



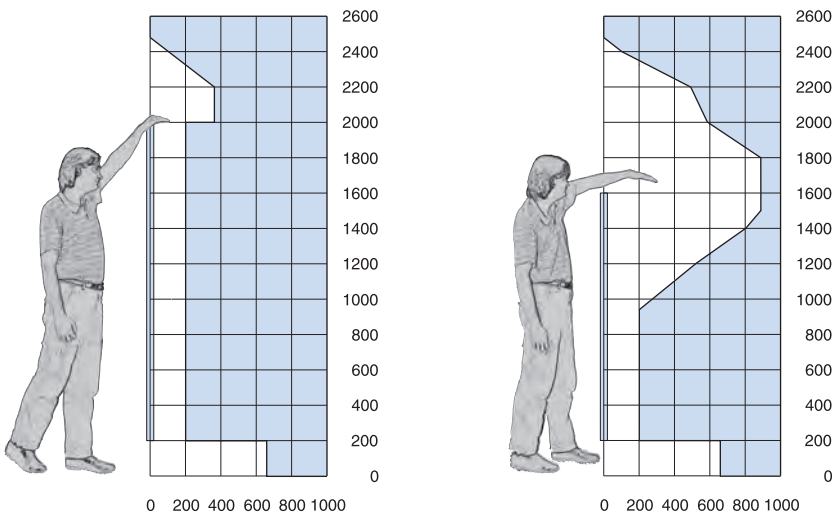
Standards for guards

Standards for guards

Besides the essential safety requirements of the **machinery directive 98/37/EC** and the **DIN EN ISO 12100 part 1+2** - safety of machinery - the following standards (Type B Standards) apply when designing guards, e.g. safety barriers.

EN 294 - Safety distances to prevent danger zones being reached by the upper limbs

The safety distances depend on the height and size of the opening in the safety guard. A mesh size of 40×40 mm requires a safety distance of 200 mm. The following figures show the safety distance profiles in accordance with **EN 294** and **EN 811** for two different heights of the safety barrier. The safety distance layout of a concrete safety barrier always requires a risk assesment according to **DIN EN ISO 12100**.

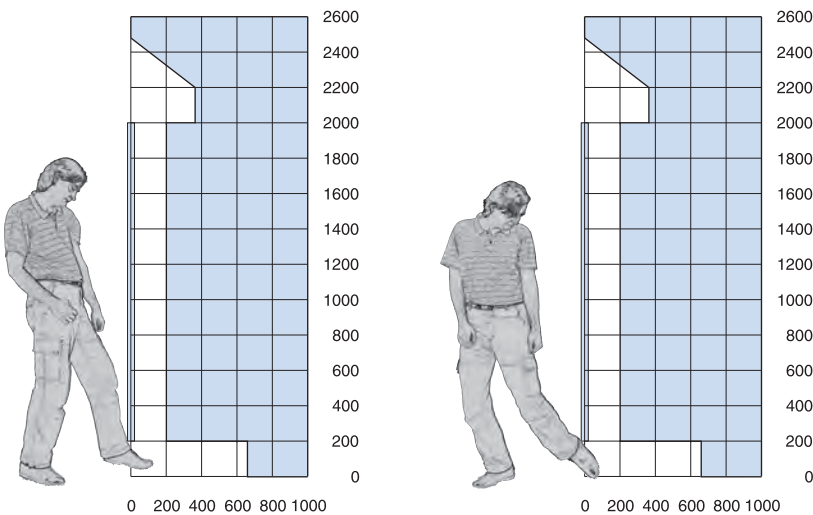


EN 811 - Safety distances to prevent danger zones being reached by the lower limbs

When the following preconditions are fulfilled EN 811 allows greater openings than EN 294:

- the related persons are at least 14 years old
- it is justifiable predictable that for reaching the hazardous area only the lower limbs are used.

In accordance with EN 811 openings greater than 180 mm (slit shaped) or 240 mm (square / circular type) allow access to the whole body. Besides this an extended rule exists for ground clearance, where access from upright position is assumed. Ground clearance of 200 mm results in a safety distance of 665 mm for the feet area, as it is shown in the following figures.



