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European Technical Assessment ETA-13/0124 of 20/03/2018

General Part

Technical Assessment Body issuing the European Technical Assessment	Instytut Techniki Budowlanej
Trade name of the construction product	DMX® type WBD, KG, WL, KRD, KMP, KMR, KMRP, KP, ŁZ, KS, KSO, KW, KWO, KB
Product family to which the construction product belongs	Three-dimensional nailing plates
Manufacturer	DOMAX Sp. z o.o. Al. Parku Krajobrazowego 109 PL 84-207 Koleczkowo, Łężyce, Poland
Manufacturing plant	DOMAX Sp. z o.o. Al. Parku Krajobrazowego 109 PL 84-207 Koleczkowo, Łężyce, Poland
This European Technical Assessment contains	45 pages including 2 Annexes which form an integral part of this Assessment
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of	Guideline for European Technical Approval ETAG 015, Edition November 2012 "Three-dimensional nailing plates", used as European Assessment Document (EAD)
This version replaces	ETA-13/0124 issued on 28/03/2013

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Specific Part

1 Technical description of the product

The three-dimensional nailing plates DMX® are one-piece, non-welded elements, made of galvanized steel sheet grade DX51D+Z275 according to EN 10346 (WBD, KG, WL, KRD, KMP, KMR, KMRP, KP, ŁZ, KSO, KWO). The KS, KW, KB plates are made of electrogalvanized steel DC01 according to EN 10131 or S235 according to EN 10025-2.

The DMX® WBD, KG, WL, KRD, KMP, KMR, KMRP, KP, ŁZ, KSO, KWO three-dimensional nailing plates are made of the cold-formed steel sheet grade DX51D according to EN 10346 with the zinc coating mass of 275 g/m^2. The thickness is 1,0 mm (WL), 1,5 mm (KG, KMP, KSO, KWO), 2,0 mm (WBD, KRD, KMR, KMRP) and 2,5 mm (KP, ŁZ). The KS, KW, KB plates are made of electrogalvanized steel DC01 according to EN 10131 or S235 according to EN 10025-2 with minimum 12 µm of zinc layer. The thickness is 1,5 to 2,0 mm (KS), 1,5 to 5,0 mm (KW) and 3,0 to 5,0 mm (KB).

The range of the DMX® type WBD, KG, WL, KRD, KMP, KMR, KMRP, KP, ŁZ, KS, KSO, KW, KWO, KB three-dimensional nailing plates is given in Annex A. The characteristic material values, dimensions and tolerances of the three-dimensional nailing plates not indicated in that Annex shall correspond to the respective values laid down in the technical documentation of this European Technical Assessment. The dimension tolerances shall meet the requirements of EN 22768-1.

2 Specification of the intended use in accordance with the applicable European Assessment Document (EAD)

The DMX® three-dimensional nailing plates are intended to be used for connecting the mutually perpendicular, load-bearing, solid timber elements, in side-grain to side-grain configurations, in joints for which requirements for mechanical resistance and stability in the sense of the basic work requirement 1 of Regulation (EU) No 305/2011 shall be fulfilled.

Ring shank nails according to EN 14592 with the diameter of 4 mm and characteristic tensile capacity $F_{ax,Rk}$ not less than 1,80 kN shall be used for connections made with the DMX® three-dimensional nailing plates.

In respect of the requirements concerning corrosion resistance, DMX® three-dimensional nailing plates are for use in timber structures subjected to the internal conditions defined by service classes 1 and 2 according to EN 1995-1-1 (Eurocode 5), in corrosion aggressiveness categories C1 and C2 according to EN ISO 12944-2, without action of acid gases or vapours.

The provisions made in this European Technical Assessment are based on an assumed working life of the three-dimensional nailing plates of 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the manufacturer or the Technical Assessment Body, but should only be regarded as means for choosing the right products in relation to the expected economically reasonable working life of the works.

3 Performance of the product and references to the methods used for its assessment

3.1 Mechanical resistance and stability (BWR 1)

3.1.1 Strength

The characteristic load-carrying capacities of joints loaded according to static diagrams No 1 and 2 shown in Annex B, determined by tests carried out according to ETAG 015, clause 5.1.3, are given in Annex B. The characteristic load-carrying capacities of joints for other load directions shall be calculated on the basis of EN 1995-1-1 (Eurocode 5) or according to national regulations. The design values shall be determined according to EN 1995-1-1 (Eurocode 5).

3.1.2 Stiffness

No performance assessed.

3.1.3 Ductility in cyclic testing

No performance assessed.

3.2 Safety in case of fire (BWR 2)

3.2.1 Reaction to fire

The three dimensional nailing plates are classified in Class A1 of reaction to fire (non-combustible products) in accordance with EN 13501-1 and European Commission Decision 96/603/EC amended by European Commission Decision 2000/605/EC.

3.2.2 Resistance to fire

No performance assessed.

3.3 Hygiene, health and the environment (BWR 3)

Regarding the dangerous substances, there may be requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Regulation, these requirements need also to be complied with, when and where they apply.

3.4 Sustainable use of natural resources (BWR 7)

No performance assessed.

3.5 General aspects

The DMX® three-dimensional nailing plates durability and serviceability have been assessed satisfactory when used in conditions defined by service classes 1 and 2 according to EN 1995-1-1 (Eurocode 5). The installation instructions including special installation techniques and provisions for the qualification of the personnel are given in the manufacturer's technical documentation.

3.6 Methods used for the assessment

The assessment of three dimensional nailing plates for the declared intended use has been made in accordance with the ETAG 015 *"Three-dimensional nailing plates"*.

4 Assessment and verification of constancy of performance (AVPC) system applied, with reference to its legal base

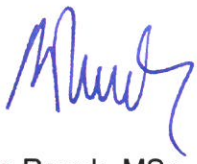
According to the Decision 97/638/EC of the European Commission the system 2+ of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) applies.

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable European Assessment Document (EAD)

Technical details necessary for the implementation of the AVCP system are laid down in the control plan which is deposited at Instytut Techniki Budowlanej.

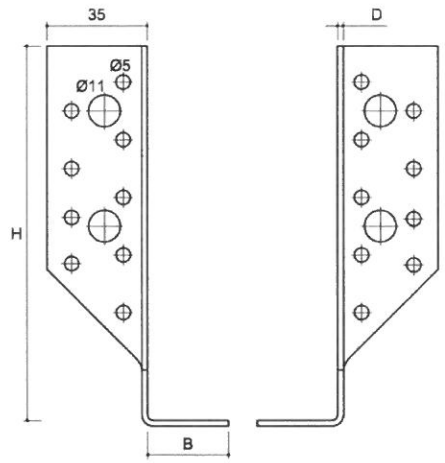
For type testing the results of the tests performed as part of the assessment for the European Technical Assessment shall be used unless there are changes in the production line or plant. In such cases the necessary type testing has to be agreed between Instytut Techniki Budowlanej and the notified body.

Issued in Warsaw on 20/03/2018 by Instytut Techniki Budowlanej

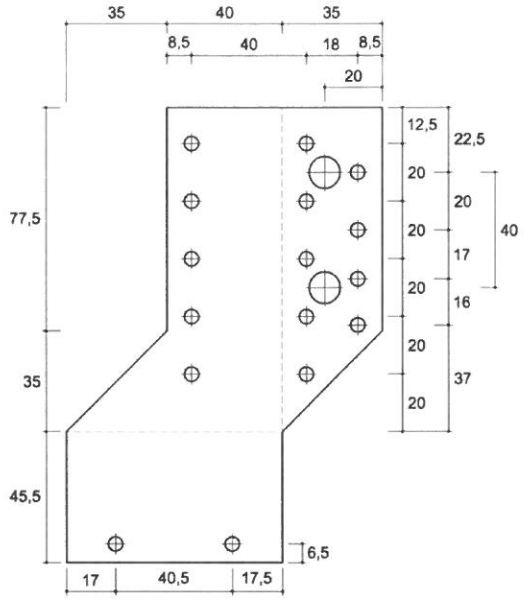


Anna Panek, MSc

Deputy Director of ITB



WBD 130L WBD 130P



Szablon B1

Table 1. WBD three-dimensional nailing plate symbols and dimensions

Symbol	Dimensions, mm			Type	Number of holes	
	H	B	D		Ø11	Ø5
WBD 105L WBD 105P	105	25	2	A1	1	13
WBD 130L WBD 130P	130	28	2	B1	2	16
WBD 140L WBD 140P	140	50	2	C1	2	19
WBD 170L WBD 170P	170	50	2	D1	3	22
WBD 200L WBD 200P	200	50	2	E1	3	25

DMX® type WBD, KG, WL, KRD, KMP, KMR, KMRP, KP, ŁZ, KS, KSO, KW, KWO, KB	**Annex A1** of European Technical Assessment ETA-13/0124
Three-dimensional nailing plates DMX® WBD	

