



Castle for Building Materials *W.L.L.*



The New Generation of
Mechanical Splicing
works now...



DTR Rebar Splicing System

Technical Background

It's a big improvement when mechanical splicing like taper threaded rebar splicing replaced the traditional lap splicing. Since then, due to the shortcoming of the taper thread, a lot of parallel thread systems have been developed, like parallel thread on forged head of rebar, trying to take the advantage of the parallel thread, but does not work well.

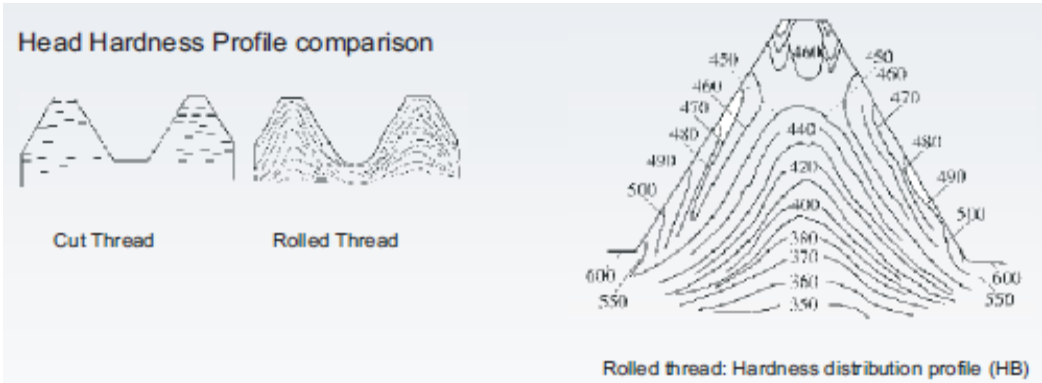
Now our latest parallel thread system (DTR) has been developed and proved to work the same good and even better than the other mechanical splicing systems. The major technology breakthrough is that we make the thread by rolling instead of cutting. Thread rolling is a cold hardening process and has the following advantages over thread cutting:

- ✓ The thread strength and hardness increased by the cold hardening process. The hardness of the teeth bottom is increased the most and results in the great improvement of wear-resisting property of the thread. The fatigue strength is increased by 20%-40%, the tensile strength is increased by 20% -30% and the shear strength increased by 5%.
- ✓ The thread rolling produces much better surface roughness than thread cutting; the fatigue limit is increased by 50% thanks to the smooth thread surface.
- ✓ The rolling makes the best use of the rebar material, no material waste. Save material by 5-10% in comparison to thread cutting on the forged rebar head.



But the above advantages can only be obtained when the base material has good roundness. Thanks to our newly developed rib tearing off technology, we remove the ribs on the rebar and rectify the roundness before thread rolling; this ensures the thread rolling is just like on a smooth round bar so the standard rolled thread is produced.

How about the material loss during the rib tearing off? Yes, the rib is removed but the material strength on the thread has been greatly increased and it's even more than the strength loss of the removed material (the rib), so the splice is equal strength to the base material (the rebar)





Features:

- High Performance, the ultimate tensile and compression strength of rebar can be fully applied with no compromise, satisfying all the major
- industry standards such as UBC1997, BS8110, NF35-20-1 and DIN1045
- Thread Rolling, no forging, the material properties of the rebar (Base Metal) kept and even strengthened without any change or damage, thread strength enhanced by cold rolling process.
- Two Processes, tearing off the rib and thread rolling, completed on one machine, Simple and easy operation, high efficiency.
- Highly versatile, suitable for most splicing situations.
- Short connector length, cost effective.
- The thread end can be made in advance so the installation can be done in any weather conditions, no power supply required.
- Easy connection at site, work without the need of a torque spanner.



