



Axelent X-Guard[®]

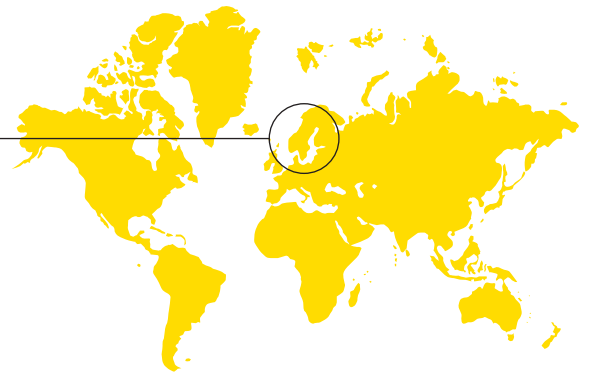
Machine guarding without limitations



AXELEN

Contents

INTRODUCTION	3-7
X-GUARD IN GENERAL	8-11
X-GUARD PANELS	12-13
X-GUARD DOORS & HEIGHTS	14-17
X-GUARD LOCKS	18-19
X-GUARD ACCESSORIES	20-23
X-GUARD REFERENCES	24-30
MACHINE SAFETY STANDARDS AND RISK ASSESSMENT	31-33
X-TRAY FOR X-GUARD	34-35
DID YOU KNOW THIS ABOUT X-GUARD?	36
SNAPPERWORKS	37
ENVIRONMENT AND SUSTAINABLE WORK	38
OTHER INFORMATION ABOUT AXELENT	39
THE AXELENT GROUP	40-41



Welcome to a safe world - with Axelent

The Axelent Group has grown into an international group of companies with a total workforce of over 200 people. Our products are sold in over 50 countries and our vision is to keep on expanding.

The world has become yellow and black

Yellow posts and black panels have always been Axelent's hallmark right from the start, the colors inspired by our logo. For a long time we were alone in these colors and it was easy to recognize Axelent in the market. Today things are different. You can no longer be sure that the yellow and black machine guards you see are made by Axelent. Something, however, you can be sure of is that our high standards of security, speed and smart solutions have made us one of the market leaders in machine safety. We are represented in more than 50 countries worldwide, and while our colors have now become universal, Axelent is still the original.

Code of Conduct

It is vital that Axelent is run in an ethically, socially and environmentally correct manner regardless of where our location might be in the world. Contributing to a sustainable society is a key part of our operations and is vital to our future success.

Therefore, we have developed our Axelent Code of Conduct booklet, a set of guidelines for how we conduct ourselves in our business operations.

Please visit our webpage to download the booklet.

Axelent Quality Model





Your safety is our business concept No matter where in the world you are

At Axelent we know what production standstill can cost and we are aware of the consequences of poor safety in production. We also know that the regulations surrounding machine safety can be complicated to find your way around.

We therefore offer all our customers a safety package. A holistic approach with the tested and approved machine guarding forming the core combined with our know-how and service to provide you with an effective and rapidly delivered machine safety solution. At Axelent we seek to become your safety partner, no matter where in the world you are.



You can count on X!

- ✓ A top quality range of products and accessories.
- ✓ Products that comply with all current requirements and EU standards.
- ✓ A standard range that is easy to complement.
- ✓ We give you a quote including drawings within four hours.
- ✓ Easily assembled products with clear instructions.
- ✓ SnapperWorks. Tailored and easy-to-use drawing application available to all our customers.
- ✓ X-Pack™ a unique packaging system that guarantees intact and rapid delivery.
- ✓ Axelent Safety – Risk analyses and other specialist knowledge.



We know almost everything there is to know about safety and mesh wall systems

Axelent is a Swedish company with extensive experience within the manufacture of mesh wall systems in the form of protection and partitioning systems for industry, warehouses and construction. Speed, safety, service and smart solutions are watchwords that characterise our entire organisation and business. We are market leaders within several sectors and our products are represented all over the world.

Effective production

Our head office is in Hillerstorp, Sweden. All product development, production, warehousing and packaging also takes place here. Much of our production is automated in order to cope with high volumes and fast

delivery times. As all our standard products are in stock we can deliver your order within 5-7 working days.

Quotation and drawing straight away

Our own SnapperWorks drawing application enables us to quickly provide you with a quotation including a drawing and material specification.

Axelent deliveries

Thanks to Axelent's in-house packaging system, X-pack™, your Axelent products are delivered on specially adapted pallets, attractively and neatly wrapped in plastic, complete with assembly instructions. This means that products can be assembled quickly and easily making the goods easy to unload and move. We also offer technical assistance where needed.

A safe choice

Axelent has extensive, in-depth knowledge when it comes to safety for industry, warehouses and construction work. Please consult us in order to get a safe and secure environment as possible using our products.



Axelent AB – Our speed and service is based on **Rational production and an effective organisation**



Axelent AB Hillerstorp. Our 21,000 sq. m. premises houses product development, production, packaging, warehousing and sales.

Raw material storage. Our raw material storage houses large volumes of rectangular hollow sections (RHS), the basis of all our products.

Production. Axelent boasts the most modern cutting centre in Europe. Here, the hollow section is cut, drilled, tapped and washed before going further on in our X-line™, thus avoiding time- and space-consuming intermediate storage. In our X-line™, complete mesh panels are produced in a very rational process.





X-PACK™



Capacity. At Axelent we have the capacity to produce 60,000 mesh panels a month.

Coating. Coating is done using powder, which means no solvents.

X-Pack™. Our own packaging system enables us to place all our mesh panels on specially designed pallets for rapid and smooth assembly. All deliveries are plastic wrapped together with the assembly instructions and other delivery documentation.

Readymade stock. All our standard products are in stock, guaranteeing fast delivery.





X-Guard[®] – a completely new way of thinking for machine guarding

X-Guard is a completely new range of machine guard that complies with the Machinery Directive's demands on permanent guards from 29 December, 2009 (see pages 31-33).

With its wide range of standard components and accessories, X-Guard is guaranteed to cover all possible machine guard needs. Now we also have a new machine guard, X-Guard Contour, which is the first machine guard with round corners.

Safe

Axelent's machine guards are designed to fulfil all the demands put on a functional machine guard.

Functional and smart

In addition to safety, it is vital that our products work as smoothly as possible. Our machine guards have many smart solutions to facilitate the flows in and around the machines that require this type of protection.

Simple

Our machine guards are built around a standard design with regard to panels, posts, accessories and colour. This makes it easier for you to complement existing guards if required.

Complete

X-Guard machine guards are available in mesh panel sections or sheet plate and plastic sections (see pages 12-13). Axelent's large selection of doors, locks and accessories offer a complete machine guard solution tailored to your needs.

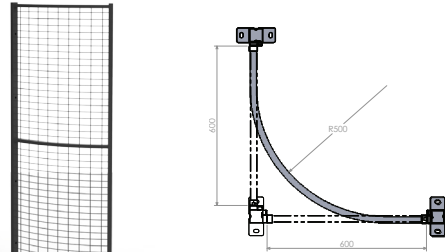
Cost-effective

Smooth and easy handling, together with speedy delivery and assembly, always gives you a good overall economy when choosing Axelent's machine guards.



X-Guard® Contour

In 2012 Axelent launched an unique machine guard with round corners, X-Guard Contour. The new, rounded panels are part of our X-Guard series so they are easily combined with other parts of the same series. Read more about it's benefits below in "Space-saving".



Axelent X-Guard® Contour

The panels come in three different heights, 1300, 1900 and 2200 mm, and in two angles, 45° and 90°.

Standard panels come in colour RAL 9011 but can be customized to specific requirements.

For more information see product facts on p 12.

A machine guard that grows

X-Guard was launched in 2008, since then new dimensions in panels, posts and accessories have been added. We listen to our customers to enable us to develop the range as new needs arise.

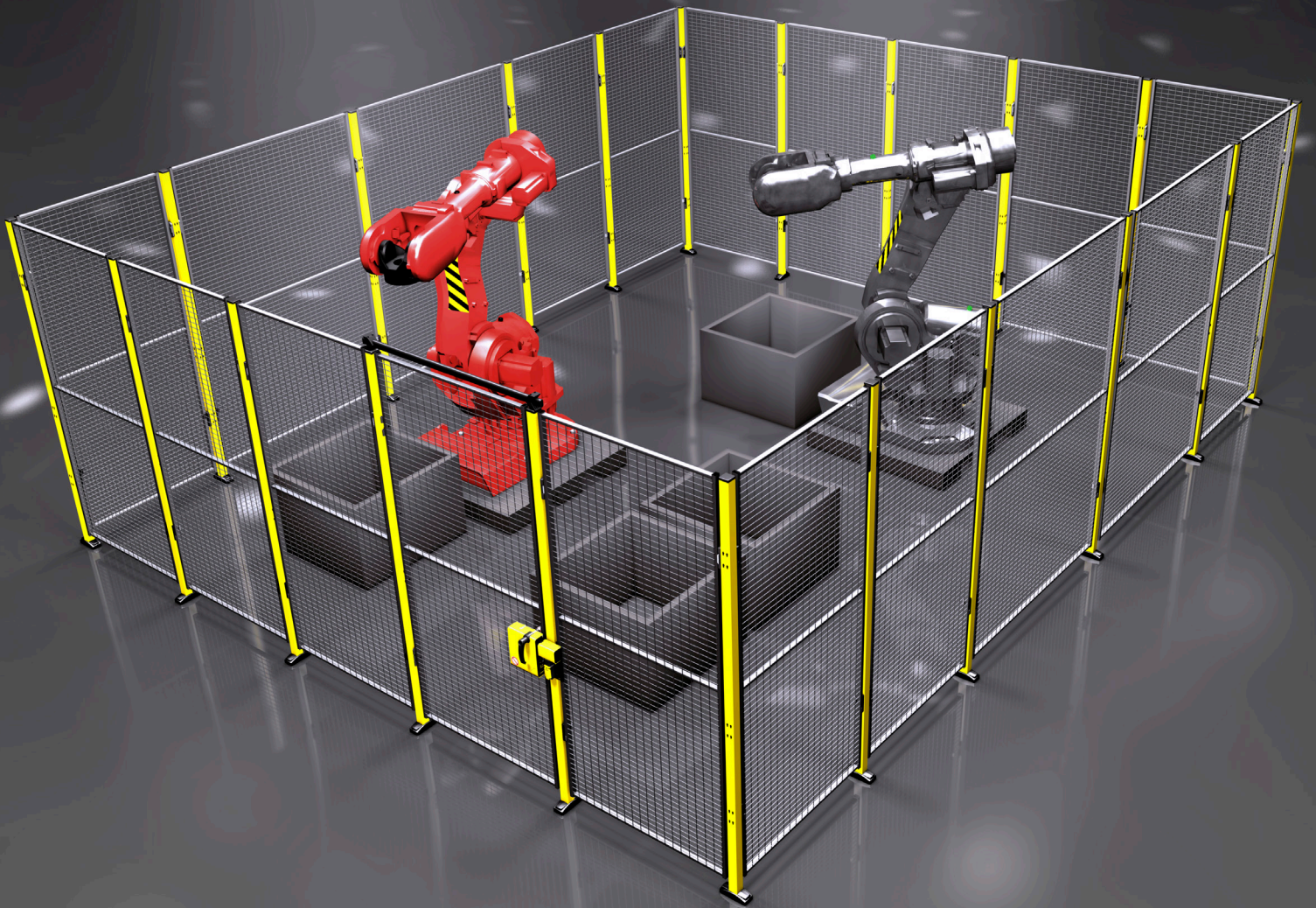
Space-saving

It may seem like only a small improvement, but nobody has previously dared to veer from the traditional machine guard design with 90° right angles.

