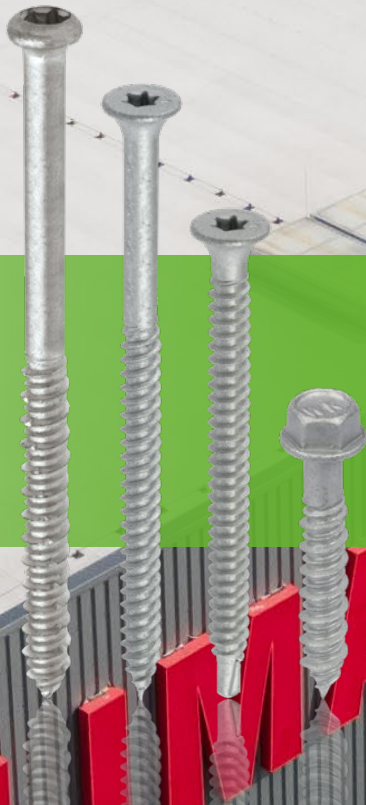


KLIMAS

FASTENER TECHNOLOGIES



FASTENERS FOR FLAT ROOF
THERMAL INSULATION AND
WATERPROOFING SYSTEM

Wkręt-met
KLIMAS

POLISH
PRODUCER

KLIMAS



Production plant no. 2 and central warehouse - total area of 30,000 m²
New investment: plants no. 3 and 4 - total area of 30,000 m²



Production plant no. 1 - total area of 20,000 m²



4

PRODUCTION AND
STORAGE FACILITIES
OF TOTAL AREA OF

80 000 m²

Production of Klimas Wkręt-met fastening technologies is held in 4 modern facilities, located in Kuźnica Kiedrzyńska and Wanaty near Częstochowa. The Company has launched production in its third facility in Wanaty which, with use of state-of-the-art technologies and applications, implements the assumptions of the Industry 4.0. programme.



PRODUCTION PROCESS OF STEEL PRODUCTS:

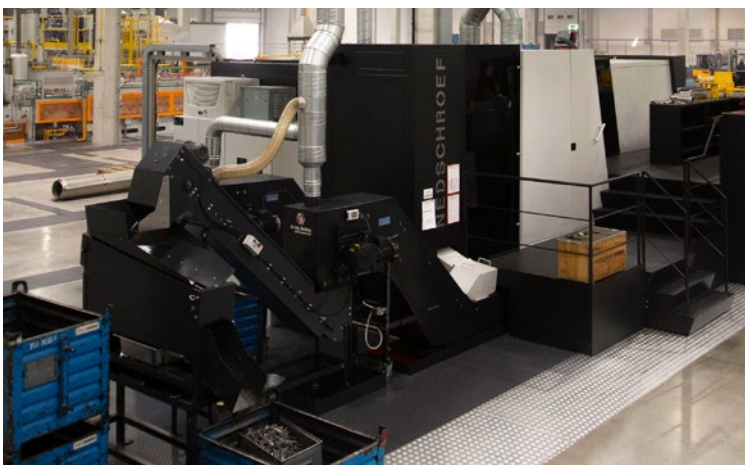
- Top-quality raw-material from European steelworks.
- Various steel grades.
- Own RGD department.
- Extensive machine park.
- Hardening (heat treatment).
- Application of protective coats.
- Possibility of painting heads and washers to RAL colours.
- Quality control at each production stage.
- Polish and European technical assessments.

WE PRODUCE

30 000 000 pcs. of SCREWS DAILY



Production plant no. 1 - total area of 20.000 m²



OWN PRODUCTION OF FASTENER TECHNOLOGIES

PRODUCTS DEVELOPED BY R&D
WIDE RANGE OF SIZES
TOP QUALITY

MORE THAN

400

MODERN MACHINES



- Highest quality production materials.
- Appropriate flexibility is guaranteed by conditioning of polyamide products.
- Own production using the highest quality hybrid injection moulding machines with robots.
- Automatic packing process: from carton/blister to pallet wrapping.

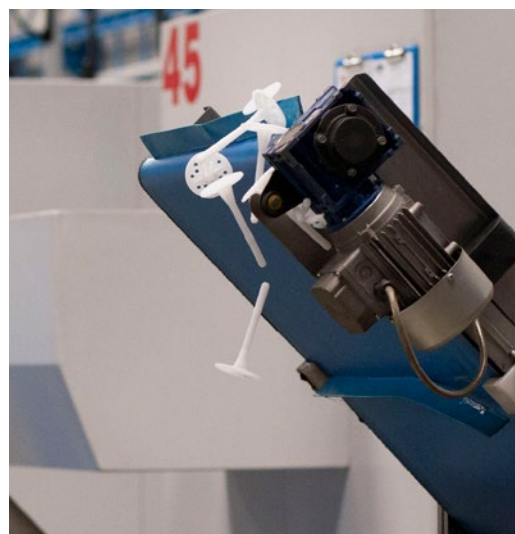
WE PRODUCE

9 000 000

pcs. of PLASTIC FASTENERS DAILY



Production plant no. 2 and central warehouse - total area of 30,000 m²



OWN PRODUCTION OF FASTENER TECHNOLOGIES

PRODUCTS DEVELOPED BY R&D
WIDE RANGE OF SIZES
TOP QUALITY

MORE THAN

120

STATE-OF-THE-ART INJECTION MOULDERS



PROCESS OF SCREW HARDENING:

- Advanced machine park including 7 hardening furnaces.
- 2 modern furnaces for hardening of screws over 200 mm long while keeping high quality of parameters – no curvature.
- Automated hardening line – high capacity.

WE HARDEN

21 000 000 pcs. of **SCREWS**
DAILY





CUSTOM COATING



White Zinc

Zinc coating guarantee of quality and high level of anti-corrosion protection.



Yellow Zinc

Zinc coating guarantee of quality and high level of anti-corrosion protection.



SQ Ceramic

Very high level of anti-corrosion protection (several times higher than the traditional galvanization).

Advanced machine park: **ZN yellow without CR6+**.

Advanced processing line for SQ Ceramic coating.

Automatic passivation and top coat line.

State-of-the-art robots and baths for sealing of coating.



ADVANCED PROCESSING LINE – HARDENING PLANT AND GALVANIZING LINE DEPARTMENT

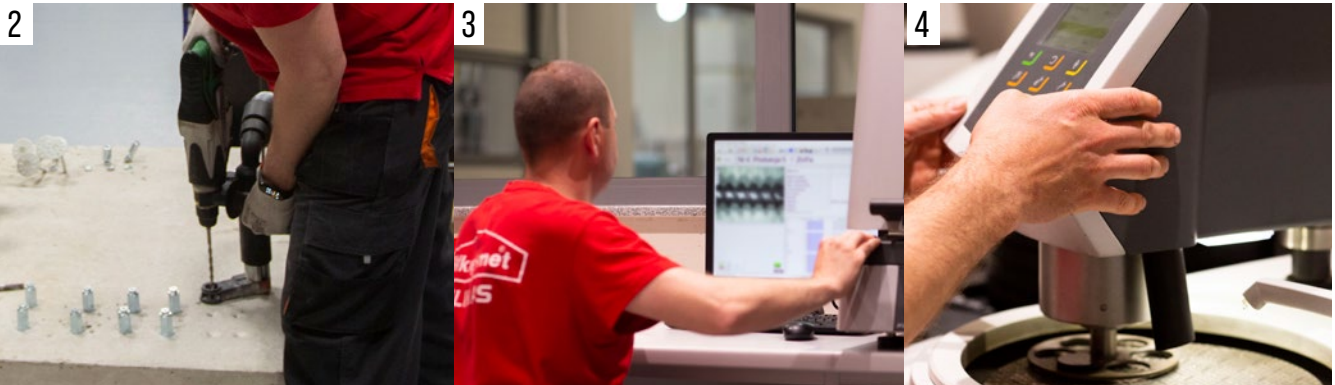
PRECISION
HIGH QUALITY
HIGH PRODUCTION CAPACITY

HARDENING FURNACES



1

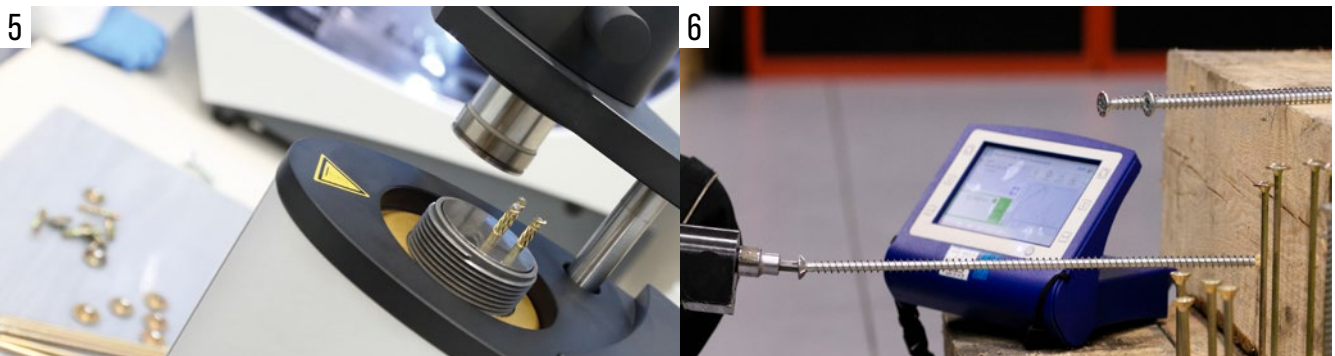
1. Hardness and micro Vickers hardness testing. | 2. Assembly and load-resistance tests for all substrate categories according to ETAG. | 3. Testing thickness of corrosion protection plating using X-ray fluorescence spectroscopy tester - Fischerscope X-RAY XDL. Analysis of chemical composition of alloy steels. | 4. Preparation of metallographic micro-sections - metallographic tests. | 5. Preparation of metallographic micro-sections - metallographic tests. | 6. Torque value testing | 7. Determination of tensile strength for wire and finished goods. | 8. Metallographic tests - control of thermal and chemical treatment process, hardness, structure. | 9. Testing of corrosion resistance in salt spray/cyclic chamber. | 10. Accelerated ageing of paint coats in UV chamber. | 11. Testing of loading resistance of fasteners - characteristic pull-out strength.



2

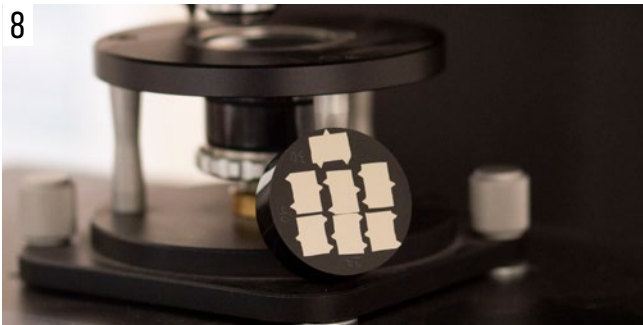
3

4



5

6



APPROVALS
CERTIFICATES
AWARDS



20

EUROPEAN APPROVALS



MODERN PACKING

- Automated picking and packing processes.
- Most popular packaging: unit packages, bags, blisters.
- High performance

HIGH STORAGE WAREHOUSE

24 000 PALLET PLACE



OUR ASSETS KLIMAS WKREĆ-MET - WHY IT IS WORTH?

KLIMAS

FASTENER TECHNOLOGIES



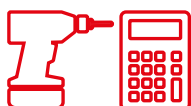
BRAND MOST FREQUENTLY CHOSEN BY CONTRACTORS IN POLAND*

*according to annual research of ASM
- Centre for Market Research and Analysis (2020)



Certified products - 21 European Technical Approvals and 21 Polish Technical Approvals

Our products regularly receive Polish and European technical approvals what proves their reliability. Due to these documents Polish and foreign Clients obtain a guarantee of the highest quality of Klimas Wkręt-met brand products.



Technical advisory

Caring about the Client's comfort, we ensure the assistance of technical advisors in the selection of our products. Persons interested in our offer may always count on the professional support in the selection of fastening systems adequate to the needs of the Client and requirements of the specific construction.



Partnership

Our company is set on continuous improvement of its production control processes at each stage of manufacture. We wish to provide our customers with services of the highest possible standard.



Our company offers products that find application in many different industries

Specialised sections of products reach many selected groups of customers who value and appreciate their reliability.

Klimas Wkręt-met undertakes cooperation with companies from various industries using products marked with our brand. Thus, for example, thanks to cooperation with window producers we deliver them high quality products used by them in the production process – and in return we receive the knowledge necessary for enhancing our products and developing brand new innovative products by Klimas Wkręt-met that perfectly fit the needs of a given industry or field.



Integrated Management System

Quality Management System according to PN-EN ISO 9001.

OH&S Management System according to PN-EN ISO 45001.

Energy Management System according to PN-EN ISO 50001.



Construction Brand of the Year 2021

For the 9th time, Klimas Wkręt-met won the most prestigious title on the market of building materials in Poland.

Forbes Diamond Award 2021

Klimas Wkręt-met has been awarded with Forbes Diamond 2021. According to the ranking compiled by Forbes Magazine and Bisnode Polska, the producer of fastening techniques dynamically increased its sales value in the last three years.

Statuettes of the Polish Windows and Doors Association

The Polish Windows and Doors Association awarded Klimas Wkręt-met for its achievements in the woodwork industry. The Association also awarded the prestigious title of Honorary Member to the founder and President of the company - Wojciech Klimas.

Construction Company of the Year

The editors and the Program Council of the "Builder" magazine once more awarded Klimas Wkręt-met the title of Construction Company of the Year. The distinction is awarded to companies characterized by dynamic development and strong market position. This title aims at selecting the most outstanding companies in the country, their promotion and popularization of good business practices.

Creator of Construction 2020

For 9 years now, the Polish Chamber of Civil Engineers has been distinguishing individuals and companies that shape the construction market with their activities, introduce new technologies and innovative solutions, as well as take care of the quality of products and services offered and can be proud of their CSR activities. The title of the Creator of Construction 2019 went to President Wojciech Klimas, as well as to the entire Klimas Wkręt-met company.





DAFA - Flat Roof and Fasade Contractors Association

The organization undertakes activities aimed at unification of executive standards and commercial conditions, creation of partnership relations, initiation of activities influencing the development of the industry and integration of environments that operate in the area of design and construction of flat roofs and facades.



PoId - Polish Windows and Doors Association

The organization unites domestic manufacturers, suppliers and distributors related to woodwork. The Association aims to combat all forms of unfair competition, set professional standards and carry out technical analyses, among other things.



PSD - Polish Roofers' Association

The Polish Roofers' Association unites professionals from the roofing industry: contractors, experts, designers, suppliers and manufacturers of construction materials for roofing.



EDG - Energy Efficient Finished Houses Association

The EDG Association is an organization associating manufacturers of prefabricated buildings and producers of materials dedicated to this type of construction in Poland. The organization places great emphasis on increasing awareness and taking care of the quality and reliability of services.



SSO - Association for External Thermal Insulation Composite Systems - ETICS

Membership in the Association for Thermal Insulation composite systems allows us to actively contribute to the development of energy efficient and sustainable construction industry. The Association unites the leading manufacturers of thermal insulation composite systems in Poland.



SDD - Wooden House Association

One of product categories carried by Klimas Wkręt-met are fasteners for wooden constructions that work great in the wooden construction industry. That is why, since 2014, the company has been a member of the Wooden House Association which promotes wood as an environmentally friendly material and gathers all stakeholders interested in the subject of wooden houses. A significant goal of the organization is to take up activities aimed at improving the quality of houses made of wood.



BCC - Business Centre Club










The Klimas Wkręt-met company has been awarded the European Medal. The award was granted by the largest organization of individual employers in the country - Business Center Club. Awards were granted by the Business Center Club on June 12th this year at Warsaw headquarter placed in the Lubomirski Palace. It was the final of the 30th edition of the event. Among the guests were European Medal winners, honorary winners, Chancellors of the BCC Regional Lodge and the representatives of the European Economic and Social Committee.

PRODUCT INDEX

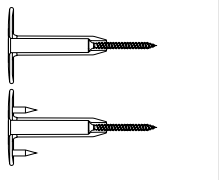

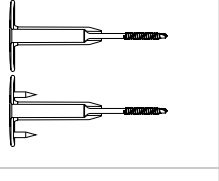

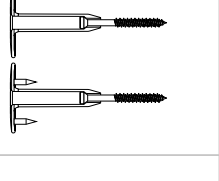

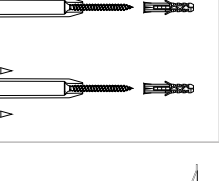



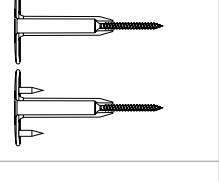

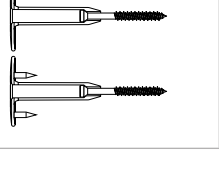


FASTENERS FOR FLAT ROOF THERMAL INSULATION AND WATERPROOFING SYSTEM

TYPE	PRODUCT NAME	page
LINO 13	 ø 13 plastic sleeve NYLON	22
LINO K 13	 ø 13 plastic sleeve with spiker (extra holding power) NYLON	24
WDB-T-4,8	 Self-tapping fastener for profiled roof sheets of 0,50 - 0,75 mm in thickness and wooden substrate	26
WSR-T-4,8	 Self-drilling fastener for profiled roof sheets of 0,5 - 1,25 mm thickness	28
WBSW-6,3	 Self-tapping fastener for concrete and wooden substrate	30
WBG-D	 Self-tapping fastener for concrete substrates	32
KD-04-W5 KD-05 KD-01 KD-02-W-5,5 KD-07-WW	 Steel washers - round	34
KD-03-P KD-03-W5 KD-03-W7 KD-03-W9 KD-03-WW7	 Steel washers - oval	35
SMN-6x50/SMN-8x60	 Expansion plug NYLON	36
KNX-8x50	 Plastic sleeve plug for concrete substrates NYLON (to be combined with WDB-T fastener)	37
FBZ	 Vapour barrier foil	38

Installation accessories

TYPE	PRODUCT NAME	page	
PH-2, TX-20, TX-30		Driver bit PH-2	39
			
DWB-400 M6		Extention for M6 bits	39
TX20-S2M6 TX30-S2M6 PH2-S2M6		Bits M6 for extention DWB-400 M6	39
SW-8		Socketed wrench SW-8	39
H-A		Drill bits for concrete type SDS ø 5,0 mm	40
SD-4		Drill bits for concrete type SDS ø 6,0 ø 8,0 mm	40
DWS-500		Drill extention with wedge for WSDP	40
WSDP		Drill for DWS-500 extension - 5,0 mm	40

Fastener type selection of substrate

FASTENER TYPE SELECTION - TECHNICAL DATA	TYPE		page	
Substrate: steel sheets profile 0,50 - 0,75 mm in thickness	LINO/LINO K + WDB-T, KD + WDB-T			52
Substrate: steel sheets profile 0,50 - 1,25 mm in thickness	LINO/LINO K + WSR-T, KD + WSR-T			58
Substrate: concrete C12/15, C20/25, thin concrete slabs	LINO/LINO K + WBSW, KD + WBSW			64
Substrate: concrete C12/15, C20/25, thin concrete slabs	LINO/LINO K + WDB-T + KNX KD + WDB-T + KNX			70
Substrate: concrete C12/15, C20/25	KD + SMN-6X50, KD + SMN-8X60			76
Substrate: concrete C12/15, C20/25, thin concrete slabs	KD + WB6-D			77
Wooden substrate: timber C24, OSB board, plywood	LINO/LINO K + WDB-T, KD + WDB-T			78
Wooden substrate: timber C24, OSB board, plywood	LINO/LINO K + WBSW, KD + WBSW			82
Vapour foil	FBZ-0250			120

KLIMAS

FASTENER TECHNOLOGIES



**FASTENERS FOR FLAT ROOF THERMAL INSULATION
AND WATERPROOFING SYSTEM**

LINO - 13 (PA)

1 THE HIGHEST QUALITY

The sleeve is made of nylon-polyamide (PA)

2 LEVELING OF THERMAL BRIDGES

3 EASY OF ASSEMBLE

4 ANTI-CORROSION PROTECTION

corrosion protection of fasteners according to the test of 15 Kesternich cycles

5 PRODUCT MARKING

product identification - product feature

WE DELIVER COMPLETED SLEEVES WITH FASTENER*

* on request and order



FASTENERS FOR FLAT ROOF THERMAL INSULATION AND WATERPROOFING SYSTEM

PRODUCTION PROGRAMME

PLASTIC SLEEVE, FASTENERS, STEEL WASHERS, ACCESSORIES



KLIMAS WKRET-MET



Plastic sleeve \varnothing 13 for fixing of flat roof thermal insulation and waterproofing systems

LINO 13

\varnothing 13

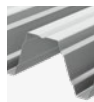
Plastic sleeve for fixing of flat roof thermal insulation and waterproofing systems to be used with self-tapping or self-drilling fasteners.



ETA-15/0578



SUBSTRATES (ETAG 006)



Substrate: steel sheets
profile of 0,50 - 1,25 mm
in thickness



Substrate: concrete C12/15,
C20/25, thin concrete slabs



Wooden substrate: timber
C24, OSB board, plywood

SLEEVE MATERIAL	Poliamid (Nylon)
COMPATIBLE FASTENER TYPES AND DIAMETERS	WDB-T-4,8 mm, WSR-T-4,8 mm, WBSW-6,3 mm
APPLICATION	<ul style="list-style-type: none"> For fixing thermal insulation type: EPS; XPS; MW; PIR; PUR For fixing waterproofing type: PVC; TPO/ FPO; EPDM and bituminous membrane for all substrates



NYLON

Nylon body made of top quality plastic materials.



TELESCOPIC DESIGN

Telescopic design prevents damage to waterproofing systems; fastener's internal air pocket reduces the effect of thermal bridging.



SPECIAL PROTRUSIONS

Special protrusions on the inside of the fastener prevent the fastener from popping up.