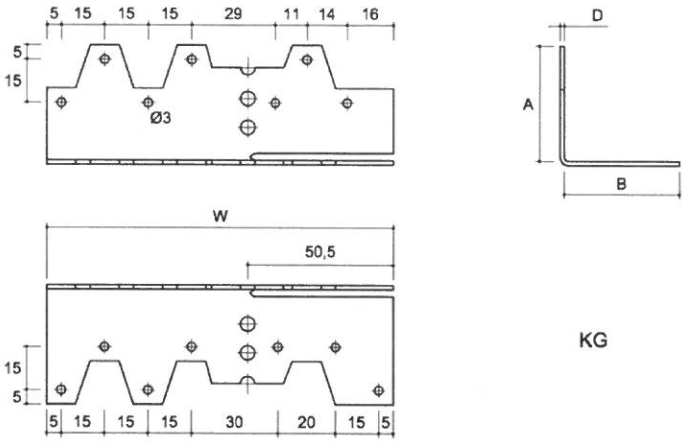


Table 2. KG three-dimensional nailing plate symbols and dimensions

Symbol	Dimensions, mm				Number of holes
	W	A	B	D	Ø3
KG	120	40	40	1,5	14

DMX® type WBD, KG, WL, KRD, KMP, KMR, KMRP, KP, ŁZ, KS, KSO, KW, KWO, KB	**Annex A2** of European Technical Assessment ETA-13/0124
Three-dimensional nailing plates DMX® KG	

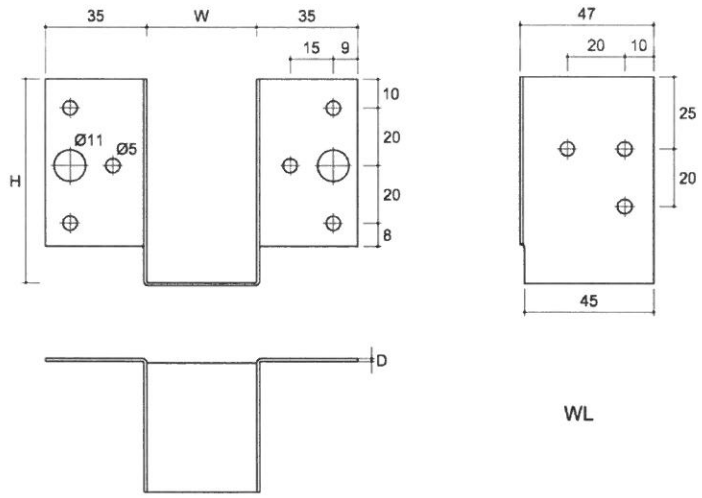


Table 3. WL three-dimensional nailing plate symbols and dimensions

Symbol	Dimensions, mm			Number of holes	
	W	H	D	Ø11	Ø5
WL 5	25	77	1	2	12
WL 6	38	71	1	2	12
WL 7	41	70	1	2	12
WL 8	51	65	1	2	12
WL 9	60	60	1	2	12

DMX® type WBD, KG, WL, KRD, KMP, KMR, KMRP, KP, ŁZ, KS, KSO, KW, KWO, KB	**Annex A3** of European Technical Assessment ETA-13/0124
Three-dimensional nailing plates DMX® WL	

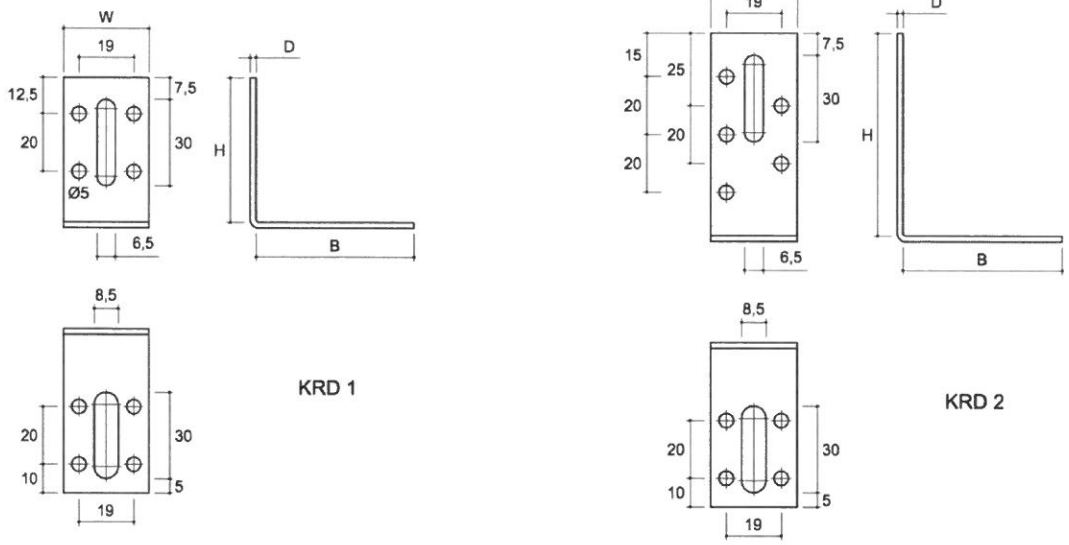


Table 4. KRD three-dimensional nailing plate symbols and dimensions

Symbol	Dimensions, mm				Number of holes
	W	H	B	D	Ø5
KRD 1	30	50	55	2	8
KRD 2	30	70	55	2	9

DMX® type WBD, KG, WL, KRD, KMP, KMR, KMRP, KP, ŁZ, KS, KSO, KW, KWO, KB	**Annex A4** of European Technical Assessment ETA-13/0124
Three-dimensional nailing plates DMX® KRD	

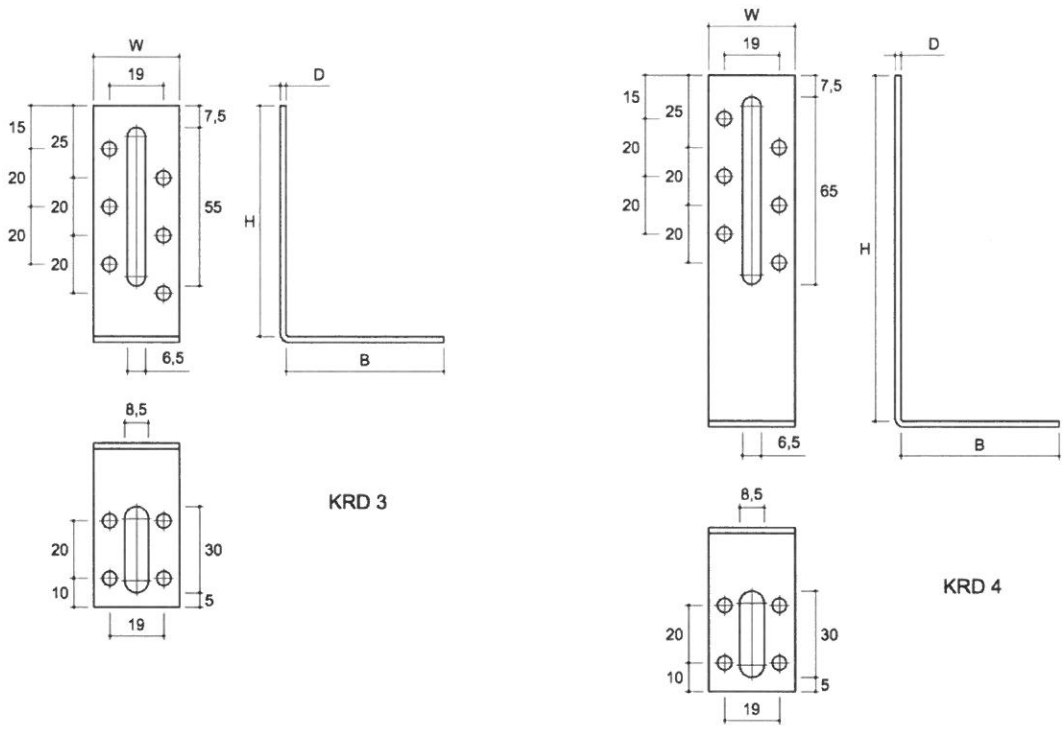
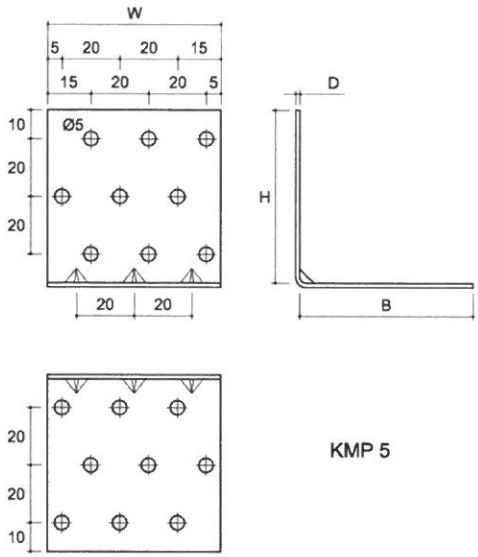


Table 5. KRD three-dimensional nailing plate symbols and dimensions

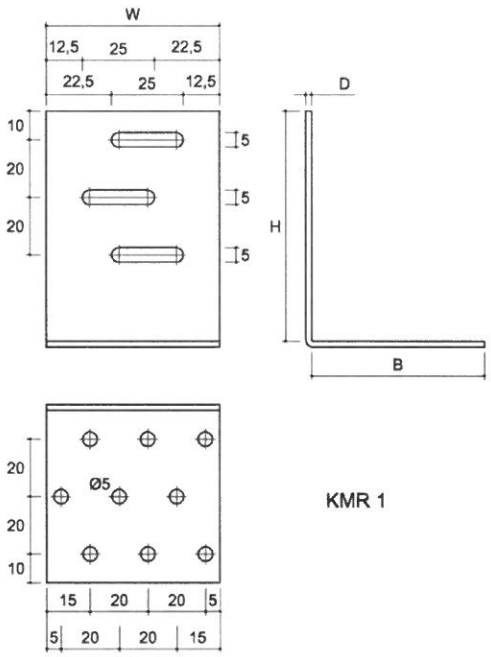
Symbol	Dimensions, mm				Number of holes
	W	H	B	D	Ø5
KRD 3	30	80	55	2	10
KRD 4	30	120	55	2	10



