



le futur en construction

ENVELOPE AND COVERING

Lighweight Construction

TEST REPORT No. CL04-023

(English language translation, the original version is in French language)

This Test Report attests only to the characteristics of the object submitted for testing and does not prejudge the characteristics of similar products. So it does not constitute a product certification in the sense of Article L 115-27 of the Consumer Code and of the Law of June 3, 1994.

The reproduction of this Test Report is authorised only in its integral form.

It includes 7 pages.

Only the original version is valid

REQUESTED BY:

**SADEV
2 Allée des Faisans
Z.I. de Vovray
74603 SEYNOD**

PARIS - MARNE-LA-VALLEE - GRENOBLE - NANTES - SOPHIA ANTIPOLIS
CENTRE SCIENTIFIQUE ET TECHNIQUE DU BÂTIMENT

OBJECT

Determination of the tensile strength for mechanical fixings used in structural glass systems.

REFERENCE TEXTES

CSTB procedures, described in § 2 of the test procedures, accepted by the requester.

SAMPLES USED FOR TESTS

Date of receipt : January 12, 2004

Test date : February 19 and 20, 2004

Origin : The samples were delivered to CSTB by the SADEV

Identification : The samples were registered under number CL 1530

Done at Marne-la-Vallée, March 16, 2004

**The Technician in charge
with the tests,**



L. GASNIER

**The Engineer in charge with the
tests,**



M. COSSAVELLA

1. DESCRIPTION OF THE TESTED SAMPLES

3 types of mechanical fixings have been tested:

- Rotule FXR 1001
- Rotule FXR 1101
- Rotule with cylindrical head FXR 1003

For the 3 mechanical fixings, the cages are made of stainless steel type X2 Cr Ni Mo 17-12-2 and the axis are made of stainless steel type X4 Cr Ni Mo 16-5-1.

2. TESTING PROCEDURES

The tests were carried out on an MTS -10 M type testing machine, using a 50 kN load cell and a test speed of 1 mm/min.

The fixing head was positioned in a borehole reamed in a stiff steel plate fixed on the testing machine (see photo in Annex).

We determine the tensile force corresponding to a permanent strain of 0.1 mm as well as the ultimate tensile force.

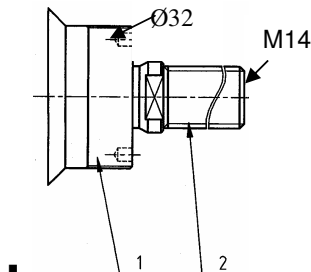
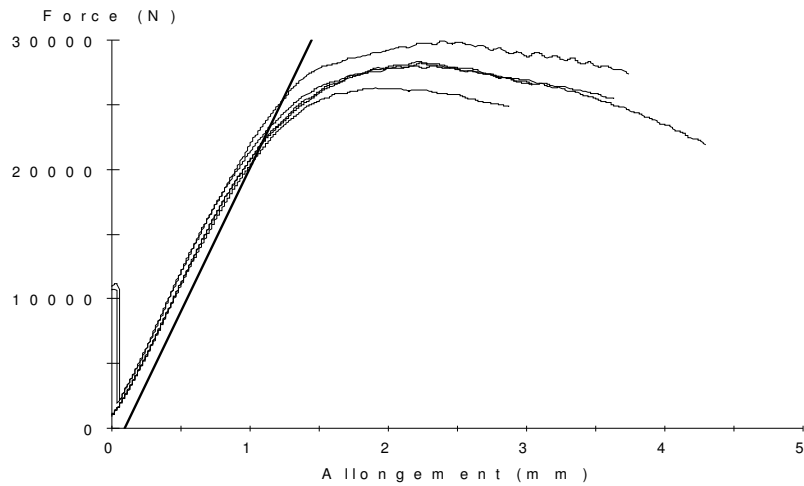
3. TEST RESULTS

The results are given in the following tables.