DIN EN 953 - Guards

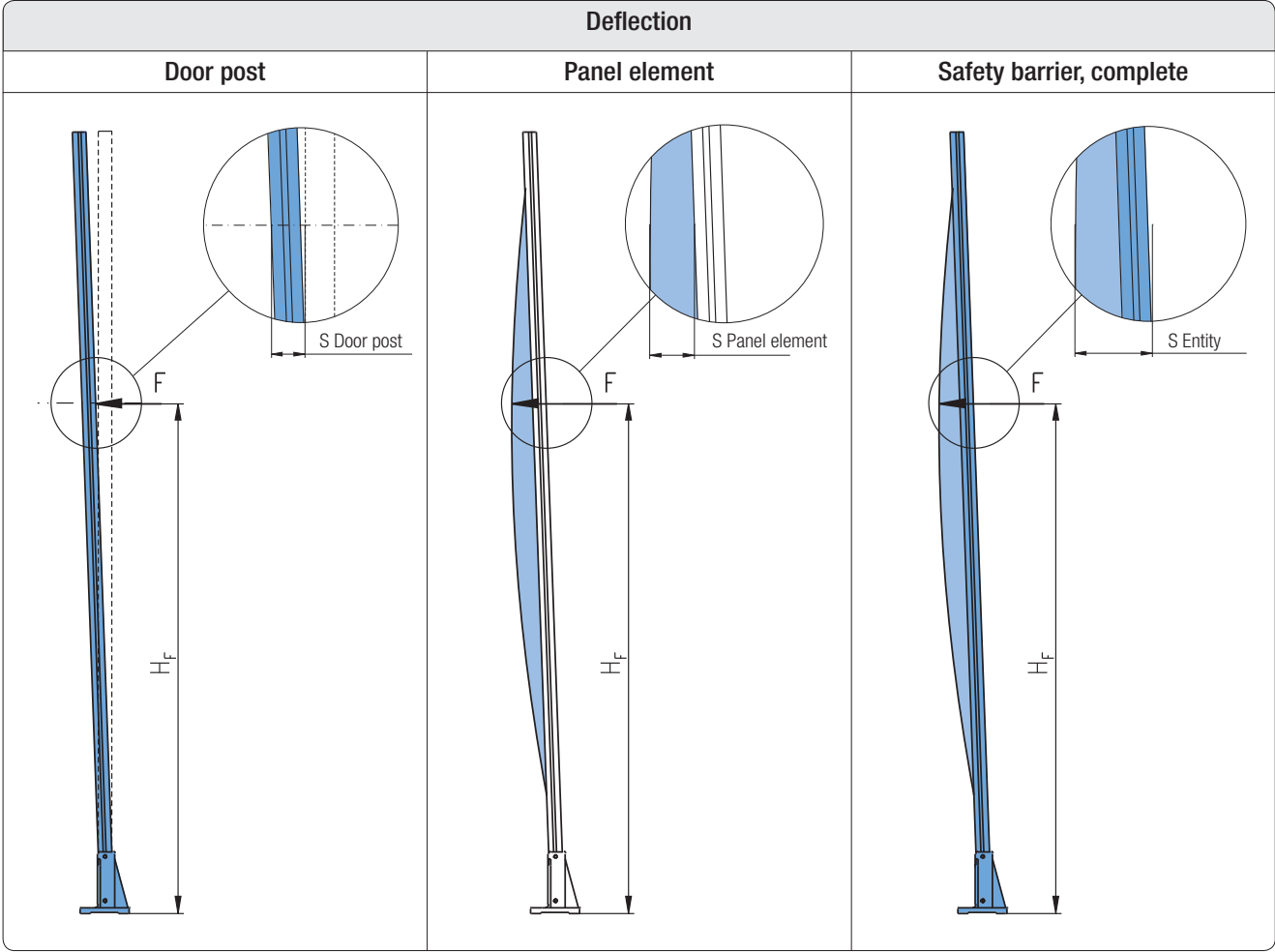
General requirements for the design and construction of fixed and movable guards

Note

If for a certain machinery a special machinery safety standard (Type C Standard) is provided, the specifications of this Type C Standard take precedence.

Examples of Type C Standards:

- DIN EN 619 - Continuous handling equipment and systems
 - DIN EN 693 - Hydraulic presses
 - DIN EN 775 - Industrial robots.
- Recommendations for safety