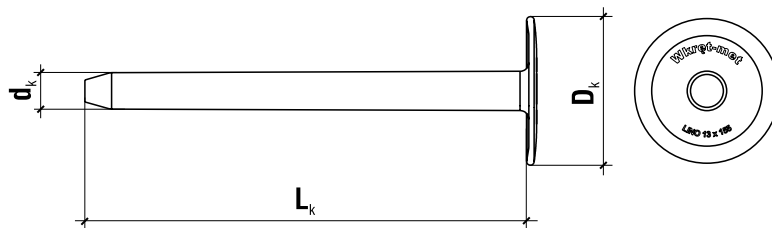
PRODUCT MARKING

Easy to identify.

Poliamid (Nylon)

\varnothing 13

LINO 13
Length range: 35 - 285 mm

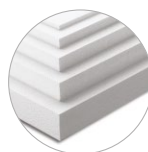


Technical data

	Code	Sleeve length	Sleeve diameter	Collar diameter	Quantity per box
	Poliamid	L _k [mm]	d _k [mm]	D _k [mm]	[pcs.]
LINO 13					
ø 13	LINO13035PA(200)	35	13	50	200
	LINO13055PA(200)	55	13	50	200
	LINO13085PA(200)	85	13	50	200
	LINO13105PA(200)	105	13	50	200
	LINO13135PA(200)	135	13	50	200
	LINO13155PA(200)	155	13	50	200
	LINO13185PA(200)	185	13	50	200
	LINO13235PA(100)	235	13	50	100
	LINO13285PA(100)	285	13	50	100

HOW TO READ THE CODE, e.g. LINO13035PA(200)?				
LINO	13	035	PA	(200)
Type	Sleeve diameter: 13 mm	Sleeve length: 35 mm	Sleeve material: Poliamid (NYLON)	Quantity per box: 200

Recommended for thermal insulation materials



polystyrene foam



mineral wool



PIR
foam



PUR
foam

WE DELIVER COMPLETED SLEEVES WITH FASTENER*

*on request and on order



ACCESSORIES

SEE PAGE 41

Plastic sleeve Ø 13 with spikes (extra holding power) for fixing of flat roof thermal insulation and waterproofing systems

LINO K 13

Ø 13

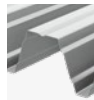
Plastic sleeve with spikes (extra holding power) for fixing of flat roof thermal insulation and waterproofing systems to be used with self-tapping or self-drilling fasteners.



ETA-15/0578



SUBSTRATES (ETAG 006)



Substrate: steel sheets
profile of 0,50 - 1,25 mm
in thickness



Substrate: concrete C12/15,
C20/25, thin concrete slabs



Wooden substrate: timber
C24, OSB board, plywood

SLEEVE MATERIAL	Poliamid (Nylon)
COMPATIBLE FASTENER TYPES AND DIAMETERS	WDB-T-4,8 mm, WSR-T-4,8 mm, WBSW-6,3 mm
APPLICATION	<ul style="list-style-type: none"> For fixing thermal insulation type: EPS; XPS; MW; PIR; PUR For fixing waterproofing type: PVC; TPO/ FPO; EPDM and bituminous membrane for all substrates



NYLON

Nylon body made of top quality plastic materials.



SPIKE - EXTRA HOLDING POWER

Extra holding power provided by three spikes makes heavy load bearing more efficient, especially when using wide waterproofing single-ply membrane systems..



TELESCOPIC DESIGN

Telescopic design prevents damage to waterproofing systems; fastener's internal air pocket reduces the effect of thermal bridging.



SPECIAL PROTRUSIONS

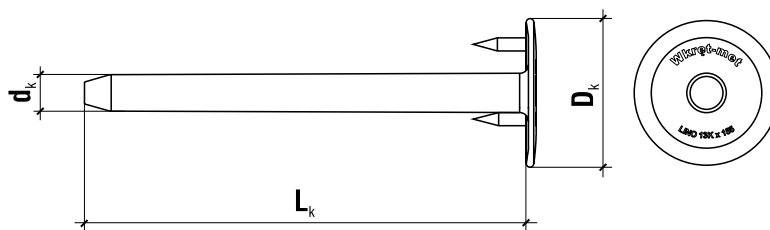
Special protrusions on the inside of the fastener prevent the fastener from popping up.



PRODUCT MARKING

Easy to identify.

Poliamid (Nylon)	
Ø 13	LINO K 13 Length range: 35 - 285 mm



Technical data

	Code	Sleeve length	Sleeve diameter	Collar diameter	Quantity per box
	Poliamid	L_k [mm]	d_k [mm]	D_k [mm]	[pcs.]
LINO 13					
ø 13	LINOK13035PA(200)	35	13	50	200
	LINOK13055PA(200)	55	13	50	200
	LINOK13085PA(200)	85	13	50	200
	LINOK13105PA(200)	105	13	50	200
	LINOK13135PA(200)	135	13	50	200
	LINOK13155PA(200)	155	13	50	200
	LINOK13185PA(200)	185	13	50	200
	LINOK13235PA(100)	235	13	50	100
	LINOK13285PA(100)	285	13	50	100

HOW TO READ THE CODE, e.g. LINOK13035PA(200)?				
LINO K	13	035	PA	(200)
Type	Sleeve diameter: 13 mm	Sleeve length: 35 mm	Sleeve material: Poliamid (NYLON)	Quantity per box: 200

Recommended for thermal insulation materials



polystyrene foam



mineral wool



PIR
foam



PUR
foam

WE DELIVER COMPLETED SLEEVES WITH FASTENER*

*on request and on order



ACCESSORIES

SEE PAGE 41

Self-tapping fastener for fastening of flat roof thermal insulation and waterproofing systems to 0,50 ÷ 0,75 mm thickness steel sheets profile, timber, OSB and plywood.

WDB-T

Ø 4,8

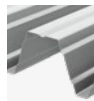
Self-tapping fastener for fastening of flat roof thermal insulation and waterproofing systems to 0,50 ÷ 0,75 mm thick profiled roof sheets, timber, OSB and plywood.



ETA-15/0578



SUBSTRATES (ETAG 006)



Substrate: steel sheets profile of 0,50 - 0,75 mm in thickness



Substrate: concrete C12/15, C20/25, thin concrete slabs with KNX expansion anchor



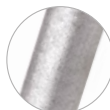
Wooden substrate: timber C24, OSB board, plywood

Fastener MATERIAL	Carbon steel / SQ Ceramic coated
COMPATIBLE SLEEVE	LINO 13, LINO K 13
APPLICATION	<ul style="list-style-type: none"> For fixing thermal insulation type: EPS; XPS; MW; PIR; PUR For fixing waterproofing type: PVC; TPO/ FPO; EPDM and bituminous membrane for all substrates



TX-20

TX drive guarantees optimum torque transfer.



SQ CERAMIC COATED

Highest corrosion protection.



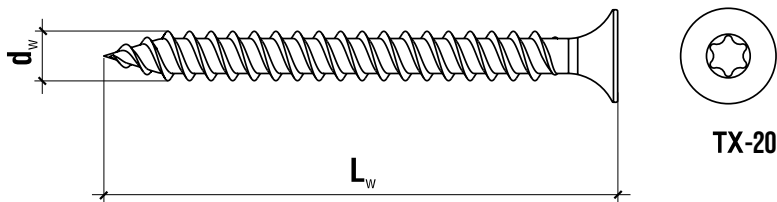
THREAD TO THE END OF FASTENER

Facilitates screwing in to the substrate.

SQ Ceramic

Ø 4,8

WDB-T
Length range: 40 - 240 mm



Technical data

	Code	Fastener diameter	Fastener length	Quantity per box
	SQ Ceramic	d_w [mm]	L_w [mm]	[pcs.]
WDB-T				
ø4,8	WDB-T-48040-D(100)	4,8	40	100
	WDB-T-48050-D(100)	4,8	50	100
	WDB-T-48060-D(100)	4,8	60	100
	WDB-T-48070-D(100)	4,8	70	100
	WDB-T-48080-D(100)	4,8	80	100
	WDB-T-48090-D(100)	4,8	90	100
	WDB-T-48100-D(100)	4,8	100	100
	WDB-T-48120-D(100)	4,8	120	100
	WDB-T-48140-D(100)	4,8	140	100
	WDB-T-48160-D(100)	4,8	160	100
	WDB-T-48180-D(100)	4,8	180	100
	WDB-T-48200-D(100)	4,8	200	100
	WDB-T-48220-D(100)	4,8	220	100
	WDB-T-48240-D(100)	4,8	240	100

HOW TO READ THE CODE, e.g. WDB-T-48040-D(100)				
WDB-T-	48	040	-D	(100)
Type	Fastener diameter: 4,8 mm	Fastener length: 40 mm	Type of coating: SQ Ceramic	Quantity per box: 100

ACCESSORIES

SEE PAGE 41

Self-drilling fastener for fastening of flat roof thermal insulation and waterproofing systems to 0,50 ÷ 1,25 mm thickness steel sheets profile

WSR-T

∅ 4,8

Self-drilling fastener for fastening of flat roof thermal insulation and waterproofing systems to 0,50 ÷ 1,25 mm thickness steel sheets profile.



ETA-15/0578



SUBSTRATES (ETAG 006)



Substrate: steel sheets profile of 0,50 - 1,25 mm in thickness

Fastener MATERIAL	Carbon steel / SQ Ceramic coated
COMPATIBLE SLEEVE	LINO 13, LINO K 13
APPLICATION	<ul style="list-style-type: none"> For fixing thermal insulation type: EPS; XPS; MW; PIR; PUR For fixing waterproofing type: PVC; TPO/ FPO; EPDM and bituminous membrane for all substrates



TX-20

TX drive guarantees optimum torque transfer.



SQ CERAMIC COATED

Highest corrosion protection.



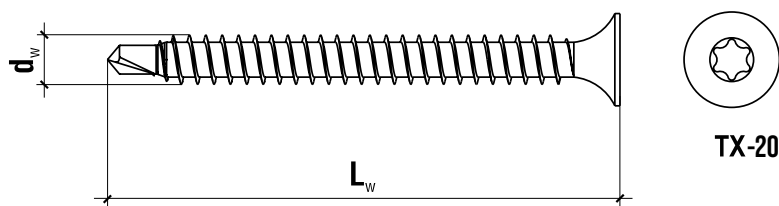
SELF-DRILLING TIP

With a sharp bit which reduces torque, it makes for exceptionally fast drilling through metal sheets.

SQ Ceramic

∅ 4,8

WSR-T
Length range: 40 - 300 mm



Technical data

	Code	Fastener diameter	Fastener length	Quantity per box
	SQ Ceramic	d_w [mm]	L_w [mm]	[pcs.]
WSR-T				
ø4,8	WSR-T-48040-D(100)	4,8	40	100
	WSR-T-48050-D(100)	4,8	50	100
	WSR-T-48060-D(100)	4,8	60	100
	WSR-T-48070-D(100)	4,8	70	100
	WSR-T-48080-D(100)	4,8	80	100
	WSR-T-48090-D(100)	4,8	90	100
	WSR-T-48100-D(100)	4,8	100	100
	WSR-T-48120-D(100)	4,8	120	100
	WSR-T-48140-D(100)	4,8	140	100
	WSR-T-48160-D(100)	4,8	160	100
	WSR-T-48180-D(100)	4,8	180	100
	WSR-T-48200-D(100)	4,8	200	100
	WSR-T-48220-D(100)	4,8	220	100
	WSR-T-48240-D(100)	4,8	240	100
	WSR-T-48260-D(100)	4,8	260	100
	WSR-T-48300-D(100)	4,8	300	100

HOW TO READ THE CODE, e.g. WSR-T-48040-D(100)

WSR-T-	48	040	-D	(100)
Type	Fastener diameter: 4,8 mm	Fastener length: 40 mm	Type of coating: SQ Ceramic	Quantity per box: 100

ACCESSORIES

SEE PAGE 41

Self-tapping fastener for fastening of flat roof thermal insulation and waterproofing systems to concrete, timber, OSB and plywood

WBSW

Ø 6,3

Self-tapping fastener for fastening of flat roof thermal insulation and waterproofing systems to concrete, timber, OSB and plywood.



ETA-15/0578



SUBSTRATES (ETAG 006)



Substrate: concrete C12/15, C20/25,
thin concrete slabs



Timber, OSB board and plywood

Fastener MATERIAL	Carbon steel / SQ Ceramic coated
COMPATIBLE SLEEVE	LINO 13, LINO K 13
APPLICATION	<ul style="list-style-type: none"> For fixing thermal insulation type: EPS; XPS; MW; PIR; PUR For fixing waterproofing type: PVC; TPO/ FPO; EPDM and bituminous membrane for all substrates
CONCRETE DRILL BIT	<ul style="list-style-type: none"> Diameter 5,0 mm



TX-30

TX drive guarantees optimum torque transfer.



SQ CERAMIC COATED

Highest corrosion protection.



DOUBLE THREAD

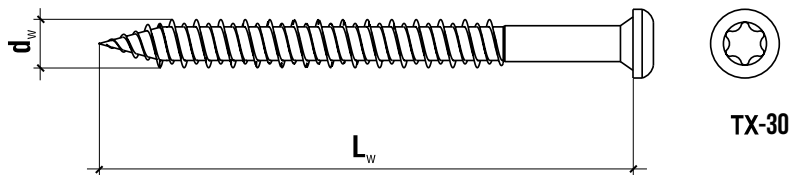
Facilitates direct installation in concrete.



SQ Ceramic

Ø 6,3

WBSW
Length range: 60 - 300 mm



Technical data

	Code	Fastener diameter	Fastener length	Quantity per box
	SQ Ceramic	d_w [mm]	L_w [mm]	[pcs.]
WBSW				
ø 6,3	WBSW-63060-D(100)	6,3	60	100
	WBSW-63070-D(100)	6,3	70	100
	WBSW-63080-D(100)	6,3	80	100
	WBSW-63090-D(100)	6,3	90	100
	WBSW-63100-D(100)	6,3	100	100
	WBSW-63120-D(100)	6,3	120	100
	WBSW-63140-D(100)	6,3	140	100
	WBSW-63160-D(100)	6,3	160	100
	WBSW-63180-D(100)	6,3	180	100
	WBSW-63200-D(100)	6,3	200	100
	WBSW-63220-D(100)	6,3	220	100
	WBSW-63240-D(100)	6,3	240	100
	WBSW-63300-D(100)	6,3	300	100

HOW TO READ THE CODE, e.g. WBSW-63060-D?				
WBSW	63	060	-D	(100)
Type	Fastener diameter: 6.3 mm	Fastener length: 60 mm	Type of coating: SQ Ceramic	Quantity per box: 100

ACCESSORIES

SEE PAGE 41



Self-tapping fastener for fastening of flat roof thermal insulation and waterproofing to be used with with KD steel washers

WB6-D

Ø 6,3

Self-tapping fastener for fastening of flat roof thermal insulation and waterproofing to be used with with KD steel washers.



ETA-15/0578



SUBSTRATES (ETAG 006)



Substrate: concrete C12/15, C20/25,
thin concrete slabs

Fastener MATERIAL	Carbon steel / SQ Ceramic coated
COMPATIBLE WASHERS	KD-07-WW, KD-03-W7, KD-03-W9, KD-03-WW7
APPLICATION	<ul style="list-style-type: none"> For fixing waterproofing type: PVC; TPO/ FPO; EPDM and bituminous membrane for all substrates
Drill for concrete	<ul style="list-style-type: none"> Ø 5,0 mm



SW-8
Flanged hex head.



SQ CERAMIC COATED
Highest corrosion protection.

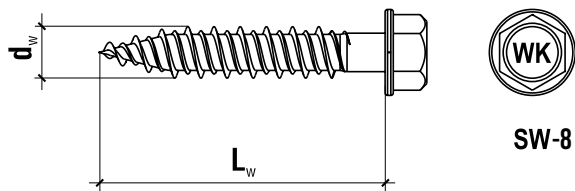


DOUBLE THREAD
Facilitates direct installation in concrete.

SQ Ceramic

Ø 6,3

WB6-D
35 - 45 mm



Technical data

	Code	Fastener diameter	Fastener length	Quantity per box
	SQ Ceramic	d_w [mm]	L_w [mm]	[pcs.]
WB6-D				
ø6,3	WB6-D-63035	6,3	35	250
	WB6-D-63045	6,3	45	250

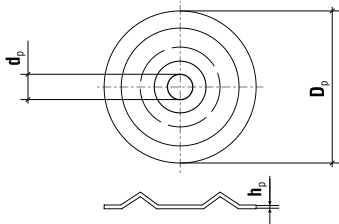
HOW TO READ THE CODE, e.g. WB6-D-63035

WB6	-D	63	035
Type	Type of coating: SQ Ceramic	Fastener diameter: 6.3 mm	Fastener length: 35 mm

ACCESSORIES

SEE PAGE 41

KD Steel washers for fixing of flat roof thermal insulation and waterproofing systems to be used with WDB, WSR, WBSW, WB6 fasteners and SMN expansion anchors

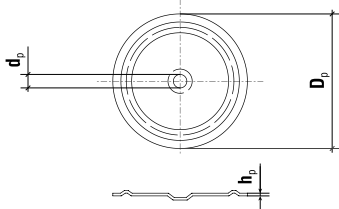


STEEL WASHER - ROUND, RAISED

KD-04-W5

Ø 40

WASHER MATERIAL	Steel
COMPATIBLE Fasteners	WDB-T, WSR-T

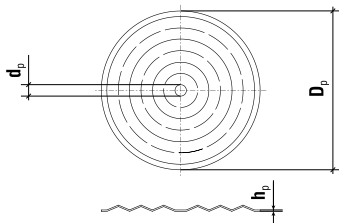


STEEL WASHER - ROUND, FLAT

KD-05

Ø 50

WASHER MATERIAL	Steel
COMPATIBLE Fasteners	WDB-T, WSR-T

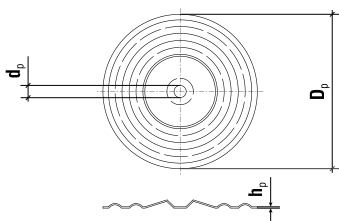


STEEL WASHER - ROUND FLAT

KD-01

Ø 70

WASHER MATERIAL	Steel
COMPATIBLE Fasteners	WDB-T, WSR-T



STEEL WASHER - ROUND, RAISED

KD-02-W-5,5

Ø 70

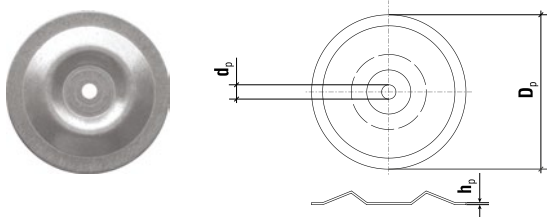
WASHER MATERIAL	Steel
COMPATIBLE Fasteners	WDB-T, WSR-T

Technical data

	Code	D _p [mm]	d _p [mm]	h _p [mm]	Quantity per box [pcs.]
Ø 40	KD-04-W5(X200)	40	5,0	1,0	200
Ø 50	KD-05(X200)	50	5,0	1,0	200
Ø 70	KD-01(X200)	70	5,0	0,6	200
	KD-02-W-5.5(X200)	70	5,5	0,6	200

STEEL WASHER - ROUND, DOUBLE RAISED PROFILE

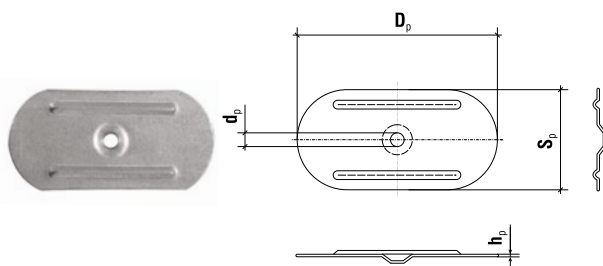
KD-07-WW
ø70



WASHER MATERIAL	Steel
COMPATIBLE Fasteners	WDB-T, WSR-T, WBSW, WB6-D, SMN-6

STEEL WASHER - OVAL, FLAT

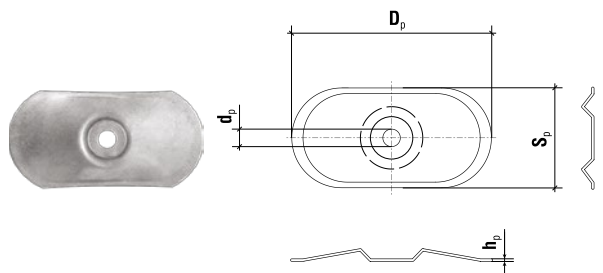
KD-03-P
80x40



WASHER MATERIAL	Steel
COMPATIBLE Fasteners	WDB-T, WSR-T

STEEL WASHER - OVAL, RAISED

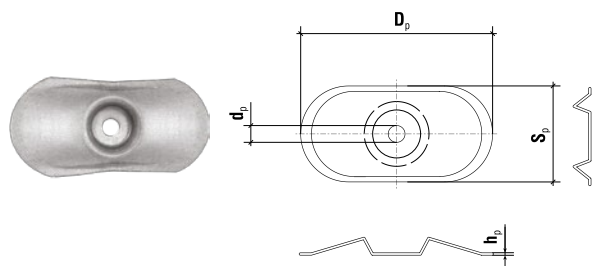
KD-03-W
80x40



WASHER MATERIAL	Steel
COMPATIBLE PLUGS	KD-03-W5: WDB-T, WSR-T KD-03-W7: WDB-T, WSR-T, WBSW, WB6-D, SMN-6 KD-03-W9: WB6-D, SMN-8

STEEL WASHER - OVAL DOUBLE RAISED PROFILE

KD-03-WW7
80x40



WASHER MATERIAL	Steel
COMPATIBLE FASTENERS	WDB-T, WSR-T, WBSW, WB6-D, SMN-6

Technical data

	Code	D _p [mm]	D _p x S _p [mm]	d _p [mm]	h _p [mm]	Quantity per box [pcs.]
ø 70	KD-07-WW(X200)	70	-	6,5	0,9	200
80x40	KD-03-P(X200)	-	80 x 40	5,5	1,0	200
	KD-03-W5(X200)	-	80 x 40	5,0	1,0	200
	KD-03-W7(X200)	-	80 x 40	7,0	1,0	200
	KD-03-W9(X200)	-	80 x 40	9,0	1,0	200
	KD-03-WW7(X200)	-	80 x 40	7,0	1,0	200

Expansion anchor to be used with KD steel washers

SMN

Ø 6,0 Ø 8,0

Expansion anchor to be used with KD steel washers.



