ceiling panel

Thickness	60 mm 2.36"	
Widths	0,35 m 1.15'; 0,55 m 1.80'	1,20 m 3.94'
Maxi. lengths	4 m 13.12'	6 m 19.68'
Thermal conductivity coefficient	$\lambda = 0,041 \text{ W/m} \cdot ^\circ\text{C}$ 0.023 Btu.ft/h.ft ² .°F	
Thermal transmission coefficient	$U_c = 0,612 \text{ W/m}^2 \cdot ^\circ\text{C}$ 0.109 Btu/h.ft ² .°F	
R-value	1,6	
Acceptable resisting to buckling	$\geq 210 \text{ kPa}$ 30.46 PSI (2,1 daN/cm ² 30.45 lbf/sp.in)	
Weight	18 kg/m ² 3.48 lbs/sq.ft (2 faces 0,6 mm 0.02")	

Acceptable span in ceiling

		Walkable(*)	Non walkable
Without opening	-	2,40 m 7.87'	3,20 m 10.50'
With opening	If panel with opening, between 2 panels without opening	2,40 m 7.87'	3,20 m 10.50'
	If majority of panels with one to two opening by panel	2,00 m 6.56'	2,80 m 9.19'
	If opening «nonstandard» or important frequency of opening	1,60 m 5.25'	2,40 m 7.87'

Span = distance between two suspension pieces, longways of panel.

Loads take into account for measures = 60 daN/m² 12.53 lbf/ft² (panel weight included, panel on 2 supports) + 150 daN 337.21 lbf (if accessible ceiling, concentrated load at any point of the ceiling).

Small sections can be cut out (width < 600 mm 1.96') without compromising the safety of the ceiling.

With «nonstandard» openings (width > 0,665 m 2.18' and/or area > 0,45 m² 4.84 ft²) it is necessary to provide additional fastening joist.

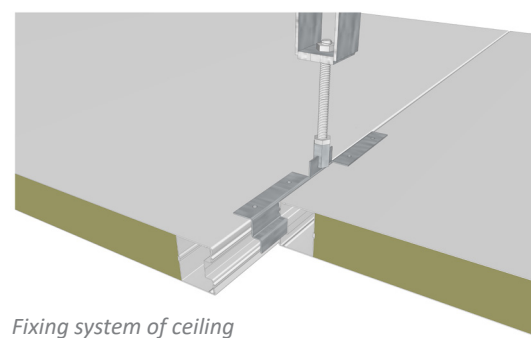
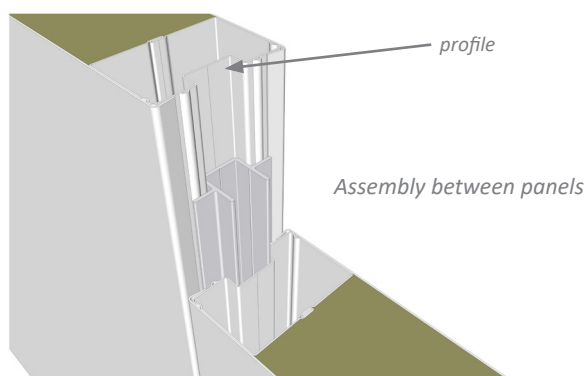
(*) : The SM60 ceiling must not be considered as a technical platform. For maintenance, it supports the passage of one person.

Installation

Assembly

Profiles integrated in the thickness of SM panels, enable the assembly of panels and the passage of cables. The system uses an aluminium key profile that is integrated in the grooves of the 4 sides of the ceiling panels.

A metallic profile is integrated in the grooves in order to hang the ceiling panels to the building structure.



Tightness

- Silicon sealant (quality-label SNJF ; complies with FDA 21 CFR 175.105)
- Polymer MS caulk
- Flexible sealant in closed cells reticulate polyethylene adhesive strips, density 50 kg/m^3 3.12 lb.ft^3 , in the form of adhesive strip (over the ceiling)

Reports and approvals

Fire reaction:

Euroclass = A2-s1,d0

Flame spread index (ASTM E84-01) = Class 1

Class 0 (BS 476 part 6&7)

Flame spread (BS 476 part 7) = Class 1

Fire spread index (BS 476 part 6) = 0,7

FM Global approval: FM Approvals (standard 4880) = Class 1

UL approval (cable routing) Safety E471046

Consult the data n°0112 «Reports and approvals».