Thread Rolling



Rebar Splice

The advantage of our machine

- Solid and reliable, powerful and versatile, one machine can cover all the rebar sizes from 16mm to 50mm.
- High efficiency, it takes only one minute for standard threading on a 32mm Rebar.
- Two Processes, tearing off the rib and thread rolling combined perfect and integrated seamlessly.
- Max. thread length up to 120mm. The thread length is easily set by the length marking plate, no other adjustments required.
- Semi-automatic, auto feeding once the thread rolling starts and auto reverse after the threading is finished.
- Easy adjustment for different sizes of rebars, the rebar size on the scale helps to adjust to the right diameter much faster and easier.
- Easy change of blades and rollers. The blade base and roller base are easy to take out from the threading head for replacement.



Our machines available for rent, please contact our agency for details.



Coupler Size and dimensions

All the major applications use one type of coupler only

Description	Rebar diameter ϕ (mm)	Coupler Outer Diameter (mm)	Coupler Length (mm)	Coupler Thread M (mm)	Coupler Thread Pitch (mm)
DTR 12	12	18	34	12.5	2.0
DTR 14	14	21	40	14.5	2.0
DTR 16	16	25	45	16.5	2.5
DTR 18	18	27	50	18.5	2.5
DTR 20	20	30	55	20.5	2.5
DTR 22	22	32	60	22.5	2.5
DTR 25	25	38	65	25.5	3.0
DTR 28	28	42	70	28.5	3.0
DTR 32	32	48	80	32.5	3.0
DTR 36	36	54	90	36.5	3.0
DTR 40	40	61	100	40.5	3.0
DTR 50	50	77	118	50.5	3.5



Note: Special sizes / types available on request.

Coupler size & Dimensions

Tools & accessories

Blades: (4 blades/set) are used to tear off the rib of the rebar



Threading rollers: (3 rollers/set) are used for thread rolling. Both have been proved to be long life in production world wide as well as for different profiles of rebar.



Thread Gauge: ensures the rolled thread on the rebar within the required range.



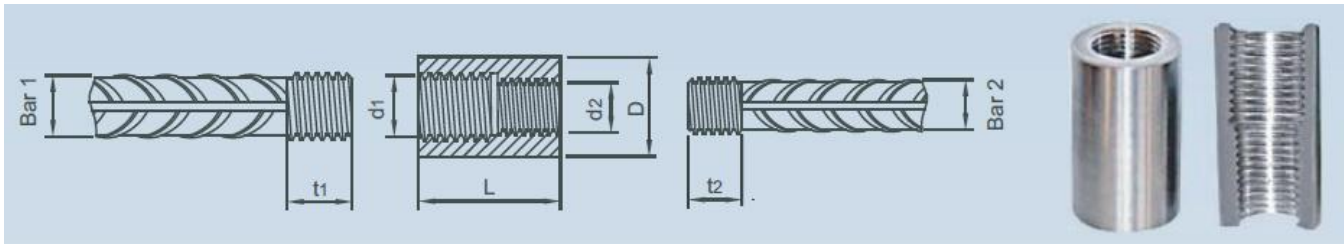
Work Spanners: To tight the splice at sight, no torque spanners required.





Transit Coupler DTRT

The transit coupler is used to connect the rebars of different sizes. Our DTRT transit coupler is easy to use as the rebar thread is made just the same as the standard splice.



Description	Rebar 1 Diameter ϕ (mm)	Rebar 2 Diameter ϕ (mm)	Coupler Diameter D (mm)	Coupler Length L (mm)	d1 (mm)	d2 (mm)	t1 (mm)	t2 (mm)
DTRT 40-32	40	32	60	95.0	40.5	32.5	44	38
DTRT 40-25	40	25	60	87.5	40.5	25.5	44	30
DTRT 32-25	32	25	48	77.5	32.5	25.5	35	30
DTRT 32-16	32	16	48	67.5	32.5	16.5	35	19
DTRT 25-16	25	16	38	60.0	25.5	16.5	28	19

Note: Special transit sizes available upon request.