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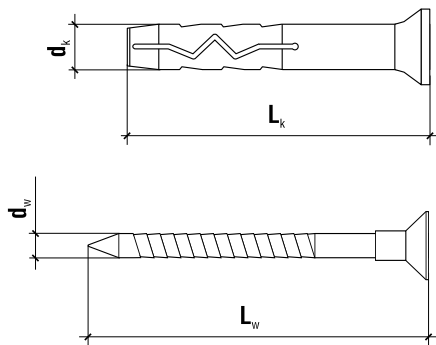
SUBSTRATES (ETAG 006)



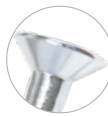
Substrate: concrete C12/15, C20/25

Poliamid (Nylon)

Ø 6 Length 50 mm
Ø 8 Length 60 mm



PLUG MATERIAL	Poliamid (NYLON)
COMPATIBLE PRODUCTS	KD-07-WW, KD-03-WW7, KD-03-W7 for SMN-06050, KD-03-W9 for SMN-08060
APPLICATION	· For fixing waterproofing type: PVC; TPO/FPD; EPDM and bituminous membrane for all substrates



BETTER HOLDING POWER

Increased head diameter ensures much better holding power of the elements being installed!



SECURE FIXING

Fastener countersunk head is more solid with special underhead strengthening!

HOW TO READ THE CODE, e.g. SMN-06050?

SMN	06	050
Type	Plug diameter: 6.0 mm	Plug length: 50 mm

Technical data

	Code	Plug diameter	Plug length	Quantity per box
		d _k [mm]	L _k [mm]	[pcs.]
KNX				
Ø 6,0	SMN-06050	6,0	50	200
Ø 8,0	SMN-08060	8,0	60	100

Minimum anchorage depth:

SMN-6x50 h_{eff} = 50 mm

SMN-8x60 h_{eff} = 60 mm

ACCESSORIES

SEE PAGE 41



Expansion sleeve plug to be used with LINO and WDB-T-4.8 fastener and KD steel washers

KNX

ø 8,0

Expansion sleeve plug to be used with LINO and WDB-T-4,8 fastener and KD steel washers.



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SUBSTRATES (ETAG 006)

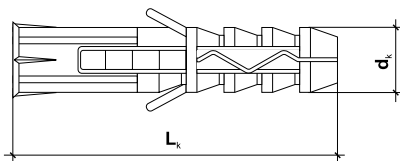


**Substrate: concrete C12/15, C20/25,
thin concrete slabs**

Poliamid (Nylon)

ø 8,0

**KNX
Length 50 mm**



PLUG MATERIAL	Poliamid (NULON)
COMPATIBLE PRODUCTS	LINO 13, LINO K 13, WDB-T
APPLICATION	<ul style="list-style-type: none"> For fixing thermal insulation type: EPS; XPS; MW; PIR; PUR For fixing waterproofing type: PVC; TPO/ FPO; EPDM and bituminous membrane for all substrates



GRIPPED FIRMLY IN PLACE

During the first stage of installation the plug is held firmly in place as the expansion plugs on its outside prevent it from turning once it has been placed in the hole.



WIDENED RIM

Its widened rim prevents the plug from sinking too deep into the drill hole.

HOW TO READ THE CODE, e.g. KNX-08050

KNX	08	050
Type	Sleeve diameter: 8.0 mm	Sleeve length: 50 mm

Technical data

	Code	Sleeve diameter	Sleeve length	Quantity per box
		d _k [mm]	L _k [mm]	[pcs.]
KNX				
ø 8,0	KNX-08050	8,0	50	250

ACCESSORIES

SEE PAGE 41

Vapour barrier foil

FBZ 

To make water vapour barrier foil in roof structures



Technical data		
Thickness	[mm]	0,20 (±30%)
Width x length	[m] x [mb]	2 x 50
Roll height H	[m]	1,05
Water resistance acc. 2 kPa	[-]	spełnia
Diffusion coefficient	[Sd]	50m (±30%)
Tear strenght - along the roll	[N]	≥ 35
Tear strenght - across roll	[N]	≥ 35
Reaction to fire	Class	F
Temperature resistance	[°C]	od -15 do +80
Standard	[-]	PN-EN 13984:2013
DoP	[-]	CN-02030-1-15

Sample vapour barrier foil assembly on the concrete substrate



DRIVER BITS TYPE

PH-2, TX-20, TX-30

For: SMN, WDB-T, WSR-T, WBSW



Code	Type	Sleeve length (LINO 13; LINOK 13) [mm]	Fastener type
PH-S2-02110	PH-2	-	SMN6, SMN8
PH-S2-02160	PH-2	-	SMN6, SMN8
PH-S2-02250	PH-2	-	SMN6, SMN8
PH-S2-02350	PH-2	-	SMN6, SMN8
TX-20S2-160	TX-20	35, 55, 85, 105, 135	WDB-T, WSR-T
TX-20S2-250	TX-20	155, 185	WDB-T, WSR-T
TX-20S2-350	TX-20	235, 285	WDB-T, WSR-T
TX-30S2-160	TX-30	35, 55, 85, 105, 135	WBSW
TX-30S2-250	TX-30	155, 185	WBSW
TX-30S2-350	TX-30	235, 285	WBSW

Extention for M6 bits

DWB-400 M6

For: SMN, WDB-T, WSR-T, WBSW



Code	Efective length [mm]
DWB-400 M6	400

Bits M6 for extention DWB-400

PH2-S2 M6, TX-20-S2 M6, TX-30-S2 M6

For: SMN, WDB-T, WSR-T, WBSW



Code	Type	Sleeve size (LINO)	Fastener type
PH2-S2 M6	PH-2	-	SMN6, SMN8
TX-20-S2 M6	TX-20	35 - 285	WDB-T, WSR-T
TX-30-S2 M6	TX-30	35 - 285	WBSW

Socket wrench SW-8

SW-8

For WB6-D



Code	Efective length [mm]
WM-08050	50

Drill bits for concrete type SDS \varnothing 5,0 mm

H-A

For: WBSW, WB6-D



Code	Drill bit diameter [mm]	Effective length [mm]
H-A 782404	5,0	110 / 60
H-A 782406	5,0	160 / 110
H-A 782407	5,0	210 / 160
H-A 782408	5,0	260 / 210
H-A 782409	5,0	310 / 260
H-A 782400	5,0	465 / 400

Drill bits for concrete type SDS \varnothing 6,0 \varnothing 8,0 mm

SD4

For: SMN 6, SMN 8, KNX 8



Code	Drill bit diameter [mm]	Effective length [mm]
SD4-06110	6,0	110 / 60
SD4-06160	6,0	160 / 110
SD4-06210	6,0	210 / 160
SD4-08110	8,0	110 / 160
SD4-08160	8,0	160 / 110
SD4-08210	8,0	210 / 160
SD4-08260	8,0	260 / 210
SD4-08360	8,0	360 / 310
SD4-08410	8,0	410 / 360

Drill extension with wedge for WSDP

DWS-500

For: WBSW, WB6-D



Code	Effective length [mm]
DWS-500	500

Conical drill for DWS-500 extension - 5,0 mm

WSDP

For: WBSW, WB6-D



Code	Drill bit diameter [mm]	Effective length [mm]
WSDP-05100	5,0	100 / 60
WSDP-05160	5,0	160 / 120

Technical data

• Selection of fasteners for the application

page

• Introduction 44 - 48



INTRODUCTION

Fastening of flat roof thermal insulation and waterproofing systems

I. Basic information

Roof slopes are exposed to weathering including:

- wind load – wind-induced suction, shearing force, bending force
- exposure to rain – rainfall
- snow load
- exposure to the sun – UV radiation

To prevent damage which is likely to occur on flat roofs it is essential that membrane and layers of thermal insulation materials be installed correctly.

Correct installation of thermal insulation and waterproofing materials for flat roofs requires suitable fixings to be used on a given roof surface. It is also very important to apply appropriate fastener number and spacing in particular roof zones.

II. Flat roof zones

It is essential to use the appropriate number of fixings for particular roof zones of a structure, which always depends on the wind zone, structure's height and surroundings.

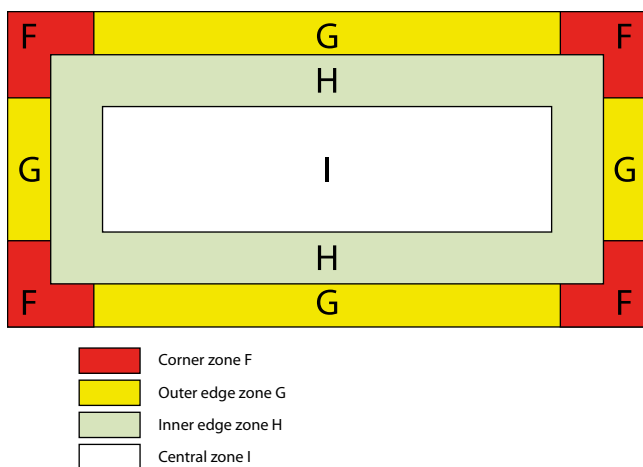


Fig. 1 Flat roof zones



Roof slope can be divided into four zones:

- corner zone
- outer and inner edge zones
- central zone.

The appropriate number of fixings for particular zones will ensure fault-free and reliable roofing. Using too few fixings might result in the waterproofing membrane being damaged or even blown off.

The appropriate number of fixings should be calculated according to the wind actions standard PN-EN-1991-1-4:2008 (based on Eurocode 1)

III. Requirements for fasteners

According to the guidelines provided by ETAG 006 for fasteners for mechanical fixing of flat roof thermal insulation and waterproofing systems, fasteners must meet the following conditions:

- pull-out resistance,
- resistance to self-unfastening of the fastener from the decking made from profiled roof sheets,
- resistance to corrosion according to Kesternich test (min. 15 cycles, DIN 500 2.0 S standard),
- fastener impact resistance.

According to guidelines the following fixing methods with roof fasteners can be applied:

- telescopic fixing (plastic sleeve + self-drilling or self-tapping fastener) – for flat roofs with thermal insulation systems,
- rigid fixing (steel washer + fastener) – for flat roofs without thermal insulation (for waterproofing systems only).

IV. Flat roof substrates

Guidelines for the use of roof fasteners provide for testing of the following substrates:

- profiled sheeting with thickness of 0.5 - 0.75 mm
- profiled sheeting with thickness of over 0.5 - 1.00, max. 2 x 1.25 mm,
- concrete decking (concrete, lightweight concrete slabs),
- timber boarding (timber, plywood, OSB).

Resistance parameters for roof decking are specified in technical approvals or guidelines provided by manufacturer.

Application of fasteners that meet all the above-listed requirements and conditions will allow for long-lasting and reliable serviceability of a structure.

V. Installation recommendations

In order to correctly install fasteners it is important to choose appropriate power tools with an adjustable clutch, drills and driver bits of a suitable diameter.

VI. Calculation methods for flat roof loads

Correct calculation of the loads acting on particular zones of the flat roof

should be based on relevant standards and regulations. All the necessary information on wind-induced suction values is provided in the PN-EN 199-1-4:2008 standard "wind actions.." – the standard divides the area of Poland into three wind zones. One of the coefficients necessary for the calculations is the basic wind speed, whose values will vary for different locations of a structure within a given zone.



Fig. 2. Map of wind zones in Poland

Table 1. Basic wind speed





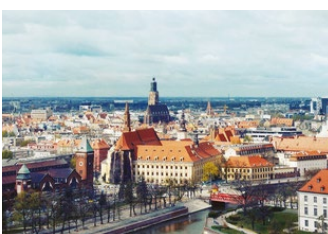
Strefa	$v_{b,0}$ [m/s]	$v_{b,0}$ [m/s]	$q_{b,0}$ [kN/m ²]	$q_{b,0}$ [kN/m ²]
	A ≤ 300 m	A > 300 m	A ≤ 300 m	A > 300 m
1	22	$22 \times [1 + 0,0006 (A - 300)]$	0,30	$0,30 \times [1 + 0,0006 (A - 300)]^2$
2	26	26	0,42	0,42
3	22	$22 \times [1 + 0,0006 (A - 300)]$	0,30	$0,30 \times [1 + 0,0006 (A - 300)]^2 \times \left[\frac{20000 - A}{20000 + A} \right]$

$v_{b,0}$ – basic wind speed (m)

$q_{b,0}$ – fundamental value of wind speed pressure (m)

Note: A – height above sea level (m)

Tab 2. Terrain categories

Terrain categories and parameters	
	<p>TERRAIN CATEGORY 0 Sea, costal area exposed to the sea</p>
	<p>TERRAIN CATEGORY I Lakes or areas with negligible vegetation and no obstacles</p>
	<p>TERRAIN CATEGORY II Terrain with low vegetation, such as grass, and isolated obstacles (trees, buildings) spaced at least 20 times their height</p>
	<p>TERRAIN CATEGORY III Terrain covered with regular vegetation or buildings or with isolated obstacles spaced no more than 20 times their height (rural, suburban and wooded areas)</p>
	<p>TERRAIN CATEGORY IV Terrain in which at least 15% of the surface is covered with buildings of average height exceeding 15 m</p>

Tab 3. Flat roofs - external pressure coefficient

Roof type		Column							
		F		G		H		I	
		$C_{pe,10}$	$C_{pe,1}$	$C_{pe,10}$	$C_{pe,1}$	$C_{pe,10}$	$C_{pe,1}$	$C_{pe,10}$	$C_{pe,1}$
Featheredge roof		-1,8	-2,5	-1,2	-2,0	-0,7	-1,2	+0,2	+0,2
Attic-style roof	$h_g/h=0,025$	-1,6	-2,2	-1,1	-1,8	-0,7	-1,2	+0,2	-0,2
	$h_g/h=0,05$	-1,4	-2,0	-0,9	-1,6	-0,7	-1,2	+0,2	-0,2
	$h_g/h=0,10$	-1,2	-1,8	-0,8	-1,4	-0,7	-1,2	+0,2	-0,2
	Rounded edge roof	$rlh=0,05$	-1,0	-1,5	-1,2	-1,8	-0,4	+0,2	-0,2
		$rlh=0,10$	-0,7	-1,2	-0,8	-1,4	-0,3	+0,2	-0,2
		$rlh=0,20$	-0,5	-0,8	-0,5	-0,8	-0,3	+0,2	-0,2
Mansard roof	$\alpha=30^\circ$	-1,0	-1,5	-1,0	-1,5	-0,3	+0,2	-0,2	
	$\alpha=45^\circ$	-1,2	-1,8	-1,3	-1,9	-0,4	+0,2	-0,2	
	$\alpha=60^\circ$	-1,3	-1,9	-1,3	-1,9	-0,5	+0,2	-0,2	

NOTE 1. For attic roofs or roofs with rounded edges you can use linear interpolation for intermediate values h_g/h and rlh

NOTE 2. For mansard roofs you can use linear interpolation between $\alpha=30^\circ$, 45° and $\alpha=60^\circ$. If $\alpha>60^\circ$, you can use linear interpolation between values given for $\alpha=60^\circ$ and values given for flat roofs with sharp edges.

NOTE 3. In column I, where positive and negative values are given, both should be considered.

NOTE 4. External pressure coefficient for mansards only is shown in Table 7.4a. "External pressure coefficients for gable roofs with wind direction 0° "; columns F and G depend on the inclination angle of the mansard edge.

NOTE 5. For rounded edges only external pressure coefficients are calculated from linear interpolation along the rounding, between the values on the wall and on the roof.

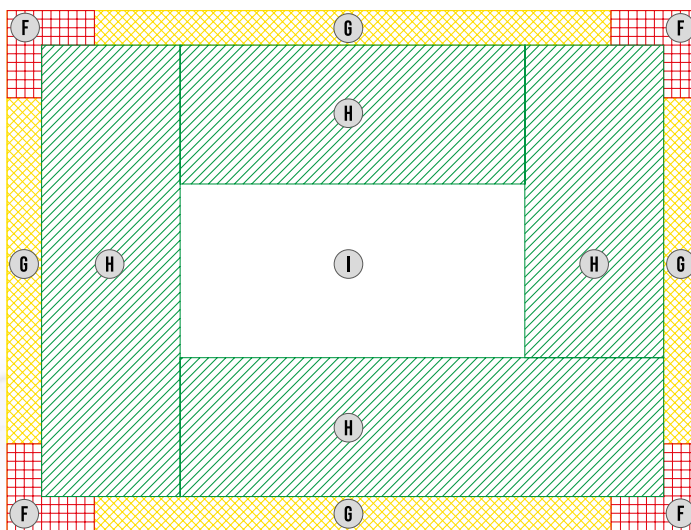
DEDICATED PROGRAM FOR THE NUMBER OF FASTENERS ON FLAT ROOFS - MF DATENTECHNIK

MF Dach

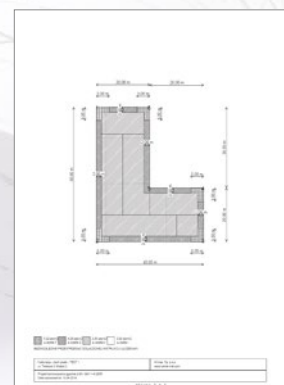
Ihre Software fürs Handwerk

- Universal program to optimize the number of fasteners on flat roofs.
- The program is based on the ETAG 006 guidelines and the standard for wind action on structures - PN EN 1991-1-4, Eurocode 1.
- The program takes into account all the requirements of the wind standard.
- Enables the introduction of all technical data of the facility and the materials used in the calculations.
- Automatic division of the flat roof plane into zones with their graphic presentation.

MF DATENTECHNIK - diagram of the division of a flat roof plane into wind zones



ZONE F - Corner zone	pcs/m ²	
ZONE G - Outer zone	pcs/m ²	
ZONE H - Inner edge zone	pcs/m ²	
ZONE I - Central zone	pcs/m ²	



Technical data

	page
· Fastener type selection table - index	48 - 49
· Accessories selection table - index	50 - 51
· Tables for selecting fastener length for a given substrate:	
· steel sheets profile 0,50 - 1,25 mm thickness	52 - 63
· concrete	64 - 77
· timber, OSB board, plywood	78 - 88

Table of the correct selection of fasteners for fixing of flat roof thermal insulation and waterproofing systems



			Plastic sleeve		Self-tapping fastener
			LINO 13	LINO K 13	WDB-T-4,8
			PA	PA	steel
Substrate		Substrate thickness [mm]	page 22	page 24	page 26
Profiled steel sheet		Steel grade			
Profiled steel sheet	S 280 GD	0,50	✓	✓	✓
	S 280 GD	0,63	✓	✓	✓
	S 280 GD	0,75	✓	✓	✓
	S 280 GD	0,88	✓	✓	
	S 280 GD	≥1,00	✓	✓	
Concrete		Standard			
Concrete C12/15	EN 206	50*/60**/70***	✓	✓	
Concrete C20/25	EN 206	50*/60**/70***	✓	✓	
Thin wall concrete panel	EN 206	20*	✓	✓	
Wooden substrate		Standard			
Timber C 24	EN 14081	30	✓	✓	✓
OSB board	EN 300	18	✓	✓	✓
Plywood	EN 313	20	✓	✓	✓












*, **, *** -for the thickness of the concrete substrate



Self-drilling fastener	Self-tapping fasteners		Steel washers	Plug SMN 6	Plug SMN 8	Plastic expansion sleeve
WSR-T-4,8	WSW-6,3	WB6-D	KD	SMN-6 x 50	SMN-8 x 60	KNX-8 x 50
steel	steel		steel	PA/steel	PA/steel	PA
page 28	page 30	page 32	page 34-35	page 36	page 36	page 37
✓			✓			
✓			✓			
✓			✓			
✓			✓			
✓			✓			
	✓	✓	✓	✓**	✓***	✓*
	✓	✓	✓	✓**	✓***	✓*
	✓	✓	✓			✓*
	✓		✓			
	✓		✓			
	✓		✓			

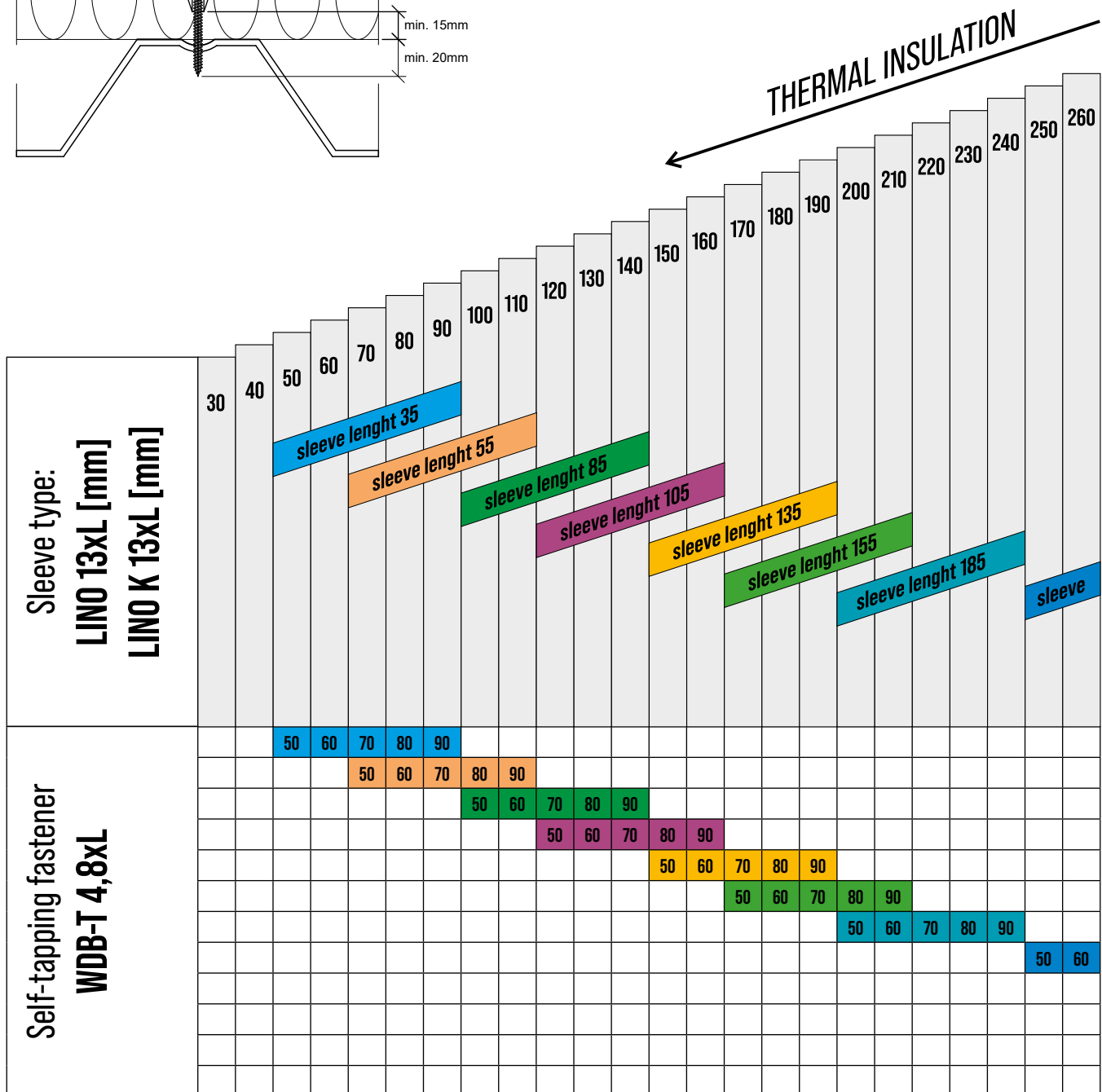
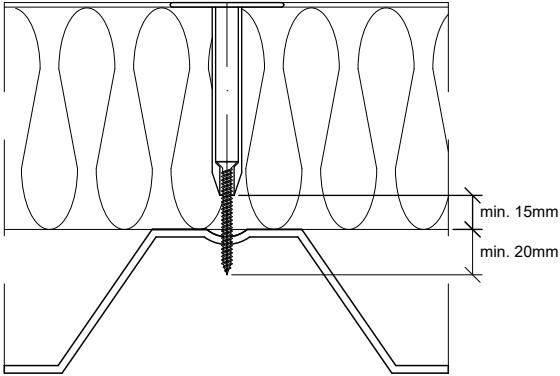
Accessories selection table - flat roofs

