



Pendulum test 3mm PC 280J

## Pendulum test ISO 14120:2015

(C.2.5.1 Resistance of guards against impact from Outside the hazard zone)

**Date:** 2019 – 03 – 21

**Location:** Anva Arion Sweden AB

**Test performed by:** Mats Brindeland, Anton Persson

	1	2
	E=280J, 0.95m Optisafe outside Original panel	E=280J, 0.95m Optisafe outside Modified with a screw
a)	Yes	No
b)	Yes	No
c)	Yes	No
d)	Yes	No
e)	Yes	No
f)	No	No

Weight of body=30kg.

Body size: L=141mm, Ø223mm

280J simulates a body with the weight of 90kg crashing into the fence at 2.5m/s (8.99km/h).

From ISO 14120:2015 C.2.5.1:

*“a) buckling/bulging (permanent deformation without crack);*

*b) incipient crack (visible only on one surface);*

*c) through crack (crack visible from one surface to the other);*

*d) penetration (hard or soft body penetrating the material);*

*e) guard window or infill material being loosened from its fixing;*

*f) guard loosened from guard support.*

*The test is passed if*

*— the deformations or cracks do not exceed values specified to avoid harm,*

*— there is no penetration, and*

*— damages e) and f) above are not observed.”*

## Introduction:

This is a test with Optisafe Panels 3mm polycarbonate instead of our standard 4mm polycarbonate. To test the strength, Optisafe panel 1900x1000mm was used with support on both sides. Pendulum test with a weight of 30kg was swung against 2/3 of system height (1400mm above ground).

## Result:

The result for without an extra screw was devastating. When the weight hit the panel, it went through the plastic because the PC was soft and broke free out from its fixings (See video). To prevent the penetration a screw was screwed into the top of the panel to hold both the fixing and plastic and prevent the it to escape from its fixings (See picture). That easy fix made the panel much stronger and was able to resist the force when a second test was made. The frame got slightly bent but not too much (See pictures)

## Equipment that was used in the crash rig and test:

- 4X Post 2100 with adjustable foot
- 2X Prosafe 1900x1000 panel
- 6X Weight 5kg
- 1X Optisafe 1900x1000 with 3mm Polycarbonate

All the posts were bolted by 4 expander bolts on each foot.

All the panels were bolted by 3 bolts on each side.

All the standard bolts for each panel was used (Prosafe M8x50, Optisafe M8x40).