▪ Rotule FXR 1001

Sample n°	ultimate tensile force (N)	0,1 mm permanant strain force (N)
1	28209	22000
2	26263	21055
3	29926	22283
4	28009	20398
5	28337	21745
Mean : m	28149	21496
Wide uncertainty: e	2455	1267
m-e	25694	20229
Weightening coefficient c	-	1,75
(m-e) / c	-	11559

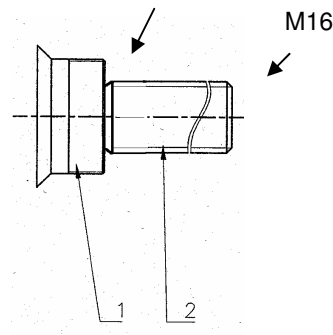
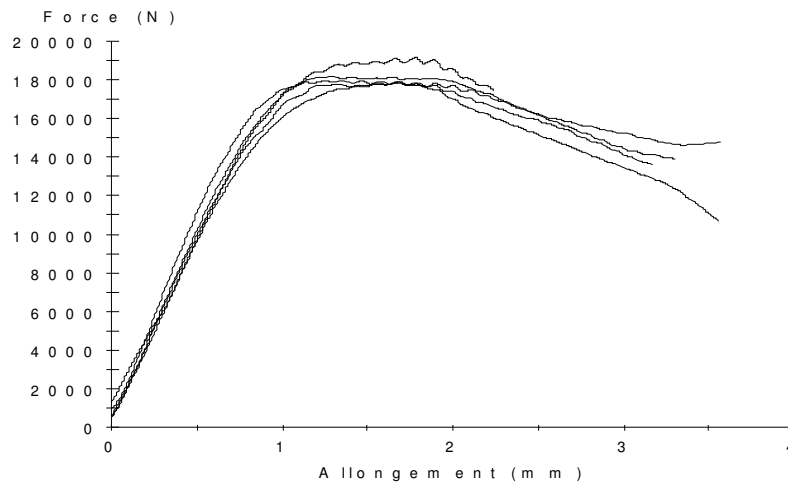
Nota : For samples n°2 and 5, we noticed a 0,3 mm displacement for a force of 2185 N and 1802 N, respectively.



2	1	Axe de rotule	X4 Cr Ni Mo 16-5-1 suivant EN 10088-3	
1	1	Corps de rotule	X2 Cr Ni Mo 17-12-2 suivant EN 10088-3	Serti

▪ Rotule FXR 1101

Sample n°	ultimate tensile force (N)	0,1 mm permanant strain force (N)
1	19164	16794
2	17941	15766
3	17861	14990
4	17916	14861
5	18176	15839
Mean : m	18212	15650
Wide uncertainty: e	879	1296
m-e	17333	14354
Weightening coefficient c	-	1,75
(m-e) / c	-	8202

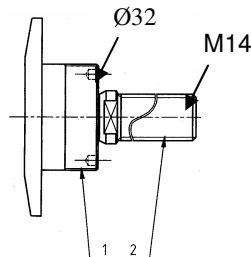
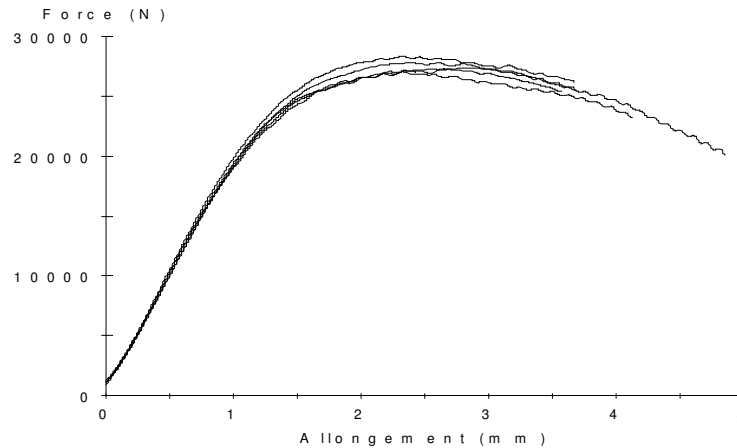


2	1	Axe de rotule	X4 Cr Ni Mo 16-5-1 suivant EN 10088-3	
1	1	Corps de rotule	X2 Cr Ni Mo 17-12-2 suivant EN 10088-3	Serti

▪ Rotule cylindrical head FXR 1003

Sample n°	ultimate tensile force (N)	0,1 mm permanant strain force (N)
1	27399	20470
2	27803	22046
3	27059	20851
4	27310	21166
5	28325	21685
Mean : m	27579	21244
Wide uncertainty: e	864	1062
m-e	26715	20182
Weightening coefficient c	-	1,75
(m-e) / c	-	11532

Nota : For samples n°1, 2, 3 and 5, we noticed a 0,3 mm displacement for a force of 926 N, 3830 N, 1899 N and 390 N respectively.



2	1	Axe de rotule	X4 Cr Ni Mo 16-5-1 suivant EN 10088-3	
1	1	Corps de rotule	X2 Cr Ni Mo 17-12-2 suivant EN 10088-3	Serti

ANNEX



Rotule FXR 1003

END OF REPORT