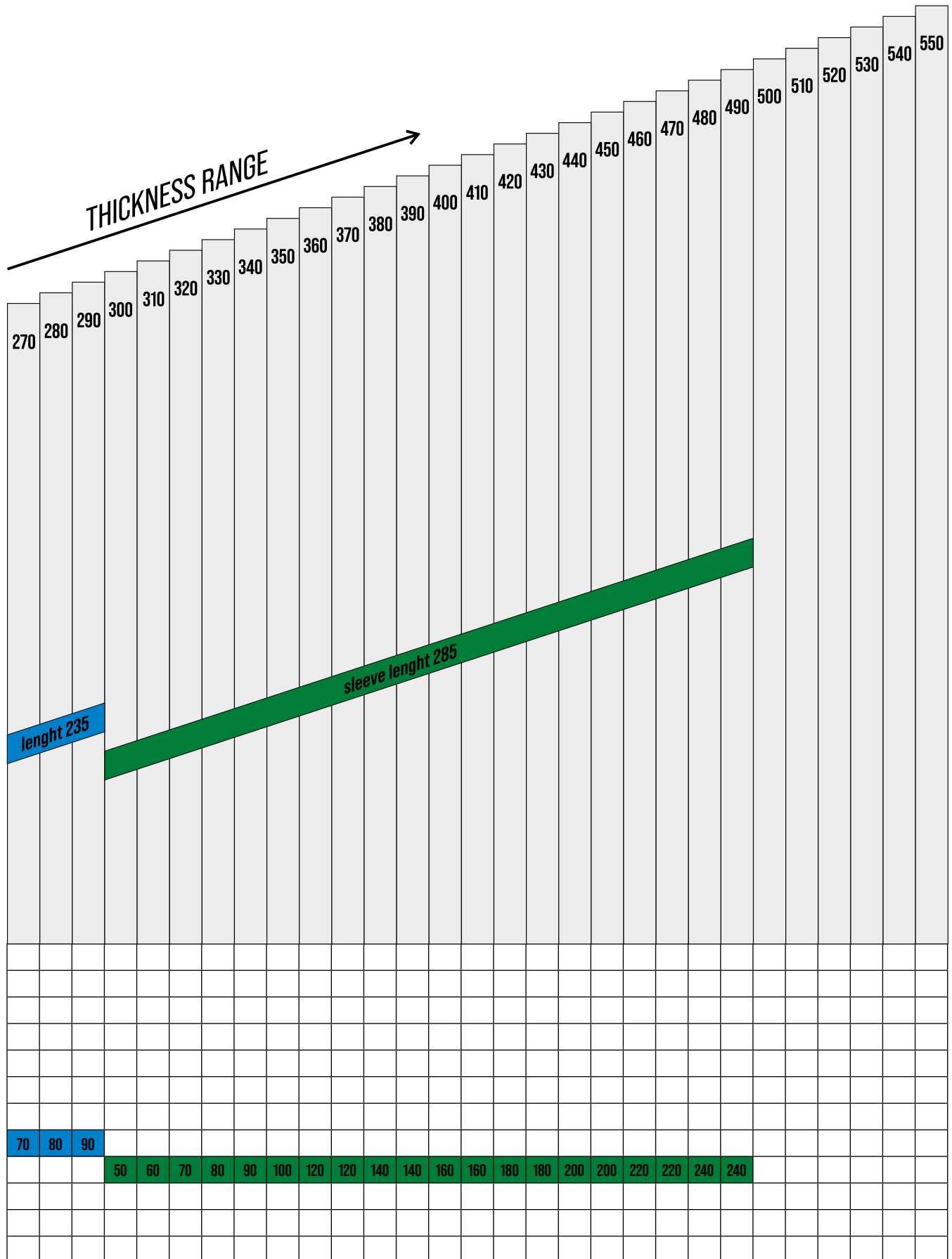


TYPE	CODE	Drill diameter [mm]	Length/effective length [mm]	LINO 13	LINO K 13
Driver bits, type PH					
	PH-S2-02110	-	110 / 100		
	PH-S2-02160	-	160 / 150		
	PH-S2-02250	-	250 / 240		
	PH-S2-02350	-	350 / 340		
Driver bits, type TX-20					
	TX-20S2-160	-	160 / 150	✓	✓
	TX-20S2-250	-	250 / 240	✓	✓
	TX-20S2-350	-	350 / 340	✓	✓
Driver bits, type TX-30					
	TX-30S2-160	-	160 / 150	✓	✓
	TX-30S2-250	-	250 / 240	✓	✓
	TX-30S2-350	-	350 / 340	✓	✓
Extention for M6 bits					
	DWB-400 M6	-	400	✓	✓
Bits M6 for extention DWB-400 M6					
	PH2-S2 M6	-	-	✓	✓
	TX-20-S2 M6	-	-	✓	✓
	TX-30-S2 M6	-	-	✓	✓
Socketed wrench, type SW-8					
	WM-08050	-	50		
SDS drill bit for concrete Ø 5,0 mm					
	H-A 782404	5,0	110 / 60		
	H-A 782406	5,0	160 / 110		
	H-A 782407	5,0	210 / 160		
	H-A 782408	5,0	260 / 210		
	H-A 782409	5,0	310 / 260		
	H-A 782400	5,0	465 / 400		
SDS drill bit for concrete Ø 6,0 mm					
	SD4-06110	6,0	110 / 60		
	SD4-06160	6,0	160 / 110		
	SD4-06210	6,0	210 / 160		
SDS drill bit for concrete Ø 8,0 mm					
	SD4-08110	8,0	110 / 160		
	SD4-08160	8,0	160 / 110		
	SD4-08210	8,0	210 / 160		
	SD4-08260	8,0	260 / 210		
	SD4-08360	8,0	360 / 310		
	SD4-08410	8,0	410 / 360		
Drill extention with wedge for WSDP					
	DWS-500	-	500		
Drill for DWS-500 extention Ø 5,0 mm					
	WSDP-05100	5,0	100 / 60		
	WSDP-05160	5,0	160 / 120		

Plastic sleeve LINO + WDB-T-4,8 fastener

Substrate: Profiled steel sheet 0,50 ÷ 0,75 mm





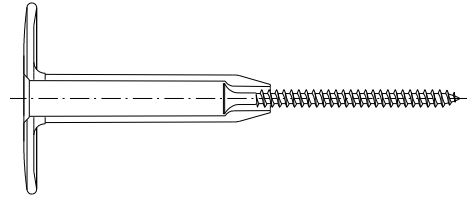
Plastic sleeve LINO + WDB-T-4,8 fastener

TABLES FOR SELECTING FASTENER LENGTH


Substrate: Profiled steel sheet 0,50 ÷ 0,75 mm



ETA-15/0578



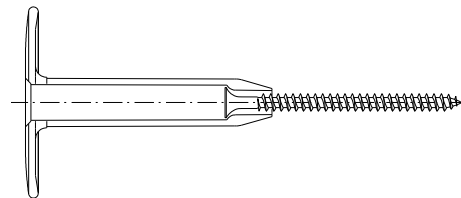
Self-tapping fastener
WDB-T-4,8

Insulation material thickness [mm]	LINO 13 Sleeve PA ø 13 [mm]	LINO K 13 Sleeve with spikes ø 13 [mm]	Steel sheet profile thickness [mm] 0,50; 0,63; 0,75
	PA		TX 
50	LINO13035	LINOK13035	WDB-T-48050-D
60	LINO13035	LINOK13035	WDB-T-48060-D
70	LINO13055	LINOK13055	WDB-T-48050-D
80	LINO13055	LINOK13055	WDB-T-48060-D
90	LINO13055	LINOK13055	WDB-T-48070-D
100	LINO13085	LINOK13085	WDB-T-48050-D
110	LINO13085	LINOK13085	WDB-T-48060-D
120	LINO13105	LINOK13105	WDB-T-48050-D
130	LINO13105	LINOK13105	WDB-T-48060-D
140	LINO13105	LINOK13105	WDB-T-48070-D
150	LINO13135	LINOK13135	WDB-T-48050-D
160	LINO13135	LINOK13135	WDB-T-48060-D
170	LINO13155	LINOK13155	WDB-T-48050-D
180	LINO13155	LINOK13155	WDB-T-48060-D
190	LINO13155	LINOK13155	WDB-T-48070-D
200	LINO13185	LINOK13185	WDB-T-48050-D
210	LINO13185	LINOK13185	WDB-T-48060-D
220	LINO13185	LINOK13185	WDB-T-48070-D
230	LINO13185	LINOK13185	WDB-T-48080-D
240	LINO13185	LINOK13185	WDB-T-48090-D
250	LINO13235	LINOK13235	WDB-T-48050-D
260	LINO13235	LINOK13235	WDB-T-48060-D
270	LINO13235	LINOK13235	WDB-T-48070-D
280	LINO13235	LINOK13235	WDB-T-48080-D


Plastic sleeve LINO + WDB-T-4,8 fastener

TABLES FOR SELECTING FASTENER LENGTH

Substrate: Profiled steel sheet 0,50 ÷ 0,75 mm



Self-tapping fastener
WDB-T-4,8

Insulation material thickness [mm]	LINO 13 Sleeve PA ø 13 [mm]	LINO K 13 Sleeve with spikes ø 13 [mm]	Steel sheet profile thickness [mm] 0,50; 0,63; 0,75
	PA		TX 
290	LINO13235	LINOK13235	WDB-T-48090-D
300	LINO13285	LINOK13285	WDB-T-48050-D
310	LINO13285	LINOK13285	WDB-T-48060-D
320	LINO13285	LINOK13285	WDB-T-48070-D
330	LINO13285	LINOK13285	WDB-T-48080-D
340	LINO13285	LINOK13285	WDB-T-48090-D
350	LINO13285	LINOK13285	WDB-T-48100-D
360	LINO13285	LINOK13285	WDB-T-48120-D
370	LINO13285	LINOK13285	WDB-T-48120-D
380	LINO13285	LINOK13285	WDB-T-48140-D
390	LINO13285	LINOK13285	WDB-T-48140-D
400	LINO13285	LINOK13285	WDB-T-48160-D
410	LINO13285	LINOK13285	WDB-T-48160-D
420	LINO13285	LINOK13285	WDB-T-48180-D
430	LINO13285	LINOK13285	WDB-T-48180-D
440	LINO13285	LINOK13285	WDB-T-48200-D
450	LINO13285	LINOK13285	WDB-T-48200-D
460	LINO13285	LINOK13285	WDB-T-48220-D
470	LINO13285	LINOK13285	WDB-T-48220-D
480	LINO13285	LINOK13285	WDB-T-48240-D
490	LINO13285	LINOK13285	WDB-T-48240-D

PA - poliamid (nylon)

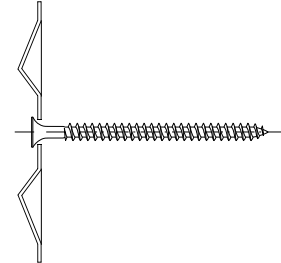
Steel washer + WDB-T-4,8 fastener

TABLES FOR SELECTING FASTENER LENGTH

Substrate: Profiled steel sheet 0,50 ÷ 0,75 mm



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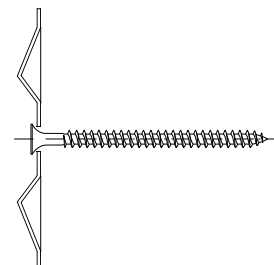


Insulation material thickness [mm]	Steel washer KD-04-W5	Steel washer KD-01	Steel washer KD-03-W5	Steel washer KD-05	Steel washer KD-03-P
0	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
10	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
20	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
30	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
40	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
50	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
60	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
70	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
80	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
90	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
100	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
110	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
120	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
130	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
140	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
150	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
160	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
170	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
180	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
190	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
200	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
210	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
220	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P


Steel washer + WDB-T-4,8 fastener

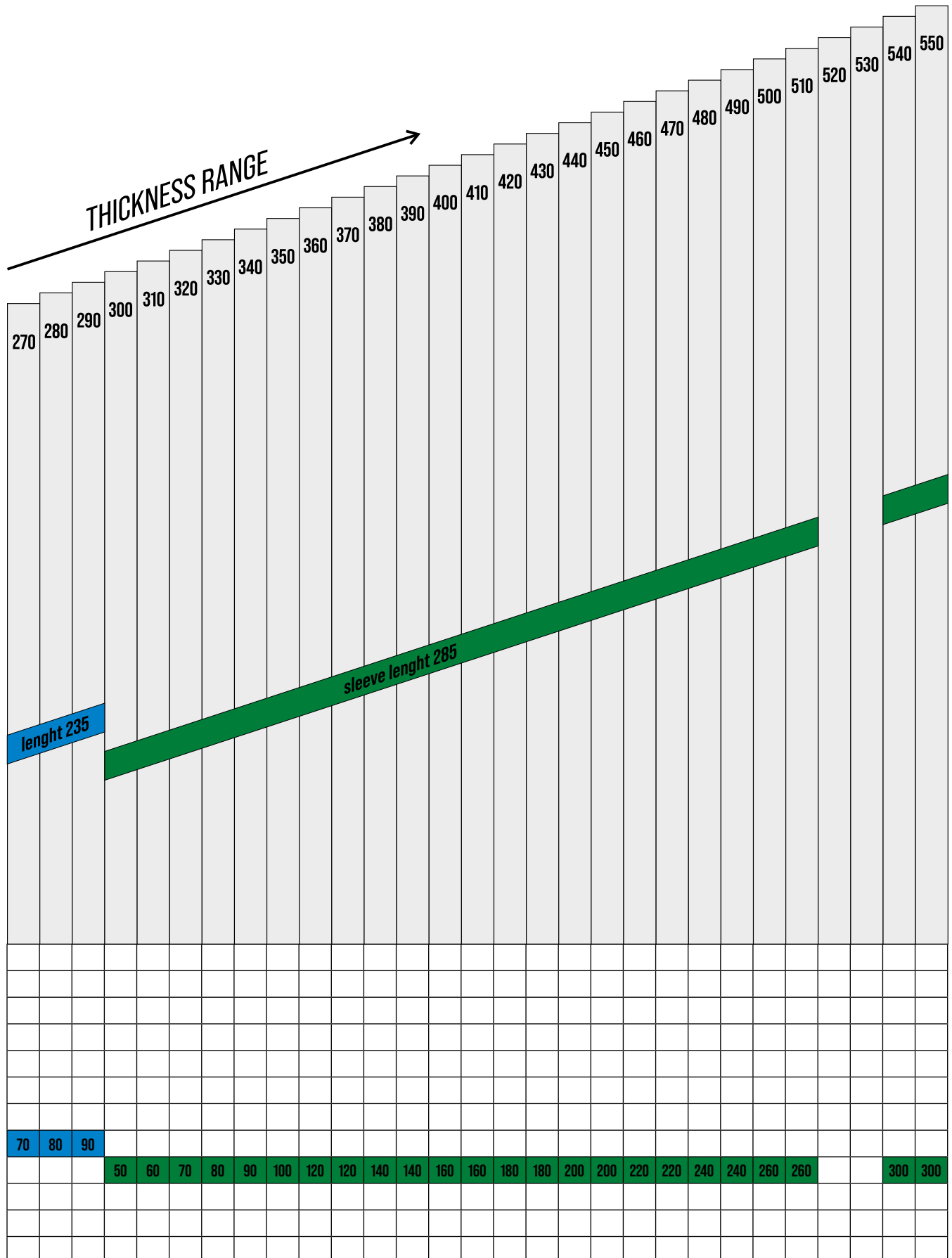
TABLES FOR SELECTING FASTENER LENGTH

Substrate: Profiled steel sheet 0,50 ÷ 0,75 mm



Self-tapping fastener
WDB-T-4,8

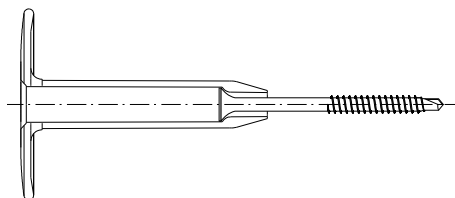
Steel washer KD-02-W-5,5	Steel washer KD-07-WW	Steel washer KD-03-WW7	Steel washer KD-03-W7	Steel sheet profile thickness [mm] 0,50; 0,63; 0,75
				TX 
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48040-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48040-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48040-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48050-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48060-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48070-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48080-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48090-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48100-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48120-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48120-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48140-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48140-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48140-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48160-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48160-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48180-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48180-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48200-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48200-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48220-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48220-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48240-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48240-D




Plastic sleeve LINO + WSR-T-4,8 fastener

TABLES FOR SELECTING FASTENER LENGTH

Substrate: Profiled steel sheet 0,50 ± 1,25 mm



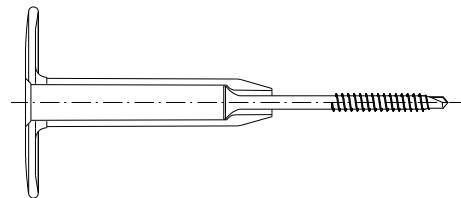
Self-drilling fastener
WSR-T-4,8

Insulation material thickness [mm]	LINO 13 Sleeve PA ø 13 [mm]	LINO K 13 Sleeve with spikes ø 13 [mm]	Steel sheet profile thickness [mm] 0,50; 0,63; 0,75; 0,88; 1,00; 1,25
	PA		TX 
50	LINO13035	LINOK13035	WSR-T-48050-D
60	LINO13035	LINOK13035	WSR-T-48060-D
70	LINO13055	LINOK13055	WSR-T-48050-D
80	LINO13055	LINOK13055	WSR-T-48060-D
90	LINO13055	LINOK13055	WSR-T-48070-D
100	LINO13085	LINOK13085	WSR-T-48050-D
110	LINO13085	LINOK13085	WSR-T-48060-D
120	LINO13105	LINOK13105	WSR-T-48050-D
130	LINO13105	LINOK13105	WSR-T-48060-D
140	LINO13105	LINOK13105	WSR-T-48070-D
150	LINO13135	LINOK13135	WSR-T-48050-D
160	LINO13135	LINOK13135	WSR-T-48060-D
170	LINO13155	LINOK13155	WSR-T-48050-D
180	LINO13155	LINOK13155	WSR-T-48060-D
190	LINO13155	LINOK13155	WSR-T-48070-D
200	LINO13185	LINOK13185	WSR-T-48050-D
210	LINO13185	LINOK13185	WSR-T-48060-D
220	LINO13185	LINOK13185	WSR-T-48070-D
230	LINO13185	LINOK13185	WSR-T-48080-D
240	LINO13185	LINOK13185	WSR-T-48090-D
250	LINO13235	LINOK13235	WSR-T-48050-D
260	LINO13235	LINOK13235	WSR-T-48060-D
270	LINO13235	LINOK13235	WSR-T-48070-D
280	LINO13235	LINOK13235	WSR-T-48080-D

Plastic sleeve LINO + WSR-T-4,8 fastener

TABLES FOR SELECTING FASTENER LENGTH

Substrate: Profiled steel sheet 0,50 ÷ 1,25 mm



Self-drilling fastener
WSR-T-4,8

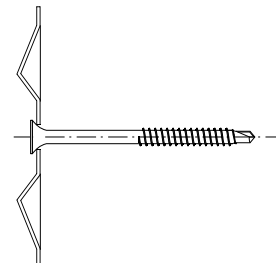
Insulation material thickness [mm]	LINO 13 Sleeve PA ø 13 [mm]	LINO K 13 Sleeve with spikes ø 13 [mm]	Steel sheet profile thickness [mm] 0,50; 0,63; 0,75; 0,88; 1,00; 1,25
	PA		TX
290	LINO13235	LINOK13235	WSR-T-48090-D
300	LINO13285	LINOK13285	WSR-T-48050-D
310	LINO13285	LINOK13285	WSR-T-48060-D
320	LINO13285	LINOK13285	WSR-T-48070-D
330	LINO13285	LINOK13285	WSR-T-48080-D
340	LINO13285	LINOK13285	WSR-T-48090-D
350	LINO13285	LINOK13285	WSR-T-48100-D
360	LINO13285	LINOK13285	WSR-T-48120-D
370	LINO13285	LINOK13285	WSR-T-48120-D
380	LINO13285	LINOK13285	WSR-T-48140-D
390	LINO13285	LINOK13285	WSR-T-48140-D
400	LINO13285	LINOK13285	WSR-T-48160-D
410	LINO13285	LINOK13285	WSR-T-48160-D
420	LINO13285	LINOK13285	WSR-T-48180-D
430	LINO13285	LINOK13285	WSR-T-48180-D
440	LINO13285	LINOK13285	WSR-T-48200-D
450	LINO13285	LINOK13285	WSR-T-48200-D
460	LINO13285	LINOK13285	WSR-T-48220-D
470	LINO13285	LINOK13285	WSR-T-48220-D
480	LINO13285	LINOK13285	WSR-T-48240-D
490	LINO13285	LINOK13285	WSR-T-48240-D
500	LINO13285	LINOK13285	WSR-T-48260-D
510	LINO13285	LINOK13285	WSR-T-48260-D
550	LINO13285	LINOK13285	WSR-T-48300-D