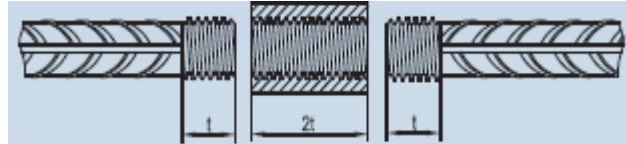


APPLICATIONS



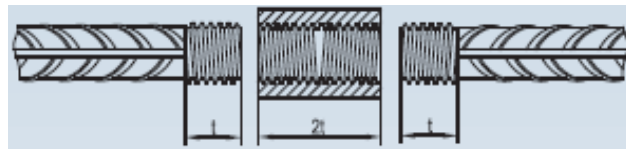
Standard Type:

Suitable for normal splicing where the continuation rebar can be rotated.



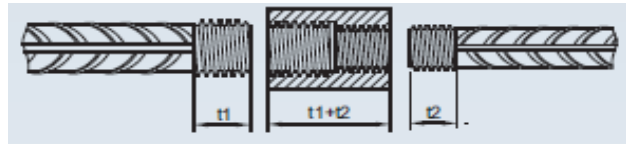
Right/Left thread Type:

Suitable for situation where both rebars are hard to rotate. The thread on one rebar is made to be right-handed while the other is made left-handed. The connection can be done by turning the coupler only.



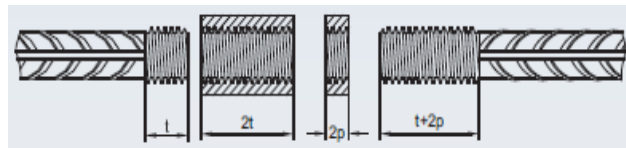
Transit Type:

The coupler has 2 different sizes of thread on each end, to connect the rebars of different diameters.



Extended with locknut:

The thread of one bar is extended to full coupler length, plus a locknut, suitable for applications where the continuation rebar cannot be rotated nor moved.



Note: Special model of machine available to obtain the extended thread length.

For other applications not mentioned above, please contact our engineers.



Appendix I Test Report of Coupler DTR 16

Test Description : Testing of Rebar Coupler (Rebar Splice)
 Test Equipment : 1. 1000 kN Tensile test machine.
 2. INSTRON 1343 Electro-Hydraulic Servo Fatigue Machine

Test Samples

1. Rebar Coupler DTR 16 as samples to be tested.

Description : Rebar Coupler DTR 16 Material : CK45
 Dimensions: L : 45mm, Outer Diameter 25mm Thread : M16.5 x 2.5

2. Rebar Ø 16 as base metal.

Description : Rebar Ø 16 Grade: HRB400
 Dimensions : Nominal diameter 16mm, Theoretical section 201mm²



Test Results and Conclusion:

1. Test of Mechanical Properties of Rebar (Base Metal)

Rebar Sample NO.	No.1	No.2	No.3	Average	Required
Actual Diameter (mm)	15.48	15.80	15.52	15.60	
Yield Strength (N/mm ²)	440	435	430		≥400
Tensile Strength (N/mm ²)	618	620	610		≥570

Test Conclusion: The rebar as base metal for the test is qualified

2. Tensile test of the Splice (Single Direction)

Coupler Sample No.	No.1	No.2	No.3	Average	Required
Tensile Strength f_{mst}^0 (N/mm ²)	625	622	628		≥ f_{st}^0
Inelastic deformation u (mm)	0.07	0.08	0.07	0.07	≤0.10
Grand Elongation δ_{sgt} (%)	10.8	10.5	11.0	10.8	≥4.0
Breaking Mode	Bar	Bar	Bar		

Test Conclusion: Tensile test (single direction) passed

3. Repeated tension and compression test under High Stress

Coupler Sample No.	No.4	No.5	No.6	Average	Required
Tensile Strength f_{mst}^0 (N/mm ²)	630	628	632		≥ f_{st}^0
Residual Deformation u_{20}	0.08	0.07	0.07	0.07	≤0.3
Breaking Mode	Bar	Bar	Bar		

Test Conclusion: Repeated tension and compression test under High stress passed.