By opening ourselves to new shapes we allow the machine guards to be an attractive yet integrated part of the whole. With X-Guard Contours more 'friendly' design, you don't have to deal with square corners that take up unnecessary space, and you'll get a machine guard that smoothly fits in the production environment.



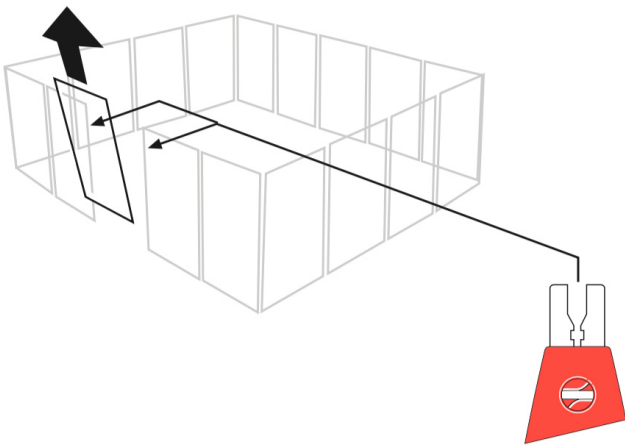
We have listened to the market and followed the machine makers' lead by giving our products a new dimension that embraces design and function.





X-Key

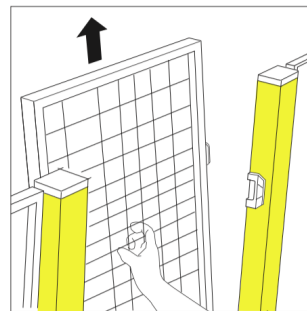
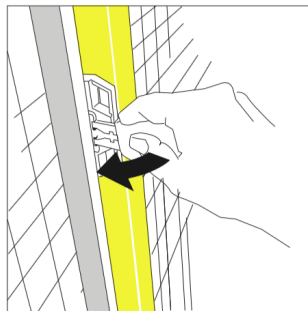
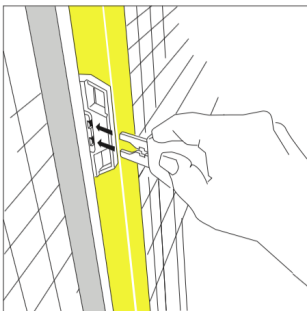
A unique key designed for the rapid release of a panel. Forget all other tools. The X-Key is all you need. More info can be found on page 22.

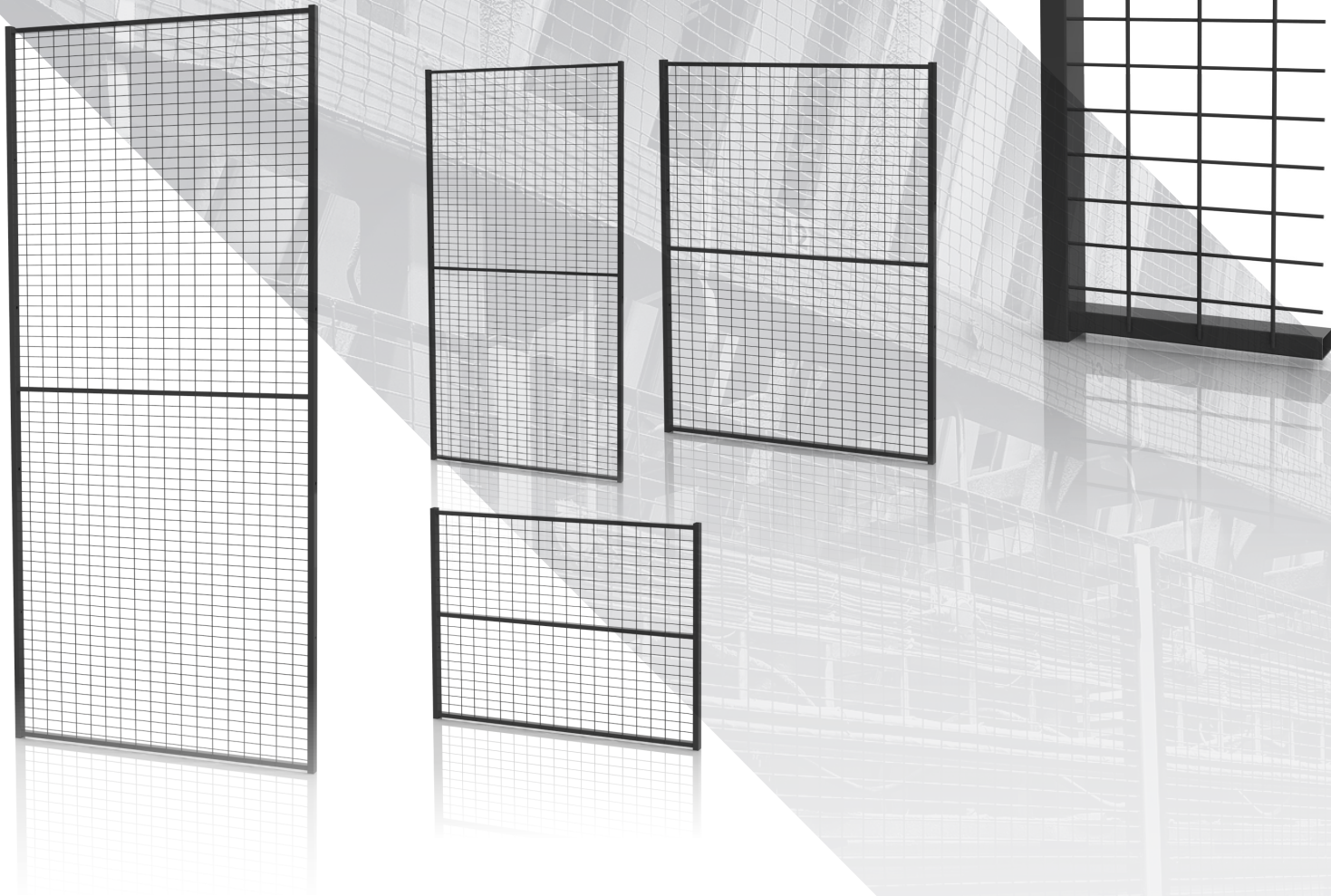


X-Guard® – a flexible system with extremely smart solutions

Doors and panels are designed to ensure you can switch whenever necessary. You can change hinge and lock handing with a simple operation. This means you can quickly change the machine guard as and when the need arises.

Use the X-Key, place it into the upper fitting, push it to the side and the panel will come loose. Done!










X-Guard® - Mesh, Plastic and Metal

Mesh

Our mesh panels provide sufficient protection in most industrial environments. The panels come in a variety of widths and heights, as specified on the product sheet.

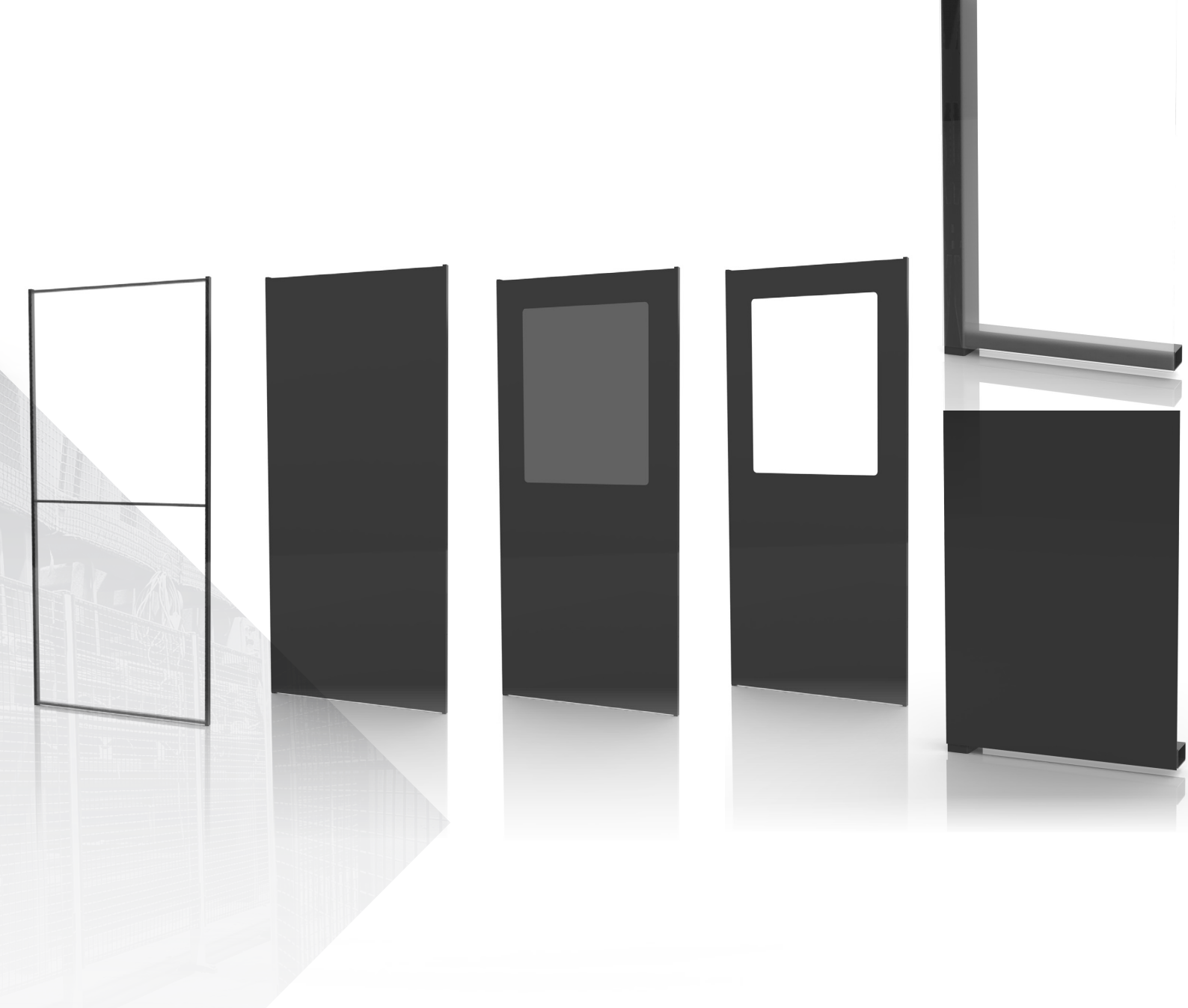
Axellent's standard colours

Posts		Panels	
			
Yellow RAL 1018	Red RAL 3020	Black RAL 9011	
			
Black RAL 9011	Blue RAL 5005		

PRODUCT FACTS MESH PANELS

Safety distance	120, 200 mm
Uprights	30x20 mm
Horizontals	25x15 mm
Posts	50x50, 70x70 mm
Vertical wires	Ø 3 mm
Horizontal wires	Ø 2.5 mm
Mesh aperture	50x30, 50x20 mm
Finish	Phosphatising/Epoxy paint
Colour mesh panel	Black RAL 9011
Colour post 50x50 mm	Yellow RAL 1018, black RAL 9011, blue RAL 5005, red RAL 3020
Colour post 70x70 mm	Yellow RAL 1018

(other colours can be quoted)



Sheet metal and plastic

Some environments require a more comprehensive protection in the form of plastic or sheet metal covered walls. X-Guard Plastic and Sheet Metal System is easy to assemble and you can use the same posts and door packages as for our mesh products. In order to avoid gaps between the section and post we recommend that you use our custom edging plate.