Ceiling fixings for panels SI-SM-ST

GSP-0219-E/B

Ceiling panels can be :

- self-supporting rests on the vertical partitions with, eventually, strengthening by «Omega» profiles or mesh wire frames or,
- suspended according to the span depending to the accessibility or not of the ceiling, to the size and the frequency of openings made for accessories integration.

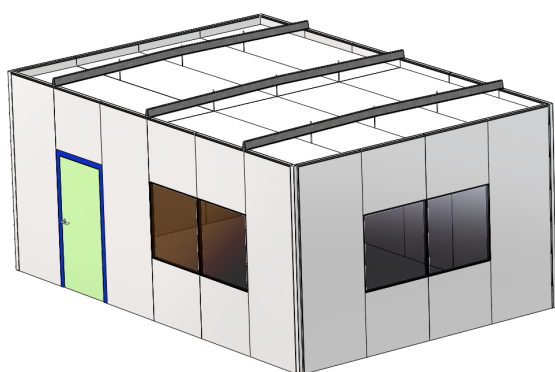
Warning:

Ceilings cannot be used as walkways. They cannot be used as storage areas, temporary or definitively. They only support the occasional passage of one person for maintenance.

Ceiling secured by «Omega» fitting

Principle: Setting up of Omega fitting perpendicular or parallel to right of sealants.

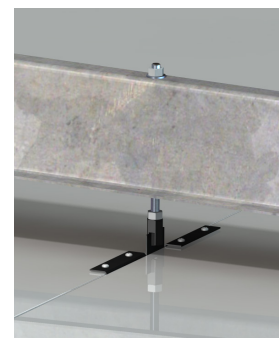
The center distance between profile is according to the acceptable span of panels (limited at 2,40 m 7.87') or by the Omega capacity.



View of construction with suspension by Omega



Repartition piece



Panel fixing to the Omega

Omega height = 120 mm 4.7" or 170 mm 6.7"

	Omega height 120 mm 4.7" thickness 3 mm 0.11" I = 154 cm ⁴ I/v = 25 cm ³ maxi length = 6 m 19.7'	Omega height 170 mm 6.7" thickness 3 mm 0.11" I = 392 cm ⁴ I/v = 44 cm ³ maxi length = 7 m 23'
Omega span	Maximum centre distance between Omegas	Maximum centre distance between Omegas
until 4 m 13.1'	2,40 m 7.9'	2,40 m 7.9'
4,40 m 14.4'	2,00 m 6.6'	2,40 m 7.9'
4,80 m 15.7'	1,50 m 4.9'	2,40 m 7.9'
5,20 m 17'	1,20 m 3.9'	2,40 m 7.9'
5,60 m 18.4'	1,20 m 3.9'	2,20 m 7.2'
6,00 m 19.7'	1 m 3.3'	1,80 m 5.9'
6,50 m 21.3'	-	1,40 m 4.6'
7 m 23'	-	1,20 m 3.9'

Base of calculation:

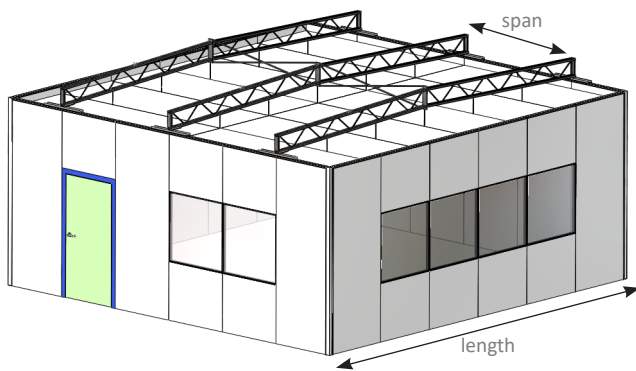
Without clear elements, take into account

Uniformed load : 80 kg/m²

Safe deflection : 1/200th of span

Ceiling with mesh wire frame

Principle: Setting up of supporting mesh wire frames, braced together (at least 2) to make the ceiling self-supporting. The center distance between the frame elements is function of the acceptable span of panels (limited at 2,40 m 7.87') or the frame elements capacity.