4. Repeated tension and compression test under Big Deformation

Coupler Sample No.	No.7	No.8	No.9	Average	Required	
Tensile Strength f_{mst}^0 (N/mm ²)	625	628	622		≥ f_{st}^0	
Residual Deformation	U^4	0.06	0.06	0.07	0.06	≤0.3
	U^8	0.11	0.10	0.13	0.11	≤0.6
Breaking Mode	Bar	Bar	Bar			

Test Conclusion: Repeated tension and compression test under Big deformation passed

Conclusion: "All the test results meet the requirements of Grade SA Rebar Coupler"



Appendix II Test Report of Coupler DTR 20

Test Description : Testing of Rebar Coupler (Rebar Splice)
 Test Equipment : 1. 1000 kN Tensile test machine.
 2. INSTRON 1343 Electro-Hydraulic Servo Fatigue Machine

Test Samples

1. Rebar Coupler DTR 20 as samples to be tested.

Description : Rebar Coupler DTR 20 Material : CK45
 Dimensions: L : 55mm, Outer Diameter 30mm Thread : M20.5 X 2.5

2. Rebar Ø 20 as base metal.

Description : Rebar Ø 20 Grade: HRB400
 Dimensions : Nominal diameter 20mm, Theoretical section 314mm²



Test Results and Conclusion:

1. Test of Mechanical Properties of Rebar (Base Metal)

Rebar Sample NO.	No.1	No.2	No.3	Average	Required
Actual Diameter (mm)	19.85	20.00	19.87	19.91	
Yield Strength (N/mm ²)	440	430	435		≥400
Tensile Strength (N/mm ²)	625	615	618		≥570

Test Conclusion: The rebar as base metal for the test is qualified

2. Tensile test of the Splice (Single Direction)

Coupler Sample No.	No.1	No.2	No.3	Average	Required
Tensile Strength f_{mst}^0 (N/mm ²)	630	628	632		≥ f_{st}^0
Inelastic deformation u (mm)	0.08	0.07	0.06	0.07	≤0.10
Grand Elongation δ_{sgt} (%)	9.0	9.5	8.5	9.0	≥4.0
Breaking Mode	Bar	Bar	Bar		

Test Conclusion: Tensile test (single direction) passed

3. Repeated tension and compression test under High Stress

Coupler Sample No.	No.4	No.5	No.6	Average	Required
Tensile Strength f_{mst}^0 (N/mm ²)	633	636	635		≥ f_{st}^0
Residual Deformation u_{20}	0.06	0.07	0.08	0.07	≤0.3
Breaking Mode	Bar	Bar	Bar		

Test Conclusion: Repeated tension and compression test under High stress passed.

4. Repeated tension and compression test under Big Deformation

Coupler Sample No.	No.7	No.8	No.9	Average	Required	
Tensile Strength f_{mst}^0 (N/mm ²)	635	630	632		≥ f_{st}^0	
Residual Deformation	U^A	0.09	0.08	0.07	0.08	≤0.3
	U^B	0.13	0.10	0.11	0.11	≤0.6
Breaking Mode	Bar	Bar	Bar			

Test Conclusion: Repeated tension and compression test under Big deformation passed

Conclusion: "All the test results meet the requirements of Grade SA Rebar Coupler"



Appendix III Test Report of Coupler DTR 25

Test Description : Testing of Rebar Coupler (Rebar Splice)
 Test Equipment : 1. 1000 kN Tensile test machine.
 2. INSTRON 1343 Electro-Hydraulic Servo Fatigue Machine

Test Samples

1. Rebar Coupler DTR 25 as samples to be tested.

Description : Rebar Coupler DTR 25 Material : CK45
 Dimensions L : 65mm, Outer Diameter : 38mm Thread : M25.5 X 3

2. Rebar Ø 25 as base metal.

Description : Rebar Ø 25 Grade: HRB400
 Dimensions : Nominal diameter 25mm, Theoretical section 490mm²



Test Results and Conclusion:

1. Test of Mechanical Properties of Rebar (Base Metal)

Rebar Sample NO.	No.1	No.2	No.3	Average	Required
Actual Diameter (mm)	24.84	24.96	24.82	24.87	
Yield Strength (N/mm ²)	445	440	450		≥400
Tensile Strength (N/mm ²)	620	630	625		≥570