The plastic walls are heat resistant up to 60 degrees and available with clear or green coloured plastic, the last-mentioned as a protection for welding flare. Our green coloured plastic meets fire safety standards UL 94 V0 and also EN 1598.

The sections are available in 2 heights and various widths which are shown on a separate leaflet.

Panel with window

This new panel replaces previous systems that combined half sections of sheet and plastic.

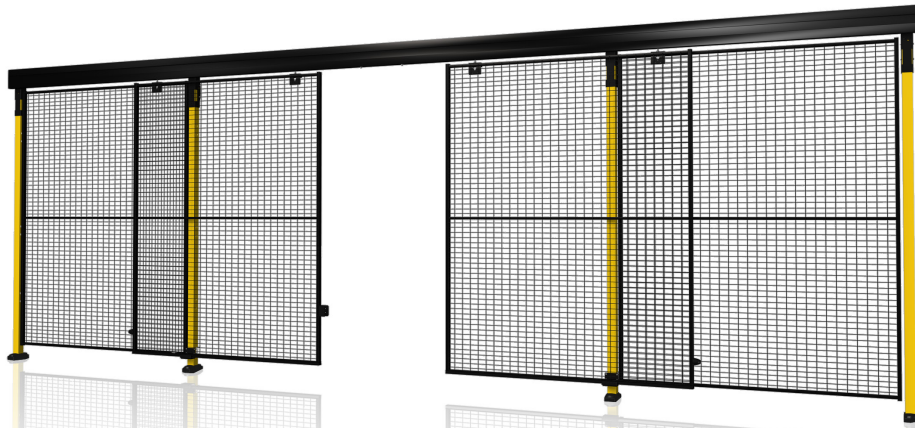
These panels are used when you wish to monitor a certain process.

PRODUCT FACTS PLASTIC AND SHEET PANELS

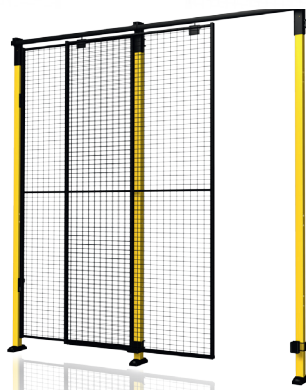
Uprights	30x20 mm
Horizontals	25x15 mm
Plastic	2 mm (thermoplastic polyester)
Sheet	0,8 mm
Posts	50x50, 70x70 mm
Colour panel	Black RAL 9011
Colour post 50x50 mm	Yellow RAL 1018, black RAL 9011, blue RAL 5005, red RAL 3020
Colour post 70x70 mm	Yellow RAL 1018

(other colours can be quoted)

①



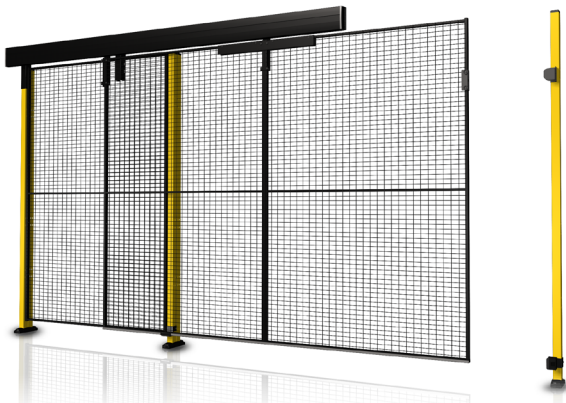
②



③



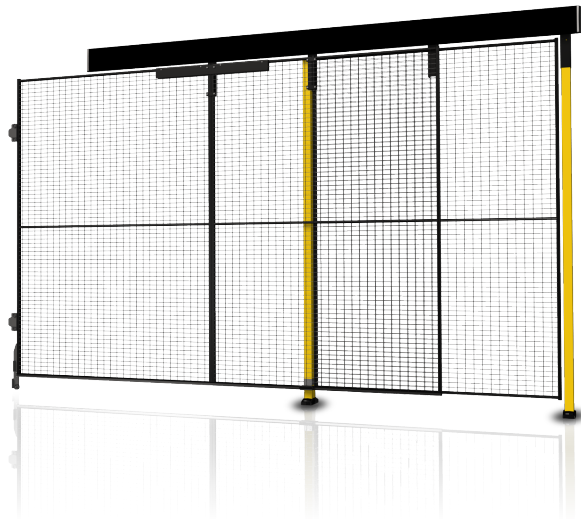
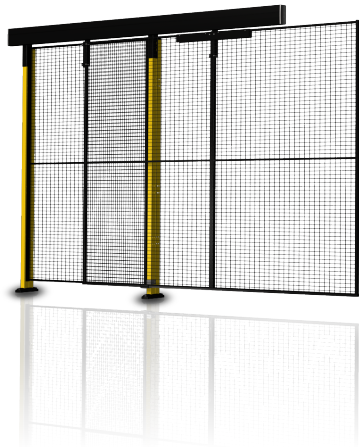
④



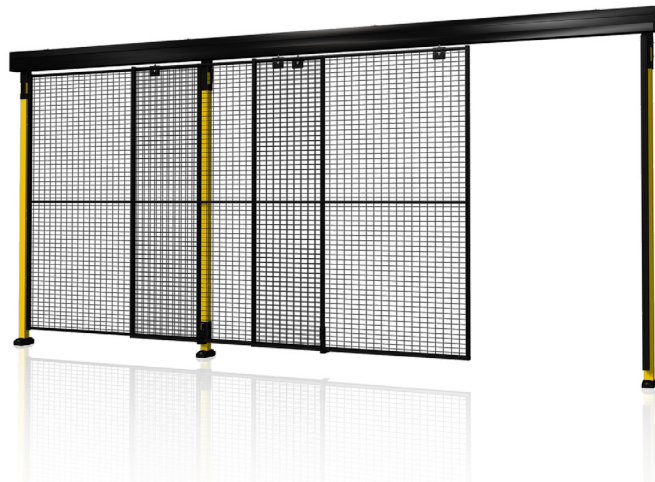
X-Guard® - Doors

- ① Sliding door with centre lock, perfect solution when there is limited space and the door should be placed in the middle of a wall. Maximal width is 5900 mm.
- ② Single sliding door, can be built from max opening 5700 mm.
- ③ Double sliding door, for cramped areas and for two feed positions from the machine. Available in sizes up to 2x2900 mm.
- ④ Single sliding door without rail, has an opening of 3 metres and no upper limitation. The door is perfect when handling large volumes carried by overhead crane or forklift. Maximum width 3000 mm and maximum height 2300 mm.

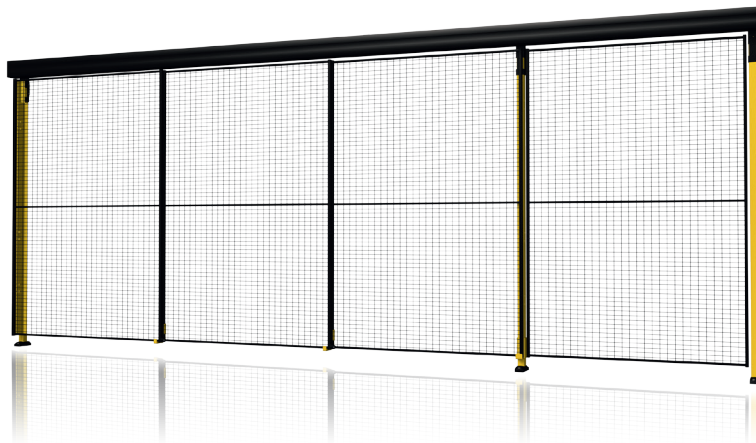
5



6



7

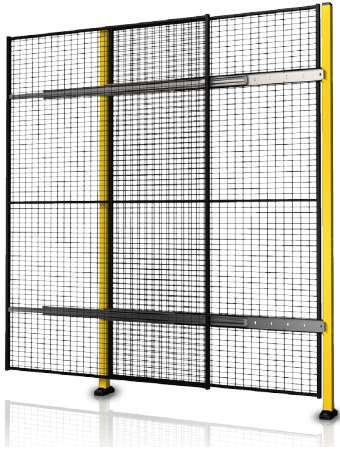


⑤ Sliding door without rail, has an opening of 6 metres and no upper limitation. The door is perfect when handling large volumes carried by overhead crane or forklift. Maximum width 2x3000 mm and maximum height 2300 mm.

⑥ Double sliding door with 2-step rail, is used where a large opening is required but where there is limited space at the side. The panels overlap each other instead of sliding to the side. Maximum width 2x1500 mm and maximum height 2300 mm.

⑦ Triple sliding door with 3-step rail, is used where a large opening is required but where there is limited space at the side. The panels overlap each other instead of sliding to the side. Maximum width 3x1500 mm and maximum height 2300 mm.

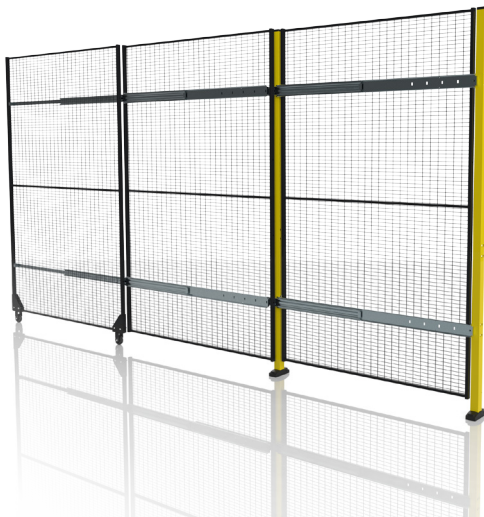
8



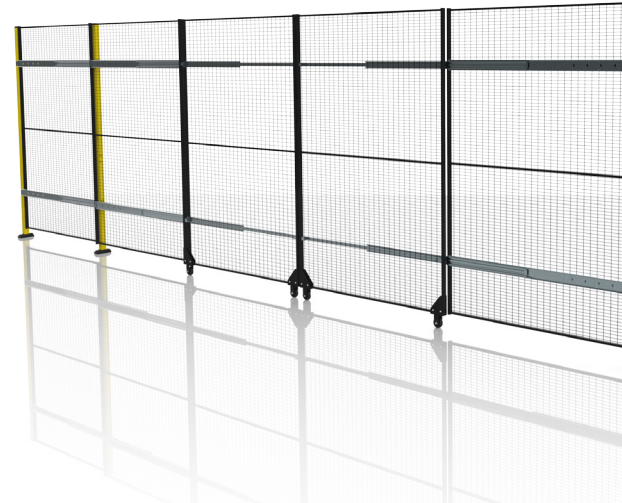
9



10



11



X-Guard® - Doors

8 Single sliding door without rail. An ideal solution for an opening with no overhead obstruction and where the need for a large opening isn't necessary. Maximum widths 900 mm and 1400 mm, maximum height 2300 mm.