Hjo 2019-03-21



**Mats Brindeland**  
Sales Protect

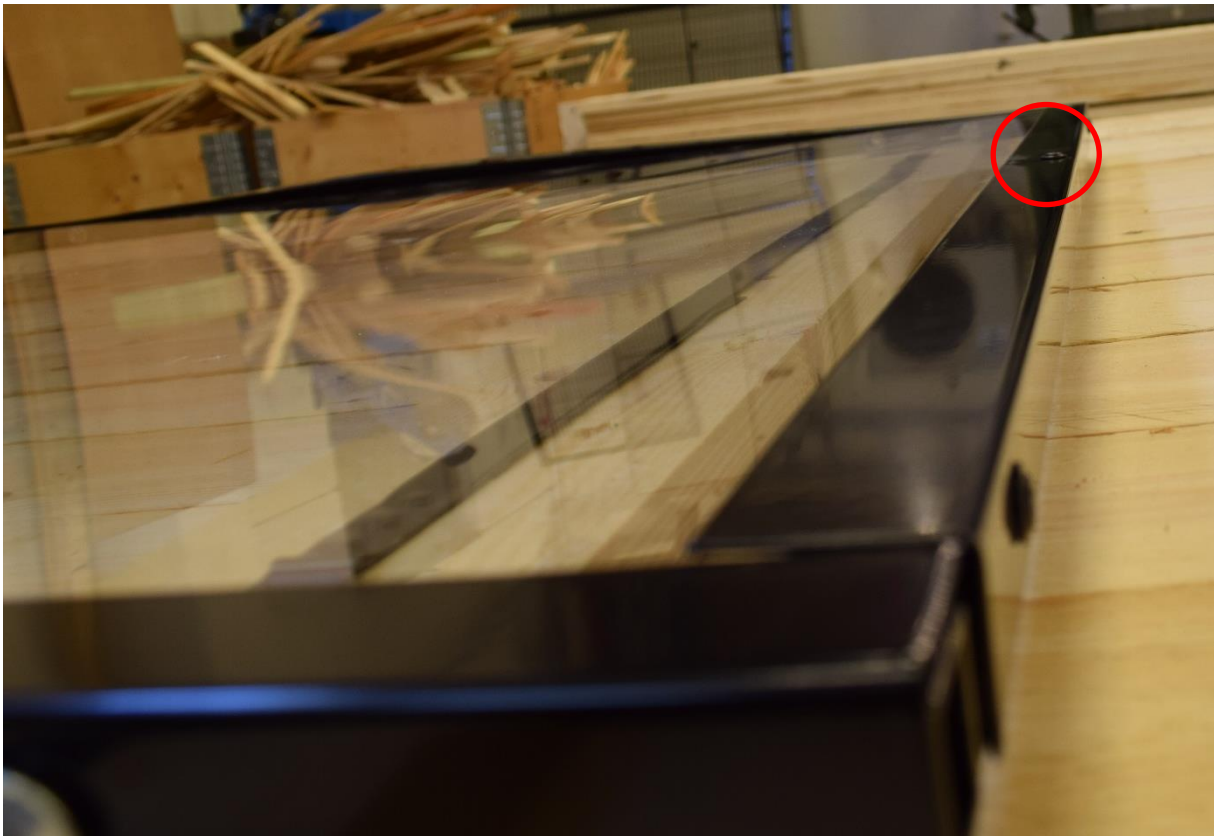
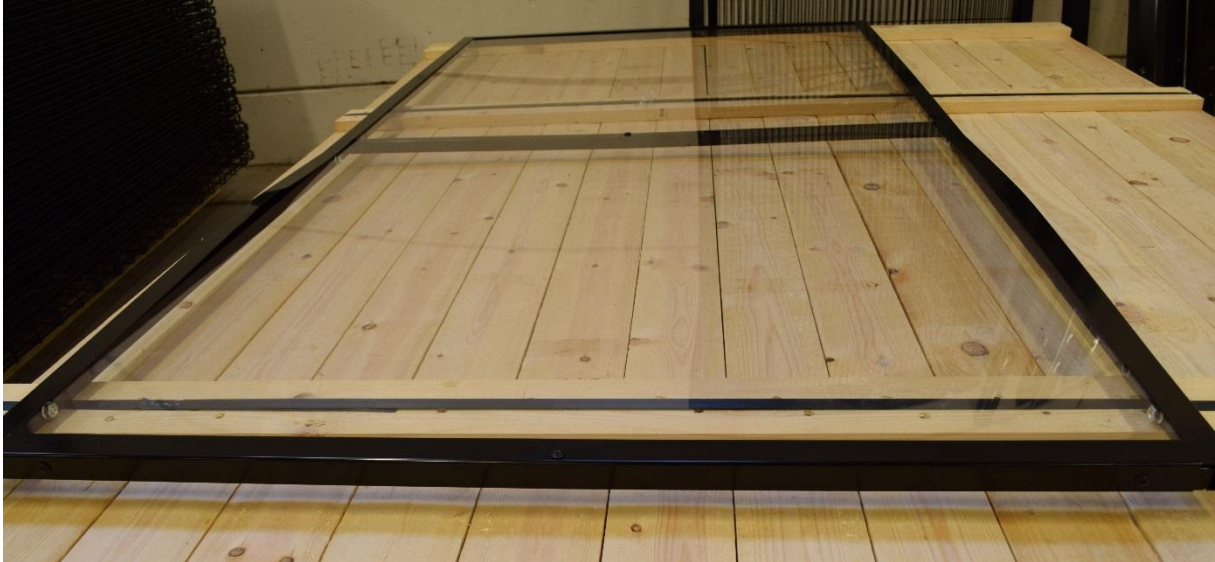


**Anton Persson**  
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## 280J from outside the hazard zone original panel

- See separate video.

## 280J from outside the hazard zone with screw



*Fixing with an extra screw*