View of a construction with secured to supporting frame



Repartition piece



Fixing panel to frame

Framework height = 320 mm 12.6"

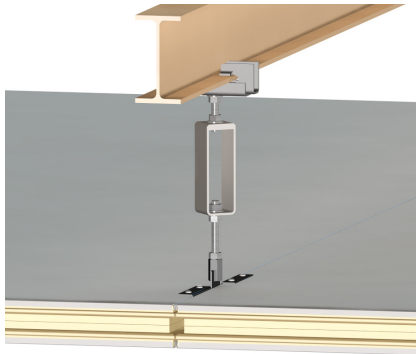
Frame length	Maximum span between frameworks	Frame length	Maximum span between frameworks
6,40 m 21'	2,40 m 7.87'	10,80 m 35.4'	2,20 m 7.21'
6,80 m 22.3'	2,40 m 7.87'	11,20 m 36.7'	2,00 m 6.56'
7,20 m 23.6'	2,40 m 7.87'	11,60 m 38.1'	1,80 m 5.9'
7,60 m 24.9'	2,40 m 7.87'	12,00 m 39.4'	1,70 m 5.58'
8,00 m 26.2'	2,40 m 7.87'	12,40 m 40.7'	1,50 m 4.92'
8,40 m 27.6'	2,40 m 7.87'	12,80 m 42'	1,40 m 4.59'
8,80 m 28.9'	2,40 m 7.87'	13,20 m 43.3'	1,25 m 4.10'
9,20 m 30.2'	2,40 m 7.87'	13,60 m 44.6'	1,15 m 3.77'
9,60 m 31.5'	2,40 m 7.87'	14,00 m 45.9'	1 m 3.28'
10,00 m 32.8'	2,40 m 7.87'		
10,40 m 34.1'	2,40 m 7.87'		

Base of calculation: Without clear elements, take into account

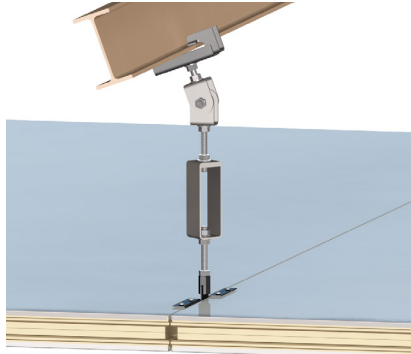
Uniformed load : 80 kg/m²

Safe deflection : 1/200th of span

Ceiling fixings from building



Suspension to metallic framework parallel to ceiling by single tensioner (threaded rod, nut, socket, pliers, tensioner, ceiling support)

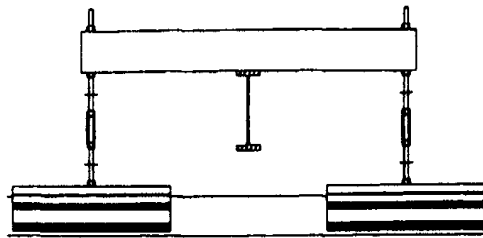


Suspension to frame with swivelling fitting nonparallel to ceiling by tensioner and adjusting hanger



Suspension under concrete slab by fastened with bracket fixed with 2 plugs

Other type of suspension : double fixing by rudder on purlin.



You must define your project indoor and the outdoor type of atmosphere in order to select the most appropriate types of panel facings.

Indoor atmosphere

With no clean room specific data, we have to reply on food and food processing industries classification for metallic panel facing types.

Aggressivity	Cleaning	Hygrometry	Temperature	Examples	Minimum category of appropriate coatings (NF P34.301)	Recommended coatings
Ai 1 Non-aggressive environment	Regular maintenance	Low	-40°C to +25°C -40° to +77°F	Storage of wrapped dry products	I	Polyester 25 µm PVDF 35 µm PVC 120 µm PET 55 µm Stainless steel 304 Stainless steel 304 + PVC + PET
Ai 2 Non-aggressive environment	Regular maintenance	Average	0°C to +25°C +32° to +77°F	Storage in controlled atmosphere	II	
Ai3 Non-aggressive environment	No Intensive cleaning	High	0°C to +25°C +32° to +77°F	Storage, processing moist ambient	IIIa	
Ai4 Slightly aggressive environment	No Intensive cleaning	High	0°C to +30°C +32° to +86°F	Preparation of pre-cooked foods	IVb	PVDF 35 µm PVC 120 µm PET 55 µm Stainless steel 304 Stainless steel 304 + PVC + PET
Ai5 Aggressive environment	Intensive cleaning	High	0°C to +35°C +32° to +95°F	Cooking rooms, dryers	Vc	PVC 120 µm PET 55 µm Stainless steel 304 Stainless steel 304 + PVC + PET
Ai6 Very aggressive environment	Very intensive cleaning	Saturated	0°C to +40°C +32° to +104°F	Showers washrooms	(*)	Stainless steel 304 + PVC + PET Stainless steel 316L

