

DECLARATION OF PERFORMANCE No WDB-10/20

1. Unique identification code of the product-type: **WDBLS-10; WDBLP-10**
2. Intended use/es: **Mechanical fasteners for use in concrete**
3. Manufacturer: **KLIMAS Sp. z o.o.
ul. Wincentego Witosa 135/137
Kuźnica Kiedrzyńska 42-233 Mykanów**
4. Authorised representative: **not applicable**
5. System/s of AVCP: **system 1**
6. European Assessment Document:
 - a) EAD 330232-00-0601
 - b) ETA-20/0768 25.11.2020
 - c) DiBt Deutsches Institut fur Bautechnik
 - d) 2323

7. Declared performance/s:

7a. Mechanical resistance and stability (BWR 1)

Table C1: Design method EN-1992-4:2018 method A and Technical Report TR055

Characteristic resistance under tension load (static and quasi-static loading)

Fastener size			WDB 10	
Head type			LS	LP
Steel failure				
Characteristic resistance	$N_{Rk,s}$	[kN]	57,0	
Partial factor	$\gamma_{Ms}^{1)}$	[-]	1,4	
Pull-out failure				
Characteristic resistance in cracked concrete C20/25	$N_{Rk,p}$	[kN]	10,0	
Characteristic resistance in uncracked concrete C20/25	$N_{Rk,p}$	[kN]	16,0	
Increasing factors for $N_{Rk,p}$ in cracked or uncracked concrete	ψ_c	C30/37	1,22	
		C40/50	1,41	
		C50/60	1,58	
Installation factor	γ_{inst}	[-]	1,0	
Concrete cone failure				
Effective embedment depth	h_{ef}	[mm]	58,1	
Characteristic edge distance	$c_{cr,N}$	[mm]	$1,5h_{ef}$	
Characteristic spacing	$s_{cr,N}$	[mm]	$3h_{ef}$	
Factor for cracked concrete	k_{cr}	[-]	7,7	
Factor for uncracked concrete	k_{ucr}	[-]	11,0	
Splitting failure				
Characteristic resistance in uncracked concrete C20/25	$N_{Rk,sp}^0$	[kN]	$N_{Rk,sp}^0 = N_{Rk,p}$	
Characteristic edge distance for splitting	$c_{cr,sp}$	[mm]	$1,5h_{ef}$	
Characteristic anchor spacing for splitting	$s_{cr,sp}$	[mm]	$3h_{ef}$	

¹⁾ In absence of other national regulations.

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Table B3: Design method EN-1992-4:2018 method A and Technical Report TR055

Minimum thickness of member , Minimum spacing and edge distance

Fastener size			WDB 10
Head type			LS, LP
Minimum member thickness	h_{min}	[mm]	130
Minimum edge distance	c_{min}	[mm]	60
Minimum spacing	s_{min}	[mm]	60

Table C4: Design method EN-1992-4:2018 method A and Technical Report TR055

Characteristic resistance under shear load (static and quasi-static loading)

Fastener size			WDB 10
Head type			LS LP
Setting depth	h_{nom}	[mm]	75
Effective embedment depth	h_{ef}	[mm]	58,1
Steel failure without lever arm			
Characteristic resistance	$V_{Rk,s}^0$	[kN]	26,8
Ductility factor	k_7	[-]	0,8
Partial factor	$\gamma_{Ms}^{1)}$	[-]	1,5
Steel failure with lever arm			
Characteristic resistance	$M_{Rk,s}^0$	[Nm]	79,0
Partial factor	$\gamma_{Ms}^{1)}$	[-]	1,5
Concrete pryout failure			
k-factor	k_8	[-]	1,0
Partial factor	$\gamma_{Mcp}^{1)}$	[-]	1,5
Concrete edge failure			
Effective length of anchor	l_f	[mm]	58,1
Outside diameter of fastener	d_{nom}	[mm]	9,24
Partial factor	$\gamma_{Mc}^{1)}$	[-]	1,5

¹⁾In absence of other national regulations.

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Table C3: Design method EN-1992-4:2018 method A and Technical Report TR055

Displacements under tension loads for non-cracked and cracked concrete (static and quasi-static loading)

Fastener size	Head type	Concrete	Tension load N	Displacement	
				δ_{N0}	$\delta_{N\infty}$
[-]	[-]	[-]	[kN]	[mm]	[mm]
WDB 10	LS	cracked C20/25	4,8	0,2	1,0
	LP				
WDB 10	LS	uncracked C20/25	7,6	0,1	1,0
	LP				

Table C5: Design method EN-1992-4:2018 method A and Technical Report TR055

Displacements under shear loads for non-cracked and cracked concrete (static and quasi-static loading)

Fastener size	Head type	Concrete	Shear load V	Displacement	
				δ_{V0}	$\delta_{V\infty}$
[-]	[-]	[-]	[kN]	[mm]	[mm]
WDB 10	LS	Cracked and uncracked C20/25	12,8	1,8	2,7
	LP				