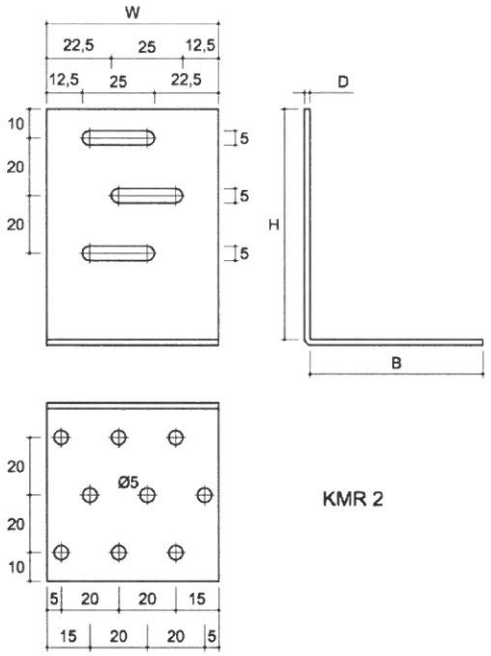
KMP 5

Table 6. KMP three-dimensional nailing plate symbols and dimensions

Symbol	Dimensions, mm				Number of holes
	W	H	B	D	Ø5
KMP 1	40	40	40	1,5	8
KMP 2	60	40	40	1,5	12
KMP 3	80	40	40	1,5	16
KMP 4	40	60	60	1,5	12
KMP 5	60	60	60	1,5	18
KMP 6	80	60	60	1,5	24
KMP 7	40	80	80	1,5	16
KMP 8	60	80	80	1,5	24
KMP 9	80	80	80	1,5	32



KMR 1



KMR 2

Table 7. KMR three-dimensional nailing plate symbols and dimensions

Symbol	Dimensions, mm				Number of holes
	W	H	B	D	Ø5
KMR 1	60	80	60	2	9
KMR 2	60	80	60	2	9

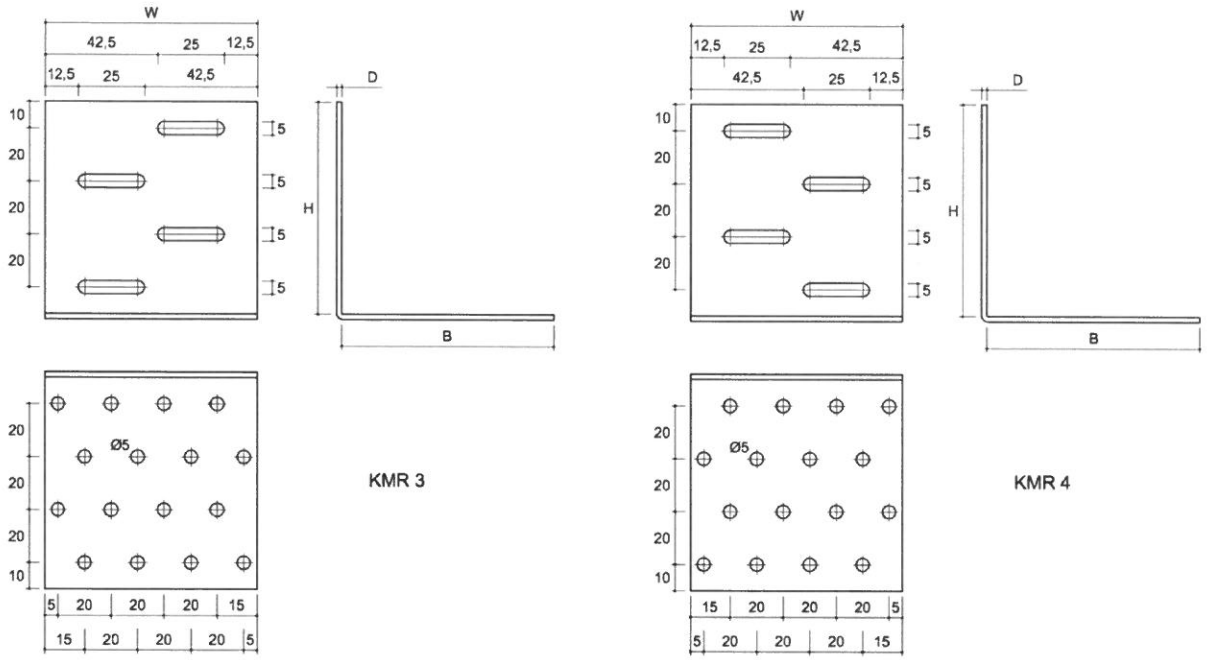


Table 8. KMR three-dimensional nailing plate symbols and dimensions

Symbol	Dimensions, mm				Number of holes
	W	H	B	D	Ø5
KMR 3	80	80	80	2	16
KMR 4	80	80	80	2	16

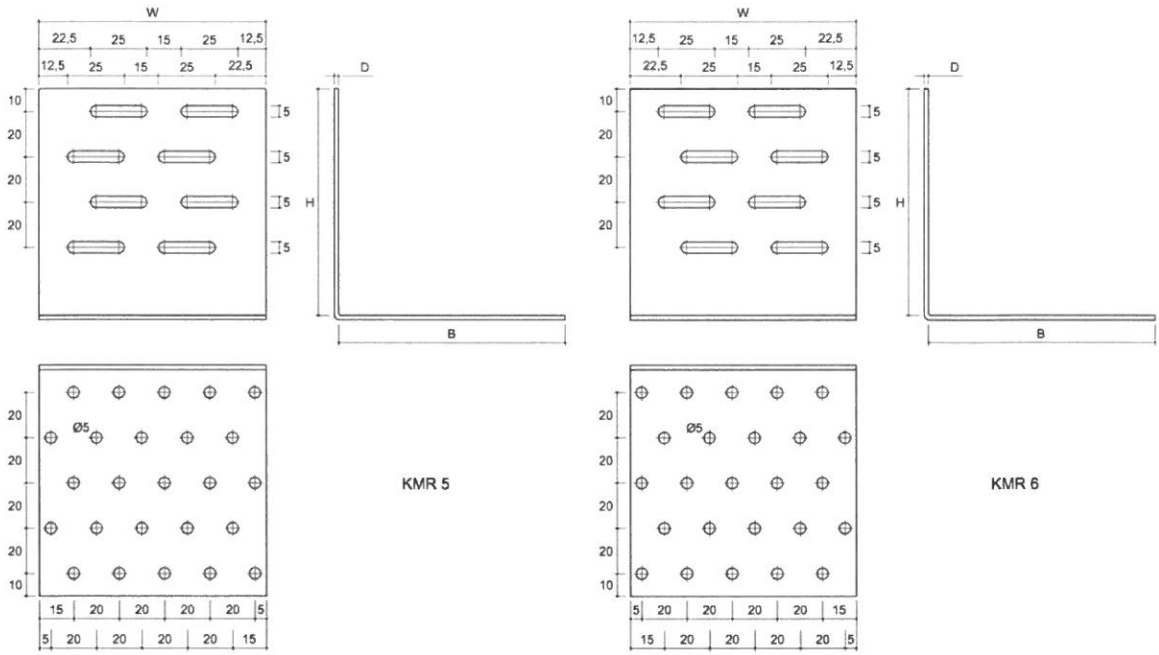


Table 9. KMR three-dimensional nailing plate symbols and dimensions

Symbol	Dimensions, mm				Number of holes
	W	H	B	D	Ø5
KMR 5	100	100	100	2	25
KMR 6	100	100	100	2	25

