

Technische Universität Graz  
Technische Versuchs- und Forschungsanstalt  
für Festigkeits- und Materialprüfung  
(*Testing and Research Laboratory*  
*for materials testing*)  
*Accredited Test and Monitoring Agency*

**TVFA**  
**TU Graz**

Letter:                      dated                      Order No. 75.295/03      Date: 2004-07-12/pay

## **Report**

**on the**

### **Procedure of the Qualification Test**

Test subject:                      **ANCON MBT ET Coupler  
for Ribbed Rebars**

Client:                              Ancon Building Products GesmbH  
Gerspergasse 9/3/Top 1  
A-1210 Vienna

Receipt of Order:                      2003 10 30

Receipt of Specimen                      2003 11 04 (couplers)  
2003 11 10 (rebars)

This test report comprises                      4 pages of text  
7 enclosures

The test results stated in this report refer to the test subject only  
Tests are only carried out subject to a written order.  
Shortened versions of test report publications are to be agreed with TVFA.

According to Section 9 Part H of the Charter of the Technical University of Graz, the TVFA (Technical Test and Research Agency) is associated with the Institute for Material Testing and Building Materials Technology. By BMwA Zi 92714/196-IX/2/99 of 1999-07-18 notification in accordance with the Federal AkkGes (BGBl. 468/1992) and ZI OIB-160-001/99-010 notification of 2000-07-12 in accordance with Stmk. AkkG (BGBl. 62/1995) the TVFA was accredited as Testing and Monitoring Agency.

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## 1. Test Request

On 30.10.2003 the client requested from the TVFA (Technische Versuchs- und Forschungsanstalt für Festigkeits- und Materialprüfung of the Technical University of Graz, Austria) the undertaking of a qualification test for MBT ET couplers.

## 2. Test Subject

ANCON MBT ET coupler for 10 mm to 36 mm dia. rebars.

The tests were carried out on joints of the diameters 10, 16, 26 and 36 mm. Drawings of the tested couplers are enclosed.

The reinforcing steel used was hot-rolled, BSt 550 ribbed rebars from Messrs. Marienhütte, tempered from hot-forming.

The specimens were allocated the test number 614 by the TVFA.

## 3. Test Procedure

### Slippage test (5 test runs per diameter)

The specimens were subjected to a load of 330 N/mm<sup>2</sup>. After a 15 seconds hold the specimens were relieved of the load and the total slippage from both ends of the couplers was measured in the relieved state. At each end slippage was measured with two dial gauges facing each other and the average from the results taken. At the outset of the tests the dial gauges were set to zero without any load applied.

The specimens were then subjected up to the ultimate load. With this test the maximum load and the location of the fracture were established.

The tensile tests were carried out based on ÖNORM EN 10002-1 "Metallische Werkstoffe – Zugversuch" (tensile tests for metals).

### Fatigue test (3 test runs per diameter)

The fatigue tests were carried out with the following parameters according to D 50 100 "Dauerschwingversuch" (fatigue test):

Nominal dia (mm)	Maximum stress $\sigma$ (N/mm <sup>2</sup> )	Alternating stress amplitude $2\sigma_A$ (N/mm <sup>2</sup> )
10	325	120
16	325	120
26	325	80
36	325	80

Number of cycles  $2 \times 10^6$

Illustrations of the specimen and the test performance are to be found in the appendix.

#### 4. Test Equipment

##### Slippage tests / tensile tests

Amsler universal testing machine 400 kN, Inv. No. F29 with “Messphysik” control system, Inv. NO. F60.

Amsler universal testing machine 1000 kN, Inv. Nr. F18

Helios analogue dial gauges, Inv. No. D88

##### Fatigue tests

Losenhausen pulsating hydraulic fatigue-test machine, 600 kN, Inv. No. F8

Losenhausen pulsating hydraulic fatigue-test machine, 100 kN, Inv. No. F11

#### 5. Test Results

##### Slippage tests

10 mm dia.

Test No.	Slippage [mm]	Failure load [N/mm <sup>2</sup> ]	Type of fracture
1	0.043	652	Rod fracture within the effective length
2	0.073	648	Rod fracture within the effective length
3	0.067	638	Rod fracture within the effective length
4	0.025	635	Rod fracture within the effective length
5	0.020	647	Rod fracture at the transition to the coupler
<b>Targets</b>	<b>≤ 0.10</b>	<b>≥ 620</b>	

16 mm dia.

Test No.	Slippage [mm]	Failure load [N/mm <sup>2</sup> ]	Type of fracture
1	0.075	655	Rod fracture within the effective length
2	0.070	626	Rod fracture within the effective length
3	0.060	634	Rod fracture within the effective length
4	0.070	652	Rod fracture at the transition to the coupler
5	0.075	654	Rod fracture within the effective length
<b>Targets</b>	<b>≤ 0.10</b>	<b>≥ 620</b>	

26 mm dia.

Test No.	Slippage [mm]	Failure load [N/mm <sup>2</sup> ]	Type of fracture
1	0.085	660	Rod fracture within the effective length
2	0.095	674	Rod fracture at the transition to the coupler
3	0.070	662	Rod fracture at the transition to the coupler
4	0.060	656	Rod fracture within the effective length
5	0.085	660	Rod fracture at the transition to the coupler
<b>Targets</b>	<b>≤ 0.10</b>	<b>≥ 620</b>	

36 mm dia.

Test No.	Slippage [mm]	Failure load [N/mm <sup>2</sup> ]	Type of fracture
1	0.075	680	Rod fracture within the effective length
2	0.075	692	Rod fracture at the transition to the coupler
3	0.090	685	Rod fracture at the transition to the coupler
4	0.090	696	Rod fracture within the effective length
5	0.025	690	Rod fracture at the transition to the coupler
<b>Targets</b>	<b>≤ 0.10</b>	<b>≥ 620</b>	

Example diagrams of the tests are shown in the appendix.

#### Fatigue Tests

All three specimens endured the  $2 \times 10^6$  stress cycles without fracture.

Authorised Clerk

Ing. M. Payer

*Stamp*

Head of TVFA:

University Professor P. Maydl

Fig. 1 Slippage measurement

Fig. 2 Tensile test,  
fracture within the effective length

Fig. Fatigue test