9 Double sliding doors without rail, with centre lock. An ideal solution for an opening with no overhead obstruction and where the need for a large opening isn't necessary. Maximum widths 1800 mm and 2800 mm, maximum height 2300 mm.

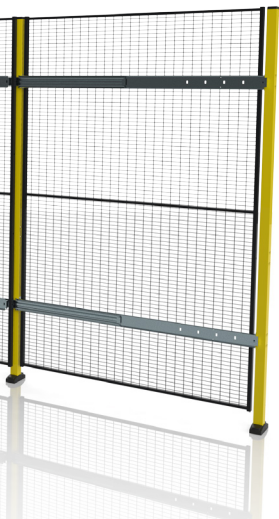
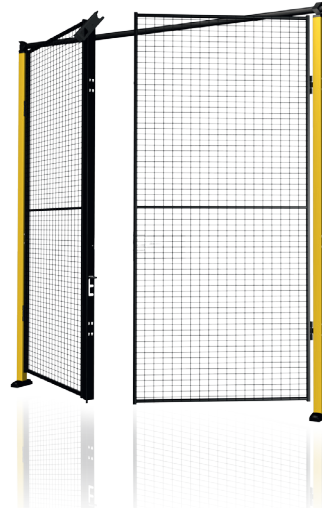
10 Single sliding door without rail. An ideal solution for an opening with no overhead obstruction and where the need for a large opening is necessary. Maximum widths 1900 mm and 2900 mm, maximum height 2300 mm.

11 Sliding doors without rail, with centre lock. An ideal solution for an opening with no overhead obstruction and where the need for a large opening is necessary. Maximum widths 3800 mm, 4800 and 5800 mm, maximum height 2300 mm.

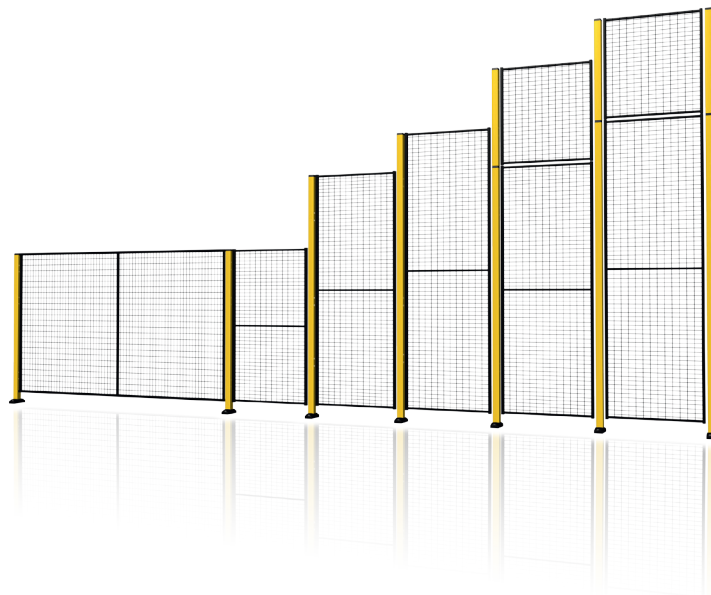
12



13

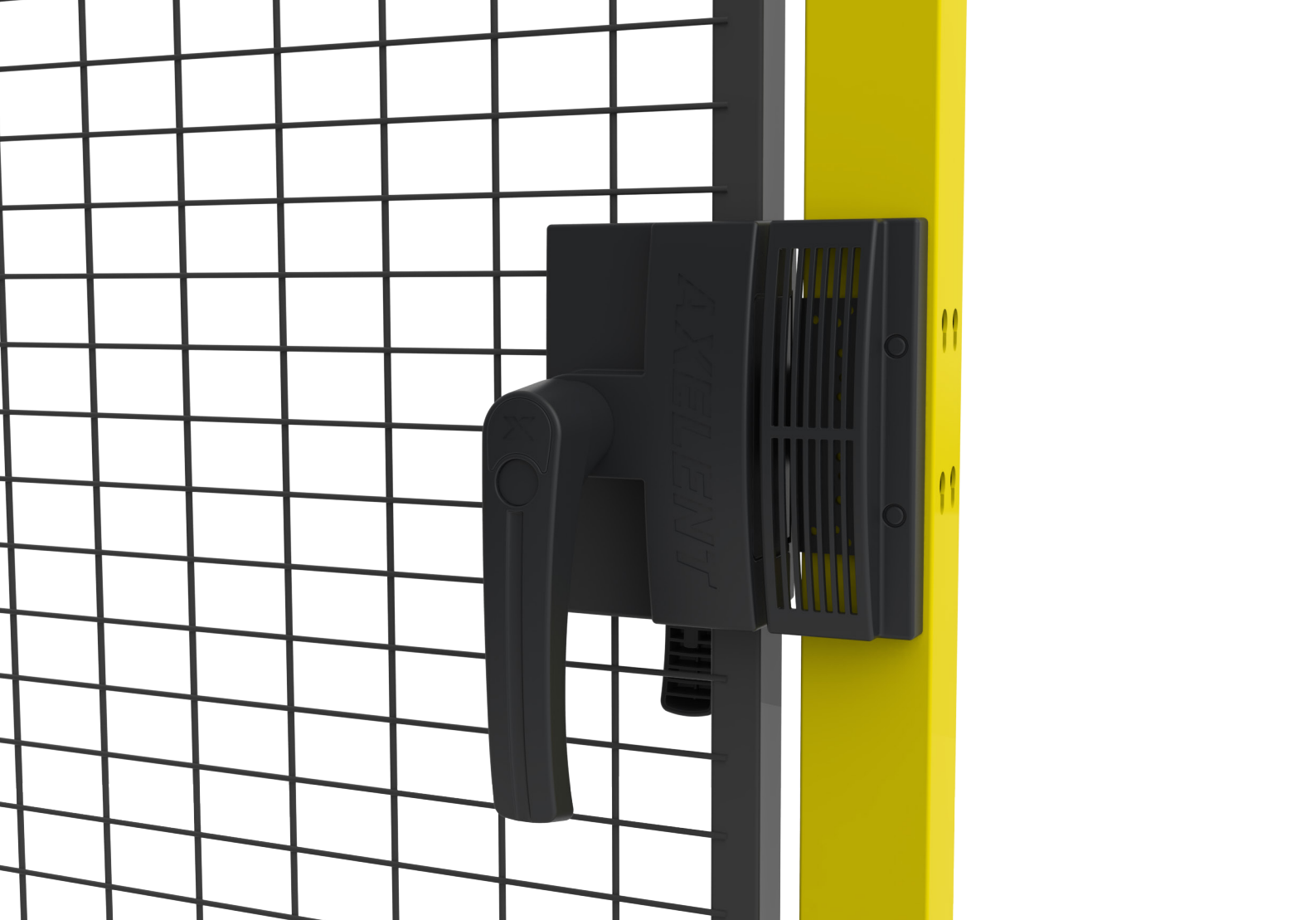


14



X-Guard® - Doors & Heights

- 12 Single hinge door, max opening 1500 mm.
- 13 Double hinge door, access for wider goods, pallet truck etc max opening 2x1500 mm.
- 14 The panels come in a variety of widths. The heights are 750, 1300, 1900 and 2200 mm.

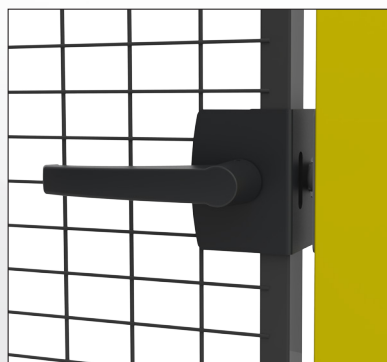


Locks

Hitch lock (large photo)

This lock is an alternative to our X-lock and has an integrated mounting for non-contact switches. The lock has an adjustable hitch for eliminating any internal play.

The handle is spring-loaded to remove the ability of the door to automatically fully close. To fully shut the door requires deliberate operation of the handle eliminating accidental closure. Euro cylinder locking is available as an option. With this variant the key should be carried with the engineer into the cell to prevent accidental closure.



Snap lock

The door closes with a simple push and is kept closed by the built-in catch.

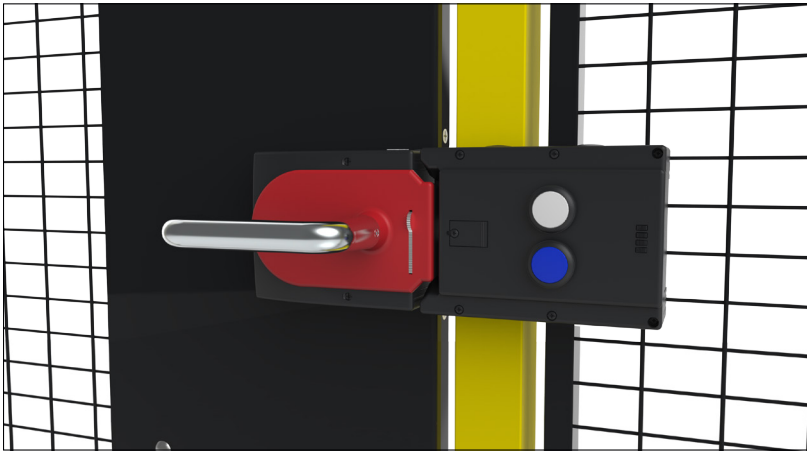


Pad lock

Our most simple lock system. A normal hinge lock secure the area from being entered by unauthorized.

Switch / Emergency Stop

Axellent collaborates with several market leaders within the sector, including Allen-Bradley GuardMaster, Euchner, Jokab, Telemecanique and Siemens. This gives us a wide range to offer our customers for the safest and most optimum solution possible.



Euchner MGB

The MGB (Multifunctional Gate Box) is a unique inter- and guard locking system for the protection of safety doors on machines and systems. Four LEDs indicate information about the lock status.

The lock has an intelligent plunge whose position is detected by an RFID transponder which has a unique code. This prevents tampering while allowing the MGB meets EN ISO 13849-1 / SIL 3 according to EN 62061.