Test Conclusion: The rebar as base metal for the test is qualified

2. Tensile test of the Splice (Single Direction)

Coupler Sample No.	No.1	No.2	No.3	Average	Required
Tensile Strength f^0_{mst} (N/mm ²)	630	635	632		≥ f^0_{st}
Inelastic deformation u (mm)	0.04	0.05	0.04	0.04	≤0.10
Grand Elongation δ_{sgt} (%)	7.5	9.0	8.5	8.3	≥4.0
Breaking Mode	Bar	Bar	Bar		

Test Conclusion: Tensile test (single direction) passed

3. Repeated tension and compression test under High Stress

Coupler Sample No.	No.4	No.5	No.6	Average	Required
Tensile Strength f^0_{mst} (N/mm ²)	632	638	636		≥ f^0_{st}
Residual Deformation u_{20}	0.05	0.07	0.06	0.06	≤0.3
Breaking Mode	Bar	Bar	Bar		

Test Conclusion: Repeated tension and compression test under High stress passed.

4. Repeated tension and compression test under Big Deformation

Coupler Sample No.	No.7	No.8	No.9	Average	Required	
Tensile Strength f^0_{mst} (N/mm ²)	638	635	637		≥ f^0_{st}	
Residual Deformation	U^A	0.05	0.04	0.05	0.05	≤0.3
	U^B	0.12	0.14	0.10	0.12	≤0.6
Breaking Mode	Bar	Bar	Bar			

Test Conclusion: Repeated tension and compression test under Big deformation passed

Conclusion: "All the test results meet the requirements of Grade SA Rebar Coupler"



Appendix IV Test Report of Coupler DTR 32

Test Description : Testing of Rebar Coupler (Rebar Splice)
 Test Equipment : 1. 1000 kN Tensile test machine.
 2. INSTRON 1343 Electro-Hydraulic Servo Fatigue Machine

Test Samples

1. Rebar Coupler DTR 32 as samples to be tested.

Description : Rebar Coupler DTR 32 Material : CK45
 Dimensions L : 80mm, Outer Diameter : 48mm Thread : M32.5 X 3.0

2. Rebar Ø 32 as base metal.

Description : Rebar Ø 32 Grade: HRB400
 Dimensions : Nominal diameter 32mm, Theoretical section 804.2mm²



Test Results and Conclusion:

1. Test of Mechanical Properties of Rebar (Base Metal)

Rebar Sample NO.	No.1	No.2	No.3	Average	Required
Actual Diameter (mm)	31.88	31.72	31.74	31.78	
Yield Strength (N/mm ²)	415	425	425		≥400
Tensile Strength (N/mm ²)	615	625	620		≥570

Test Conclusion: The rebar as base metal for the test is qualified

2. Tensile test of the Splice (Single Direction)

Coupler Sample No.	No.1	No.2	No.3	Average	Required
Tensile Strength f_{mst}^0 (N/mm ²)	630	635	628		≥ f_{st}^0
Inelastic deformation u (mm)	0.05	0.04	0.03	0.04	≤0.10
Grand Elongation δ_{sgt} (%)	8.5	9.5	10.0	9.3	≥4.0
Breaking Mode	Bar	Bar	Bar		

Test Conclusion: Tensile test (single direction) passed

3. Repeated tension and compression test under High Stress

Coupler Sample No.	No.4	No.5	No.6	Average	Required
Tensile Strength f_{mst}^0 (N/mm ²)	625	638	630		≥ f_{st}^0
Residual Deformation u_{20}	0.06	0.05	0.04	0.05	≤0.3
Breaking Mode	Bar	Bar	Bar		

Test Conclusion: Repeated tension and compression test under High stress passed.