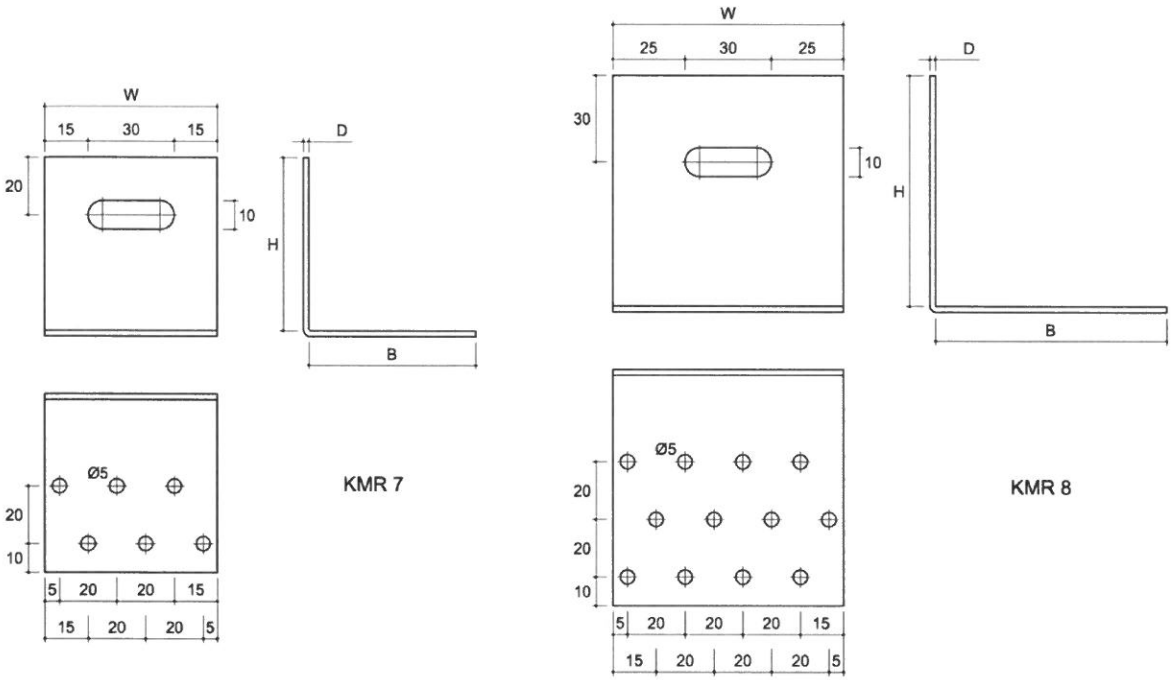
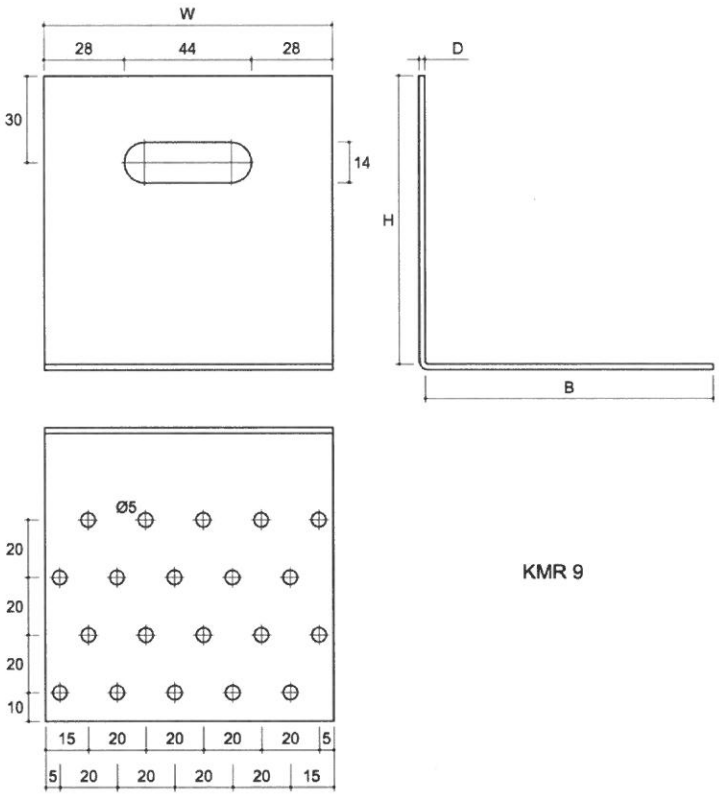


Table 10. KMR three-dimensional nailing plate symbols and dimensions

Symbol	Dimensions, mm				Number of holes
	W	H	B	D	Ø5
KMR 7	60	60	60	2	6
KMR 8	80	80	80	2	12



KMR 9

Table 11. KMR three-dimensional nailing plate symbols and dimensions

Symbol	Dimensions, mm				Number of holes
	W	H	B	D	Ø5
KMR 9	100	100	100	2	20

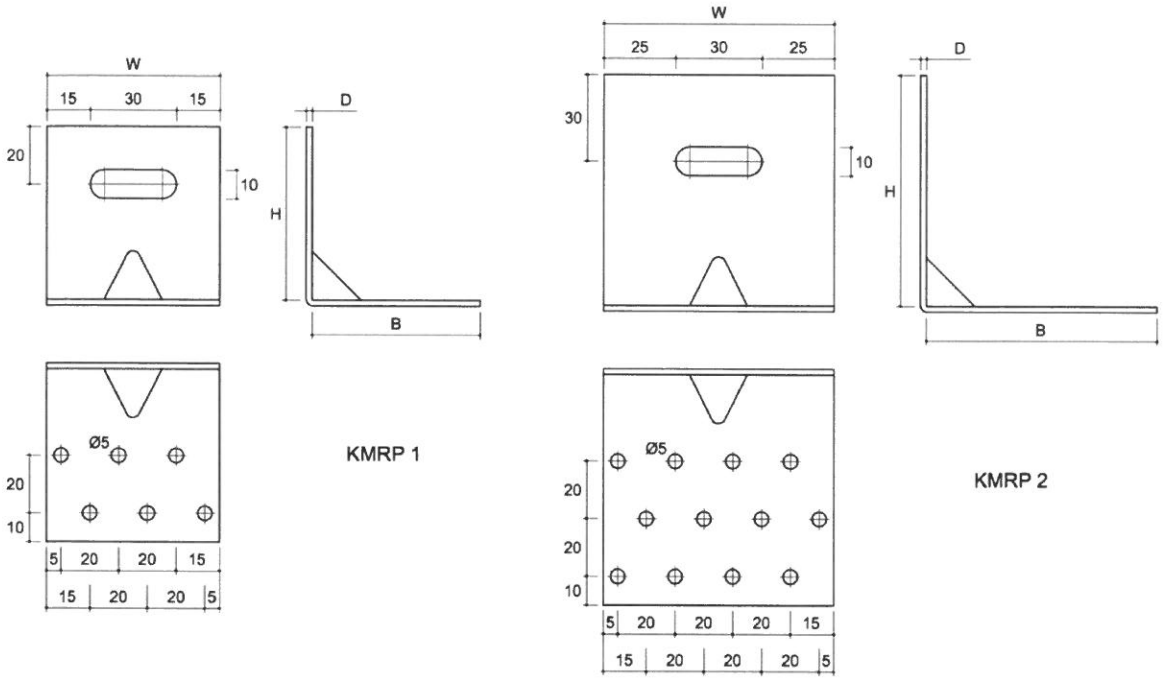
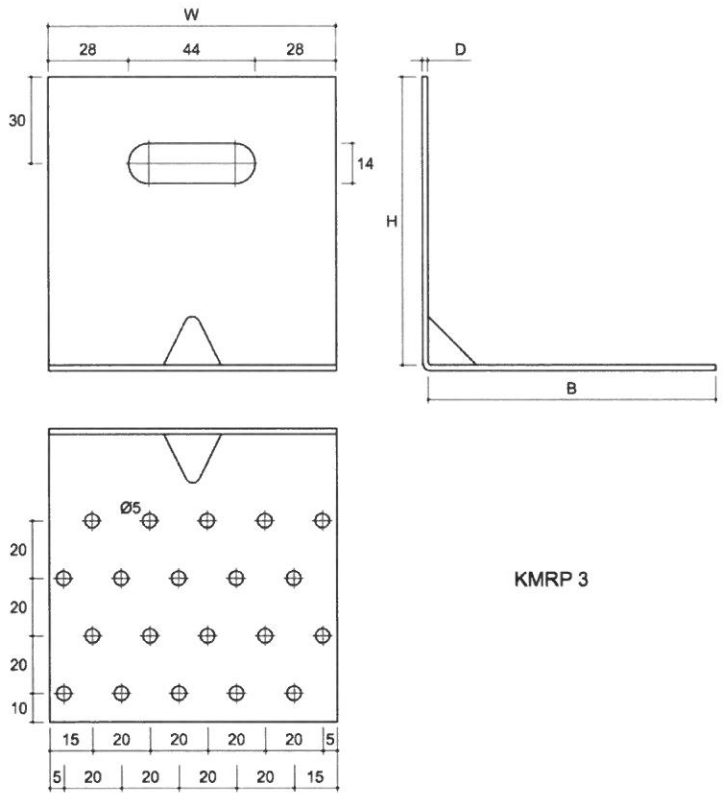


Table 12. KMRP three-dimensional nailing plate symbols and dimensions

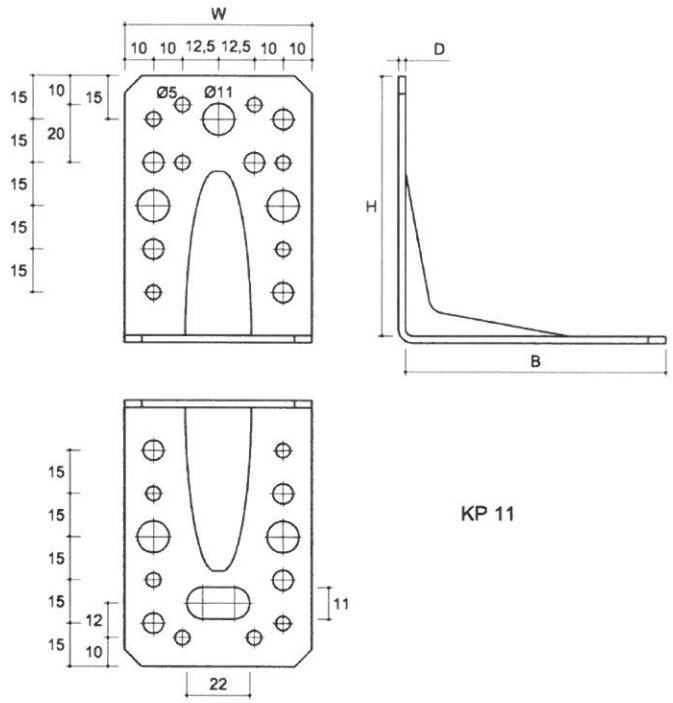
Symbol	Dimensions, mm				Number of holes
	W	H	B	D	Ø5
KMRP 1	60	60	60	2	6
KMRP 2	80	80	80	2	12