Extract from DTU 45.1 – Food handling facilities

N.B. :

- The table is provided as a guide only, the classes must be appropriate to the controlled conditions of each facility.
- A single parameter could justify the selection of ambient conditions (hygrometry, cleaning frequency, chemical aggressivity, salinity)

Aggressivity criteria

- 1 – No aggressive ambient conditions: environment presenting no aggressivity due to corrosive chemical components and/or microorganisms.
- 2 – Slightly aggressive ambient conditions: environment with no aggressive ambient conditions but whose walls could occasionally be splashed with slightly aggressive liquids.
- 3 – aggressive ambient conditions: environment where acid, basic or saline acid vapours occur and/or with presence of microorganisms and/or likely to be subjected to disinfection.
- 4 – very aggressive ambient conditions: environment where acid, base or saline acid vapours or gas occur and/or with presence of microorganisms and/or frequent risk of splashing of walls and/or likely to be subjected to disinfection with aggressive products.

Cleaning criteria

- 1 – regular maintenance: this involves regular supervision and occasional cleaning (frequency from one to several years according to the use of the facility) using non-aggressive methods and resources (no pressure washing).
- 2 – non-aggressive cleaning (usually on monthly basis): cleaning performed with neutral products at temperature of $< 30^{\circ}\text{C}$ 86°F and low pressure spraying of $\leq 0.3\text{Mpa}$ $6\ 266\ \text{lbf/sq.ft.}$
- 3 – intensive cleaning (usually on daily basis): cleaning performed with neutral products (ph 5 to 9) at temperature of $< 40^{\circ}\text{C}$ 104°F and pressure of $3.5\ \text{Mpa}$ $73\ 099\ \text{lbf/sq.ft.}$ (pressure of spray nozzle).
- 4 – very intensive cleaning (usually on daily basis): cleaning performed with occasional use of extreme pH (< 5 or > 9) and/or high temperature ($< 60^{\circ}\text{C}$ 140°F) and/or high pressure washing (pressure $< 5\text{Mpa}$ $104\ 430\ \text{lbf/sq.ft.}$ at output from nozzle and impact pressure $< 0.04\text{Mpa}$ $835\ \text{lbf/sq.ft.}$).

Humidity criteria

- 1 – humidity ambient conditions: ambient conditions are said to be «humid» where the hygrometry of the facility is high and if under the operating conditions of the facility there is a risk of condensation.
- 2 – very humid ambient conditions: ambient conditions are said to be very humid where the hygrometry of the facility is very high and if under the operating conditions of the facility the risk of condensation is frequent.
- 3 – saturated ambient conditions: ambient conditions are said to be saturated where the hygrometry of the facility is very high and if there is a permanent risk of condensation in the operating conditions of the premises.

Outdoor atmosphere

Outdoor atmospheres are classified by categories in order to comply with NF P 34-301 specifications for the selection of panel facings.

	Rural or no polluted atmosphere III	Urban or industrial atmosphere		Marine atmosphere				Specific atmosphere	
		normal III	harsh	20 to 10 km <i>12.43 to 6.22 mi</i> III	10 to 3 km <i>6.22 to 1.87 mi</i> IV	< 3 km <i>1.87 mi</i> V	mixte	high UV	special

Galvanized or coated with alloy (zinc and aluminium) steel

Polyester 25 μm <i>1mil</i>	● ●	● ●	●	● ●	-	-	-	-	●
PVDF 35 μm <i>1.3mil</i>	● ●	● ●	●	● ●	● ●	-	-	-	●

- unsuitable
- consult maker
- ● suitable

N.B.: the PET and PVC system are unsuitable for exterior use.