PA - poliamid (nylon)

Steel washer KD + WSR-T-4,8 fastener

TABLES FOR SELECTING FASTENER LENGTH

Substrate: Profiled steel sheet 0,50 ± 1,25 mm

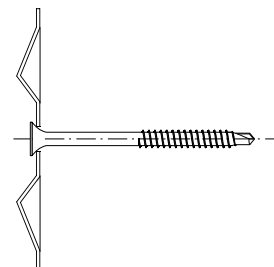


Insulation material thickness [mm]	Steel washer KD-04-W5	Steel washer KD-01	Steel washer KD-03-W5	Steel washer KD-05	Steel washer KD-03-P
0	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
10	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
20	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
30	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
40	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
50	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
60	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
70	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
80	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
90	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
100	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
110	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
120	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
130	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
140	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
150	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
160	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
170	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
180	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
190	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
200	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
210	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
220	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
230	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
240	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P
280	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P

Steel washer KD + WSR-T-4,8 fastener

TABLES FOR SELECTING FASTENER LENGTH

Substrate: Profiled steel sheet 0,50 ÷ 1,25 mm



Self-drilling fastener
WSR-T-4,8

Steel washer KD-02-W-5,5	Steel washer KD-07-WW	Steel washer KD-03-WW7	Steel washer KD-03-W7	Steel sheet profile thickness [mm] 0,50; 0,63; 0,75; 0,88; 1,00; 1,25
				TX 
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WSR-T-48040-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WSR-T-48040-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WSR-T-48040-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WSR-T-48050-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WSR-T-48060-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WSR-T-48070-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WSR-T-48080-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WSR-T-48090-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WSR-T-48100-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WSR-T-48120-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WSR-T-48120-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WSR-T-48140-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WSR-T-48140-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WSR-T-48160-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WSR-T-48160-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WSR-T-48180-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WSR-T-48180-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WSR-T-48200-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WSR-T-48200-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WSR-T-48220-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WSR-T-48220-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WSR-T-48240-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WSR-T-48240-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WSR-T-48260-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WSR-T-48260-D
KD-02-W-5,5	KD-07-WW	KD-03-WW7	KD-03-W7	WSR-T-48300-D

Plastic sleeve LINO + WBSW-6,3 fastener

Substrate: concrete



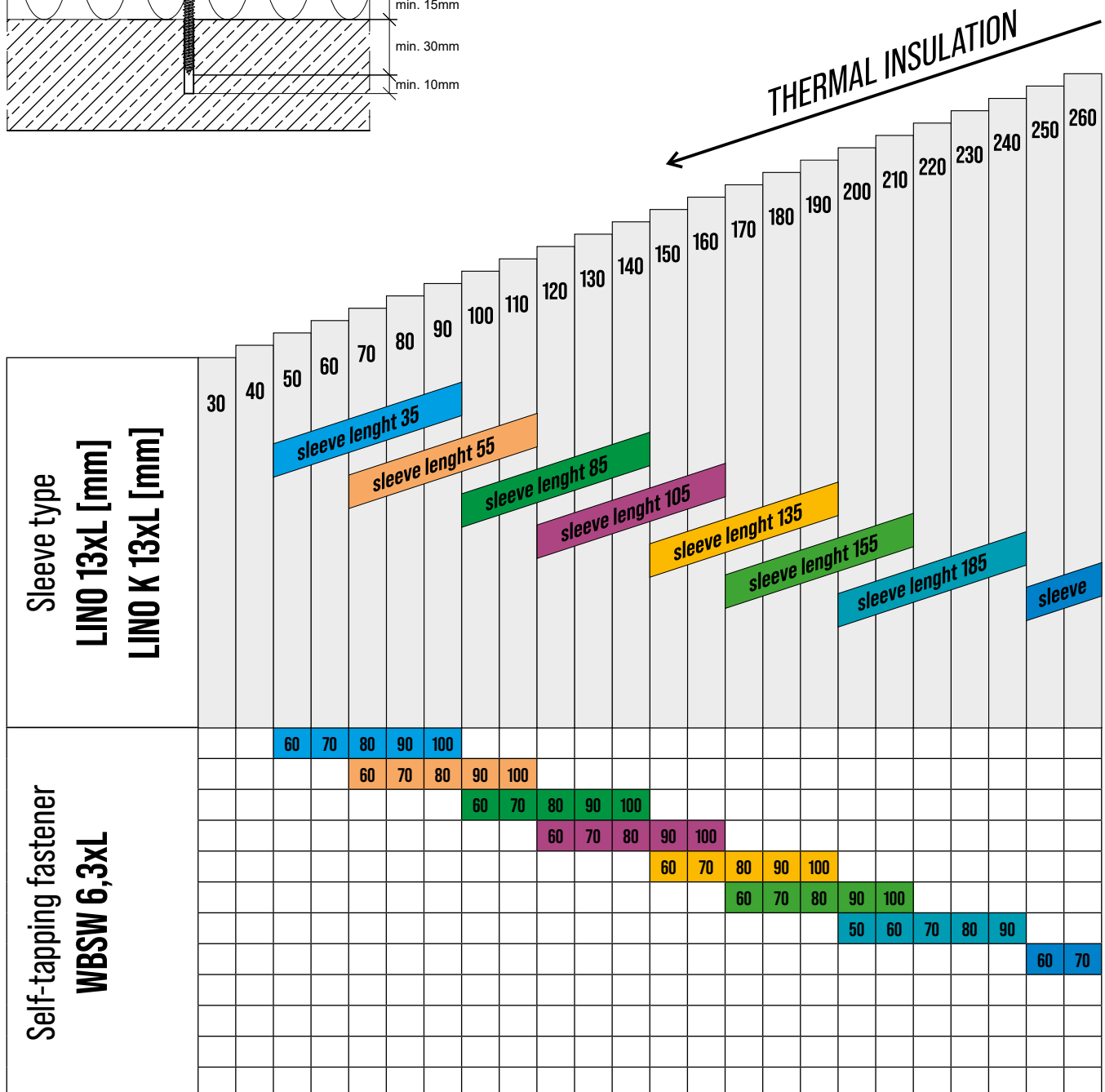
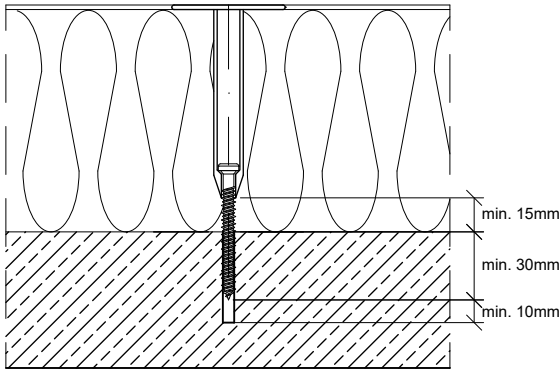
LINO 13

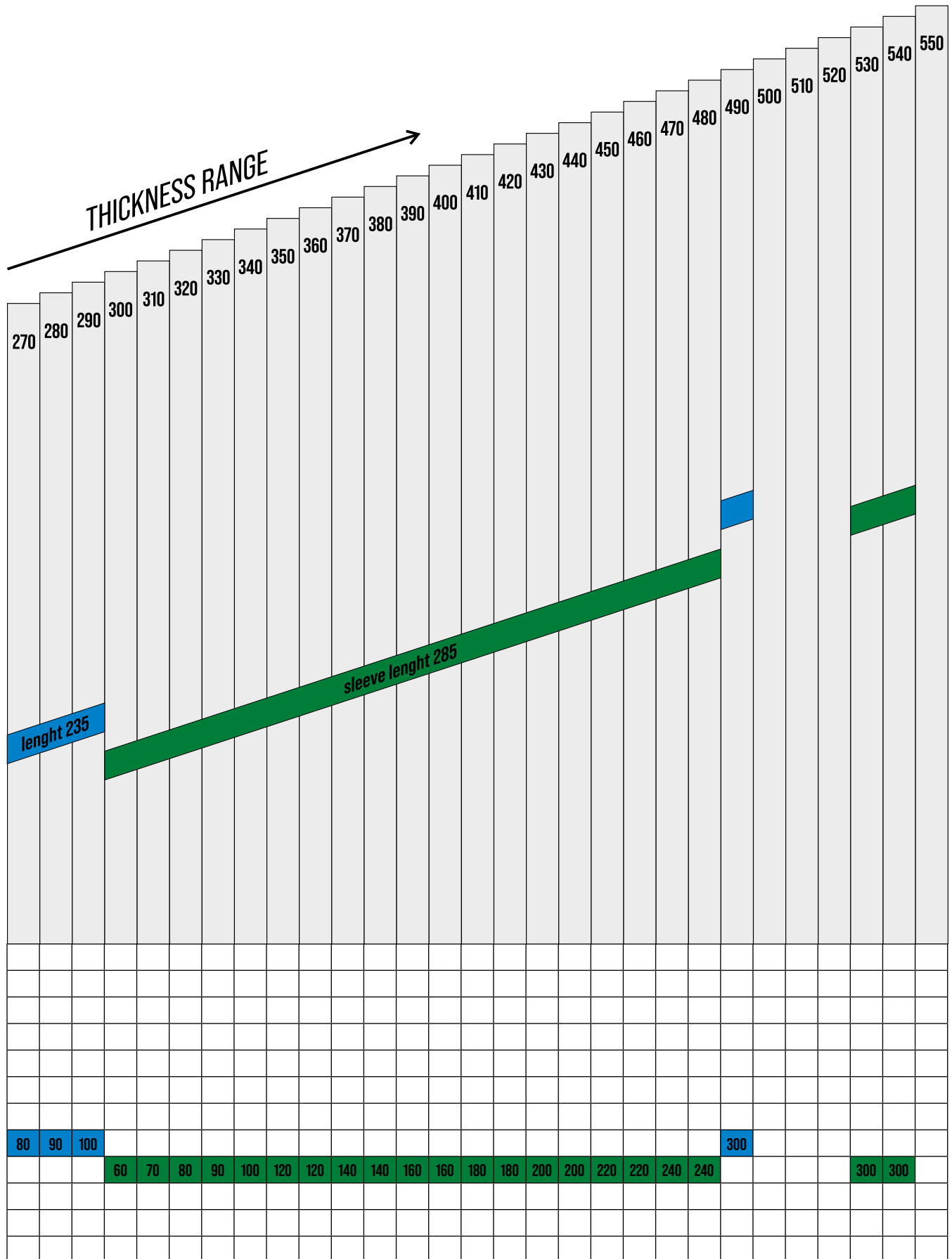


LINO K 13



Self-tapping fastener WBSW





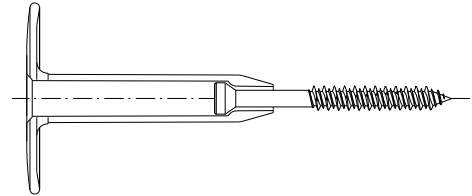
Plastic sleeve LINO + WBSW-6,3 fastener

TABLES FOR SELECTING FASTENER LENGTH

Substrate: concrete



ETA-15/0578



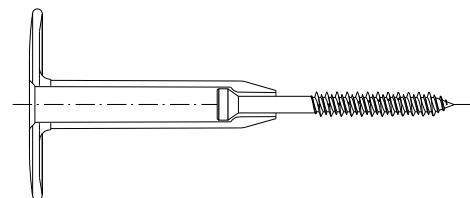
Self-tapping fastener
WBSW-6,3

Insulation material thickness [mm]	LINO 13 Sleeve PA ø 13 [mm]	LINO K 13 Sleeve with spikes ø 13 [mm]	Concrete C12/15; C20/25 Drill diameter Ø 5.0 mm Depth of drilled hole 40 mm Anchorage depth heff = 30 mm	Thin concrete slabs Drill diameter Ø 5.0 mm Depth of drilled hole 40 mm Anchorage depth heff = 20 mm
	PA			
50	LINO13035PA	LINOK13035PA	WBSW-63060-D	WBSW-63060-D
60	LINO13035PA	LINOK13035PA	WBSW-63070-D	WBSW-63070-D
70	LINO13055PA	LINOK13055PA	WBSW-63060-D	WBSW-63060-D
80	LINO13055PA	LINOK13055PA	WBSW-63070-D	WBSW-63070-D
90	LINO13055PA	LINOK13055PA	WBSW-63080-D	WBSW-63080-D
100	LINO13085PA	LINOK13085PA	WBSW-63060-D	WBSW-63060-D
110	LINO13085PA	LINOK13085PA	WBSW-63070-D	WBSW-63070-D
120	LINO13105PA	LINOK13105PA	WBSW-63060-D	WBSW-63060-D
130	LINO13105PA	LINOK13105PA	WBSW-63070-D	WBSW-63070-D
140	LINO13105PA	LINOK13105PA	WBSW-63080-D	WBSW-63080-D
150	LINO13135PA	LINOK13135PA	WBSW-63060-D	WBSW-63060-D
160	LINO13135PA	LINOK13135PA	WBSW-63070-D	WBSW-63070-D
170	LINO13155PA	LINOK13155PA	WBSW-63060-D	WBSW-63060-D
180	LINO13155PA	LINOK13155PA	WBSW-63070-D	WBSW-63070-D
190	LINO13155PA	LINOK13155PA	WBSW-63080-D	WBSW-63080-D
200	LINO13185PA	LINOK13185PA	WBSW-63060-D	WBSW-63060-D
210	LINO13185PA	LINOK13185PA	WBSW-63070-D	WBSW-63070-D
220	LINO13185PA	LINOK13185PA	WBSW-63080-D	WBSW-63080-D
230	LINO13185PA	LINOK13185PA	WBSW-63090-D	WBSW-63090-D
240	LINO13185PA	LINOK13185PA	WBSW-63100-D	WBSW-63100-D
250	LINO13235PA	LINOK13235PA	WBSW-63060-D	WBSW-63060-D
260	LINO13235PA	LINOK13235PA	WBSW-63070-D	WBSW-63070-D

Plastic sleeve LINO + WBSW-6,3 fastener

TABLES FOR SELECTING FASTENER LENGTH

Substrate: concrete



Self-tapping fastener
WBSW-6,3

Insulation material thickness [mm]	LINO 13 Sleeve PA ø 13 [mm]	LINO K 13 Sleeve with spikes ø 13 [mm]	Concrete C12/15; C20/25 Drill diameter Ø 5.0 mm Depth of drilled hole 40 mm Anchorage depth heff = 30 mm	Thin concrete slabs Drill diameter Ø 5.0 mm Depth of drilled hole 40 mm Anchorage depth heff = 20 mm
	PA			
270	LINO13235PA	LINOK13235PA	WBSW-63080-D	WBSW-63080-D
280	LINO13235PA	LINOK13235PA	WBSW-63090-D	WBSW-63090-D
290	LINO13235PA	LINOK13235PA	WBSW-63100-D	WBSW-63100-D
300	LINO13285PA	LINOK13285PA	WBSW-63060-D	WBSW-63060-D
310	LINO13285PA	LINOK13285PA	WBSW-63070-D	WBSW-63070-D
320	LINO13285PA	LINOK13285PA	WBSW-63080-D	WBSW-63080-D
330	LINO13285PA	LINOK13285PA	WBSW-63090-D	WBSW-63090-D
340	LINO13285PA	LINOK13285PA	WBSW-63100-D	WBSW-63100-D
350	LINO13285PA	LINOK13285PA	WBSW-63120-D	WBSW-63120-D
360	LINO13285PA	LINOK13285PA	WBSW-63120-D	WBSW-63120-D
370	LINO13285PA	LINOK13285PA	WBSW-63140-D	WBSW-63140-D
380	LINO13285PA	LINOK13285PA	WBSW-63140-D	WBSW-63140-D
390	LINO13285PA	LINOK13285PA	WBSW-63160-D	WBSW-63160-D
400	LINO13285PA	LINOK13285PA	WBSW-63160-D	WBSW-63160-D
410	LINO13285PA	LINOK13285PA	WBSW-63180-D	WBSW-63180-D
420	LINO13285PA	LINOK13285PA	WBSW-63180-D	WBSW-63180-D
430	LINO13285PA	LINOK13285PA	WBSW-63200-D	WBSW-63200-D
440	LINO13285PA	LINOK13285PA	WBSW-63200-D	WBSW-63200-D
450	LINO13285PA	LINOK13285PA	WBSW-63220-D	WBSW-63220-D
460	LINO13285PA	LINOK13285PA	WBSW-63220-D	WBSW-63220-D
470	LINO13285PA	LINOK13285PA	WBSW-63240-D	WBSW-63240-D
480	LINO13285PA	LINOK13285PA	WBSW-63240-D	WBSW-63240-D
540	LINO13285PA	LINOK13285PA	WBSW-63300-D	WBSW-63300-D

PA - poliamid (nylon)

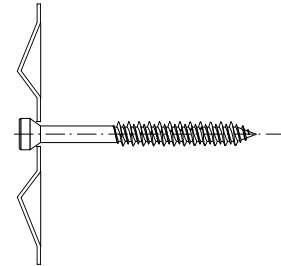
Steel washer KD + WBSW-6,3 fastener

TABLES FOR SELECTING FASTENER LENGTH

Substrate: concrete



ETA-15/0578



Self-tapping fastener
WBSW-6,3

Insulation material thickness [mm]	Steel washer			Concrete C12/15; C20/25	Thin concrete slabs
	KD-07-WW	KD-03-WW7	KD-03-W7	Drill diameter Ø 5.0 mm Depth of drilled hole 40 mm Anchorage depth heff = 30 mm	Drill diameter Ø 5.0 mm Depth of drilled hole 40 mm Anchorage depth heff = 20 mm
20	KD-03-W7	KD-03-WW7	KD-03-W7	WBSW-63060-D	WBSW-63060-D
30	KD-03-W7	KD-03-WW7	KD-03-W7	WBSW-63060-D	WBSW-63060-D
40	KD-03-W7	KD-03-WW7	KD-03-W7	WBSW-63070-D	WBSW-63070-D
50	KD-03-W7	KD-03-WW7	KD-03-W7	WBSW-63080-D	WBSW-63080-D
60	KD-03-W7	KD-03-WW7	KD-03-W7	WBSW-63090-D	WBSW-63090-D
70	KD-03-W7	KD-03-WW7	KD-03-W7	WBSW-63100-D	WBSW-63100-D
80	KD-03-W7	KD-03-WW7	KD-03-W7	WBSW-63120-D	WBSW-63120-D
90	KD-03-W7	KD-03-WW7	KD-03-W7	WBSW-63120-D	WBSW-63120-D
100	KD-03-W7	KD-03-WW7	KD-03-W7	WBSW-63140-D	WBSW-63140-D
110	KD-03-W7	KD-03-WW7	KD-03-W7	WBSW-63140-D	WBSW-63140-D
120	KD-03-W7	KD-03-WW7	KD-03-W7	WBSW-63160-D	WBSW-63160-D
130	KD-03-W7	KD-03-WW7	KD-03-W7	WBSW-63160-D	WBSW-63160-D