KMRP 3

Table 13. KMRP three-dimensional nailing plate symbols and dimensions

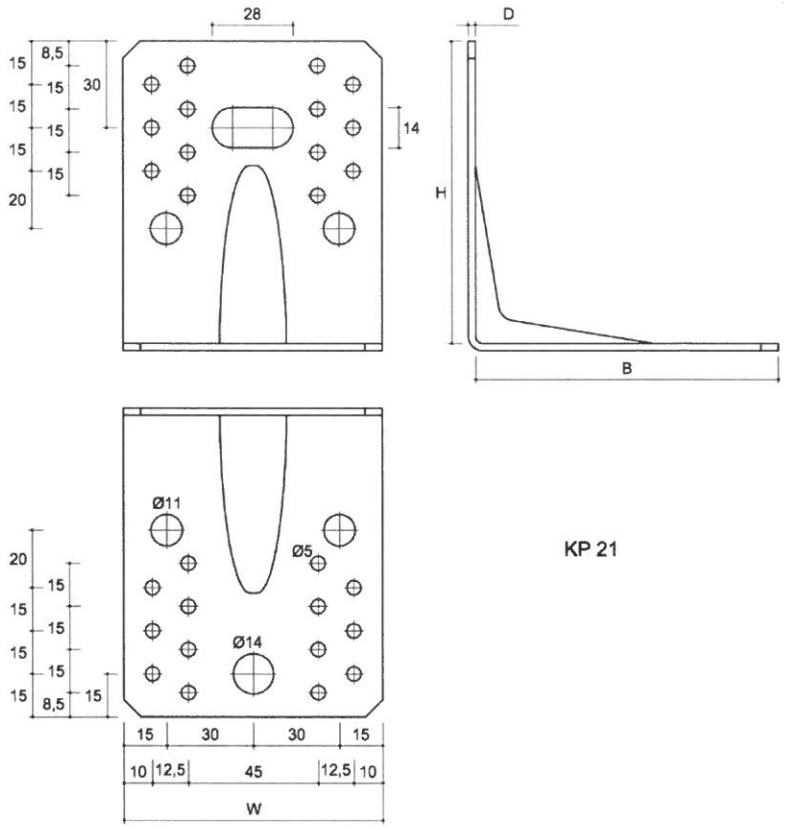
Symbol	Dimensions, mm				Number of holes
	W	H	B	D	Ø5
KMRP 3	100	100	100	2	20



KP 11

Table 14. KP three-dimensional nailing plate symbols and dimensions

Symbol	Dimensions, mm				Number of holes		
	W	H	B	D	Ø11	Ø7	Ø5
KP 11	65	90	90	2,5	5	9	13

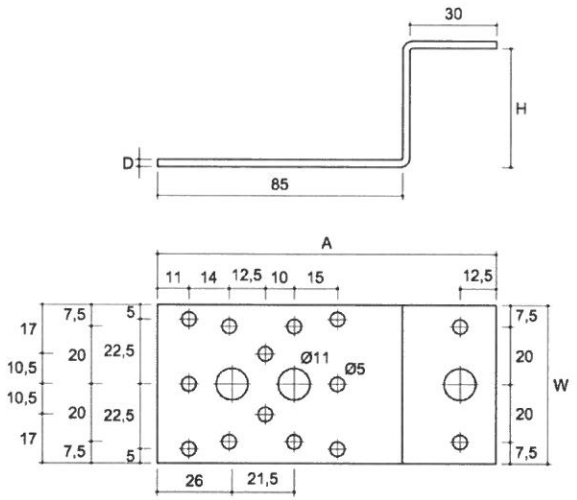


KP 21

Table 15. KP three-dimensional nailing plate symbols and dimensions

Symbol	Dimensions, mm				Number of holes		
	W	H	B	D	Ø14	Ø11	Ø5
KP 21	90	105	105	2,5	1	4	28

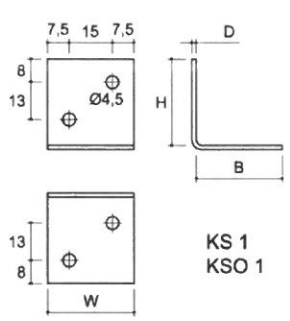
DMX® type WBD, KG, WL, KRD, KMP, KMR, KMRP, KP, ŁZ, KS, KSO, KW, KWO, KB	**Annex A15** of European Technical Assessment ETA-13/0124
Three-dimensional nailing plates DMX® KP	



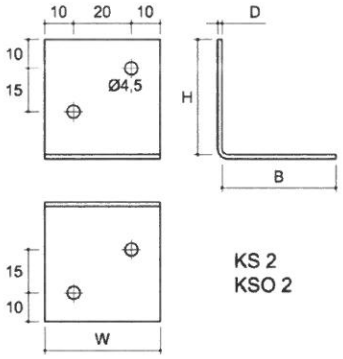
LZ 1

Table 16. ŁZ three-dimensional nailing plate symbols and dimensions

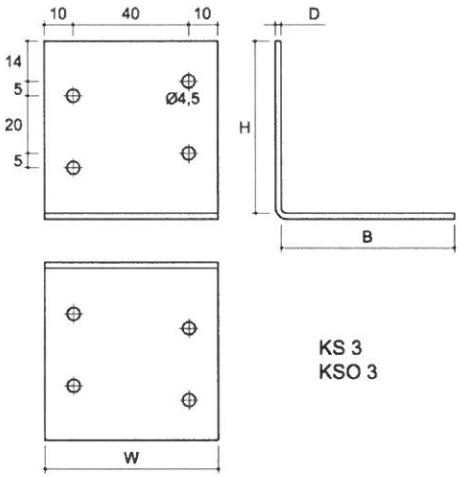
Symbol	Dimensions, mm				Number of holes	
	W	H	A	D	Ø11	Ø5
ŁZ 1	55	41	117,5	2,5	3	14
ŁZ 2	55	51	117,5	2,5	3	14
ŁZ 2	55	61	117,5	2,5	3	14



KS 1
KSO 1



KS 2
KSO 2



KS 3
KSO 3

Table 17. KS and KSO three-dimensional nailing plate symbols and dimensions

Symbol	Dimensions, mm				Number of holes
	W	H	B	D	Ø4,5
KS 1 KSO 1	30	30	30	1,5	4
KS 2 KSO 2	40	40	40	1,5	4
KS 3 KSO 3	60	60	60	2	8

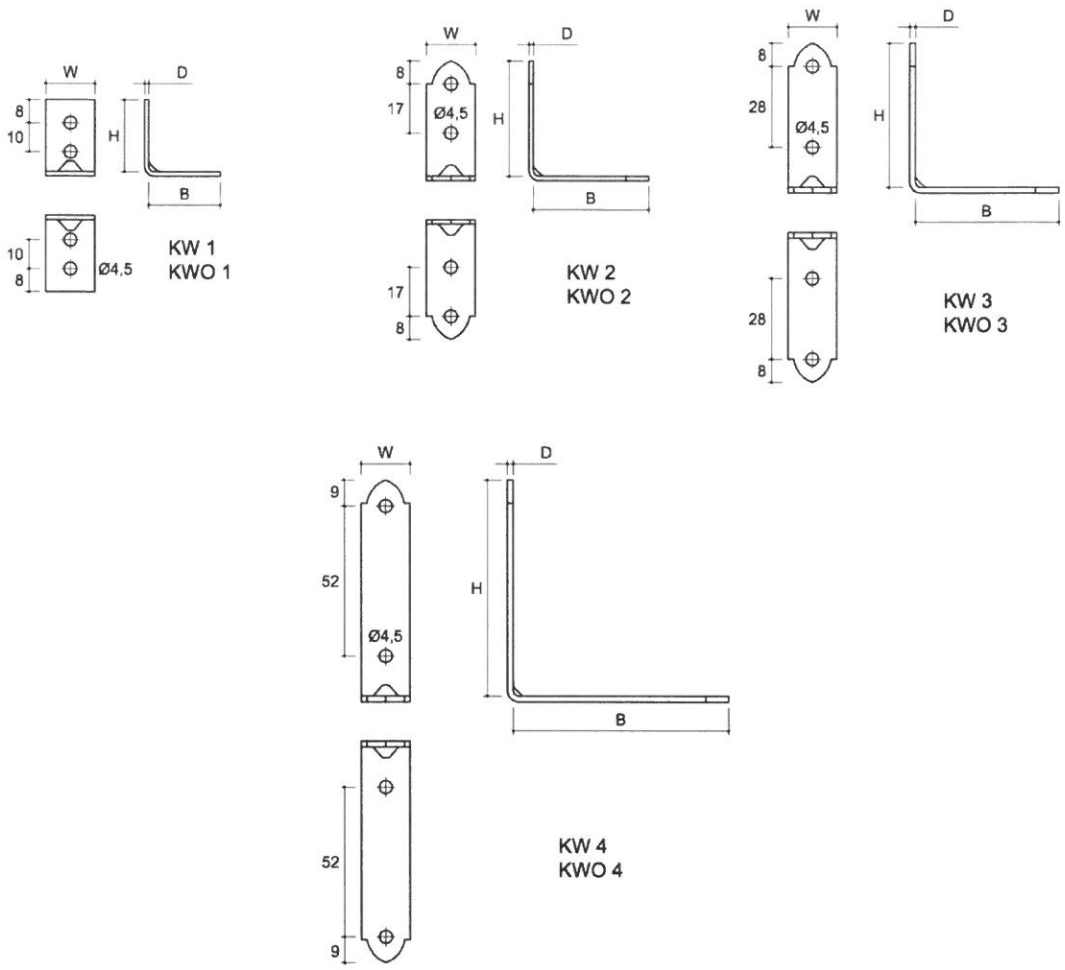


Table 18. KW and KWO three-dimensional nailing plate symbols and dimensions

Symbol	Dimensions, mm				Number of holes
	W	H	B	D	Ø4,5
KW 1 KWO 1	17	25	25	1,5	4
KW 2 KWO 2	17	40	40	1,5	4
KW 3 KWO 3	17	50	50	2	4
KW 4 KWO 4	17	75	75	2	4