Technical characteristics of the supports

- z225 hot-galvanized **pre-powder coated or lined steel sheet**, mini shade s280 GD+Z, according to standard NF EN 10326, thickness 0,50 mm *0.019"*, 0,63 mm *0.024"* or 0,75 mm *0.029"*

- **Stainless steel sheet** shades, thickness 0,60 mm *0.023"* or 0,80 mm *0.031"*

* x5CrNi 18-10 (EN 1-4301 or AISI 304)

* x2CrNiMo17-12-2 (EN 1-4404 or AISI 316L)

- **Pre-powder coated aluminium** shade EN AW.3004 H46 according to standard EN 1396, thickness 0,67 mm *0.026"*

Test types and results of various panel facings on galvanized steel sheets

	Testing standards and conditions	Polyester powder coat 25 µm	Conductive powder coat	PVDF powder coat 35 µm	PVC film 120 µm	PET 55 µm system
Category	XP P 34-301	IIIa		IVb	Vc	Vc
Gloss	ISO 2813 (ECCA-T2) incidence 60°	30 ± 6%	30 ± 6%	30 ± 6%	25%	30 ± 6%
Shock resistance	ISO 6272 (ECCA-T5)	No loss of panel face adherence				
Adherence by bending	ISO 1519 (ECCA-T7)	3t	3t	2t	0t	1t
Resistance to humidity	ISO 6270 (ECCA-T9)	≥ 1000 h	≥ 1000 h	≥ 1000 h	≥ 1000 h	≥ 1500 h
Resistance to neutral salt spray	ISO 7253 (ECCA-T8)	≥ 360 h	≥ 360 h	≥ 500 h	≥ 500 h	≥ 500 h
Chalk hardness	ISO 3270 (ECCA-T4)	H	H	HB	2H	2H
Adherence to panel face (grid pattern)	ISO 2409		Class «0»			
Panel face resistance to heat	ISO 3270 (ECCA-T13)	100 h to 80°C 176°F ΔE ≤ 0,1		100 h to 70°C 158°F ΔE ≤ 0,1	100 h to 70°C 158°F ΔE ≤ 0,1	
Resistance to abrasion	ISO 7784	40 mg	5.6 mg	30 mg	10 mg	
Reaction to fire	NF P 92-507	M0	M0	M0	M1	M0
Surface resistivity	ASTM D257	10 ¹¹ Ω/□	10 ⁷ Ω/□			

Special warning for HPL panel face

Compact laminated sheets are very sensitive to hygrometry conditions : high variation of dimensions under extreme high or low ambient humidity can occur.

For that reason, several precautions must be taken at the different production or delivery stages : HPL sheets or finished HPL panels must be stored under tight controlled ambient conditions: from 10 to 30°C 50°F to 86°F and relative humidity 40 to 60 %). Finished HPL panels should not be used under high temperature and/or high relative humidity conditions.

Storage and working conditions : The 2 sides of the HPL panels must remain aerated and within the average temperature range of 10 to 30°C 50°F to 86°F and relative humidity from 40 to 60 %.

Ignoring these warnings, bending or twisting of the HPL panels may occur.