4. Repeated tension and compression test under Big Deformation

Coupler Sample No.	No.7	No.8	No.9	Average	Required	
Tensile Strength f_{mst}^0 (N/mm ²)	630	628	632		≥ f_{st}^0	
Residual Deformation	U^A	0.05	0.07	0.06	0.06	≤0.3
	U^B	0.18	0.15	0.20	0.18	≤0.6
Breaking Mode	Bar	Bar	Bar			

Test Conclusion: Repeated tension and compression test under Big deformation passed

Conclusion: "All the test results meet the requirements of Grade SA Rebar Coupler"



Appendix V Test Report of Coupler DTR 40

Test Description : Testing of Rebar Coupler (Rebar Splice)
 Test Equipment : 1. 1000 kN Tensile test machine.
 2. INSTRON 1343 Electro-Hydraulic Servo Fatigue Machine

Test Samples

1. Rebar Coupler DTR 40 as samples to be tested.

Description : Rebar Coupler DTR 40 Material : CK45
 Dimensions L : 100mm, Outer Diameter : 61mm Thread : M40.5 X 3.0

2. Rebar Ø 40 as base metal.

Description : Rebar Ø 40 Grade: HRB400
 Dimensions : Nominal diameter 40mm, Theoretical section 1256mm²



Test Results and Conclusion:

1. Test of Mechanical Properties of Rebar (Base Metal)

Rebar Sample NO.	No.1	No.2	No.3	Average	Required
Actual Diameter (mm)	39.85	39.75	39.7	39.8	
Yield Strength (N/mm ²)	420	422	430		≥400
Tensile Strength (N/mm ²)	618	627	630		≥570

Test Conclusion: The rebar as base metal for the test is qualified

2. Tensile test of the Splice (Single Direction)

Coupler Sample No.	No.1	No.2	No.3	Average	Required
Tensile Strength f_{mst}^0 (N/mm ²)	632	638	635		≥ f_{st}^0
Inelastic deformation u (mm)	0.06	0.05	0.06	0.06	≤0.10
Grand Elongation δ_{sgt} (%)	9.2	8.1	9.1	8.8	≥4.0
Breaking Mode	Bar	Bar	Bar		

Test Conclusion: Tensile test (single direction) passed

3. Repeated tension and compression test under High Stress

Coupler Sample No.	No.4	No.5	No.6	Average	Required
Tensile Strength f_{mst}^0 (N/mm ²)	621	633	625		≥ f_{st}^0
Residual Deformation u_{20}	0.05	0.06	0.04	0.05	≤0.3
Breaking Mode	Bar	Bar	Bar		

Test Conclusion: Repeated tension and compression test under High stress passed.

4. Repeated tension and compression test under Big Deformation

Coupler Sample No.	No.7	No.8	No.9	Average	Required	
Tensile Strength f_{mst}^0 (N/mm ²)	615	622	631		≥ f_{st}^0	
Residual Deformation	U^4	0.06	0.05	0.07	0.06	≤0.3
	U^8	0.16	0.18	0.21	0.18	≤0.6
Breaking Mode	Bar	Bar	Bar			

Test Conclusion: Repeated tension and compression test under Big deformation passed

Conclusion: "All the test results meet the requirements of Grade SA Rebar Coupler"



Appendix VI Test Report of Coupler DTR 12

Test Description : Testing of Rebar Coupler (Rebar Splice)
 Test Equipment : 1. 1000 kN Tensile test machine.
 2. INSTRON 1343 Electro-Hydraulic Servo Fatigue Machine

Test Samples

1. Rebar Coupler DTR 12 as samples to be tested.

Description : Rebar Coupler DTR 12 Material : CK45
 Dimensions L : 34mm, Outer Diameter : 18 mm Thread : M12.5 X 2.0

2. Rebar Ø 12 as base metal.

Description : Rebar Ø 12 Grade: HRB400
 Dimensions : Nominal diameter 12mm, Theoretical section 113mm²

Test Results and Conclusion:

1. Test of Mechanical Properties of Rebar (Base Metal)

Rebar Sample NO.	No.1	No.2	No.3	Average	Required
Actual Diameter (mm)	11.41	11.38	11.42	11.40	
Yield Strength (N/mm ²)	445	4432	443		≥400
Tensile Strength (N/mm ²)	622	618	624		≥570