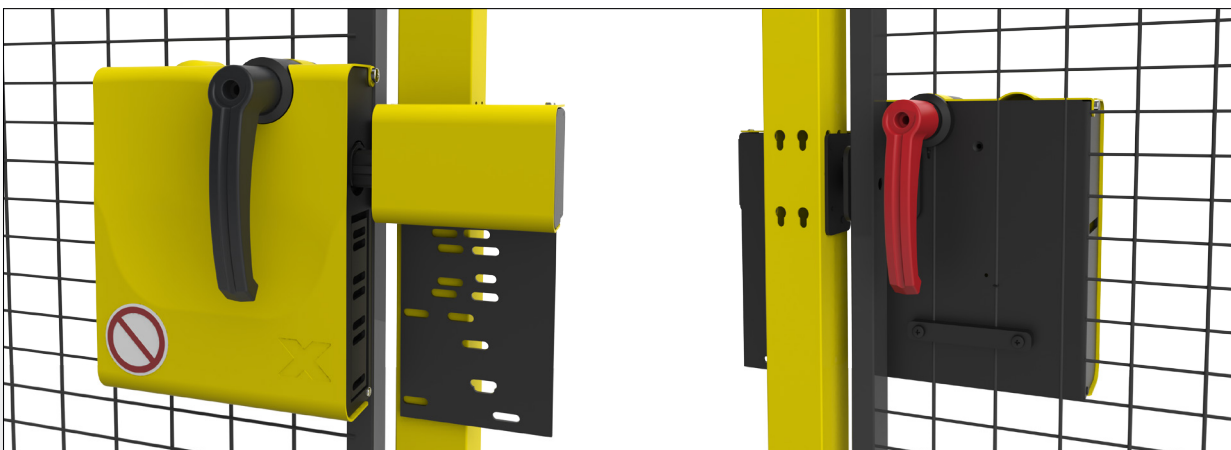
Cylinder lock

Burglar-proof lock system with easy grip handle.



Panic lock

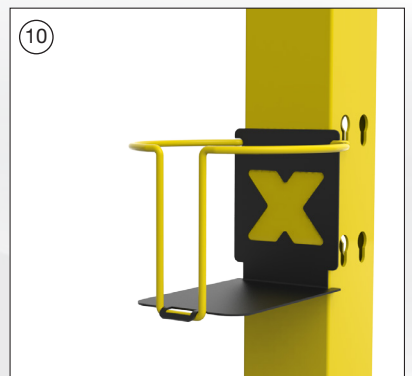
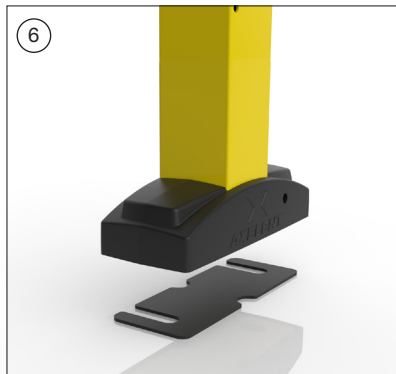
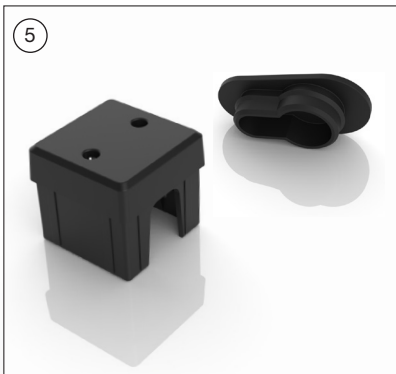
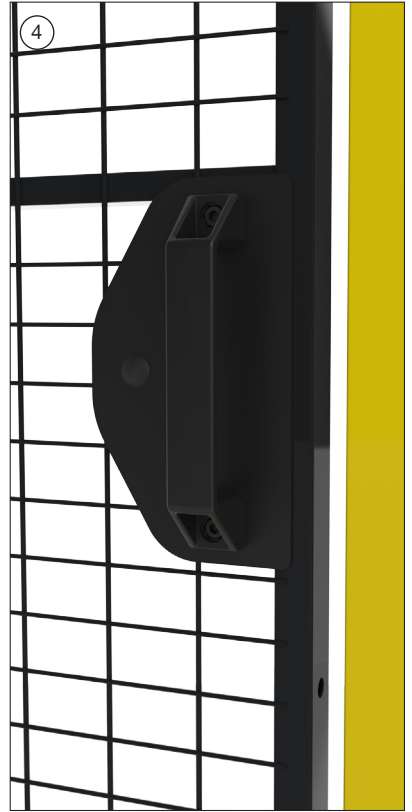
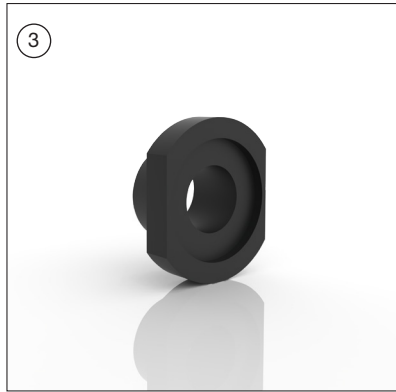
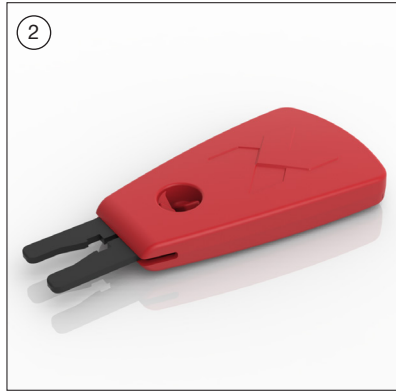
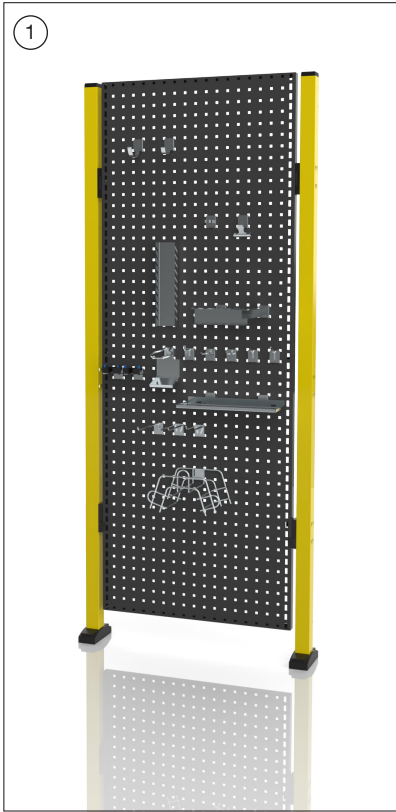
A lock with cylinder can be used as an emergency exit and means of escape where maintenance access is required. Doors with panic lock can always be opened from the inside, even when locked by key from the exterior.

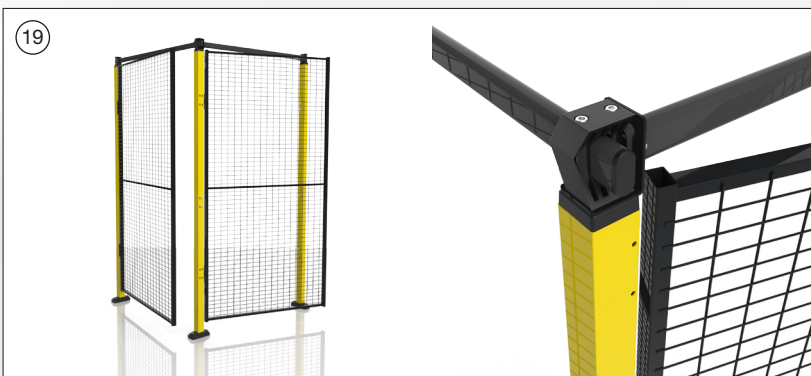
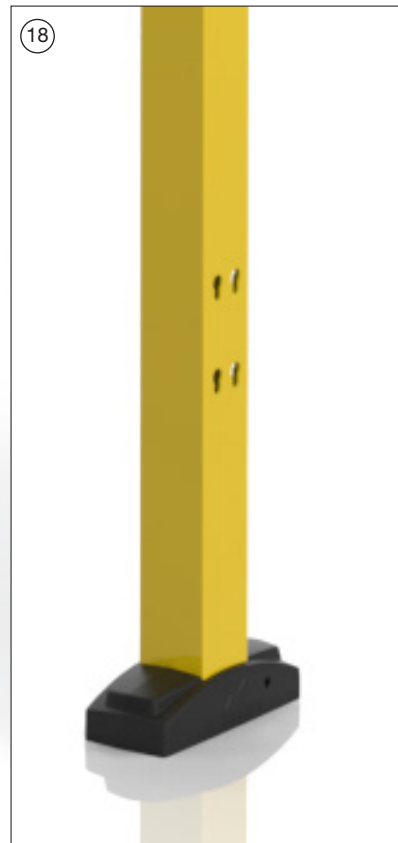
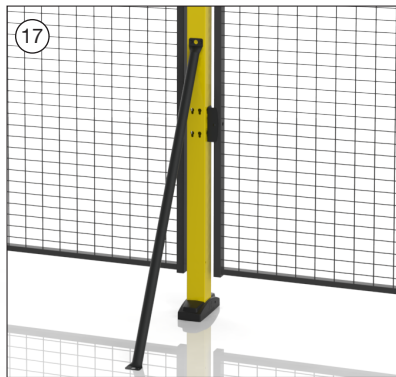
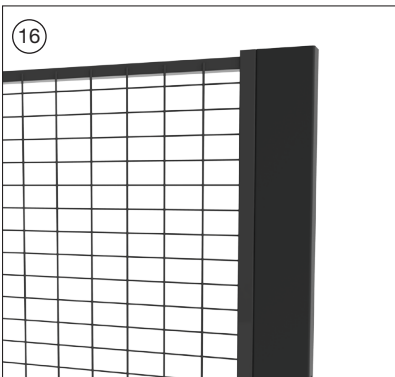
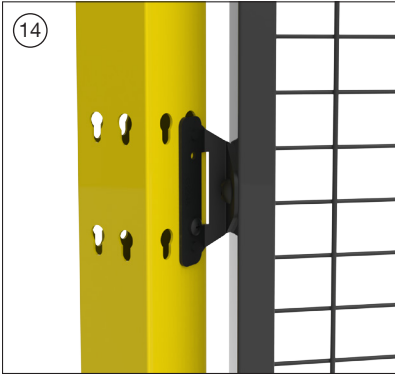
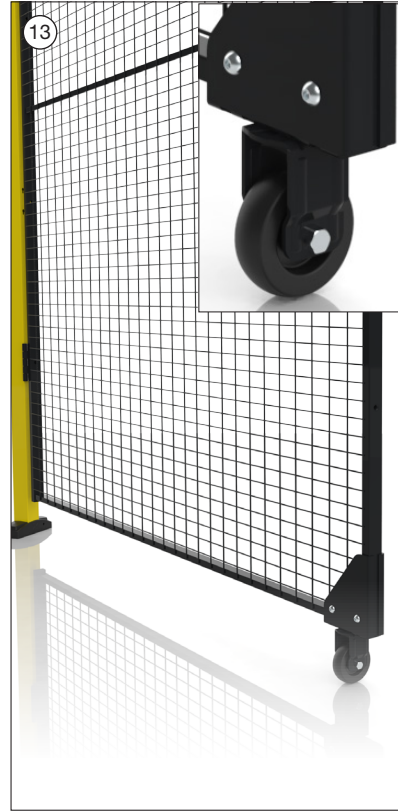
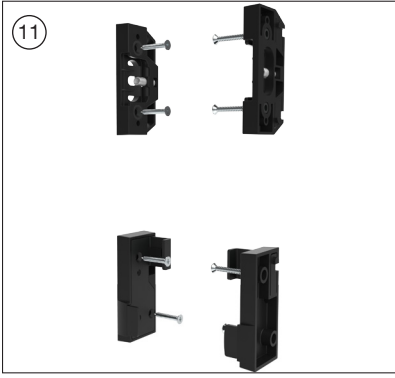


X-Lock

A versatile door lock system that suits all our accident prevention series. X-Lock has a mechanical bolt that holds hinged and sliding doors closed. The lock is designed so that it requires conscious action to open and close the door from the outside. From the inside X-Lock can not be closed, but it is always possible to open.