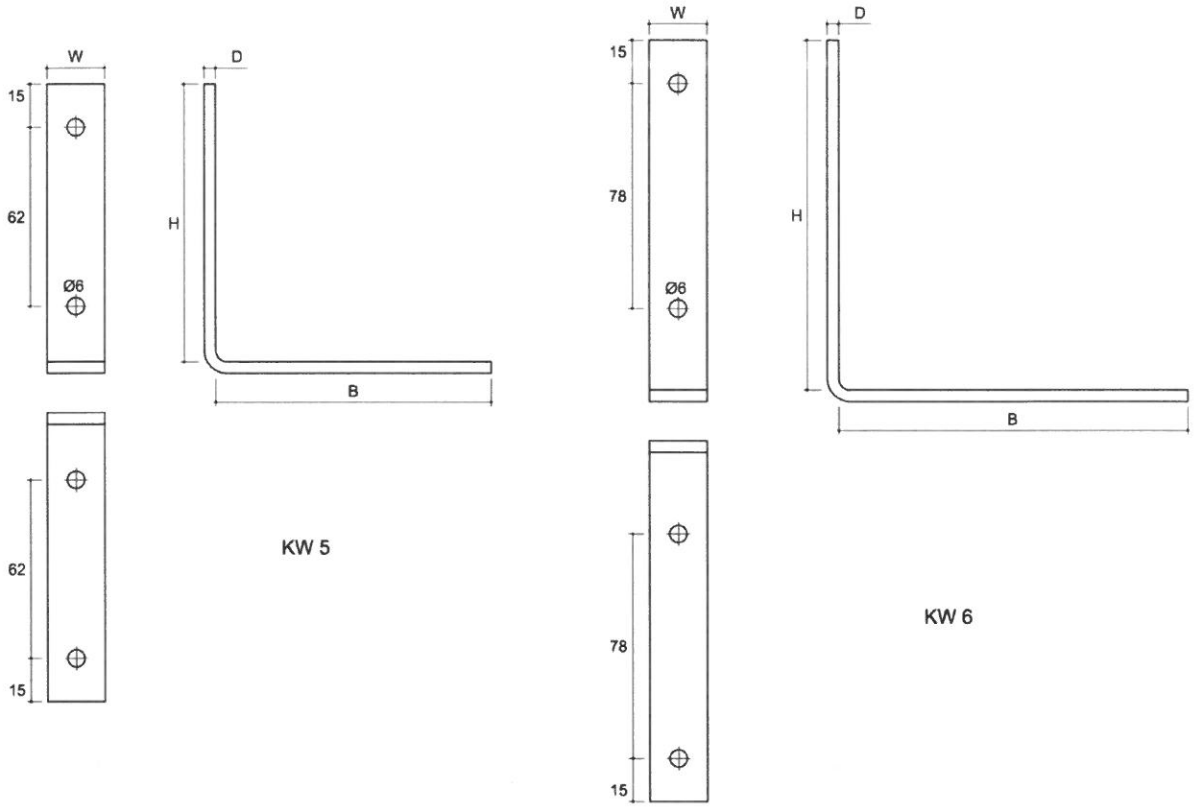
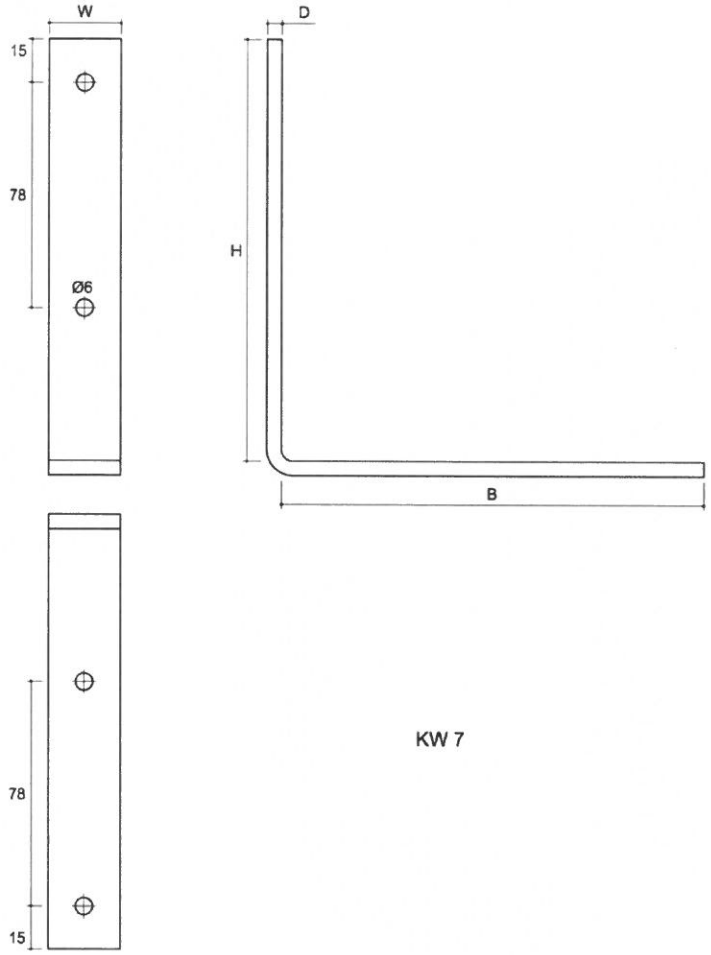


Table 19. KW three-dimensional nailing plate symbols and dimensions

Symbol	Dimensions, mm				Number of holes
	W	H	B	D	Ø6
KW 5	20	96	96	4	4
KW 6	20	121	121	4	4

DMX® type WBD, KG, WL, KRD, KMP, KMR, KMRP, KP, ŁZ, KS, KSO, KW, KWO, KB	**Annex A19** of European Technical Assessment ETA-13/0124
Three-dimensional nailing plates DMX® KW	



KW 7

Table 20. KW three-dimensional nailing plate symbols and dimensions

Symbol	Dimensions, mm				Number of holes
	W	H	B	D	Ø6
KW 7	25	146	146	5	4

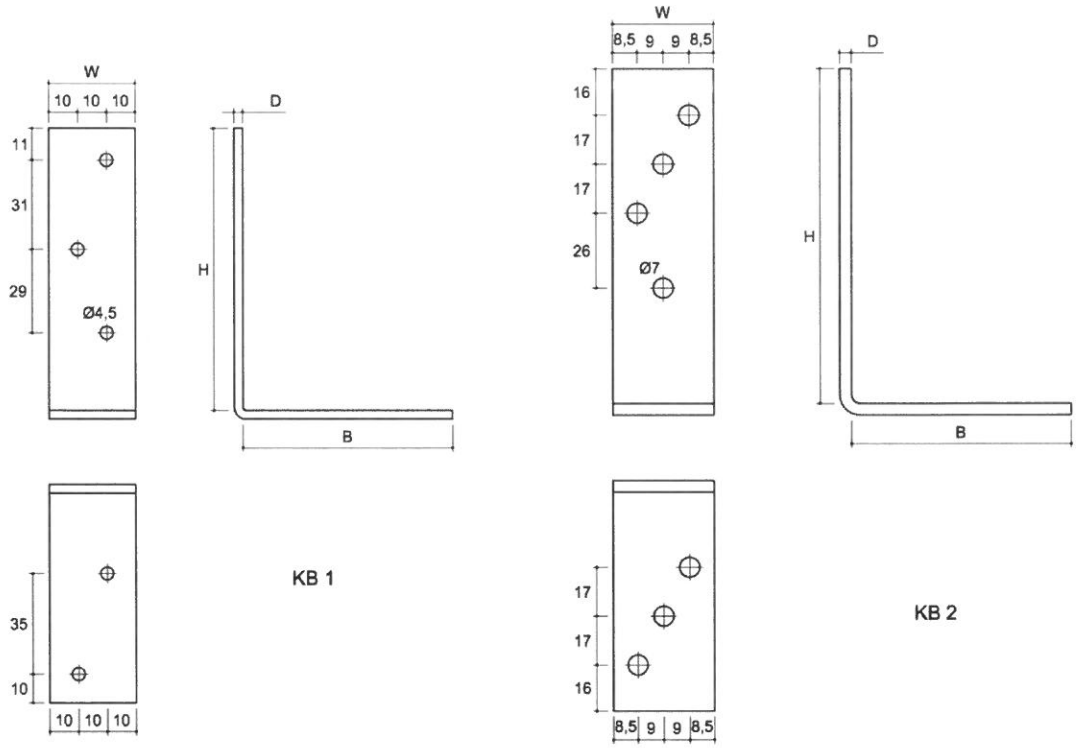
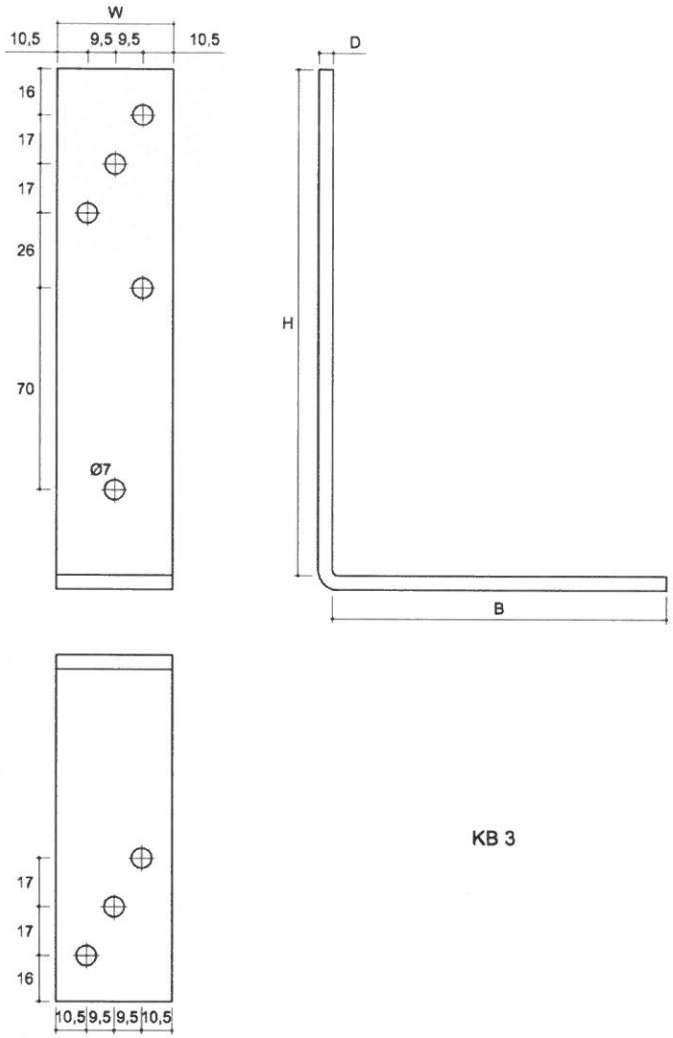


