

1 General information

Concrefy report:	2023-2265-001
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Status report:	Final (version: 001)
Research:	Mechanical splices RVS Ø20 mm
Client:	Wire & More BV. (Valkenswaard) Valkenswaard Hoge Akkers 9 5554 GA The Netherlands
Research date:	04 May 2023
Report date:	30 May 2023

2 Research

Tensile tests with slip measurement were conducted on mechanical splices on behalf of Wire & More BV. (Valkenswaard). The tests were performed on a class 1 Zwick Z1200 tensile/compression machine. A video extensometer was used to measure deformations during the tests.

3 Regulations

The tests were conducted according to EAD 160129-00-0301 .

4 Samples

Reinforcing bar	
Steel grade:	RVS 1.4362 reinforcement steel
Bar size:	20 mm
Rib geometry:	Two rows having an opposite rib angle β .
Manufacturer:	N/A
Heat number*:	N/A

Coupler specification	
Production company:	N/A
Coupler type:	M20 DUPLEX
Material code:	578 C0
Lot number*:	N/A
Bar end preparation*:	N/A
Nominal coupler length (L_1)*:	N/A
Nominal coupler diameter*:	N/A

Preparation of test pieces	
Samples prepared by*:	Wire & More BV. (Valkenswaard)
Assembly instruction*:	N/A
Torque*:	180 Nm
Assembly temperature*:	N/A
Date assembly*:	March 2023
Date received:	April 2023
Inspector (sampler)*:	N/A

5 Test results

5.1 Definition of lengths

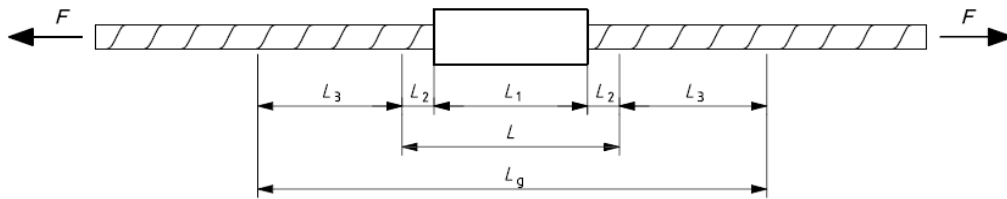


Figure 1: Definition of lengths for measuring elongation of the mechanical splice

- F Applied force
- L Length of the mechanical splice (as defined in ISO 15835-1:2009)
- L_1 Coupler length
- L_2 $2d$ where d is the nominal diameter of the reinforcing bar
- L_3 in the range, $2d$ to $3d$
- L_g Overall gauge length; $L_1 + 4d$

5.2 Tensile test on reference bar

sample	yield strength		tensile strength		Rm/Re	strain	mode of failure	assessment
	F_{eH}	R_{eH}	F_{max}	R_m		A_{gt}		
	kN	MPa	kN	MPa	-	%		
1	198,3	659	234,9	781	1,19	13,6	bar break	N/A

5.3 Slip- and tensile tests

The load cycles for slip measurement were carried out with the following settings:

Upper stress ($0,6 R_{eH,spec}$): 300 MPa
 Lower stress ($0,02 R_{eH,spec}$): 10 MPa
 Number of cycles: 1
 Gauge length (L_g): 140 mm

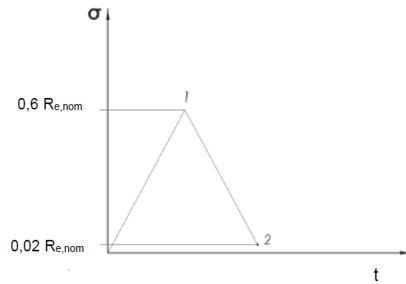


Figure 3: Slip test load cycling

σ Stress
 t time
 1 Stresses for option 1 measurement
 2 Stresses for option 2 measurement

The slip was measured according to EAD 160129-00-0301

sample	coupler		slip	yield strength		tensile strength		R_m/R_e	strain	mode of failure	fracture to coupler	assessment
	l_1	\varnothing_{act}		F_{eH}	R_{eH}	F_{max}	R_m		A_{gt}			
	mm	mm		kN	MPa	kN	MPa		%			
1	75,8	28,1	0,14	189,2	602	208,5	664	1,10	0,6	near coupler	5	N/A
2	75,8	28,2	0,10	188,1	601	208,3	663	1,10	0,8	near coupler	8	N/A
3	76,1	28,2	0,20	190,1	605	209,4	667	1,10	0,8	near coupler	6	N/A

P.L.M. Bisschop
Laboratory technician steel research

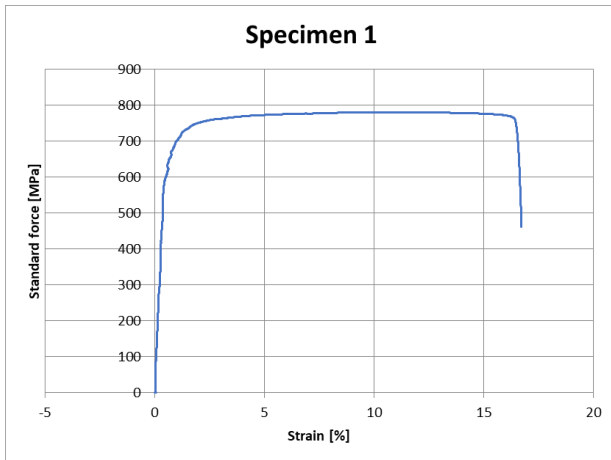
J. Nieuwold
Project leader steel research

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Annex A: Stress-strain curves

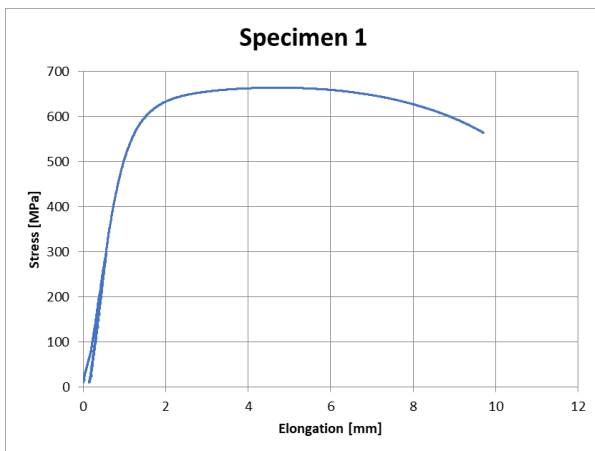
A.1: tensile test on reference bar



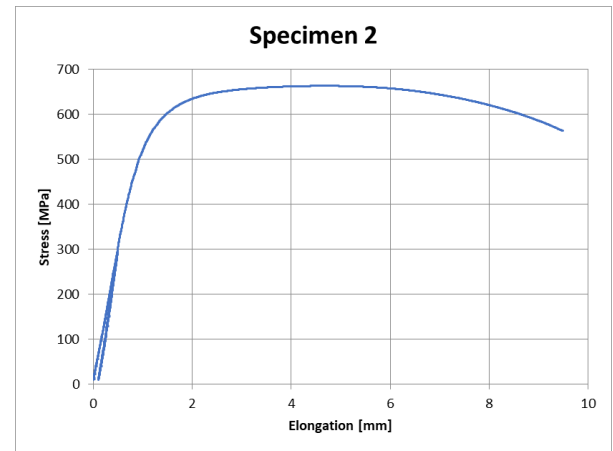
Specimen 1

Annex A: Stress-strain curves

A.2: Slip and tensile test on coupler



Specimen 1



Specimen 2



Specimen 3