Test Conclusion: The rebar as base metal for the test is qualified

2. Tensile test of the Splice (Single Direction)

Coupler Sample No.	No.1	No.2	No.3	Average	Required
Tensile Strength f_{mst}^0 (N/mm ²)	630	625	635		≥ f_{st}^0
Inelastic deformation u (mm)	0.08	0.07	0.08	0.08	≤0.10
Grand Elongation δ_{sgt} (%)	10.7	10.6	10.2	10.50	≥4.0
Breaking Mode	Bar	Bar	Bar		

Test Conclusion: Tensile test (single direction) passed

3. Repeated tension and compression test under High Stress

Coupler Sample No.	No.4	No.5	No.6	Average	Required
Tensile Strength f_{mst}^0 (N/mm ²)	626	630	622		≥ f_{st}^0
Residual Deformation u_{20}	0.08	0.08	0.07	0.08	≤0.3
Breaking Mode	Bar	Bar	Bar		

Test Conclusion: Repeated tension and compression test under High stress passed.

4. Repeated tension and compression test under Big Deformation

Coupler Sample No.	No.7	No.8	No.9	Average	Required	
Tensile Strength f_{mst}^0 (N/mm ²)	620	635	624		≥ f_{st}^0	
Residual Deformation	U^A	0.07	0.08	0.07	0.07	≤0.3
	U^B	0.11	0.12	0.13	0.12	≤0.6
Breaking Mode	Bar	Bar	Bar			

Test Conclusion: Repeated tension and compression test under Big deformation passed

Conclusion: "All the test results meet the requirements of Grade SA Rebar Coupler"



Appendix VII Test Report of Coupler DTR 14

Test Description : Testing of Rebar Coupler (Rebar Splice)
 Test Equipment : 1. 1000 kN Tensile test machine.
 2. INSTRON 1343 Electro-Hydraulic Servo Fatigue Machine

Test Samples

1. Rebar Coupler DTR 14 as samples to be tested.

Description : Rebar Coupler DTR 14 Material : CK45
 Dimensions L : 40mm, Outer Diameter : 21mm Thread : M14.5 X 2.0

2. Rebar Ø 14 as base metal.

Description : Rebar Ø 14 Grade: HRB400
 Dimensions : Nominal diameter 14mm, Theoretical section 153mm²

Test Results and Conclusion:

1. Test of Mechanical Properties of Rebar (Base Metal)

Rebar Sample NO.	No.1	No.2	No.3	Average	Required
Actual Diameter (mm)	13.42	13.35	13.38	13.38	
Yield Strength (N/mm ²)	435	442	438		≥400
Tensile Strength (N/mm ²)	625	620	628		≥570

Test Conclusion: The rebar as base metal for the test is qualified

2. Tensile test of the Splice (Single Direction)

Coupler Sample No.	No.1	No.2	No.3	Average	Required
Tensile Strength f_{mst}^0 (N/mm ²)	628	622	632		≥ f_{st}^0
Inelastic deformation u (mm)	0.07	0.08	0.07	0.07	≤0.10
Grand Elongation δ_{sgt} (%)	10.6	10.3	10.7	10.53	≥4.0
Breaking Mode	Bar	Bar	Bar		

Test Conclusion: Tensile test (single direction) passed

3. Repeated tension and compression test under High Stress

Coupler Sample No.	No.4	No.5	No.6	Average	Required
Tensile Strength f_{mst}^0 (N/mm ²)	626	625	630		≥ f_{st}^0
Residual Deformation u_{20}	0.08	0.07	0.07	0.07	≤0.3
Breaking Mode	Bar	Bar	Bar		

Test Conclusion: Repeated tension and compression test under High stress passed.

4. Repeated tension and compression test under Big Deformation

Coupler Sample No.	No.7	No.8	No.9	Average	Required
Tensile Strength f_{mst}^0 (N/mm ²)	623	621	630		≥ f_{st}^0
Residual Deformation	U^4	0.08	0.07	0.08	≤0.3
	U^8	0.13	0.12	0.11	≤0.6
Breaking Mode	Bar	Bar	Bar		

Test Conclusion: Repeated tension and compression test under Big deformation passed

Conclusion: "All the test results meet the requirements of Grade SA Rebar Coupler"