DECLARATION OF PERFORMANCE No WDB-12/20

1. Unique identification code of the product-type: **WDBLS-12**
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 12**
Head type			**LS**
Steel failure			
Characteristic resistance	$N_{Rk,s}$	[kN]	83,0
Partial factor	γ_{Ms} [1)]	[-]	1,4
Pull-out failure			
Characteristic resistance in cracked concrete C20/25	$N_{Rk,p}$	[kN]	12,0
Characteristic resistance in uncracked concrete C20/25	$N_{Rk,p}$	[kN]	25,0
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}	[-]	1,2
Concrete cone failure			
Effective embedment depth	h_{ef}	[mm]	75,4
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	$N^0_{Rk,sp}$	[kN]	$N^0_{Rk,sp} = N_{Rk,p}$
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 12**
Head type			**LS**
Minimum member thickness	h_{min}	[mm]	160
Minimum edge distance	c_{min}	[mm]	70
Minimum spacing	s_{min}	[mm]	70

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 12**
Head type			**LS**
Setting depth	h_{nom}	[mm]	95
Effective embedment depth	h_{ef}	[mm]	75,4
Steel failure without lever arm			
Characteristic resistance	$V^0_{Rk,s}$	[kN]	39,0
Ductility factor	k_7	[-]	0,8
Partial factor	γ_{Ms} [1)]	[-]	1,5
Steel failure with lever arm			
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	138,8
Partial factor	γ_{Ms} [1)]	[-]	1,5
Concrete pryout failure			
k-factor	k_8	[-]	2,0
Partial factor	γ_{Mcp} [1)]	[-]	1,5
Concrete edge failure			
Effective length of anchor	ℓ_f	[mm]	75,4
Outside diameter of fastener	d_{nom}	[mm]	11,15
Partial factor	γ_{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 12	LS	cracked C20/25	4,8	0,3	1,2
WDB 12	LS	uncracked C20/25	9,9	0,3	1,2

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 12	LS	Cracked and uncracked C20/25	18,6	1,8	2,7

Durability

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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 µm) or mechanical plated (> 30 µm)

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

Installation parameters

Fastener size			**WDB 12**
Head type			**LS**
Diameter of drill bit	d_0	[mm]	12
Embedment depth	h_{nom}	[mm]	95
Min. hole depth in concrete	$h_1 \geq$	[mm]	105
Effective embedment depth	h_{ef}	[mm]	75,4
Clearance hole in the fixture	d_f	[mm]	15
Thickness of fixture	t_{fix}	[mm]	5-55
Installation torque	T_{inst}	[Nm]	80
Wrench size (types: LS, LSF)	WS	[mm]	19
Torx size (types: LP, LG)	TX	-	-
Max. power output, machine setting	$T_{max} \leq$	[Nm]	350

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 12**
Head type				**LS**
Steel failure				
Characteristic resistance	R30	$N_{Rk,s,fi}$	[kN]	2,0
	R60	$N_{Rk,s,fi}$	[kN]	1,5
	R90	$N_{Rk,s,fi}$	[kN]	1,3
	R120	$N_{Rk,s,fi}$	[kN]	1,0
Pull-out failure				
Characteristic resistance in concrete ≥ C20/25	R30	$N_{Rk,p,fi}$	[kN]	3,0
	R60			
	R90			
	R120	$N_{Rk,p,fi}$	[kN]	2,4
Concrete cone failure				
Characteristic resistance in concrete ≥ C20/25	R30	$N^0_{Rk,c,fi}$	[kN]	8,5
	R60			
	R90			
	R120	$N^0_{Rk,c,fi}$	[kN]	6,8
Effective embedment depth		h_{ef}	[mm]	75,4
Minimum member thickness		h_{min}	[mm]	160
Spacing		$s_{cr,N,fi}$	[mm]	$4h_{ef}$
		s_{min}	[mm]	70
Edge distance		$c_{cr,N,fi}$	[mm]	$2h_{ef}$
Fire exposure from one side only		c_{min}	[mm]	70
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 12**
Head type				**all**
Steel failure without level arm				
Characteristic resistance	R30	$V_{Rk,s,fi}$	[kN]	2,0
	R60	$V_{Rk,s,fi}$	[kN]	1,5
	R90	$V_{Rk,s,fi}$	[kN]	1,3
	R120	$V_{Rk,s,fi}$	[kN]	1,0
Steel failure with level arm				
Characteristic resistance	R30	$M^0_{Rk,p,fi}$	[Nm]	3,4
	R60	$M^0_{Rk,p,fi}$	[Nm]	2,5
	R90	$M^0_{Rk,p,fi}$	[Nm]	2,1
	R120	$M^0_{Rk,p,fi}$	[Nm]	1,6
Pry-out failure				
k_8			[-]	2
Characteristic resistance	R30	$V_{Rk,cp,fi}$	[kN]	17,0
	R60			
	R90			
	R120	$V_{Rk,cp,fi}$	[kN]	13,6
Concrete edge failure				
Characteristic resistance	≤ 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
24.10.2023 r.
(place and date of issue)

Kierownik działu technicznego
Adam Szczepanowski
- 415 -
(signature)

This declaration replaces the declaration from 27.02.2023.