Table 21. KB three-dimensional nailing plate symbols and dimensions

Symbol	Dimensions, mm				Number of holes	
	W	H	B	D	Ø4,5	Ø7
KB 1	30	98	73	3	5	-
KB 2	35	116	76	4	-	7

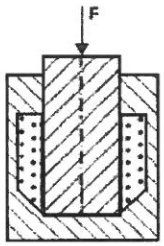


KB 3

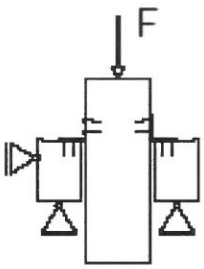
Table 22 . KB three-dimensional nailing plate symbols and dimensions

Symbol	Dimensions, mm				Number of holes
	W	H	B	D	Ø7
KB 3	40	176	116	5	8

DMX® type WBD, KG, WL, KRD, KMP, KMR, KMRP, KP, ŁZ, KS, KSO, KW, KWO, KB	**Annex 22** of European Technical Assessment ETA-13/0124
Three-dimensional nailing plates DMX® KB	

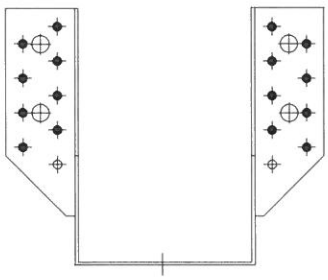


Static diagram No 1



Static diagram No 2

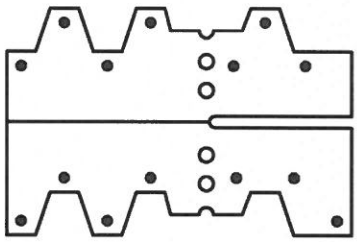
Table 23. Characteristic load-carrying capacity of joints made with DMX® type WBD three-dimensional nailing plates

DMX® symbol	Nailing*	Characteristic load-carrying capacity**, R_k, kN
WBD 105L WBD 105P WBD 130L WBD 130P WBD 140L WBD 140P WBD 170L WBD 170P WBD 200L WBD 200P		26,96

* Ring shank nails with the diameter d ≥ 4 mm and the length ≥ 40 mm. Timber grade at least C24 according to EN 338

** Loading according to static diagram No 1

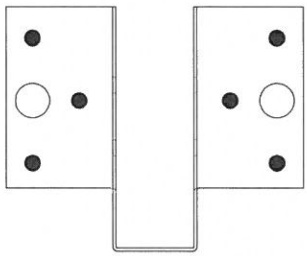
Table 24. Characteristic load-carrying capacity of joints made with type DMX® KG three-dimensional nailing plates

DMX® symbol	Nailing*	Characteristic load-carrying capacity**, R_k, kN
KG		3,44

* Ring shank nails with the diameter d ≥ 4 mm and the length ≥ 40 mm. Timber grade at least C24 according to EN 338

** Loading according to static diagram No 2

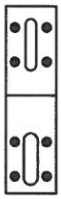
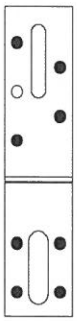
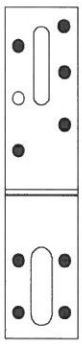
Table 25. Characteristic load-carrying capacity of joints made with DMX® type WL three-dimensional nailing plates

DMX® symbol	Nailing*	Characteristic load-carrying capacity**, $R_{k,}$ kN
WL5 WL6 WL7 WL8 WL9		14,29

* Ring shank nails with the diameter d ≥ 4 mm and the length ≥ 40 mm. Timber grade at least C24 according to EN 338

** Loading according to static diagram No 1

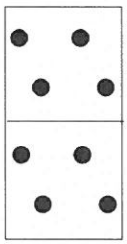
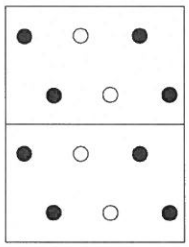
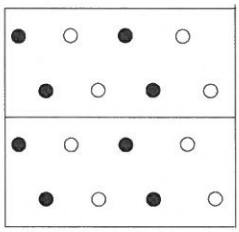
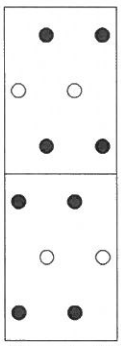
Table 26. Characteristic load-carrying capacity of joints made with DMX® type KRD three-dimensional nailing plates

DMX® symbol	Nailing*	Characteristic load-carrying capacity**, R_k, kN
KRD1		6,65
KRD2		6,68
KRD3 KRD4		6,75

* Ring shank nails with the diameter d ≥ 4 mm and the length ≥ 40 mm. Timber grade at least C24 according to EN 338

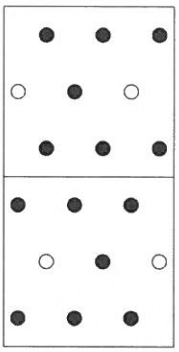
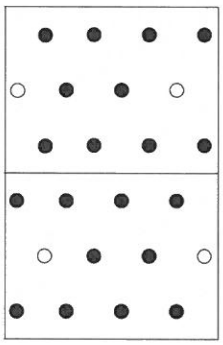
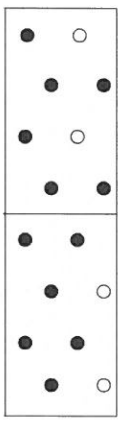
** Loading according to static diagram No 2

Table 27. Characteristic load-carrying capacity of joints made with DMX® type KMP three-dimensional nailing plates

DMX® symbol	Nailing*	Characteristic load-carrying capacity**, R_k, kN
KMP1		6,20
KMP2		5,91
KMP3		6,26
KMP4		3,41

DMX® type WBD, KG, WL, KRD, KMP, KMR, KMRP, KP, ŁZ, KS, KSO, KW, KWO, KB	**Annex B5** of European Technical Assessment ETA-13/0124
Characteristic load-carrying capacity of joints made with DMX® KMP three-dimensional nailing plates	

cont. Table 27

DMX® symbol	Nailing*	Characteristic load-carrying capacity**, R_k, kN
KMP5		5,51
KMP6		6,80
KMP7		5,53

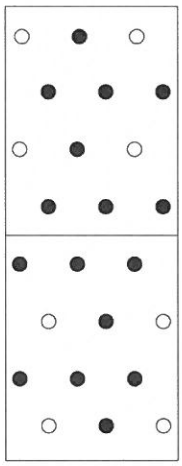
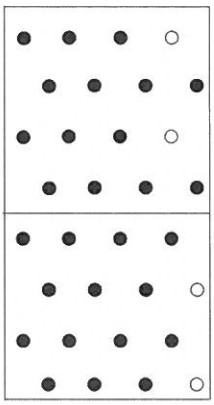
DMX® type WBD, KG, WL, KRD, KMP, KMR, KMRP, KP, ŁZ, KS, KSO, KW, KWO, KB

Characteristic load-carrying capacity of joints made with DMX® KMP three-dimensional nailing plates

