

Specific requirement for individual belay shuttles:

7. If the shuttle can also be used as connector against fall from a height, it shall be conform to EN 12275 or EN 362. Note: if change-over of connector is not on a place where you are of safe balance (platform), then connectors have to be with automatic gate locking device

D- Tests requirements

1. Only for shuttles with pulleys: function test under load (EN 12278)

This test shall be carried out on the maximum diameter of wire rope marked on the shuttle.

The shuttle is placed on a test device designed to reproduce the real loading (with maximum deflection allowed on instructions for use)

Apply a force of $F = (2 \pm 0,05)$ kN and check that the shuttle is capable to rotate ten times in either direction under this force

2. Only for continuous belay system shuttles; Deformation test (derived from EN 15567)

This test shall be carried out on both the maximum diameter of wire rope marked on the shuttle and on the minimum one

Apply a force of $F = (6 \pm 0,1)$ kN for 3 minutes in the foreseeable load direction.

Requirements:

Elastic deformation: gap of shuttle shall not be more than (Wire rope minimum diameter)-2 mm.

Permanent deformation: no visible permanent deformation of the shuttle

3. For all shuttles: Dynamic strength test (part of EN 795 type B)

3.1 Principle and test samples

The shuttle is dynamically tested on a steel tube.

> Test lanyard shall be the ones defined in EN 795:2012 [2m long EN 892 single rope, impact force $(9 \pm 1,5)$ kN]

> Type of support: the support shall be a steel tube of the maximum claimed wire rope diameter.

Note: in case of any device on which a continuous belay system shuttle could pass in a risk of fall area (e.g.: junction element, switch element,...), test shall be repeated on adequate fixation

3.2 Test structure calibration pre-test

Using a rigid test mass of 100kg, determine the free fall distance 'h' of the mass required to generate a fall arrest load of $(9 \pm 0,5/+0)$ kN by carrying out a test using a rigid anchor point fixed to a rigid structure by the test lanyard. Whatever is the test structure, the free fall distance may need to be adjusted to achieve the load of 9 kN.

3.3 Test method

The shuttle is installed on the steel tube

The rigid test mass is connected to the shuttle by the test lanyard

Move the rigid test mass downwards until the test lanyard holds the mass. Then raise the rigid test mass to the free fall distance 'h' determined in 3.2 and hold it at a maximum of 300 mm horizontally from the anchor point.

Release the rigid test mass and check requirements

3.4 Requirement

The shuttle shall not release the rigid test mass

4. For all shuttles: Static strength test

The shuttle is statically tested on a steel tube.

> Type of support: the support shall be a steel tube of the maximum claimed wire rope diameter.

> Principle: application of a strength of $F=15\text{kN}$ during 3 minutes

> Requirement: the shuttle shall not break

Note: in case of any device on which a continuous belay system shuttle could pass in a risk of fall area (e.g.: junction element or switch element), test shall be repeated.

5. For all shuttles: Corrosion resistance (EN 795)

> Expose representative samples of the metal parts of the shuttle to the neutral salt spray test in accordance with EN ISO 9227 for a period of (24 0,5/0)h. Dry for (60 5/0)min at (20 ± 2) °C. Then repeat the procedure, so that the shuttle is subjected in total to (24 0,5/0)h exposure and (60 5/0)min drying plus another (24 0,5/0)h exposure and (60 5/0)min drying. Examine the device and verify that it meets the requirements of 4.2.1. When it is necessary to gain visual access to the internal elements, dismantle the shuttle

> Requirement: there shall be no corrosion of the metal parts material that would affect their functional operation, e.g. the correct operation of moving elements. The presence of tarnishing and white scaling is acceptable

E- Marking requirements

1. Trade mark of the device
2. Reference to instructions ('I' in the book)
3. Wire rope diameter range

Note: no EN marking related to this use

F- Instructions requirements

Beyond usual requirements (name and address of the manufacturer or its representative, marking signification, maintenance, cleaning, life span, effect of chemical agents, effect of humidity and freeze, storage, transport, ...):

1. Scope of the device and how to use it
2. Wire rope compatibility: types of wire rope (at least diameter range, material and construction) on which the shuttle can be placed and a clear sentence that the shuttle shall not be used with another type of wire rope
3. Connectors and lanyard compatibility: how to choose them
4. Continuous belay system shuttles: how to place the device on the safety rope
5. Continuous belay system shuttles: wear and tear discard criteria for the gap (control value in mm) as applicable
6. Necessary clearance for the device
7. Shuttles with pulley: Speed limitations, brake recommendations (limits to prevent damage)

If relevant: instruction requirement of EN 12278, EN 12275, EN 362, EN 795