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Durability

Table A1: Design method EN-1992-4:2018 method A and Technical Report TR055

Materials

Head marking	material
WDB	Carbon steel zinc coating: electroplated ($> 5 \mu\text{m}$) or mechanical plated ($> 30 \mu\text{m}$) (only head type –LS)

Table B1: Design method EN-1992-4:2018 method A and Technical Report TR055

Installation parameters

Fastener size			WDB 10	
Head type			LS	LP
Diameter of drill bit	d_0	[mm]	10	
Embedment depth	h_{nom}	[mm]	75	
Min. hole depth in concrete	$h_1 \geq$	[mm]	85	
Effective embedment depth	h_{ef}	[mm]	58,1	
Clearance hole in the fixture	d_f	[mm]	13	
Thickness of fixture	t_{fix}	[mm]	5-75	10-75
Installation torque	T_{inst}	[Nm]	60	1) ¹⁾
Wrench size (types: LS, LSF)	WS	[mm]	17	-
Torx size (types: LP, LG)	TX	-	-	50
Max. power output, machine setting	$T_{\text{max}} \leq$	[Nm]	350	120

1) For the installation of the LP head types only impact screw driver can be us

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7b. Safety in case of fire (BWR 2)

Reaction to fire	Class A1
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Table C6: Design method EN-1992-4:2018 method A and Technical Report TR055

Characteristic tension resistance values for resistance to fire

Fastener size				WDB 10
Head type				LS LP
Steel failure				
Characteristic resistance	R30	$N_{Rk,s,fi}$	[kN]	1,0
	R60	$N_{Rk,s,fi}$	[kN]	0,9
	R90	$N_{Rk,s,fi}$	[kN]	0,7
	R120	$N_{Rk,s,fi}$	[kN]	0,5
Pull-out failure				
Characteristic resistance in concrete \geq C20/25	R30	$N_{Rk,p,fi}$	[kN]	2,5
	R60			
	R90			
	R120			
Concrete cone failure				
Characteristic resistance in concrete \geq C20/25	R30	$N^0_{Rk,c,fi}$	[kN]	4,4
	R60			
	R90			
	R120			
Effective embedment depth	h_{ef}	[mm]	58,1	
Minimum member thickness	h_{min}	[mm]	130	
Spacing	$s_{cr,N,fi}$	[mm]	$4h_{ef}$	
	s_{min}	[mm]	60	
Edge distance	$c_{cr,N,fi}$	[mm]	$2h_{ef}$	
Fire exposure from one side only	c_{min}	[mm]	60	
Fire exposure from more than one side			≥ 300 mm	

1) In absence of other national regulations.

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Table C7: Design method EN-1992-4:2018 method A and Technical Report TR055

Characteristic shear resistance values for resistance to fire

Fastener size				WDB 10
Head type				all
Steel failure without level arm				
Characteristic resistance	R30	$V_{Rk,s,fi}$	[kN]	1,0
	R60	$V_{Rk,s,fi}$	[kN]	0,9
	R90	$V_{Rk,s,fi}$	[kN]	0,7
	R120	$V_{Rk,s,fi}$	[kN]	0,5
Steel failure with level arm				
Characteristic resistance	R30	$M^0_{Rk,p,fi}$	[Nm]	1,4
	R60	$M^0_{Rk,p,fi}$	[Nm]	1,2
	R90	$M^0_{Rk,p,fi}$	[Nm]	0,9
	R120	$M^0_{Rk,p,fi}$	[Nm]	0,7
Pry-out failure				
k_s			[-]	1
Characteristic resistance	R30	$V_{Rk,cp,fi}$	[kN]	4,4
	R60			
	R90			
	R120	$V_{Rk,cp,fi}$	[kN]	3,5
Concrete edge failure				
Characteristic resistance	$\leq R90$	$V_{Rk,c,fi}$	[kN]	$V^0_{Rk,c,fi} = 0.25 * V^0_{Rk,c}^{(2)}$
	R120	$V_{Rk,c,fi}$	[kN]	$V^0_{Rk,c,fi} = 0.20 * V^0_{Rk,c}^{(2)}$

1) In absence of other national regulations.

2) $V^0_{Rk,c}$ = characteristic resistance for concrete edge failure in cracked concrete C20/C25 under normal temperature calculated acc. to EN 1992-4:2018.

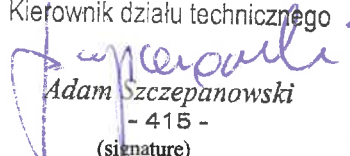
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8. Appropriate Technical Documentation and/or Specific Technical Documentation: **not applicable**

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

Signed for and on behalf of the manufacturer by:

Kuźnica Kiedrzyńska
14.01.2021 r.
(place and date of issue)

Kierownik działu technicznego

Adam Szczepanowski
- 415 -
(signature)