To prevent the machine from being started accidentally, there is a plate with three holes on the side of the X-Lock where you can secure a padlock when the door is opened. This ensures the highest safety during safety work, etc. For X-Lock EN ISO 12100 chapter 5.5.3. is applicable.





X-Guard[®] - Accessories

- 1 Tool panel** - X-Guard Toolpanel's can be used in environments where operators need storage and quick access to tools while operating machinery. The panel is available in a 700 mm width and heights of 1900 and 2200 mm. The panel is compatible with X-Guard systems and comes in our standard RAL 9011 colour but is also available in special colours upon request. Many accessories are available for Toolpanel.
- 2 X-Key** - A unique key for quick panel release. Forget about tools. All you need is X-Key. X-Guard panels can only be removed with the special X-Key. The X-Key offers quick release and replacement. As standard this is possible only from inside the hazard zone. This is also the setup recommended by Axelent, because it ensures that the respective machinery is stopped upon opening a movable guard. Fixed guards can then only be removed under safe conditions. However, if specifically required for particular maintenance jobs or because of space restrictions removal of panels is also possible from outside the guarded area. Accessory parts are required to install X-Guard for this type of access.
- 3 Tube nut M8** - This fitting can be used when you have cut the panel and need to drill a new hole.
- 4 Bail handle** - The shackle handle is supplied as a set of 2 pieces and an attachment.
- 5 Plugs** - Black rubber plugs can be used to cover holes in posts which are not used. The plugs have both an aesthetic and functional use. Plugs are available both for the top of the post, for the smaller 'keyhole' and for tubes.
- 6 Shim set** - Used to adjust the height of X-Guard posts where the floor is uneven.
- 7 Floor support 70x70 mm** - Floor support for 70x70 mm post. Gap from floor 100 mm. Available in black, unpainted or in special colour.
- 8 Cover strip** - Can be used to cover gaps between posts and panels. Cover strips in black (RAL 9011) are included in the delivery of sheet metal and plastic panels. The cover strip is available in heights of 1900 and 2200 mm and are also available in grey and special colours.
- 9 Special nut** - For plastic cap on post.
- 10 X-Cup** - Many people drink coffee and water when working. It is however not recommended to place coffee mugs near keyboards, drawings or where hot or cold drinks are not suitable. Axelent is the first company to develop a cup holder to attach to the X-Guard post. An intelligent and safe solution. X-Cup can be ordered as an accessory. Do you also want a mug for the holder? Contact your Axelent sales person.
- 11 Quick fittings** - A number of brackets are available for X-Guard as accessories. These allow simple and quick attachment of panels to posts. The quick fittings has a top and a bottom attachment. The top fitting is a simple click-on fitting which can be fitted to the three sides of the post. The click-on function means simple and above all quick fitting. A fitter is only required to fit mesh panels to X-Guard machine guards. The lower fitting acts as a guide and guides the panel into the correct position. The panel is simply clicked into place in the top bracket, when it is in place. A quick fitting is also available for free positioning of the X-Guard post.
- 12 Cutting package** - Panels may need to be cut to precise heights and widths in some environments. The X-Guard cutting pack can be used to help you cut panels and is available in both vertical and horizontal versions. The vertical version is available in four different heights; 750, 1300, 1900 and 2200 mm. The horizontal version is only available for 1500 mm but is compatible with all widths and is available with or without attachments to allow unrestricted positioning. The standard cutting pack colour is black (RAL 9011). We can however supply the colours customers require. An edging rubber can be fitted to provide a soft and good looking edge where mesh panels have been cut.
- 13 Support wheel** - In case there is a need of a support wheel, like for larger door openings etc. we can offer this. The wheel-kit is adapted for hinge door as well for sliding doors. Easy to install.
- 14 0-180° fitting** - Fitting at an angle of up to 180°. The fitting is used where the machine guard needs to be set up at angles other than 90°.
- 15 Magnet** - For use with 'Snap' close door locks.
- 16 Infill sheet metal** - A infill piece that can be used where it is important to the customer that the guard has a specific width. Infill pieces are available for all heights and for two different widths. The standard version is RAL 9011. It can however be adapted to customer requirements.
- 17 Stabilization for contractor** - Stabilization for contractor, RAL 9011.
- 18 Foot cover** - The foot cover gives a well designed appearance and makes it easier to keep clean. It consists of two sections which are simply attached together to form one unit. The foot cover is supplied with posts as standard (not 70x70).
- 19 Top frame fittings for hinge doors in corner** - Top frame fittings for hinge doors in corner provide a more stable door structure for the machine guard. The width of the top frame fitting is adapted to the usage on assembly. Top frame fitting for doors are used to fit two doors in a corner.

X-GUARD[®]



A dark grey footer area containing four vertical yellow lines that separate four rectangular grey boxes, likely serving as a design element for a presentation or report.



X-Guard® – References Projects from Sweden

Axellent has become a turnkey safety supplier. We know that staff safety has the highest priority, but also that the industry has to function efficiently. Therefore, we always look at the whole picture and can carry out everything from risk analysis to the installing and approval of safety equipment for your machine line and storage. We also offer follow-up and software to enable you to maintain the best possible safety levels in your company.







X-Guard® – References Projects from Axelent Automation & Safety, Australia

- ① 800 posts and panels (X-Guard) were used together with a variety of door solutions to deliver a customised solution. A project that took three months from the initial order to completion.
- ② Same project as above.
- ③ Customised solutions with extra high panels to reach the desired height of 5.25 metres. From the first order to the final installation, the project took 12 months to complete.



X-Guard® – References

The airport in Bogotá, Colombia

Eldorado International Airport in Bogotá is Colombia's largest airport with a current capacity of 20 million passengers per year. In connection with a modernisation programme, Crisplant in the Beumer Group was given the task of designing, making and maintaining the airport baggage handling system. Axelent had the privilege of supplying safety guards to the project.

The baggage handling system is the first high-speed system of its kind in South America. This high efficiency has also been combined with energy efficient systems and a very high level of security.

The Crisplant system is built around two fully automatic high-speed units with a sorting function that are built and integrated in the baggage handling system. The system is also fully integrated with the 132 check-in

stations, conveyors, chutes and carousels. Crisplant has also been granted a 4-year maintenance contract.

Michaela Ahlberg, Axelent Denmark:

"Bogotá is the first really large airport project for which we have been entrusted with delivering an all-exclusive solution.



The project, which is divided into several phases, comprises of 800 poles, which represents a good many metres of our X-Guard system."

Smooth onsite assembly

"The goods were supplied in several part deliveries and was managed from Crisplant's head office in Denmark. Everything was assembled onsite in Bogotá by Crisplant's own fitters. The feedback we got was that it was easy to fit on site and they appreciated the same dimensions between sections and doors as it made final assembly that much easier. The customer got 3D drawings from Axelent so they could see at the planning stage how everything just fit into place as they wanted it."

We are a partner in the project

"Looking back, we can't help but feel humbled by the outstanding collaboration we've enjoyed with one of our international clients, the Crisplant Beumer Group. In 2010 we entered an even closer phase of our business

relationship. Today we are not just suppliers but partners."

**Capacity and security in focus
Klaus Schäfer, MD, Crisplant:**

"The economic growth in South America is leading to increased air traffic, which is putting increasing demands on airport capacity and security. This is the first system of its kind in South America and the operator has chosen a baggage handling system that will help Eldorado Airport to become a central hub for the South American air traffic."



X-Guard® – References Formteknik, Sweden

Formteknik focuses on four main customer segments: Packaging, Caps and Closures and Medical Devices. When the company decided to invest in machine guards for their new robot cell, design and function were top of the list, which is why the Axelent X-Guard system was chosen for this magnificent plant.

Jan Aronson, MD at Formteknik

”X-Guard Contour has a striking design. When we first set eyes on Axelent’s X-Guard Contour, we saw straight away that it was the perfect guard for our new robot cell. The rounded shape obviously has a functional significance, but most of all, the guard gives a more well-thought-out impression, which suits us perfectly. It speaks the same language as the rest of the plant. We strive to choose the best, for ourselves as well for our customers.”



Summary of Machine Safety Standards

The current version of the Machinery Directive 2006/42/EC (amended by 2009/127/EC) has been in force since December 29, 2009. It is the basis for all machine safety requirements applicable throughout the EU. A number of published European Standards detail requirements that are applicable to Axelent X-Guard. This is a summary of pertinent quotations from these.

1. Fixed guards

Machinery Directive annex 1 chapter 1.4.2.1

"Fixed guards must be fixed by systems that can be opened or removed only with tools.

Their fixing systems must remain attached to the guards or to the machinery when the guards are removed.

Where possible, guards must be incapable of remaining in place without their fixings."

This quite stringent requirement for "no-loss" fasteners has been somewhat softened by the "Guide to application of the Machinery Directive" and a section in the new EN ISO 14120 standard (it replaces EN 953 and is therefore referenced throughout in this section):

"When it is foreseen, e.g. maintenance, that the fixed guard will be removed, the fastenings shall remain attached to the guard or to the machinery.

The requirement does not necessarily apply to fixed guards that are only liable to be removed, for example, when the machinery is completely overhauled, is subject to major repairs, or is dismantled for transfer to another site." (EN ISO 14120 5.19).

EN ISO 14120 chapter 5.3.10

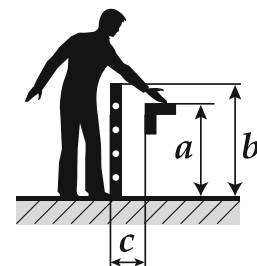
"Where practicable removable guards shall be unable to remain in place without their fixings."

