HIGH PERFORMANCE REINFORCEMENT PRODUCTS

DECLARATION OF PERFORMANCE No. DoP-HRC400-23.07

Unique identification code of the product-type:	**HRC400 Series rebar couplers (HRC410/420 standard coupler, HRC410/490 positional couplers)**
Intended uses of the construction product:	**mechanical splice for connecting reinforcing steel bars in reinforced concrete structures under static or quasi-static, fatigue and low cycle loading.**
Manufacturer:	**HRC Europe, Lierstranda 107, N-3414 Lierstranda, Norway**
System of AVCP:	**system 1+**
European Assessment Document	**EAD 160129-00-0301**
European Technical Assessment:	**ETA-22/0573**
Technical Assessment Body:	**SINTEF (NB 1071)**
Notified body:	**Kontrollrådet (NB 1111)**

Declared performance

Essential characteristics	Performance	Harmonized technical specification
Mechanical resistance to static or quasi static loading	ETA-22/0573, Annex C (see also Annex to DoP-HRC400-23.07)	EAD 160129-00-0301
Slip under loading		
Slip after loading		
Fatigue strength (S-N-curve with specific defined k1 and k2)		
Resistance to low cycle loading (seismic action)		
Reaction to fire	Class A1	

The performance of the product identified above is in conformity with the declared performance. This declaration is issued, in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer.

Signed for and on behalf of the manufacturer by:

Lisette Berg,
Managing Director (Sign.)
Lier, 03.07.2023

Annex to DoP-HRC400-23.07:

HRC400 Series Rebar Couplers (B500B and B500C) – essential characteristics acc. ETA-22/0573, Annex C

Copupler type	Nominal Rebar diameter Ø [mm]	Resistance to static or quasi static loading: Failure of rebar $f_{u,min,bar,outside}$ [1] [MPa]	Resistance to static or quasi static loading: Failure of coupler $f_{u,min,coupler}$ [2] [MPa]	Slip: under loading S_1 [3] [mm]	Slip: after loading S_2 [4] [mm]	Fatigue strength [5] (S-N-curve with specific defined k_1 and k_2): $\Delta\sigma_{Rsk}$ [MPa]	k_1	k_2	Resistance to low cycle loading (seismic action): u_{20} [6] [mm]	Ultimate tensile load, $F_{u,min}$ [7]: B500B [kN]	Ultimate tensile load, $F_{u,min}$ [7]: B500C [kN]	Failure mode [8]
Standard Coupler HRC 410/420	12	B500B: 540 B500C: 575	> 850	< 0,06	< 0,10	49 ($N = 10^7$) 69 ($N = 2 \cdot 10^6$)	4,6	8,3	0,2	61,1	65,0	Ductile rupture of the rebar outside splice
	16		> 850							108,6	115,6	
	20		> 850							169,6	180,6	
	25		> 850							265,1	282,3	
	32		> 740							434,3	462,4	
	40		> 850							678,6	722,6	
Positional Coupler HRC 410/490	25	B500B: 540 B500C: 575	> 670	< 0,10	< 0,10	49 ($N = 10^7$) 69 ($N = 2 \cdot 10^6$)	4,6	8,3	0,2	265,1	282,3	
	32									434,3	462,4	
	40									678,6	722,6	

1) $f_{u,min,bar,outside}$ according to *EN 1992-1-1*, *Annex C.1*:
For B500B: $f_{u,min,bar,outside} = k_{B500B} \cdot f_{yk} = 1{,}08 \cdot 500\ MPa = 540\ MPa$
For B500C: $f_{u,min,bar,outside} = k_{B500C} \cdot f_{yk} = 1{,}15 \cdot 500\ MPa = 575\ MPa$
Failure loads are determined by the strength of the parent rebar, not the HRC400 mechanical coupler.
The full specified elongation A_{gt} of the rebar can be developed, according to *EN 1992-1-1*, *Annex C.1*.

2) $f_{u,min,coupler}$ = minimum rebar stress equivalent to failure of the coupler. Values from test results with larger rebar than the coupler are intended for ("oversized rebar"). The full actual elongation $A_{gt,act}$ of the intended rebar size will be developed.

3) Slip across the mechanical splice under loading at $0{,}6 \cdot f_{yk} = 0{,}6 \cdot 500\ MPa = 300\ MPa$

4) Slip across the mechanical splice after unloading from $0{,}6 \cdot f_{yk}$ to a load level of $0{,}02 \cdot f_{yk} = 0{,}02 \cdot 500\ MPa = 10\ MPa$

5) Fatigue strength $\Delta\sigma_{Rsk}$ for S-N-curve with specific defined stress exponents k_1 and k_2

6) u_{20} = Residual max deformation

7) $F_{u,min} = A_{s,nom,bar,outside} \cdot f_{u,min,bar,outside} = \pi/4 \cdot Ø^2 \cdot f_{u,min,bar,outside}$

8) The actual failure loads are determined by the strength of the parent rebar, not the HRC400 couplers. Splices of rebar with lower/higher actual tensile strength will therefore achieve lower/higher actual capacities than given in the table. The failure mode remains unchanged: ductile rupture of the parent rebar.