

Efectis Nederland Report

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**Determination of the strength of Chairlink
stackchair connecting pieces for chairs in a row
according to NEN-EN 14703:2007**

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1 Introduction

On behalf of FKD International, Efectis Nederland's Centre for Fire Safety carried out an investigation to find the strongest Chairlink stackchair connecting piece made by FKD International. The investigation was carried out according to NEN-EN 14703:2007 *"Furniture-Links for non-domestic seating linked together in a row - Strength requirements and test methods"*.

The investigation was conducted at the laboratory of Efectis Nederland Centre for Fire Safety in Rijswijk on 3 October 2012. The investigation was attended by staff from FKD International and fire fighters from brigades in Amsterdam, Rotterdam, Breda and Arnhem.

The chairs and connecting pieces used in the investigation were supplied by FKD International.

2 Specimens

2.1 Chairs

The sponsor supplied 12 identical chairs for the purpose of the investigation. The chairs in question were hired from Boels Rental. The chairs were of the type Max Black. The chair has the following dimensions:

Article number : 20656
Seat height : 465 mm
Width : 450 mm
Height : 950 mm
Depth : 560 mm
Frame : steel tube profile, ext. dim. 25 x 25 mm



Photo 1: Max Black chairs (linked)

2.2 Connecting pieces

The Chairlink stackchair connecting pieces in question were made by Chairlink and were constructed using a die-cast process by FKD International.

The connecting pieces were made from glass-fibre reinforced nylon, the specific details of which are known to Efectis, but have been left out of this report at the sponsor's request.

The connecting pieces are available for three dimensions of chair leg: 20, 22 and 25 mm.

Given that the thickness of the material of the three connecting pieces was the same, the 25 mm connecting piece was selected during the test. The test results are thus valid for Chairlink stackchair connecting pieces of 20, 22 and 25 mm.

The connecting piece is shown in figure 1 and photo 2.

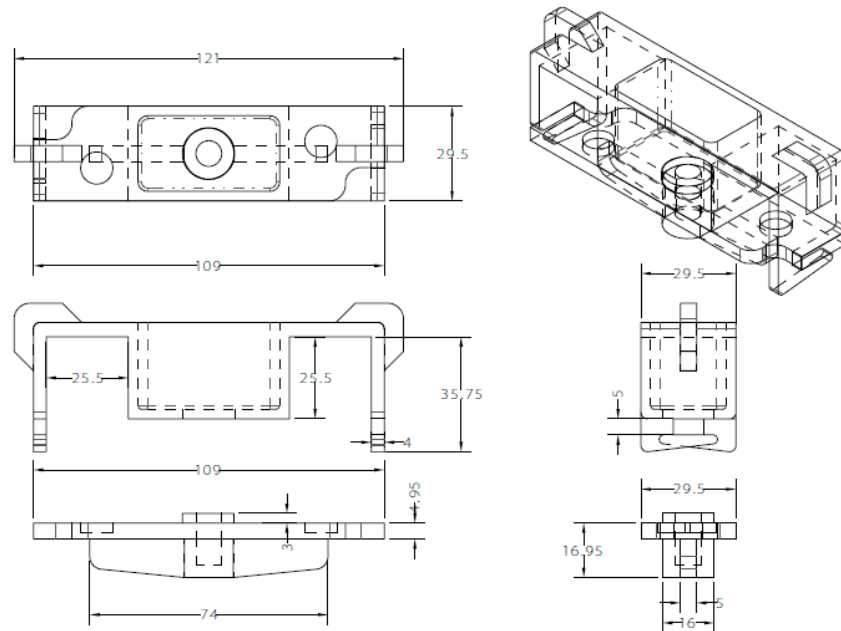


Photo 2: Chairlink stackchair 25 mm connecting piece

3 Test programme and test results

3.1 Row-movement test

This test was carried out on a row of eleven chairs. The chairs were linked together by means of the Chairlink stackchair connecting pieces on both the front legs and back legs.

The first and last chair of the row were stopped from moving in the direction of the force by means of a concrete block.

A mobile platform was placed against the middle chair. The platform was linked to a falling weight by steel cable and pulleys. The pushing force of the platform was calibrated prior to testing using a tensile force gauge, and a tensile/pushing force of 200 N was measured.

The platform was linked to an unlocking device.

The row of chairs was then subjected to the pushing force of 200 N and the movement of the middle chair in the row was determined accordingly.

Measurement: movement of the row when subjected to force from front: 82 mm
movement of the row when subjected to force from behind: 25 mm

Result: the connecting piece meets the requirements of the standard, specifically: **< 200 mm**



Photo 3: row-movement test in action

3.2 Push/pull test

This test was carried out on a row of eleven chairs. The chairs were linked together by means of the Chairlink stackchair connecting pieces on both the front legs and back legs.

The first and last chair of the row were stopped from moving in the direction of the force by means of a concrete block.

The row of chairs was then pulled over by applying a tensile force to the middle chair. The row of chairs was then pulled and pushed over in turn.

Observations:

The row of chairs remained intact both when pulled backwards and pushed forwards, and the connecting pieces sustained no damage.

Result: the connecting pieces meet the requirements of the standard, specifically that the row of chairs remains intact.



Photo 4: push/pull test in action

3.3 Horizontal impact test

This test was carried out on a row of five chairs. The chairs were linked together by means of the Chairlink stackchair connecting pieces on both the front legs and back legs.

The first and last chairs in the row were each weighed down with a concrete block weighing 160 kg. A stroke-measuring device with a body made of a size 5 basketball and steel plate, weighing 50 kg in total, was suspended from three steel cables with a length of 850 mm. In its vertical resting position, the basketball could just touch the front of the seat and, in a second situation, the middle point of the rear of the back rest. The chair was then subjected to the weight ten times, both from in front and behind. The weight travelled a distance of 60 mm.

Observations:

The row of chairs remained intact on each of the 20 impacts, and the connecting pieces remained undamaged.

Result: the connecting pieces meet the requirements of the standard, specifically that the row of chairs remains intact.



Photo 5: Horizontal impact test in action

4 Conclusions

Tests carried out on behalf of FKD International into the strength of Chairlink stackchair connecting pieces according to NEN-EN 14703:2007 demonstrated that the aforementioned connecting pieces meet the requirements of the standard in question. This conclusion applies to connecting pieces for square chair legs with dimensions of 20, 22 and 25 mm.



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