VALUES FOR SAFETY DISTANCES

EN ISO 13857 chapter 4.2.2.1.2 table 2

Dimensions in mm

Height of hazard zone ^c <i>a</i>	Height of protective structure <i>a, b</i>									
	1000	1200	1400	1600	1800	2000	2200	2400	2500	2700
Horizontal safety distance to hazard zone, <i>c</i>										
2700	0	0	0	0	0	0	0	0	0	0
2600	900	800	700	600	600	500	400	300	100	0
2400	1100	1000	900	800	700	600	400	300	100	0
2200	1300	1200	1000	900	800	600	400	300	0	0
2000	1400	1300	1100	900	800	600	400	0	0	0
1800	1500	1400	1100	900	800	600	0	0	0	0
1600	1500	1400	1100	900	800	500	0	0	0	0
1400	1500	1400	1100	900	800	0	0	0	0	0
1200	1500	1400	1100	900	700	0	0	0	0	0
1000	1500	1400	1000	800	0	0	0	0	0	0
800	1500	1300	900	600	0	0	0	0	0	0
600	1400	1300	800	0	0	0	0	0	0	0
400	1400	1200	400	0	0	0	0	0	0	0
200	1200	900	0	0	0	0	0	0	0	0
0	1100	500	0	0	0	0	0	0	0	0



a Protective structures less than 1000 mm in height are not included because they do not sufficiently restrict movement of the body.

b Protective structures lower than 1400 mm should not be used without additional safety measures.

c For hazard zones above 2700 mm, refer to 4.2.1.

» Cont. on next page

2. Safety Distances

EN ISO 14120 chapter 5.2.2

"Guards intended for preventing access to hazard zones shall be designed, constructed, and positioned to prevent parts of the body from reaching hazard zones according to ISO 13857. For interlocked movable guards, safety distances according to ISO 13855 shall also be fulfilled."

3. Distances to impede free access

EN ISO 13857

"A protective structure can be used to restrict the free movement of the lower limbs under protective structures. When this method has to be used, distances are given in annex A in relation to the height to the protective structure."

4. Regular openings for persons of 14 years of age and above

EN ISO 13857 chapter 4.2.4.1

Axelent's X-Guard Premium has an aperture of 19 x 49 mm which requires a safety distance of 120 mm, Axelent's other machine guard systems has an aperture of 29 x 49 mm which requires a safety distance of 200 mm (for further information see EN ISO 13857 chapter 4.2.4.1 table 4).

5. Viewing

EN ISO 14120 chapter 5.2.4

"Where viewing of the process is required, guards shall be designed and constructed to offer adequate viewing. This can eliminate the need for defeating them. See also 5.9."

EN ISO 14120 chapter 5.9

"Where viewing of machine operation is required through the guard, materials shall be selected with suitable properties. If perforate material or wire mesh is used this should be of adequate open area and suitable colour to permit viewing. Viewing will be enhanced if the perforate material is darker than the area observed."

6. Positive location of removable guards

EN ISO 14120 chapter 5.3.10

"Where practicable removable guards shall be unable to remain in place without their fixings."

7. Removal only by tool

EN ISO 14120 chapter 5.3.9

"Demountable parts of guards shall only be removable with the aid of a tool."

In the same section EN ISO 14120 forbids use of quick release fasteners that can be accessed from outside the guarded area. This requirement has been added to prevent side-stepping of the guard. Users could be tempted to remove a fence panel instead of using an interlocked door and thus enter the danger zone while the machine is running.

A "safe system of work" can prevent that. Axelent supplies the X-key as a special tool for quick release (as standard from inside only). The owner of the machine should limit access to this special tool to authorised

Figure A.1 (EN ISO 13857)

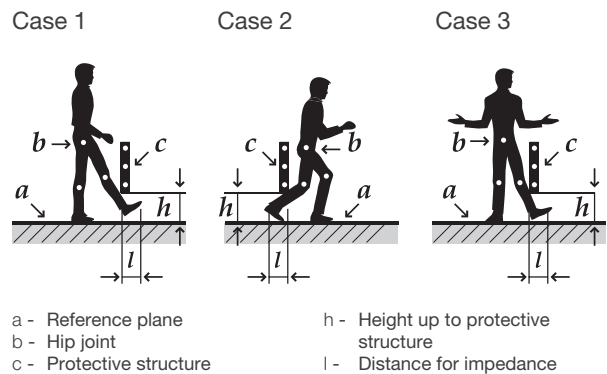


Table A.1 (EN ISO 13857)

Height up to protective structure (h)	Distance (l)		
	Case 1	Case 2	Case 3
$h \leq 200$	≥ 340	≥ 665	≥ 290
$200 < h \leq 400$	≥ 550	≥ 765	≥ 615
$400 < h \leq 600$	≥ 850	≥ 950	≥ 800
$600 < h \leq 800$	≥ 950	≥ 950	≥ 900
$800 < h \leq 1000$	≥ 1125	≥ 1195	≥ 1015

Dimensions in mm

Figure A.1 – Impeding free movement under protective structures.

Table A.1 gives distances for particular cases where access of the lower limbs is impeded when the person remains in a standing position (see figure A.1) without any additional support.

Where there is a risk of slipping or misuse, applying the values given in Table A.1 can be inappropriate.

There should be no interpolation between the values in this table. If the height, h, up to the protective structure lies between two values, then the distance for the higher value of h should be used (for further information see EN ISO 13857 chapter 4.3).

persons to prevent circumvention of the guard.

At the same time fixed guards need to be easily removed and re-installed to ensure they will be re-installed (compare section 6.4.4.1 b).

8. Selection of guards

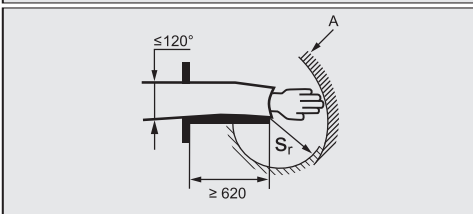
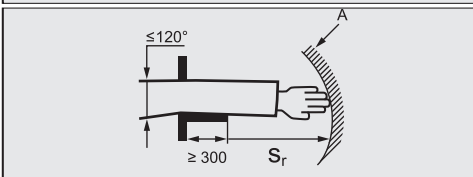
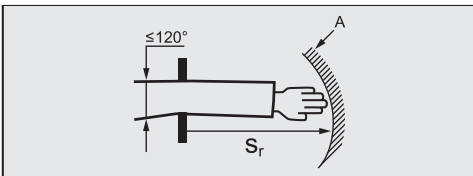
EN ISO 14120 chapter 6.4.4.1

"The following types of guard should be used: "a) Movable guard, if the foreseeable frequency of access is high (e.g. more than once per week) or if removal or replacement of a fixed guard would be difficult. Movable guards shall be associated with an interlock or an interlock with guard locking (see ISO 14119);

b) Fixed guard only, if the foreseeable frequency of access is low (e.g. less than once per week), its replacement is easy and its removal and replacement are carried out under a safe system of work."



PROTECTION AGAINST REACHING ROUND, DIMENSIONS FOR UPPER LIMBS



A = Range of arm movement
 S_r = Radial safety distance
 a = Diameter of a circular aperture or width of a square aperture or slot

PROTECTION AGAINST REACHING THROUGH OPENINGS, DIMENSIONS FOR UPPER LIMBS

The values in the following table apply only to persons who are at least 14 years old. Values in mm.

Part of the body	Figure	Opening	Safety distance		
			Slot	Square	Circular
Fingertip		$e \leq 4$	≥ 2	≥ 2	≥ 2
		$4 < e \leq 6$	≥ 10	≥ 5	≥ 5
Finger up to knuckle where finger joins hand		$6 < e \leq 8$	≥ 20	≥ 15	≥ 5
		$8 < e \leq 10$	≥ 80	≥ 25	≥ 20
Hand		$10 < e \leq 12$	≥ 100	≥ 80	≥ 80
		$12 < e \leq 20$	≥ 120	≥ 120	≥ 120
		$20 < e \leq 30$	$\geq 850^{1)}$	≥ 120	≥ 120
		$30 < e \leq 40$	≥ 850	≥ 200	≥ 120
Arm up to shoulder		$40 < e \leq 120$	≥ 850	≥ 850	≥ 850

The coloured area shows which part of the body is restricted by the size of the opening.
 For openings > 120 mm the safety distances for reaching over must be used and additional safety measures taken.
¹⁾ If the length of a slot is ≤ 65 mm, the thumb acts as a stop. The safety distance can then be reduced to 200 mm.

* The graphics are owned by Axelent

9. Geometrical factors

EN ISO 12100 chapter 4.2.1

"The design of the machine shall be such that, from the main control position, the operator is able to ensure that there are no exposed persons in the danger zones."

10. Measures for the escape and rescue of trapped persons

EN ISO 12100 chapter 6.2.5.3

"Measures for the escape and rescue of trapped persons may consist, e.g. of:

- escape routes and shelters in installations generating operator-trapping hazards;
- arrangements for moving some elements by hand, after an emergency stop;
- arrangements for reversing the movement of some elements;
- anchorage points for descender devices;
- means of communication to enable trapped operators to call for help."

As this is a sample from the applicable standards, we recommend that you read the standard relevant to each application. The basis for any decision on guards and other protective measures should always be a careful risk assessment of the entire machine and process. This document is subject to changes in applicable directives and standards.

The following text and diagrams have been reproduced with the express permission of SIS Förlag AB Stockholm, Sweden, +46 8 555 523 10, HYPERLINK "<http://www.sis.se>" www.sis.se who also sells the standards referred to in the text.





X-TRAY®

The natural choice for X-Guard®

X-Tray wire trays integrate easily with Axelent's X-Guard machine guards. Together they are the optimum choice.

Our wire trays are strong, flexible and easy to fit. You can create elegant solutions without the need for special tools. Just like X-Guard, only a few brackets and tools are required. By combining X-Tray & X-Guard you get maximum flexibility from a minimum amount of material. Simple and smart. Thanks to the almost endless possibilities, despite few components, you do not need to spend time and money on additional orders to complete your project.

Easy to combine

Axelent's X-Tray is the perfect solution for wire trays together with X-Guard machine guard.

No special tools

The combination is easy to assemble without the need for any special tools.

One supplier

Turnkey solutions from one supplier make project implementation quick and easy.