Resistance of panel faces to chemical products

Information given as a guide only

Coatings		Polyester lacquer	Conductive lacquer	PVDF 35 µm 1.38 mils	PVC 120 µm 4.7 mils	PET 55 µm 2.16 mils	Compact laminated	Stainless steel 304 + PVC + PET	Stainless steel 304	Stainless steel 316L
Chemical products	Chemical family									
Acetone	Ketone	⊖	⊖	⊖	⊖	⊖	☺	☺	☺	☺
Acetic acid (CH ₃ COOH) (vinegar) 10%	Acid	⊖	⊖	☺	☺	☺	☺	☺	☺	☺
Hydrochloric Acid (HCl) 10%	Acid	⊖	⊖	⊖	⊖	☺	☺	✓	⊖	☺
Nitric acid (H ₂ NO ₃) 10%	Acid	⊖	⊖	☺	☺	☺	☺	☺	☺	☺
Phosphoric acid (H ₃ PO ₄) 10%	Acid	⊖	⊖	☺	☺	☺	☺	☺	☺	☺
Sulphuric acid (H ₂ SO ₄) 10%	Acid	⊖	⊖	☺	☺	☺	☺	☺	☺	☺
Ethyl alcohol - Methylated spirit	Alcohol	☺	☺	☺	☺	☺	☺	☺	☺	☺
Isopropyl alcohol	Alcohol	☺	☺	☺	☺	☺	☺	☺	☺	☺
Ammonia - NH ₄ OH	Base	⊖	⊖	☺	☺	☺	☺	☺	☺	☺
Ammonium bisulphite	Salt	☺	☺	☺	☺	☺	☺	☺	☺	☺
Buthanol	Alcohol	☺	☺	☺	☺	☺	☺	☺	☺	☺
Sodium hypochlorite - NaClO (Javel water) high concentration		⊖	⊖	⊖	⊖	☺	☺	✓	☺	☺
Therebentine	Alcohol	☺	☺	☺	☺	☺	☺	☺	☺	☺
MEK (Methyl ethyl Ketone)	Ketone	⊖	⊖	⊖	⊖	⊖	☺	⊖	☺	☺
Methanol	Alcohol	☺	☺	☺	☺	☺	☺	☺	☺	☺

Caption



Prohibited



Recommended



Suitable To be studied case by case

Resistance of panel faces to chemical products

Information given as a guide only

Coatings		Polyester lacquer	Conductive lacquer	PVDF 35 µm 1.38 mils	PVC 120 µm 4.7 mils	PET 55 µm 2.16 mils	Compact laminated	Stainless steel 304 + PVC + PET	Stainless steel 304	Stainless steel 316L
Chemical products	Chemical family									
Phenol	Alcohol	☺	☺	☺	☺	☺	☺	☺	☺	☺
Potash - Potassium hydroxide - KOH - 10%	Base	☹	☹	☺	☺	☺	☺	☺	☺	☺
Alkaline industrial soap	Base soap	☹	☹	☺	☺	☺	☺	☺	☺	☺
Chlorinated industrial soap	Neutral soap	☹	☹	☺	☺	☺	☺	☺	☺	☺
No chlorinated industrial soapé	Neutral soap	☺	☺	☺	☺	☺	☺	☺	☺	☺
Kitchen salt (Sodium chloride - NaCl)	Salt	☹	☹	☹	☹	☹	☺	☺	☺	☺
Kitchen salt + use of acidic cleaning agents	Salt + Acid	☹	☹	☹	☹	☹	☹	☑	☹	☺
Sodium hydroxide - NaOH - 10%	Base	☹	☹	☹	☺	☺	☺	☺	☺	☺

Panel face resistance to hydrogen peroxide H2O2 (oxygenated water) (fogging tests)

Materials	Pre-coated sheet - polyester 25 µm 0.98 mil - PVDF 35 µm 1.38 mil - lacquer thk. ≤ 50 µm 1.97 mil	Painted sheets - paint 50 µm 1.97 mil ≤ thk. < 80 µm 3.15 mil	Painted sheets - paint thk. ≥ 80 µm 3.15 mil	Film clad sheets (process) - PET 55 µm 2.16 mil - PVC 120 µm 4.7 mils	Compact laminated	Stainless steel 304 + PVC + PET	Untreated stainless steel 304, 316L,
Decontamination frequency							
Low	☹	☹	☑	☺	☺	☺	☺
Average	☹	☹	☑	☺	☑	☺	☺
High	☹	☹	☹	☑	☑	☑	☺

Refer to Chapter 12 – Panel face shade chart for further information.



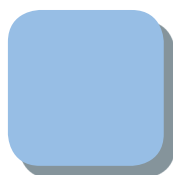
Midnight blue
RAL 5011



Pacific blue
RAL 5010



Horizon blue
RAL 5015



Glacier blue
Pantone 278C



Lagoon green
RAL 6027



Meadow green
RAL 6018



Forest green
RAL 6029



Sulphur yellow
RAL 1016



Pale orange
Pantone 1495



Bright pink
RAL 3015



Molten red
RAL 3020



Canyon red
RAL 3013



Storm grey
RAL 7040



Pebble white
RAL 9002



Iceberg white
RAL 9010

Ours colours are close to RAL and Pantone references.