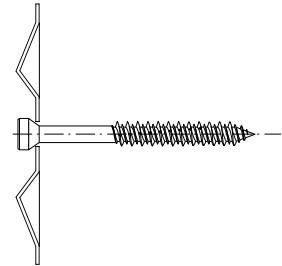
Steel washer KD + WBSW-6,3 fastener

TABLES FOR SELECTING FASTENER LENGTH

Substrate: concrete



ETA-15/0578

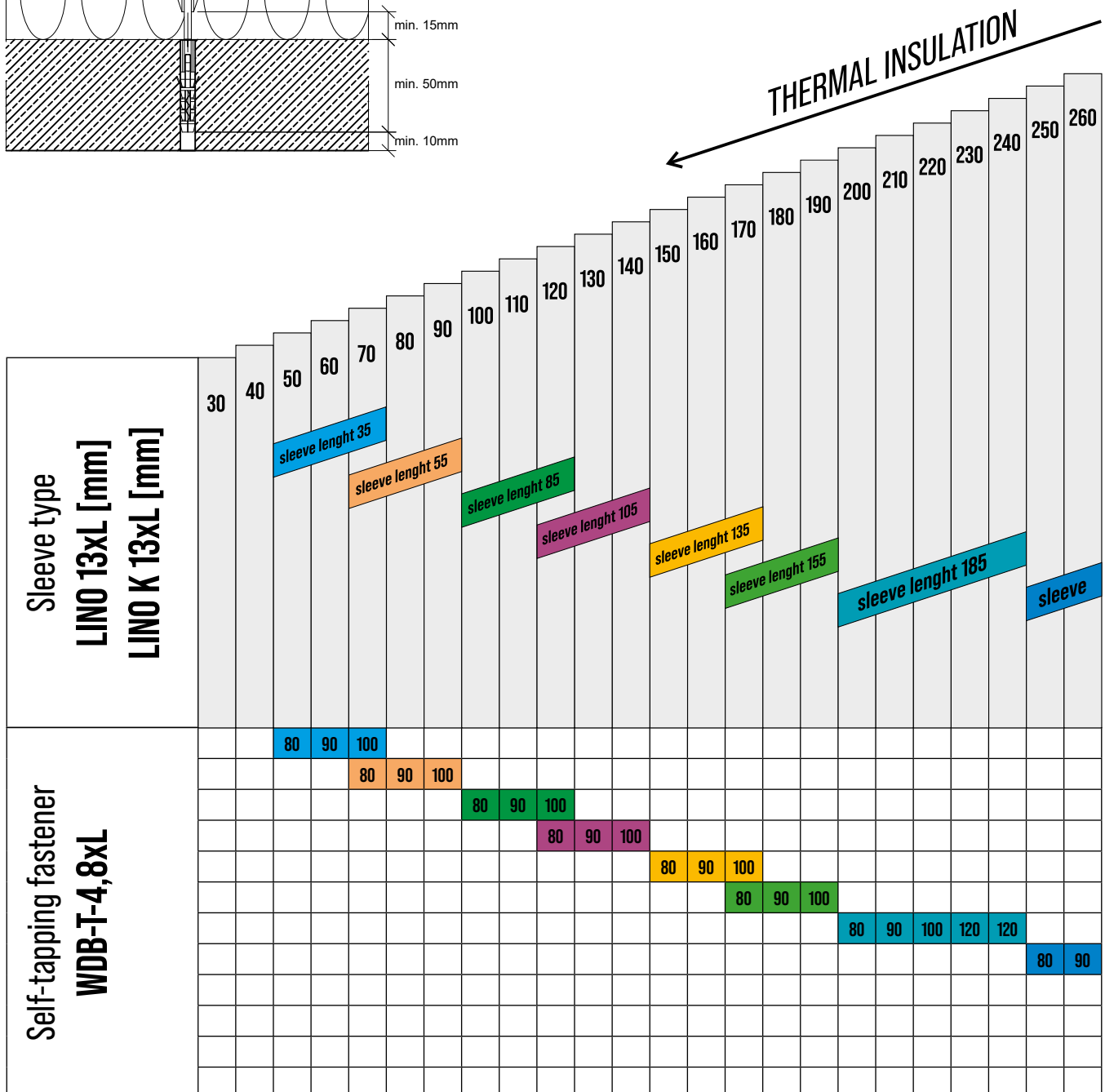
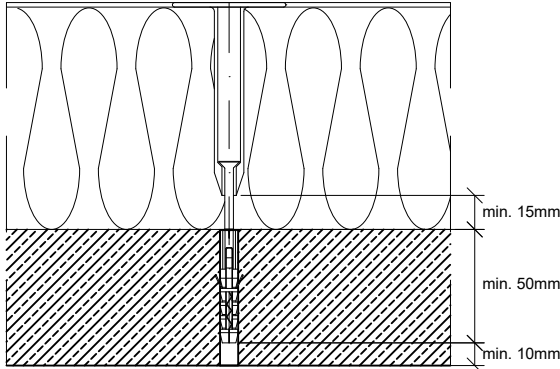


Self-tapping fastener
WBSW-6,3

Insulation material thickness [mm]	Steel washer			Concrete C12/15; C20/25	Thin concrete slabs
	KD-07-WW	KD-03-WW7	KD-03-W7	Drill diameter Ø 5.0 mm Depth of drilled hole 40 mm Anchorage depth heff = 30 mm	Drill diameter Ø 5.0 mm Depth of drilled hole 40 mm Anchorage depth heff = 20 mm
140	KD-03-W7	KD-03-WW7	KD-03-W7	WBSW-63180-D	WBSW-63180-D
150	KD-03-W7	KD-03-WW7	KD-03-W7	WBSW-63180-D	WBSW-63180-D
160	KD-03-W7	KD-03-WW7	KD-03-W7	WBSW-63200-D	WBSW-63200-D
170	KD-03-W7	KD-03-WW7	KD-03-W7	WBSW-63200-D	WBSW-63200-D
180	KD-03-W7	KD-03-WW7	KD-03-W7	WBSW-63220-D	WBSW-63220-D
190	KD-03-W7	KD-03-WW7	KD-03-W7	WBSW-63220-D	WBSW-63220-D
200	KD-03-W7	KD-03-WW7	KD-03-W7	WBSW-63240-D	WBSW-63240-D
210	KD-03-W7	KD-03-WW7	KD-03-W7	WBSW-63240-D	WBSW-63240-D
260	KD-03-W7	KD-03-WW7	KD-03-W7	WBSW-63300-D	WBSW-63300-D
270	KD-03-W7	KD-03-WW7	KD-03-W7	WBSW-63300-D	WBSW-63300-D

Plastic sleeve LINO + WDB-T-4,8 + KNX-8x50

Substrate: concrete



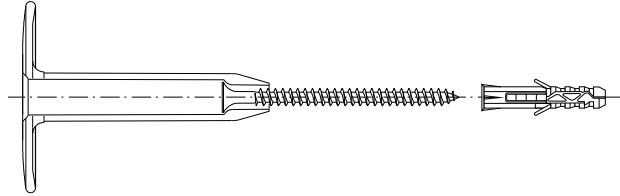
Plastic sleeve LINO + WDB-T-4,8 + KNX-8x50

TABLES FOR SELECTING FASTENER LENGTH



Substrate: concrete



ETA-15/0578



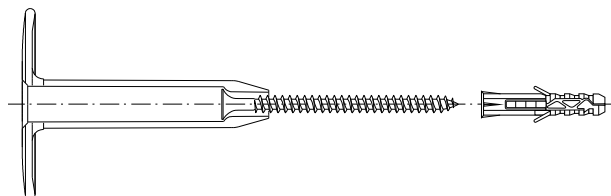
Self-tapping fastener
WDB-T-4,8

Insulation material thickness [mm]	LINO 13 Sleeve PA Ø 13 [mm]	LINO K 13 Sleeve with spikes Ø 13 [mm]	KNX - 8 x 50 sleeve PA	Concrete C12/15; C20/25 Drill diameter Ø 8.0 mm Depth of drilled hole 60 mm Anchorage depth heff = 50 mm	Thin concrete slabs Drill diameter Ø 8.0 mm Depth of drilled hole 60 mm Anchorage depth heff = 50 mm
	PA		PA	TX 	TX 
50	LINO13035PA	LINOK13035PA	KNX-08050	WDB-T-48080-D	WDB-T-48080-D
60	LINO13035PA	LINOK13035PA	KNX-08050	WDB-T-48090-D	WDB-T-48090-D
70	LINO13055PA	LINOK13055PA	KNX-08050	WDB-T-48080-D	WDB-T-48080-D
80	LINO13055PA	LINOK13055PA	KNX-08050	WDB-T-48090-D	WDB-T-48090-D
90	LINO13055PA	LINOK13055PA	KNX-08050	WDB-T-48100-D	WDB-T-48100-D
100	LINO13085PA	LINOK13085PA	KNX-08050	WDB-T-48080-D	WDB-T-48080-D
110	LINO13085PA	LINOK13085PA	KNX-08050	WDB-T-48090-D	WDB-T-48090-D
120	LINO13105PA	LINOK13105PA	KNX-08050	WDB-T-48080-D	WDB-T-48080-D
130	LINO13105PA	LINOK13105PA	KNX-08050	WDB-T-48090-D	WDB-T-48090-D
140	LINO13105PA	LINOK13105PA	KNX-08050	WDB-T-48100-D	WDB-T-48100-D
150	LINO13135PA	LINOK13135PA	KNX-08050	WDB-T-48080-D	WDB-T-48080-D
160	LINO13135PA	LINOK13135PA	KNX-08050	WDB-T-48090-D	WDB-T-48090-D
170	LINO13155PA	LINOK13155PA	KNX-08050	WDB-T-48080-D	WDB-T-48080-D
180	LINO13155PA	LINOK13155PA	KNX-08050	WDB-T-48090-D	WDB-T-48090-D
190	LINO13155PA	LINOK13155PA	KNX-08050	WDB-T-48100-D	WDB-T-48100-D
200	LINO13185PA	LINOK13185PA	KNX-08050	WDB-T-48080-D	WDB-T-48080-D
210	LINO13185PA	LINOK13185PA	KNX-08050	WDB-T-48090-D	WDB-T-48090-D
220	LINO13185PA	LINOK13185PA	KNX-08050	WDB-T-48100-D	WDB-T-48100-D
230	LINO13185PA	LINOK13185PA	KNX-08050	WDB-T-48120-D	WDB-T-48120-D
240	LINO13185PA	LINOK13185PA	KNX-08050	WDB-T-48120-D	WDB-T-48120-D
250	LINO13235PA	LINOK13235PA	KNX-08050	WDB-T-48080-D	WDB-T-48080-D
260	LINO13235PA	LINOK13235PA	KNX-08050	WDB-T-48090-D	WDB-T-48090-D

Plastic sleeve LINO + WDB-T-4,8 + KNX-8x50

TABLES FOR SELECTING FASTENER LENGTH

Substrate: concrete



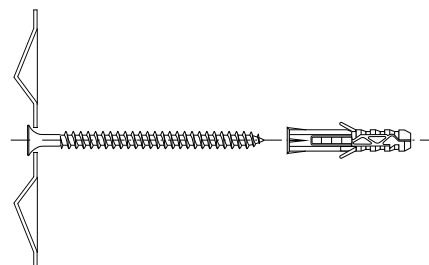
Self-tapping fastener
WDB-T-4,8

Insulation material thickness [mm]	LINO 13 Sleeve PA ø 13 [mm]	LINO K 13 Sleeve with spikes ø 13 [mm]	KNX - 8 x 50 sleeve PA	Concrete C12/15; C20/25 Drill diameter ø 8.0 mm Depth of drilled hole 60 mm Anchorage depth heff = 50 mm	Thin concrete slabs Drill diameter ø 8.0 mm Depth of drilled hole 60 mm Anchorage depth heff = 50 mm
	PA		PA	TX	TX
270	LINO13235PA	LINOK13235PA	KNX-08050	WDB-T-48100-D	WDB-T-48100-D
280	LINO13235PA	LINOK13235PA	KNX-08050	WDB-T-48120-D	WDB-T-48120-D
290	LINO13235PA	LINOK13235PA	KNX-08050	WDB-T-48120-D	WDB-T-48120-D
300	LINO13285PA	LINOK13285PA	KNX-08050	WDB-T-48080-D	WDB-T-48080-D
310	LINO13285PA	LINOK13285PA	KNX-08050	WDB-T-48090-D	WDB-T-48090-D
320	LINO13285PA	LINOK13285PA	KNX-08050	WDB-T-48100-D	WDB-T-48100-D
330	LINO13285PA	LINOK13285PA	KNX-08050	WDB-T-48120-D	WDB-T-48120-D
340	LINO13285PA	LINOK13285PA	KNX-08050	WDB-T-48120-D	WDB-T-48120-D
350	LINO13285PA	LINOK13285PA	KNX-08050	WDB-T-48140-D	WDB-T-48140-D
360	LINO13285PA	LINOK13285PA	KNX-08050	WDB-T-48140-D	WDB-T-48140-D
370	LINO13285PA	LINOK13285PA	KNX-08050	WDB-T-48160-D	WDB-T-48160-D
380	LINO13285PA	LINOK13285PA	KNX-08050	WDB-T-48160-D	WDB-T-48160-D
390	LINO13285PA	LINOK13285PA	KNX-08050	WDB-T-48180-D	WDB-T-48180-D
400	LINO13285PA	LINOK13285PA	KNX-08050	WDB-T-48180-D	WDB-T-48180-D
410	LINO13285PA	LINOK13285PA	KNX-08050	WDB-T-48200-D	WDB-T-48200-D
420	LINO13285PA	LINOK13285PA	KNX-08050	WDB-T-48200-D	WDB-T-48200-D
430	LINO13285PA	LINOK13285PA	KNX-08050	WDB-T-48220-D	WDB-T-48220-D
440	LINO13285PA	LINOK13285PA	KNX-08050	WDB-T-48220-D	WDB-T-48220-D
450	LINO13285PA	LINOK13285PA	KNX-08050	WDB-T-48240-D	WDB-T-48240-D
460	LINO13285PA	LINOK13285PA	KNX-08050	WDB-T-48240-D	WDB-T-48240-D

Plastic sleeve LINO + WDB-T-4,8 + KNX-8x50

TABLES FOR SELECTING FASTENER LENGTH

Substrate: concrete



Insulation material thickness [mm]	Steel washer KD-04-W5	Steel washer KD-01	Steel washer KD-03-W5	Steel washer KD-05	Steel washer KD-03-P	Steel washer KD-02-W-5,5
0	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
10	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
20	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
30	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
40	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
50	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
60	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
70	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
80	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
90	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
100	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
110	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
120	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
130	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
140	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
150	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
160	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
170	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
180	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
190	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P

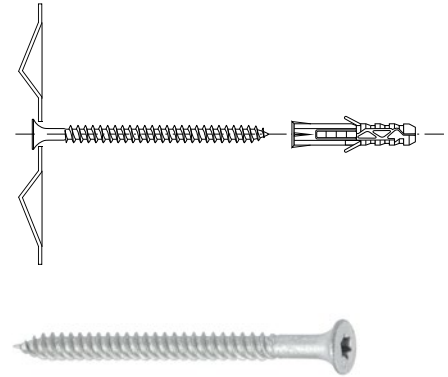
Plastic sleeve LINO + WDB-T-4,8 + KNX-8x50

TABLES FOR SELECTING FASTENER LENGTH

Substrate: concrete



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Self-tapping fastener
WDB-T-4,8

Steel washer KD-07-WW	Steel washer KD-03-WW7	Steel washer KD-03-W7	KNX - 8 x 50 sleeve PA	Concrete C12/15; C20/25 Drill diameter Ø 8.0 mm Depth of drilled hole 60 mm Anchorage depth heff = 50 mm	Thin concrete slabs Drill diameter Ø 8.0 mm Depth of drilled hole 60 mm Anchorage depth heff = 50 mm
				TX	TX
KD-07-WW	KD-03-WW7	KD-03-W7	KNX-08050	WDB-T-48050-D	WDB-T-48050-D
KD-07-WW	KD-03-WW7	KD-03-W7	KNX-08050	WDB-T-48060-D	WDB-T-48060-D
KD-07-WW	KD-03-WW7	KD-03-W7	KNX-08050	WDB-T-48070-D	WDB-T-48070-D
KD-07-WW	KD-03-WW7	KD-03-W7	KNX-08050	WDB-T-48080-D	WDB-T-48080-D
KD-07-WW	KD-03-WW7	KD-03-W7	KNX-08050	WDB-T-48090-D	WDB-T-48090-D
KD-07-WW	KD-03-WW7	KD-03-W7	KNX-08050	WDB-T-48100-D	WDB-T-48100-D
KD-07-WW	KD-03-WW7	KD-03-W7	KNX-08050	WDB-T-48120-D	WDB-T-48120-D
KD-07-WW	KD-03-WW7	KD-03-W7	KNX-08050	WDB-T-48120-D	WDB-T-48120-D
KD-07-WW	KD-03-WW7	KD-03-W7	KNX-08050	WDB-T-48140-D	WDB-T-48140-D
KD-07-WW	KD-03-WW7	KD-03-W7	KNX-08050	WDB-T-48140-D	WDB-T-48140-D
KD-07-WW	KD-03-WW7	KD-03-W7	KNX-08050	WDB-T-48160-D	WDB-T-48160-D
KD-07-WW	KD-03-WW7	KD-03-W7	KNX-08050	WDB-T-48160-D	WDB-T-48160-D
KD-07-WW	KD-03-WW7	KD-03-W7	KNX-08050	WDB-T-48180-D	WDB-T-48180-D
KD-07-WW	KD-03-WW7	KD-03-W7	KNX-08050	WDB-T-48180-D	WDB-T-48180-D
KD-07-WW	KD-03-WW7	KD-03-W7	KNX-08050	WDB-T-48200-D	WDB-T-48200-D
KD-07-WW	KD-03-WW7	KD-03-W7	KNX-08050	WDB-T-48200-D	WDB-T-48200-D
KD-07-WW	KD-03-WW7	KD-03-W7	KNX-08050	WDB-T-48220-D	WDB-T-48220-D
KD-07-WW	KD-03-WW7	KD-03-W7	KNX-08050	WDB-T-48220-D	WDB-T-48220-D
KD-07-WW	KD-03-WW7	KD-03-W7	KNX-08050	WDB-T-48240-D	WDB-T-48240-D
KD-07-WW	KD-03-WW7	KD-03-W7	KNX-08050	WDB-T-48240-D	WDB-T-48240-D

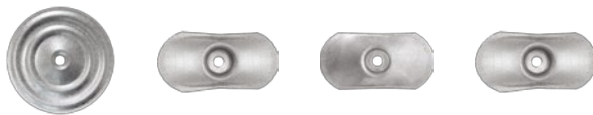
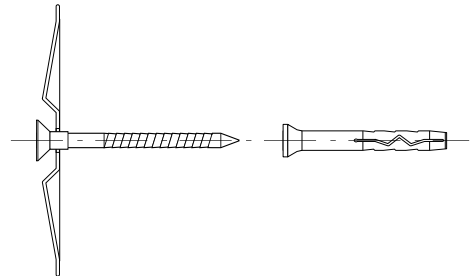
Steel washer KD + expansion plugs SMN

TABLES FOR SELECTING FASTENER LENGTH

Substrate: concrete



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Expansion plug

SMN-06050

SMN-08060

Insulation material thickness [mm]	Steel washer KD-07-WW	Steel washer KD-03-WW7	Steel washer KD-03-W7	Steel washer KD-03-W9	Concrete C12/15; C20/25 Drill diameter Ø 6.0 mm Depth of drilled hole 60 mm Min. anchorage depth heff= 50 mm	Concrete C12/15; C20/25 Drill diameter Ø 8.0 mm Depth of drilled hole 70 mm Min. anchorage depth heff= 60 mm
0	KD-07-WW	KD-03-WW7	KD-03-W7	x	SMN-06050	x
0	x	x	x	KD-03-W9	x	SMN-08060

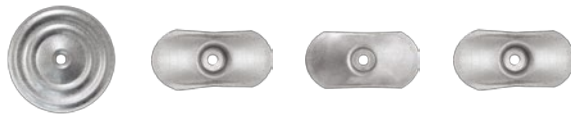
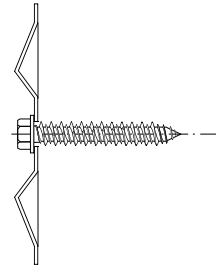
Steel washer KD + WB6-D fastener

TABLES FOR SELECTING FASTENER LENGTH

Substrate: concrete



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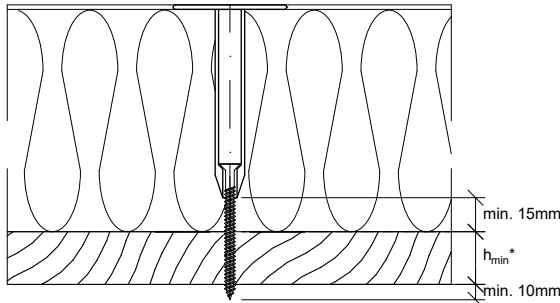


Self-tapping fastener
WB6-D

Insulation material thickness [mm]	Steel washer KD-07-WW	Steel washer KD-03-WW7	Steel washer KD-03-W7	Steel washer KD-03-W9	Concrete C12/15; C20/25 Drill diameter Ø 5.0 mm Depth of drilled hole 45/55 mm Min. anchorage depth heff= 35/45 mm	Thin concrete slabs Drill diameter Ø 5.0 mm Depth of drilled hole 45/55 mm Min. anchorage depth heff= 35/45 mm
	0	KD-07-WW	KD-03-WW7	KD-03-W7	KD-03-W9	WB6-D-63035
10	KD-07-WW	KD-03-WW7	KD-03-W7	KD-03-W9	WB6-D-63045	WB6-D-63045

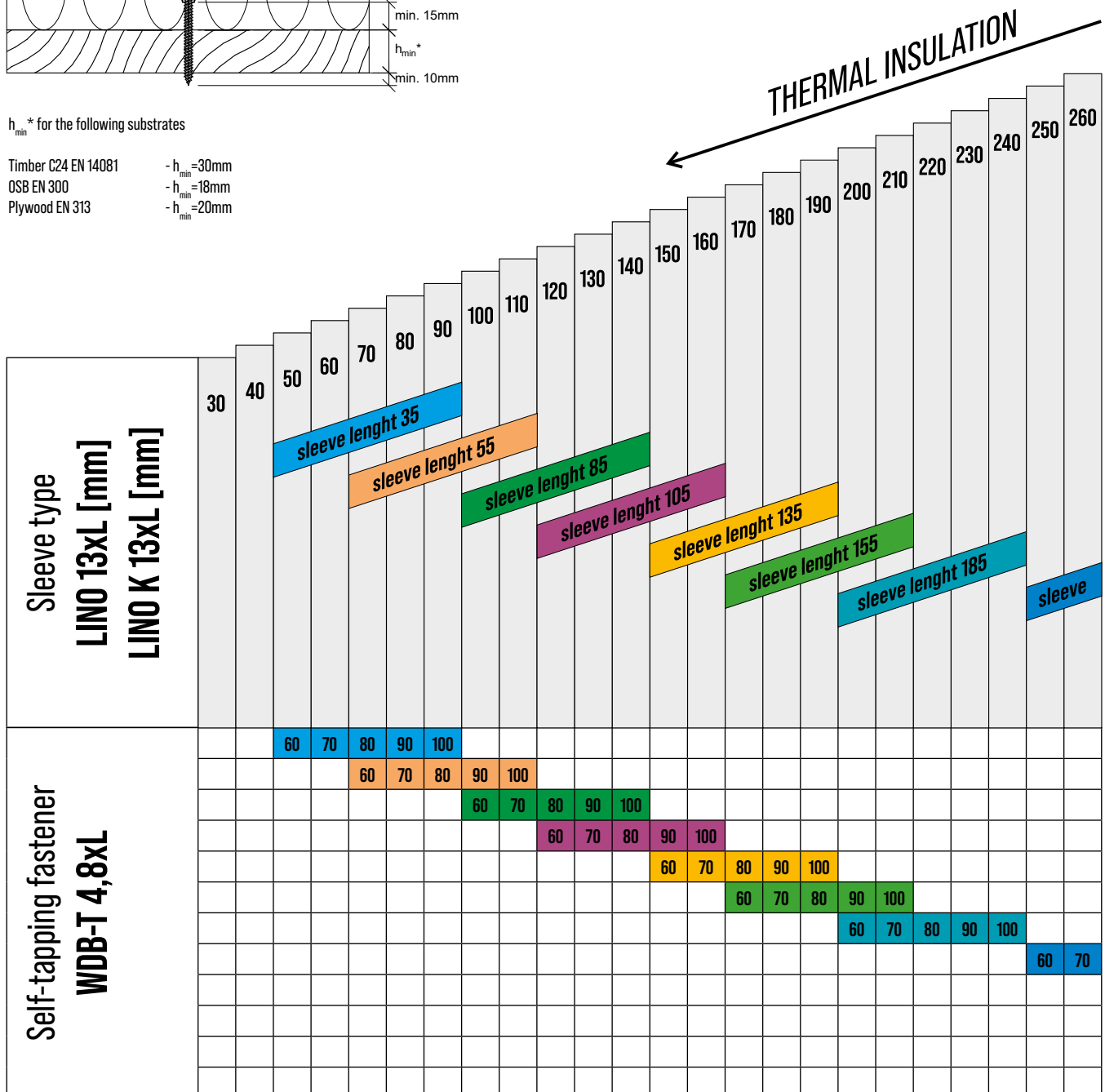
Plastic sleeve LINO + WDB-T-4,8 fastener