Annex B6

of European Technical Assessment ETA-13/0124

cont. Table 27

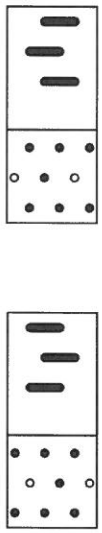
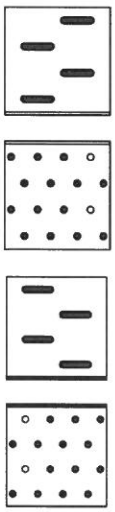
DMX® symbol	Nailing*	Characteristic load-carrying capacity**, R_k, kN
KMP8		6,57
KMP9		10,71

* Ring shank nails with the diameter d ≥ 4 mm and the length ≥ 40 mm. Timber grade at least C24 according to EN 338

** Loading according to static diagram No 2

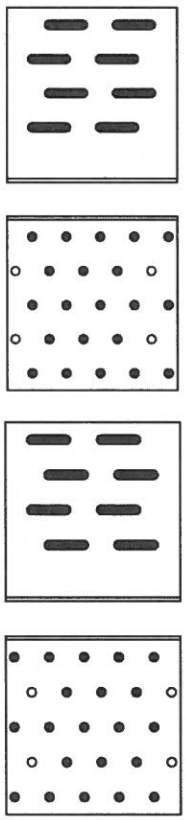
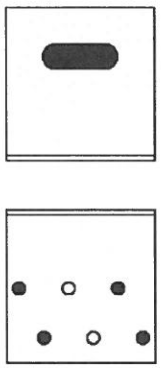
DMX® type WBD, KG, WL, KRD, KMP, KMR, KMRP, KP, ŁZ, KS, KSO, KW, KWO, KB	**Annex B7** of European Technical Assessment ETA-13/0124
Characteristic load-carrying capacity of joints made with DMX® KMP three-dimensional nailing plates	

Table 28. Characteristic load-carrying capacity of joints made with DMX® type KMR three-dimensional nailing plates

DMX® symbol	Nailing*	Characteristic load-carrying capacity**, R_k, kN
KMR1 KMR2		5,52
KMR3 KMR4		8,65

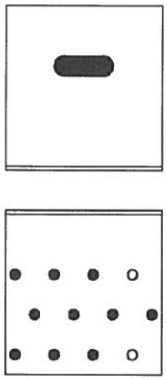
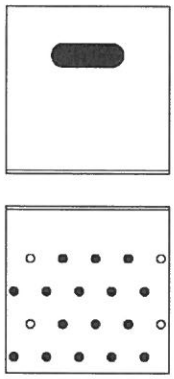
DMX® type WBD, KG, WL, KRD, KMP, KMR, KMRP, KP, ŁZ, KS, KSO, KW, KWO, KB	**Annex B8** of European Technical Assessment ETA-13/0124
Characteristic load-carrying capacity of joints made with DMX® KMR three-dimensional nailing plates	

cont. Table 28

DMX® symbol	Nailing*	Characteristic load-carrying capacity**, R_k, kN
KMR5 KMR6		10,92
KMR7		3,70

DMX® type WBD, KG, WL, KRD, KMP, KMR, KMRP, KP, ŁZ, KS, KSO, KW, KWO, KB	**Annex B9** of European Technical Assessment ETA-13/0124
Characteristic load-carrying capacity of joints made with DMX® KMR three-dimensional nailing plates	

cont. Table 28

DMX® symbol	Nailing*	Characteristic load-carrying capacity**, R_k, kN
KMR8		6,73
KMR9		6,63

* Ring shank nails with the diameter d ≥ 4 mm and the length ≥ 40 mm. Timber grade at least C24 according to EN 338

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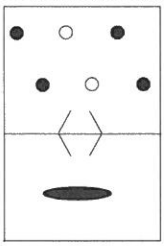
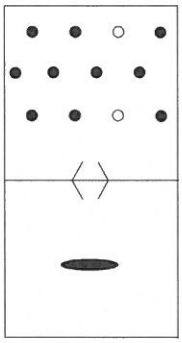
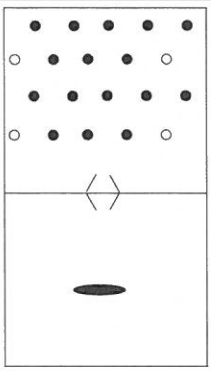
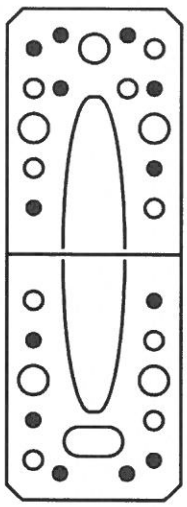
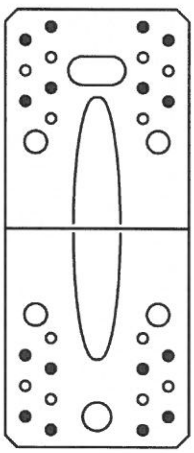
Table 29. Characteristic load-carrying capacity of joints made with DMX® type KMRP three-dimensional nailing plates

DMX® symbol	Nailing*	Characteristic load-carrying capacity**, R_k, kN
KMRP1		3.74
KMRP2		6,90
KMRP3		7,40

* Ring shank nails with the diameter d ≥ 4 mm and the length ≥ 40 mm. Timber grade at least C24 according to EN 338

** Loading according to static diagram No 2

Table 30. Characteristic load-carrying capacity of joints made with DMX® type KP three-dimensional nailing plates

DMX® symbol	Nailing*	Characteristic load-carrying capacity**, R_k, kN
KP11		3.62
KP21		3,64

* Ring shank nails with the diameter d ≥ 4 mm and the length ≥ 40 mm. Timber grade at least C24 according to EN 338

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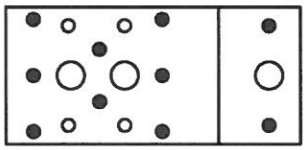
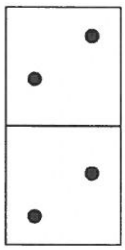
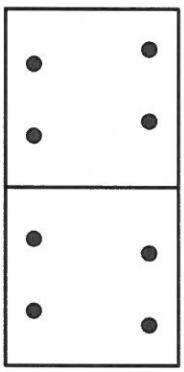
Table 31. Characteristic load-carrying capacity of joints made with DMX® type ŁZ three-dimensional nailing plates

DMX® symbol	Nailing reference drawing*	Characteristic load-carrying capacity**, R_k, kN
ŁZ1 ŁZ2 ŁZ3		3,62

* Ring shank nails with the diameter d ≥ 4 mm and the length ≥ 40 mm. Timber grade at least C24 according to EN 338

** Loading according to static diagram No 2

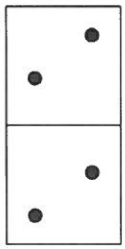
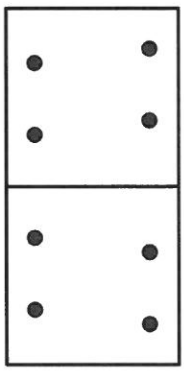
Table 32. Characteristic load-carrying capacity of joints made with DMX® type KS three-dimensional nailing plates

DMX® symbol	Nailing*	Characteristic load-carrying capacity**, R_k, kN
KS1 KS2		3,44
KS3		6,65

* Ring shank nails with the diameter d ≥ 4 mm and the length ≥ 40 mm. Timber grade at least C24 according to EN 338

** Loading according to static diagram No 2

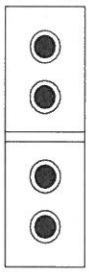
Table 33. Characteristic load-carrying capacity of joints made with DMX® type KSO three-dimensional nailing plates

DMX® symbol	Nailing*	Characteristic load-carrying capacity**, R_k, kN
KSO1 KSO2		3,49
KSO3		6,58

* Ring shank nails with the diameter d ≥ 4 mm and the length ≥ 40 mm. Timber grade at least C24 according to EN 338

** Loading according to static diagram No 2

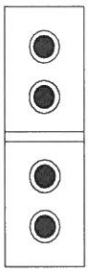
Table 34. Characteristic load-carrying capacity of joints made with DMX® type KW three-dimensional nailing plates

DMX® symbol	Nailing*	Characteristic load-carrying capacity**, R_k, kN
KW1 KW2 KW3 KW4 KW5 KW6 KW7		3,33

* Ring shank nails with the diameter d ≥ 4 mm and the length ≥ 40 mm. Timber grade at least C24 according to EN 338

** Loading according to static diagram No 2

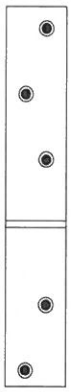
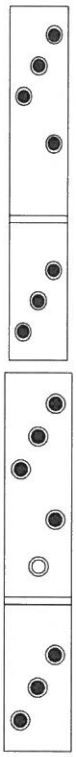
Table 35. Characteristic load-carrying capacity of joints made with DMX® type KWO three-dimensional nailing plates

DMX® symbol	Nailing*	Characteristic load-carrying capacity**, R_k, kN
KWO1 KWO2 KWO3 KWO4		2,51

* Ring shank nails with the diameter d ≥ 4 mm and the length ≥ 40 mm. Timber grade at least C24 according to EN 338

** Loading according to static diagram No 2

Table 36. Characteristic load-carrying capacity of joints made with DMX® type KB three-dimensional nailing plates

DMX® symbol	Nailing*	Characteristic load-carrying capacity**, R_k, kN
KB1		7,46
KB2 KB3		8,62

* Ring shank nails with the diameter d ≥ 4 mm and the length ≥ 40 mm. Timber grade at least C24 according to EN 338

** Loading according to static diagram No 2