Safety barrier element: without frame
Panel element: Polycarbonate 4 mm

F in N										
Standard profile	Door post	H _F		S in mm						
	Profile 40×80, 6E, LP	1,000	1.0	2.0	3.0	5.0	6.0	10.0	15.0	20.0
		1,500	3.5	5.0	10.0	15.0	20.0	35.0	62.0	95.0
	Safety barrier, complete	H _F = 1,500		S in mm						
	Profile 40×80, 6E, LP Profile 40×40, 4E, LP	Door post	2.0	2.5	5.0	8.0	10.0	17.5	31.0	48.0
		Panel element	30.0	38.0	49.0	59.0	65.0	82.0	98.0	115.0
		Entity	32.0	40.5	54.0	67.0	75.0	99.0	129.0	163.0
Panel profile	Door post	H _F		S in mm						
	Profile 60×80, 6E, Panel, LP	1,000	1.0	1.5	2.0	3.0	5.0	8.0	12.0	16.0
		1,500	2.6	3.5	7.0	10.0	14.0	26.0	40.0	52.0
	Safety barrier, complete	H _F = 1,500		S in mm						
	Profile 60×80, 6E, Panel, LP Profile 40×80, 3E, Panel, LP	Door post	1.5	2.0	3.5	5.0	7.0	13.0	20.0	26.0
		Panel element	35.0	39.0	48.0	54.0	60.0	73.0	84.0	94.0
		Entity	36.5	41.0	51.5	59.0	67.0	86.0	104.0	120.0



Dynamic load

Test layout

$v = 20 \text{ km/h}$

100 kg

Test conditions
During this test a body of 100 kg is accelerated to 20 km/h.
During impact of the body into the test barrier an energy of 1600 Joule will be released.
The impact zone is located at the upper third of the test barrier.



Dynamic load

Safety barrier unit: without frame		
Test with:	Panel element:	Polycarbonate 4 mm
	Post:	Panel profile 60×80 mm
	Frame:	Panel profile 40×40 mm



before impact



at impact



after impact

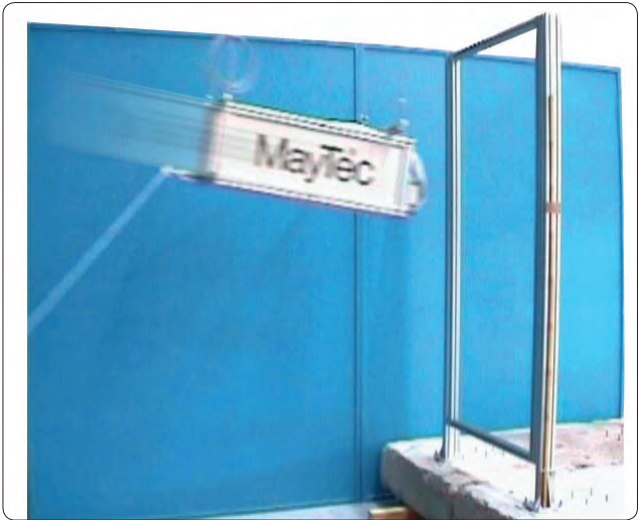
Result
MayTec safety barrier units succeeded all crash tests without permanent damage.

✓

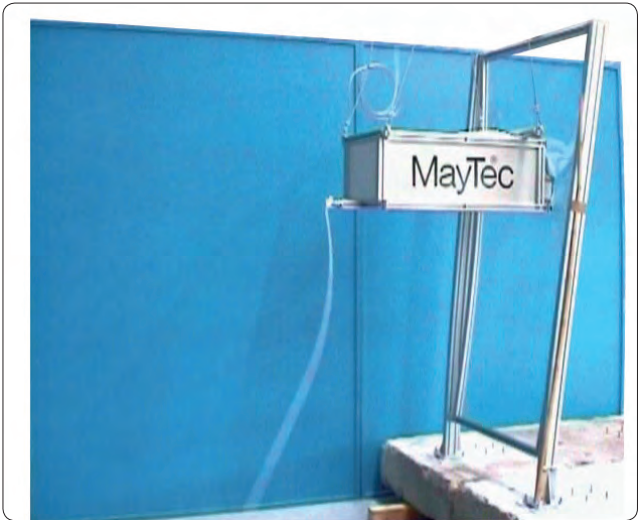


Dynamic load

Safety barrier unit: with frame		
Test with:	Panel element:	Polycarbonate 4 mm
	Post:	Panel profile 60×80 mm
	Frame:	Panel profile 40×40 mm



before impact



at impact



after impact

Result
MayTec safety barrier units succeeded all crash tests without permanent damage.

✓



Dynamic load

Safety barrier unit: with frame		
Test with:	Panel element:	Welded wire net (steel) 4×40×40 mm
	Post:	Panel profile 60×80 mm
	Frame	Panel profile 40×40 mm
	vertical: horizontal:	Wire net profile 30×30 mm



before impact



at impact



after impact

Result
MayTec safety barrier units succeeded all crash tests without permanent damage.

✓

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The key ...

to success

extremely strong

efficient

functional

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