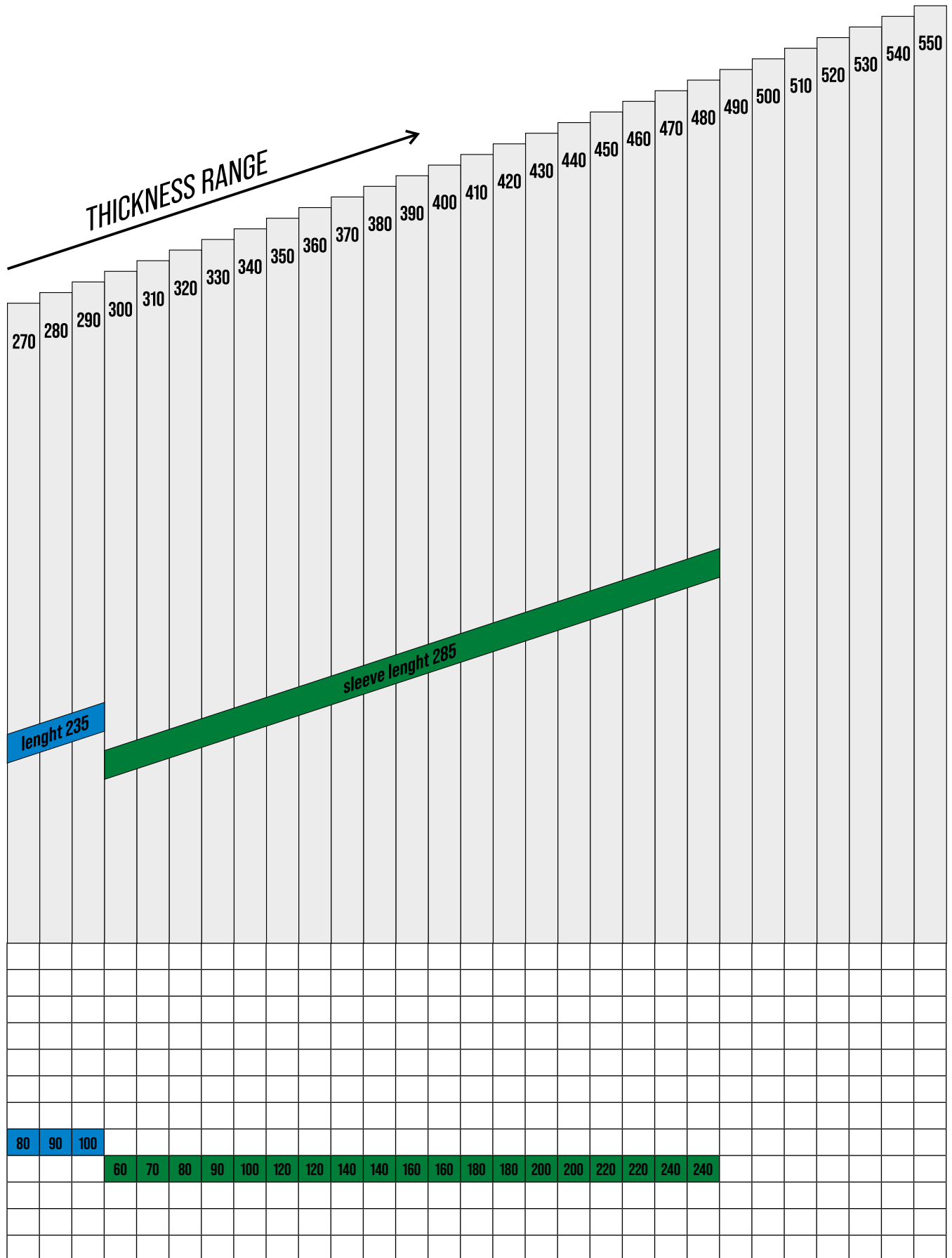
Substrate: timber, OSB board, plywood



h_{min}^* for the following substrates

- Timber C24 EN 14081 - $h_{min} = 30\text{mm}$
- OSB EN 300 - $h_{min} = 18\text{mm}$
- Plywood EN 313 - $h_{min} = 20\text{mm}$





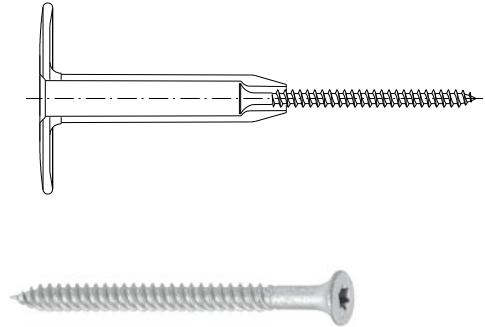
Plastic sleeve LINO + WDB-T-4,8 fastener

TABLES FOR SELECTING FASTENER LENGTH

Substrate: timber, OSB board, plywood



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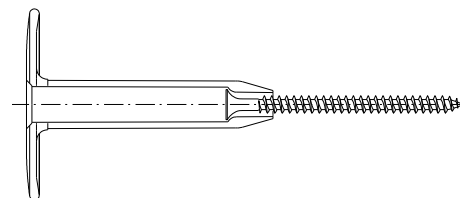
Self-tapping fastener
WDB-T-4,8

Insulation material thickness [mm]	LINO 13 Sleeve PA ø 13 [mm]	LINO K 13 Sleeve with spikes ø 13 [mm]	Timber C24 EN14081 Min. thickness 30 mm	Plywood EN313 Min. thickness 20 mm	OSB board EN300 Min. thickness 18 mm
	PA		TX	TX	TX
50	LINO13035	LINOK13035	WDB-T-48060-D	WDB-T-48060-D	WDB-T-48060-D
60	LINO13035	LINOK13035	WDB-T-48070-D	WDB-T-48070-D	WDB-T-48070-D
70	LINO13055	LINOK13055	WDB-T-48060-D	WDB-T-48060-D	WDB-T-48060-D
80	LINO13055	LINOK13055	WDB-T-48070-D	WDB-T-48070-D	WDB-T-48070-D
90	LINO13055	LINOK13055	WDB-T-48080-D	WDB-T-48080-D	WDB-T-48080-D
100	LINO13085	LINOK13085	WDB-T-48060-D	WDB-T-48060-D	WDB-T-48060-D
110	LINO13085	LINOK13085	WDB-T-48070-D	WDB-T-48070-D	WDB-T-48070-D
120	LINO13105	LINOK13105	WDB-T-48060-D	WDB-T-48060-D	WDB-T-48060-D
130	LINO13105	LINOK13105	WDB-T-48070-D	WDB-T-48070-D	WDB-T-48070-D
140	LINO13105	LINOK13105	WDB-T-48080-D	WDB-T-48080-D	WDB-T-48080-D
150	LINO13135	LINOK13135	WDB-T-48060-D	WDB-T-48060-D	WDB-T-48060-D
160	LINO13135	LINOK13135	WDB-T-48070-D	WDB-T-48070-D	WDB-T-48070-D
170	LINO13155	LINOK13155	WDB-T-48060-D	WDB-T-48060-D	WDB-T-48060-D
180	LINO13155	LINOK13155	WDB-T-48070-D	WDB-T-48070-D	WDB-T-48070-D
190	LINO13155	LINOK13155	WDB-T-48080-D	WDB-T-48080-D	WDB-T-48080-D
200	LINO13185	LINOK13185	WDB-T-48060-D	WDB-T-48060-D	WDB-T-48060-D
210	LINO13185	LINOK13185	WDB-T-48070-D	WDB-T-48070-D	WDB-T-48070-D
220	LINO13185	LINOK13185	WDB-T-48080-D	WDB-T-48080-D	WDB-T-48080-D
230	LINO13185	LINOK13185	WDB-T-48090-D	WDB-T-48090-D	WDB-T-48090-D
240	LINO13185	LINOK13185	WDB-T-48100-D	WDB-T-48100-D	WDB-T-48100-D
250	LINO13235	LINOK13235	WDB-T-48060-D	WDB-T-48060-D	WDB-T-48060-D
260	LINO13235	LINOK13235	WDB-T-48070-D	WDB-T-48070-D	WDB-T-48070-D
270	LINO13235	LINOK13235	WDB-T-48080-D	WDB-T-48080-D	WDB-T-48080-D

Plastic sleeve LINO + WDB-T-4,8 fastener

TABLES FOR SELECTING FASTENER LENGTH

Substrate: timber, OSB board, plywood



Self-tapping fastener
WDB-T-4,8

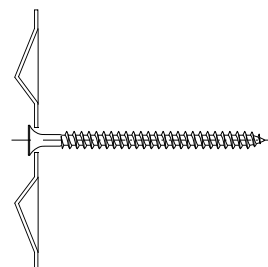
Insulation material thickness [mm]	LINO 13 Sleeve PA ø 13 [mm]	LINO K 13 Sleeve with spikes ø 13 [mm]	Timber C24 EN14081 Min. thickness 30 mm	Plywood EN313 Min. thickness 20 mm	OSB board EN300 Min. thickness 18 mm
	PA		TX	TX	TX
280	LINO13235PA	LINOK13235PA	WDB-T-48090-D	WDB-T-48090-D	WDB-T-48090-D
290	LINO13235PA	LINOK13235PA	WDB-T-48100-D	WDB-T-48100-D	WDB-T-48100-D
300	LINO13285PA	LINOK13285PA	WDB-T-48060-D	WDB-T-48060-D	WDB-T-48060-D
310	LINO13285PA	LINOK13285PA	WDB-T-48070-D	WDB-T-48070-D	WDB-T-48070-D
320	LINO13285PA	LINOK13285PA	WDB-T-48080-D	WDB-T-48080-D	WDB-T-48080-D
330	LINO13285PA	LINOK13285PA	WDB-T-48090-D	WDB-T-48090-D	WDB-T-48090-D
340	LINO13285PA	LINOK13285PA	WDB-T-48100-D	WDB-T-48100-D	WDB-T-48100-D
350	LINO13285PA	LINOK13285PA	WDB-T-48120-D	WDB-T-48120-D	WDB-T-48120-D
360	LINO13285PA	LINOK13285PA	WDB-T-48120-D	WDB-T-48120-D	WDB-T-48120-D
370	LINO13285PA	LINOK13285PA	WDB-T-48140-D	WDB-T-48140-D	WDB-T-48140-D
380	LINO13285PA	LINOK13285PA	WDB-T-48140-D	WDB-T-48140-D	WDB-T-48140-D
390	LINO13285PA	LINOK13285PA	WDB-T-48160-D	WDB-T-48160-D	WDB-T-48160-D
400	LINO13285PA	LINOK13285PA	WDB-T-48160-D	WDB-T-48160-D	WDB-T-48160-D
410	LINO13285PA	LINOK13285PA	WDB-T-48180-D	WDB-T-48180-D	WDB-T-48180-D
420	LINO13285PA	LINOK13285PA	WDB-T-48180-D	WDB-T-48180-D	WDB-T-48180-D
430	LINO13285PA	LINOK13285PA	WDB-T-48200-D	WDB-T-48200-D	WDB-T-48200-D
440	LINO13285PA	LINOK13285PA	WDB-T-48200-D	WDB-T-48200-D	WDB-T-48200-D
450	LINO13285PA	LINOK13285PA	WDB-T-48220-D	WDB-T-48220-D	WDB-T-48220-D
460	LINO13285PA	LINOK13285PA	WDB-T-48220-D	WDB-T-48220-D	WDB-T-48220-D
470	LINO13285PA	LINOK13285PA	WDB-T-48240-D	WDB-T-48240-D	WDB-T-48240-D
480	LINO13285PA	LINOK13285PA	WDB-T-48240-D	WDB-T-48240-D	WDB-T-48240-D

PA - poliamid (nylon)

Plastic sleeve LINO + WDB-T-4,8 fastener

TABLES FOR SELECTING FASTENER LENGTH

Substrate: timber, OSB board, plywood



Insulation material thickness [mm]	Steel washer KD-04-W5	Steel washer KD-01	Steel washer KD-03-W5	Steel washer KD-05	Steel washer KD-03-P	Steel washer KD-02-W-5,5
0	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
10	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
20	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
30	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
40	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
50	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
60	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
70	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
80	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
90	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
100	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
110	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
120	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
130	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
140	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
150	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
160	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
170	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
180	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
190	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
200	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P
210	KD-04-W5	KD-01	KD-03-W5	KD-05	KD-03-P	KD-03-P

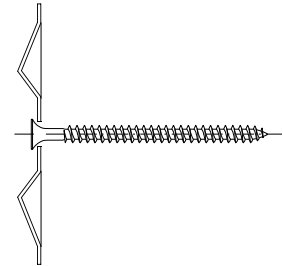
Plastic sleeve LINO + WDB-T-4,8 fastener

TABLES FOR SELECTING FASTENER LENGTH

Substrate: timber, OSB board, plywood



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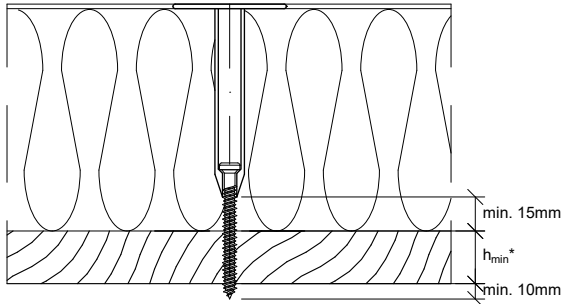


Self-tapping fastener
WDB-T-4,8

Steel washer KD-07-WW	Steel washer KD-03-WW7	Steel washer KD-03-W7	Timber C24 EN14081 Min. thickness 30 mm	Plywood EN313 Min. thickness 20 mm	OSB board EN300 Min. thickness 18 mm
			TX	TX	TX
KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48040-D	WDB-T-48040-D	WDB-T-48040-D
KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48050-D	WDB-T-48050-D	WDB-T-48050-D
KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48060-D	WDB-T-48060-D	WDB-T-48060-D
KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48070-D	WDB-T-48070-D	WDB-T-48070-D
KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48080-D	WDB-T-48080-D	WDB-T-48080-D
KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48090-D	WDB-T-48090-D	WDB-T-48090-D
KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48100-D	WDB-T-48100-D	WDB-T-48100-D
KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48120-D	WDB-T-48120-D	WDB-T-48120-D
KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48120-D	WDB-T-48120-D	WDB-T-48120-D
KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48140-D	WDB-T-48140-D	WDB-T-48140-D
KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48140-D	WDB-T-48140-D	WDB-T-48140-D
KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48160-D	WDB-T-48160-D	WDB-T-48160-D
KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48160-D	WDB-T-48160-D	WDB-T-48160-D
KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48180-D	WDB-T-48180-D	WDB-T-48180-D
KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48180-D	WDB-T-48180-D	WDB-T-48180-D
KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48200-D	WDB-T-48200-D	WDB-T-48200-D
KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48200-D	WDB-T-48200-D	WDB-T-48200-D
KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48220-D	WDB-T-48220-D	WDB-T-48220-D
KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48220-D	WDB-T-48220-D	WDB-T-48220-D
KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48240-D	WDB-T-48240-D	WDB-T-48240-D
KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48240-D	WDB-T-48240-D	WDB-T-48240-D
KD-07-WW	KD-03-WW7	KD-03-W7	WDB-T-48240-D	WDB-T-48240-D	WDB-T-48240-D

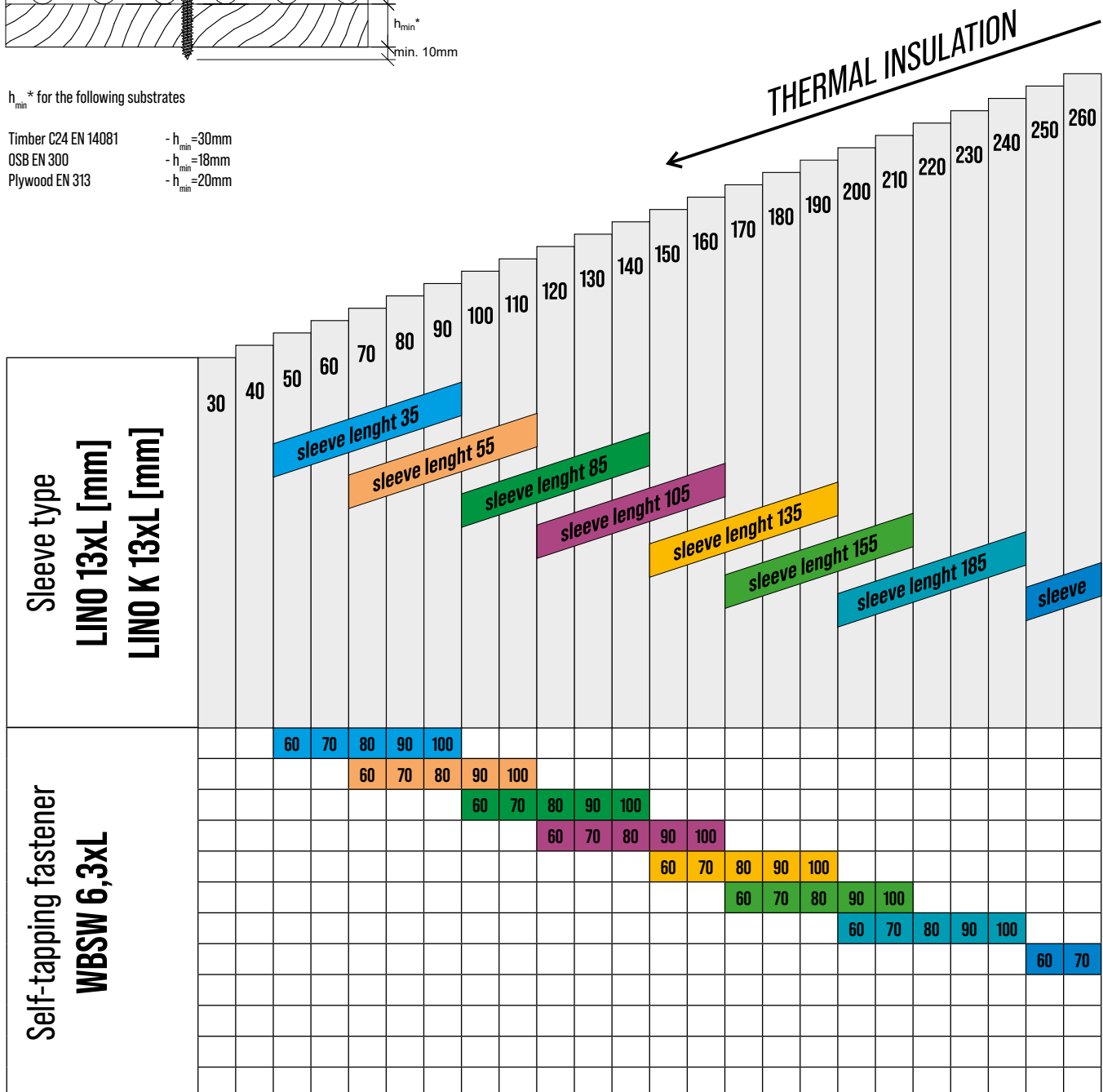
Plastic sleeve LINO + WBSW-6,3 fastener

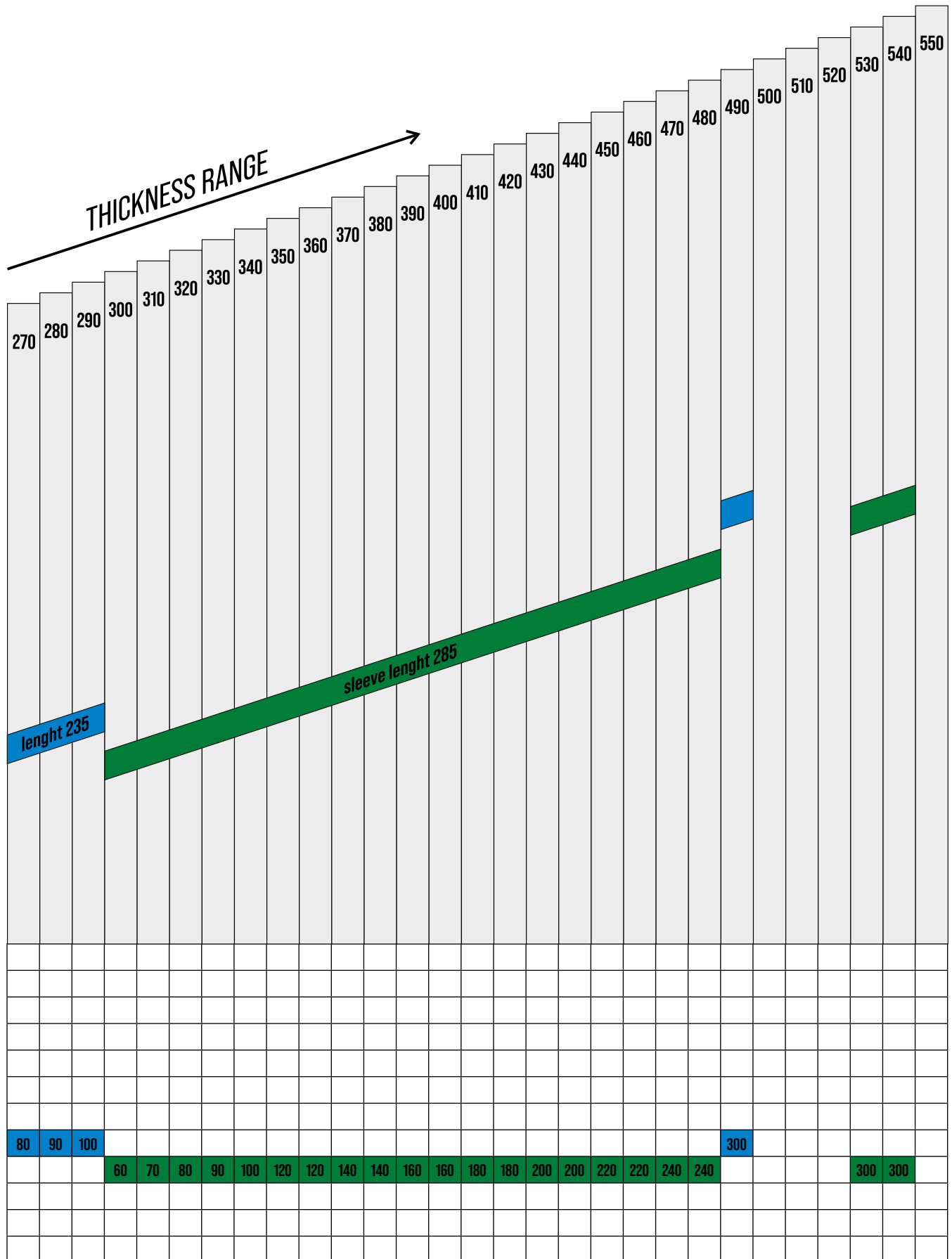
Substrate: timber, OSB board, plywood



h_{min}^* for the following substrates

- Timber C24 EN 14081 - $h_{min} = 30\text{mm}$
- OSB EN 300 - $h_{min} = 18\text{mm}$
- Plywood EN 313 - $h_{min} = 20\text{mm}$