More info
about the articles
can be found on a
seperate leaflet.
www.axelent.com

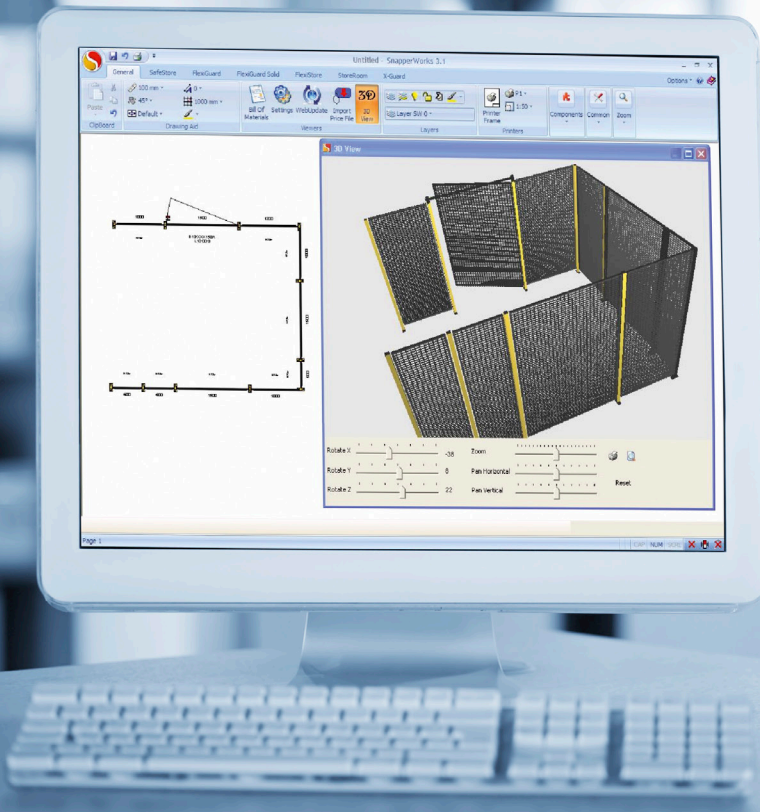


Did you know that...

- X-Guard has only one bracket for the post, no matter if it's a corner or straight wall
- The post has punched holes which gives a quick installation
- X-Guard is available in 13 different section widths and four different heights
- You do not need to pre-determine whether to have a right or left-hinged door (does not incl. X-lock)
- The fittings on the panels are pre-mounted from the factory
- It is the same building dimensions between the posts whether it's a door or a fixed section
- Door corners are standard, no additional fittings needed
- 20x30 mm frame on the section is standard
- X-Guard Lite is available as an option
- X-Guard is available with round corners, called Contour
- X-Guard have fittings for easy mounting of cable tray X-Tray

3D

X-Guard® comes
with a 3D viewer



SnapperWorks

– As simple as it is brilliant

Axellent's in-house developed, user-friendly drawing application, SnapperWorks, enables our customers to get a quick layout drawing showing specific panel sizes and elevations.

Everything is prepared, all you have to do is click and drag to get a complete drawing with all the parts you need.



Click and drag! It is that simple and quick to get an overview of what you need and what your mesh panel system will look like. The drawing can then be used as an order basis.

The benefits of SnapperWorks are many ...

- It is tailored to Axellent's modules and contains all our mesh panel and machine safety systems.
- It is easy to learn.
- The program enables you to import DWG and DXF files and draw, for instance, panels straight onto the drawing.
- From specified lengths you can let the program configure the most economical panel layout.
- It quickly provides you with a complete drawing including material specifications.

Read more about SnapperWorks at:
www.snapperworks.com



Environment and sustainable work

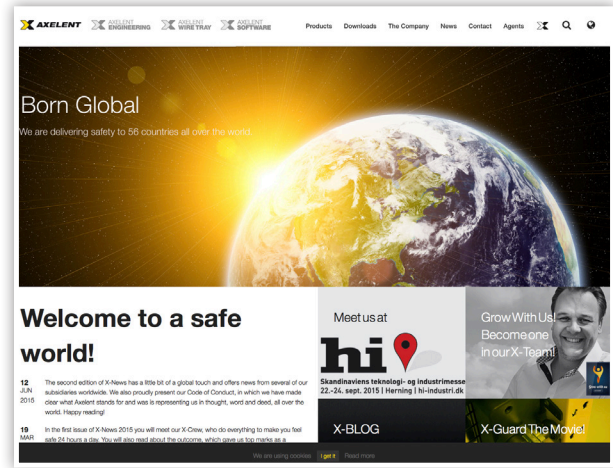
Environmental, health and safety issues are an integral part of Axelent's operations. Through management by objectives we will achieve constant improvements in this regard.

We adopt an approach that leads to long-term sustainable development through continuous improvements that contribute to reducing all conceivable environmental impact by:

- Providing resource and cost-effective solutions
- Complying with laws, ordinances and customer requirements relating to environmental responsibility
- Striving for high efficiency levels in our use of energy and natural resources
- Favouring systems for the recycling and reuse of material
- Preventing and limiting pollutants



Our website contains all the information you need about our company and our products. We publish the latest news and changes to our range. You can also download brochures and product information sheets.



Support



At Axelent we do all we can to give our customers the best possible service. Don't hesitate to contact us if you have any queries regarding our products, assembly, etc. You are also welcome to call us if you seek general advice about machine guards or machine safety.

We guarantee, deliver and assemble!

- ✓ We give you a quote including drawings within four hours.
- ✓ Inquiries received in the evening or at night are dealt with by 11 am the following day.
- ✓ We can provide a professional and experienced installation service for complete peace of mind.

Coating

We think green...
As we care about the environment we have drawn up an environmental policy to help protect our internal and external environments. For example, Axelent's own products are all powder coated and are solvent free.

but paint in yellow, black...
Each product group has its own standard colours as specified in respective group's fact sheet. But we will naturally deliver your products in the colour you desire.



X-Press

To guarantee a rapid service and secure delivery, Axelent has a smooth running logistics system with a worldwide carrier network.





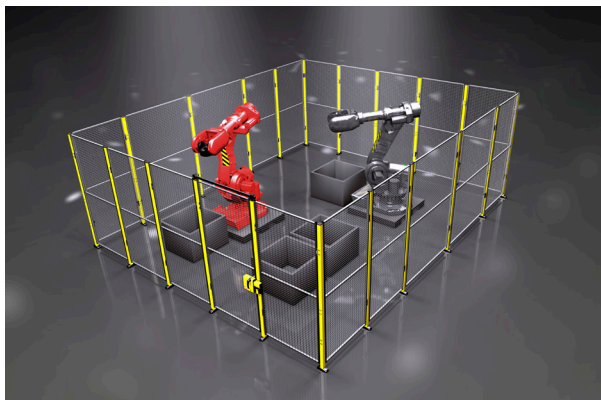
Axelent Born Global



Axelent Group

The Axelent Group is made up of three companies: Axelent, Axelent Engineering and Axelent Software. These companies have the joint vision of making the industry competitive and profitable through automation, safety, rational procedures, functions and expertise.

The companies are at the growth stage, developing their businesses in both the Swedish and international markets.



Axelent AB

Axelent AB, a leading manufacturer and global supplier of mesh panel systems for machine guarding and partitioning within industry, warehousing and lost prevention. The head office is located in Hillerstorp, Sweden, along with research and development, production, storage and packaging. Axelent has sales offices in over 50 countries and subsidiaries in more than 10 countries.

www.axelent.com



Axelent Safety

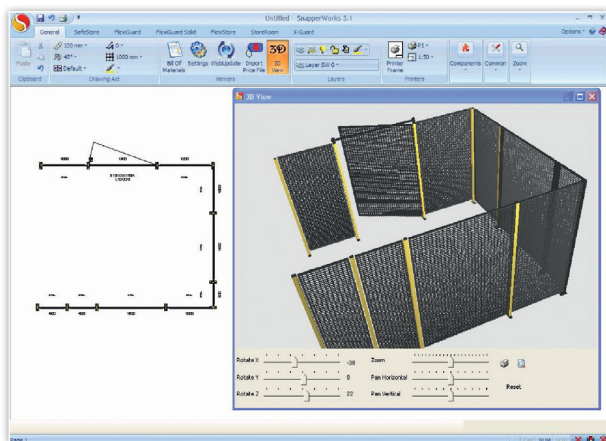
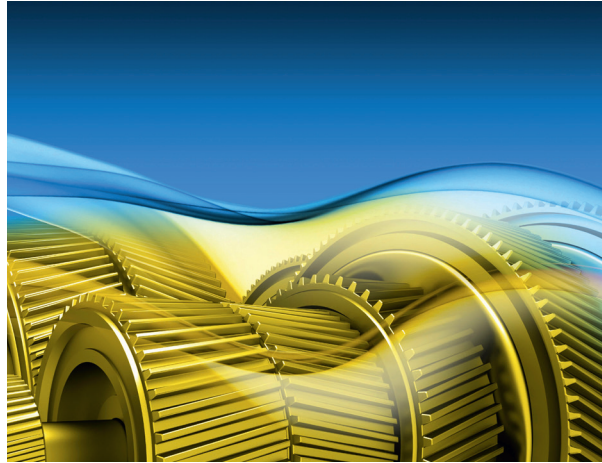
Business area Axelent Safety/Axelent ProfiServices offers complete machine safety solutions. Operations are divided into four sub areas. Risk Analysis, Design, Installation and Final Approval/CE Marking. Axelent Safety/Axelent ProfiServices also provides training, technical and legal consultation within machine safety.

www.axelent.com

Axelent Engineering AB

Axelent Engineering AB provides services and products within automation predominantly to producing industry in Scandinavia. The core business is custom hardware and robotic solutions with an emphasis on profitable flow for the entire lifecycle. By partnering with Dassault Systèmes, a world leader in 3D and PLM (Product Lifecycle Management) solutions we can also offer PLM services and products such as CATIA, 3DVIA, DELMIA and ENOVIA. This combination makes Axelent Engineering an even more complete partner for the industry in terms of innovative and profitable flows.

www.axelentengineering.se



Axelent Software AB

Axelent Software develops and markets user licences for their in-house software applications SnapperWorks and SafetyWorks. The programs are based on distributed platforms and standards that ensure a long length of life, continuous development and easy connectivity to other systems. Axelent Software's products are based on simplicity and ease of use and is in its original version developed for Axelent's products, but through various customizations applicable in most industries with standardized products.

www.axelentsoftware.com

Axelent Wire Tray

Axelent Wire Tray is a part of Axelent AB and develops, manufactures and markets a complete cable routing system based on wire trays under the brand name of X-Tray. We have created a premium brand with regard to ultimate design, functionality, materials and service. Customer collaboration is another key aspect. We appreciate customers with high demands because it enables us to continuously develop tailored solutions. Our close proximity to our design and production teams and, not least, a passion for innovative and smart solutions, means we can quickly move from concept to finished product.

Today, our products are sold all over the world and are mostly found in the energy, infrastructure, food, machinery, off shore and telecom & data industries.

www.axelentwt.com





How safe do you want to be?

Axelent AB offers a complete safety concept for machinery, construction and storage.

The Axelent head office is in Hillerstorp, Sweden, where all product development, production, storage and packaging takes place. Axelent has sales offices in 50 countries and the products are sold worldwide. The company also includes Axelent Wire Tray, who offer a complete cable routing system based on wire trays under the brand name of X-Tray.

The Axelent Group is made up of the three companies Axelent, Axelent Engineering (automation solutions) and Axelent Software. These companies have the joint mission of making Swedish industry competitive through automation, safety, rational procedures, functions and expertise.



AXELEN'T · AXELEN'T ENGINEERING · AXELEN'T SOFTWARE

AXELEN'T LTD · UNIT 9 HILLMEAD INDUSTRIAL ESTATE · MARSHALL ROAD, SWINDON SN5 5FZ UNITED KINGDOM
AXELEN'T DIRECT: 01793 52 35 35 · FAX: 01793 43 24 24
E-MAIL: SALES@AXELEN'T.COM · INTERNET: WWW.AXELEN'T.COM