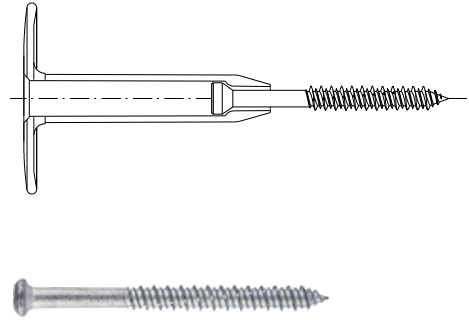
Plastic sleeve LINO + WBSW-6,3 fastener

TABLES FOR SELECTING FASTENER LENGTH

Substrate: timber, OSB board, plywood



ETA-15/0578



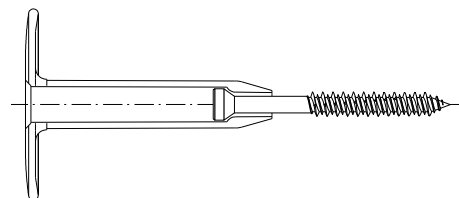
Self-tapping fastener
WBSW-6,3

Insulation material thickness [mm]	LINO 13 Sleeve PA ø 13 [mm]	LINO K 13 Sleeve with spikes ø 13 [mm]	Timber C24 EN14081 Min. thickness 30 mm	Plywood EN313 Min. thickness 20 mm	OSB board EN300 Min. thickness 18 mm
	PA		TX	TX	TX
50	LINO13035PA	LINOK13035PA	WBSW-63060-D	WBSW-63060-D	WBSW-63060-D
60	LINO13035PA	LINOK13035PA	WBSW-63070-D	WBSW-63070-D	WBSW-63070-D
70	LINO13055PA	LINOK13055PA	WBSW-63060-D	WBSW-63060-D	WBSW-63060-D
80	LINO13055PA	LINOK13055PA	WBSW-63070-D	WBSW-63070-D	WBSW-63070-D
90	LINO13055PA	LINOK13055PA	WBSW-63080-D	WBSW-63080-D	WBSW-63080-D
100	LINO13085PA	LINOK13085PA	WBSW-63060-D	WBSW-63060-D	WBSW-63060-D
110	LINO13085PA	LINOK13085PA	WBSW-63070-D	WBSW-63070-D	WBSW-63070-D
120	LINO13105PA	LINOK13105PA	WBSW-63060-D	WBSW-63060-D	WBSW-63060-D
130	LINO13105PA	LINOK13105PA	WBSW-63070-D	WBSW-63070-D	WBSW-63070-D
140	LINO13105PA	LINOK13105PA	WBSW-63080-D	WBSW-63080-D	WBSW-63080-D
150	LINO13135PA	LINOK13135PA	WBSW-63060-D	WBSW-63060-D	WBSW-63060-D
160	LINO13135PA	LINOK13135PA	WBSW-63070-D	WBSW-63070-D	WBSW-63070-D
170	LINO13155PA	LINOK13155PA	WBSW-63060-D	WBSW-63060-D	WBSW-63060-D
180	LINO13155PA	LINOK13155PA	WBSW-63070-D	WBSW-63070-D	WBSW-63070-D
190	LINO13155PA	LINOK13155PA	WBSW-63080-D	WBSW-63080-D	WBSW-63080-D
200	LINO13185PA	LINOK13185PA	WBSW-63060-D	WBSW-63060-D	WBSW-63060-D
210	LINO13185PA	LINOK13185PA	WBSW-63070-D	WBSW-63070-D	WBSW-63070-D
220	LINO13185PA	LINOK13185PA	WBSW-63080-D	WBSW-63080-D	WBSW-63080-D
230	LINO13185PA	LINOK13185PA	WBSW-63090-D	WBSW-63090-D	WBSW-63090-D
240	LINO13185PA	LINOK13185PA	WBSW-63100-D	WBSW-63100-D	WBSW-63100-D
250	LINO13235PA	LINOK13235PA	WBSW-63060-D	WBSW-63060-D	WBSW-63060-D
260	LINO13235PA	LINOK13235PA	WBSW-63070-D	WBSW-63070-D	WBSW-63070-D
270	LINO13235PA	LINOK13235PA	WBSW-63080-D	WBSW-63080-D	WBSW-63080-D

Plastic sleeve LINO + WBSW-6,3 fastener

TABLES FOR SELECTING FASTENER LENGTH

Substrate: timber, OSB board, plywood



Self-tapping fastener
WBSW-6,3

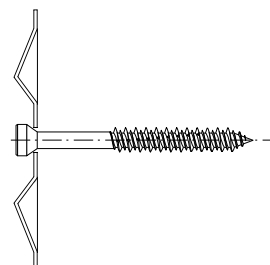
Insulation material thickness [mm]	LINO 13 Sleeve PA ø 13 [mm]	LINO K 13 Sleeve with spikes ø 13 [mm]	Timber C24 EN14081 Min. thickness 30 mm	Plywood EN313 Min. thickness 20 mm	OSB board EN300 Min. thickness 18 mm
	PA		TX	TX	TX
280	LINO13235PA	LINOK13235PA	WBSW-63090-D	WBSW-63090-D	WBSW-63090-D
290	LINO13235PA	LINOK13235PA	WBSW-63100-D	WBSW-63100-D	WBSW-63100-D
300	LINO13285PA	LINOK13285PA	WBSW-63060-D	WBSW-63060-D	WBSW-63060-D
310	LINO13285PA	LINOK13285PA	WBSW-63070-D	WBSW-63070-D	WBSW-63070-D
320	LINO13285PA	LINOK13285PA	WBSW-63080-D	WBSW-63080-D	WBSW-63080-D
330	LINO13285PA	LINOK13285PA	WBSW-63090-D	WBSW-63090-D	WBSW-63090-D
340	LINO13285PA	LINOK13285PA	WBSW-63100-D	WBSW-63100-D	WBSW-63100-D
350	LINO13285PA	LINOK13285PA	WBSW-63120-D	WBSW-63120-D	WBSW-63120-D
360	LINO13285PA	LINOK13285PA	WBSW-63120-D	WBSW-63120-D	WBSW-63120-D
370	LINO13285PA	LINOK13285PA	WBSW-63140-D	WBSW-63140-D	WBSW-63140-D
380	LINO13285PA	LINOK13285PA	WBSW-63140-D	WBSW-63140-D	WBSW-63140-D
390	LINO13285PA	LINOK13285PA	WBSW-63160-D	WBSW-63160-D	WBSW-63160-D
400	LINO13285PA	LINOK13285PA	WBSW-63160-D	WBSW-63160-D	WBSW-63160-D
410	LINO13285PA	LINOK13285PA	WBSW-63180-D	WBSW-63180-D	WBSW-63180-D
420	LINO13285PA	LINOK13285PA	WBSW-63180-D	WBSW-63180-D	WBSW-63180-D
430	LINO13285PA	LINOK13285PA	WBSW-63200-D	WBSW-63200-D	WBSW-63200-D
440	LINO13285PA	LINOK13285PA	WBSW-63200-D	WBSW-63200-D	WBSW-63200-D
450	LINO13285PA	LINOK13285PA	WBSW-63220-D	WBSW-63220-D	WBSW-63220-D
460	LINO13285PA	LINOK13285PA	WBSW-63220-D	WBSW-63220-D	WBSW-63220-D
470	LINO13285PA	LINOK13285PA	WBSW-63240-D	WBSW-63240-D	WBSW-63240-D
480	LINO13285PA	LINOK13285PA	WBSW-63240-D	WBSW-63240-D	WBSW-63240-D
540	LINO13285PA	LINOK13285PA	WBSW-63300-D	WBSW-63300-D	WBSW-63300-D

PA - poliamid (nylon)

Steel washer KD + WBSW-6,3 fastener

TABLES FOR SELECTING FASTENER LENGTH

Substrate: timber, OSB board, plywood



Self-tapping fastener
WBSW-6,3

Insulation material thickness [mm]	Steel washer KD-07-WW	Steel washer KD-03-WW7	Steel washer KD-03-W7	Timber C24 EN14081 Min. thickness 30 mm	Plywood EN313 Min. thickness 20 mm	OSB board EN300 Min. thickness 18 mm
				TX	TX	TX
30	KD-07-WW	KD-03-WW7	KD-03-W7	WBSW-63060-D	x	x
40	KD-07-WW	KD-03-WW7	KD-03-W7	WBSW-63070-D	WBSW-63060-D	WBSW-63060-D
50	KD-07-WW	KD-03-WW7	KD-03-W7	WBSW-63080-D	WBSW-63070-D	WBSW-63070-D
60	KD-07-WW	KD-03-WW7	KD-03-W7	WBSW-63090-D	WBSW-63080-D	WBSW-63080-D
70	KD-07-WW	KD-03-WW7	KD-03-W7	WBSW-63100-D	WBSW-63090-D	WBSW-63090-D
80	KD-07-WW	KD-03-WW7	KD-03-W7	WBSW-63120-D	WBSW-63100-D	WBSW-63100-D
90	KD-07-WW	KD-03-WW7	KD-03-W7	WBSW-63120-D	WBSW-63120-D	WBSW-63120-D
100	KD-07-WW	KD-03-WW7	KD-03-W7	WBSW-63140-D	WBSW-63120-D	WBSW-63120-D
110	KD-07-WW	KD-03-WW7	KD-03-W7	WBSW-63140-D	WBSW-63140-D	WBSW-63140-D
120	KD-07-WW	KD-03-WW7	KD-03-W7	WBSW-63160-D	WBSW-63140-D	WBSW-63140-D
130	KD-07-WW	KD-03-WW7	KD-03-W7	WBSW-63160-D	WBSW-63160-D	WBSW-63160-D
140	KD-07-WW	KD-03-WW7	KD-03-W7	WBSW-63180-D	WBSW-63160-D	WBSW-63160-D
150	KD-07-WW	KD-03-WW7	KD-03-W7	WBSW-63180-D	WBSW-63180-D	WBSW-63180-D
160	KD-07-WW	KD-03-WW7	KD-03-W7	WBSW-63200-D	WBSW-63180-D	WBSW-63180-D
170	KD-07-WW	KD-03-WW7	KD-03-W7	WBSW-63200-D	WBSW-63200-D	WBSW-63200-D
180	KD-07-WW	KD-03-WW7	KD-03-W7	WBSW-63220-D	WBSW-63200-D	WBSW-63200-D
190	KD-07-WW	KD-03-WW7	KD-03-W7	WBSW-63220-D	WBSW-63220-D	WBSW-63220-D
200	KD-07-WW	KD-03-WW7	KD-03-W7	WBSW-63240-D	WBSW-63220-D	WBSW-63220-D
210	KD-07-WW	KD-03-WW7	KD-03-W7	WBSW-63240-D	WBSW-63240-D	WBSW-63240-D
220	KD-07-WW	KD-03-WW7	KD-03-W7	x	WBSW-63240-D	WBSW-63240-D
260	KD-07-WW	KD-03-WW7	KD-03-W7	WBSW-63300-D	x	x
270	KD-07-WW	KD-03-WW7	KD-03-W7	WBSW-63300-D	WBSW-63300-D	WBSW-63300-D
280	KD-07-WW	KD-03-WW7	KD-03-W7	x	WBSW-63300-D	WBSW-63300-D

Fastening system for flat roof technical parameter for different substrates

	page
• Steel sheets profile 0,50 - 1,25 mm thickness	92 - 99
• Concrete, thin concrete slabs	100 - 113
• Timber. OSB board. plywood	114 - 121
• Vapour barrier foil FBZ-0250	122

LINO + WDB-T-4.8

FOR STEEL SHEETS PROFILE 0,50 - 0,75 MM THICKNESS

PLASTIC SLEEVE + SELF-TAPPING FASTENER WDB-T-4,8

Substrate: Profiled steel sheet 0,50 ± 0,75 mm

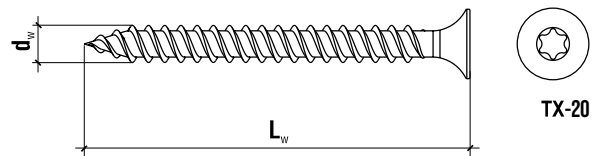


LINO 13 PA

LINO K 13 PA

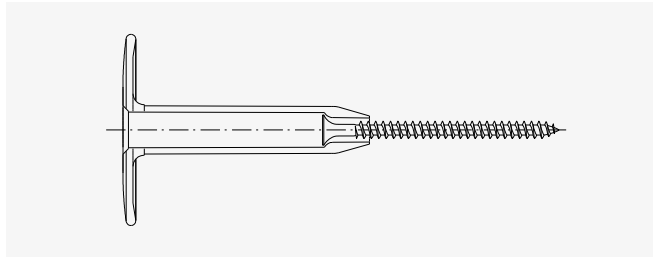


WDB-T-4,8



Fastener dimension

Code	Fastener dimensions WDB-T dw x Lw [mm]
WDB-T-48050-D	4,8 x 50
WDB-T-48060-D	4,8 x 60
WDB-T-48070-D	4,8 x 70
WDB-T-48080-D	4,8 x 80
WDB-T-48090-D	4,8 x 90
WDB-T-48100-D	4,8 x 100
WDB-T-48120-D	4,8 x 120
WDB-T-48140-D	4,8 x 140
WDB-T-48160-D	4,8 x 160
WDB-T-48180-D	4,8 x 180
WDB-T-48200-D	4,8 x 200
WDB-T-48220-D	4,8 x 220
WDB-T-48240-D	4,8 x 240



Clamping range table

Product marking - plastic sleeve		Sleeve length [mm]	Min. insulation thickness t_{fix} [mm]
PA-poliamid	PA-poliamid		
LINO13035PA(200)	LINOK13035PA(200)	35	50
LINO13055PA(200)	LINOK13055PA(200)	55	70
LINO13085PA(200)	LINOK13085PA(200)	85	100
LINO13105PA(200)	LINOK13105PA(200)	105	120
LINO13135PA(200)	LINOK13135PA(200)	135	150
LINO13155PA(200)	LINOK13155PA(200)	155	170
LINO13185PA(200)	LINOK13185PA(200)	185	200
LINO13235PA(100)	LINOK13235PA(100)	235	250
LINO13285PA(100)	LINOK13285PA(100)	285	300

Tables for selecting fastener length - page: 50-51

LINO + WDB-T-4.8

FOR STEEL SHEETS PROFILE 0,50 - 0,75 MM THICKNESS

PLASTIC SLEEVE + SELF-TAPPING FASTENER WDB-T-4,8

Technical data

Parameter	Unit	LINO 13	LINO K 13	WDB-T-4,8
Sleeve/fastener diameter	d_k/d_w [mm]	13	13	4,8
Hole in the sleeve	d_h [mm]	6,3	6,3	x
Collar of the sleeve/ head fastener diameter	D_k/D_w [mm]	50	50	9,0
Fastener drive	x	x	x	TX-20
Substrate/ steel sheets thickness	x	x	x	steel sheet 0,50 - 0,75 mm
Sleeve material	x	PA	PA	x
Fastener material	x	x	x	steel
Approval		ETA-15/0578		

PULL-OUT RESISTANCE [kN]

Substrate	LINO 13 LINO K 13 + WDB-T
Characteristic resistance [kN]	
Steel sheet th 0,50 mm	0,78
Steel sheet th 0,63 mm	0,99
Steel sheet th 0,75 mm	1,17
Design resistance [kN] $\gamma M=2.0^*$	
Steel sheet th 0,50 mm	0,39
Steel sheet th 0,63 mm	0,50
Steel sheet th 0,75 mm	0,59

Steel grade S 280 GD by EN-10346

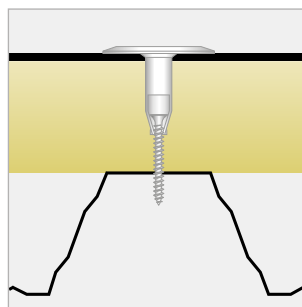
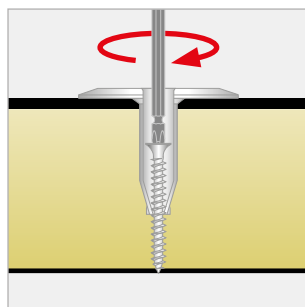
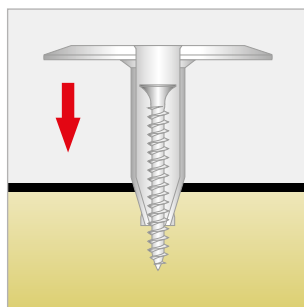
* - national safety factor shall be applied, in its absence apply 2,0

SUBSTRATE, MINIMUM THICKNESS, DISTANCE

Substrate	Min. steel sheet thickness h_{min} [mm]	Min. edge distance c_{min} [mm]	Min. spacing L_{os} [mm]
Steel sheet	0,50 - 0,75	30	120

Steel grade S 280 GD by EN-10346

MOUNTING METHOD

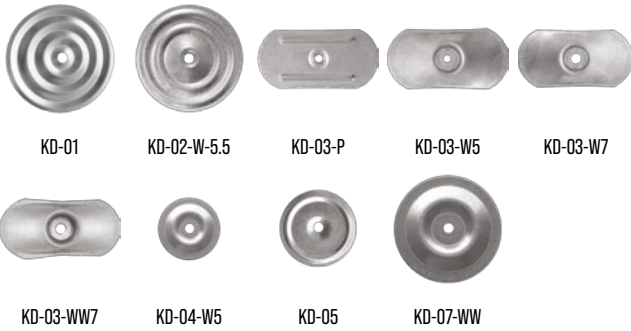


Steel washer KD + WDB-T-4,8

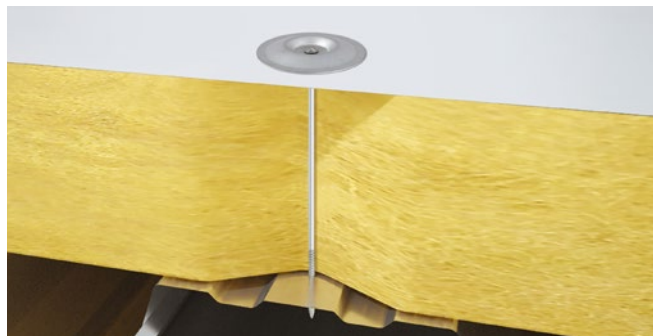
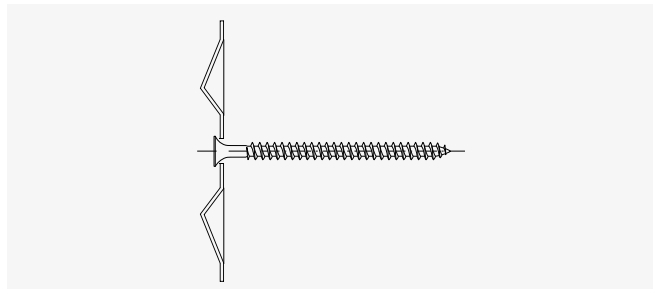
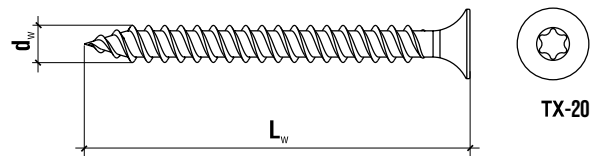
FOR STEEL SHEETS PROFILE 0,50-0,75 MM THICKNESS

KD STEEL WASHERS + SELF-TAPPING FASTENER WDB-T-4,8

Substrate: Profiled steel sheet 0,50 ÷ 0,75 mm



WDB-T-4,8



Fixing range table

Code	Fastener dimensions WDB-T $d_w \times L_w$ [mm]	MAX insulation thickness t_{tx} [mm]
WDB-T-48040-D	4,8 x 40	20
WDB-T-48050-D	4,8 x 50	30
WDB-T-48060-D	4,8 x 60	40
WDB-T-48070-D	4,8 x 70	50
WDB-T-48080-D	4,8 x 80	60
WDB-T-48090-D	4,8 x 90	70
WDB-T-48100-D	4,8 x 100	80
WDB-T-48120-D	4,8 x 120	100
WDB-T-48140-D	4,8 x 140	120
WDB-T-48160-D	4,8 x 160	140
WDB-T-48180-D	4,8 x 180	160
WDB-T-48200-D	4,8 x 200	180
WDB-T-48220-D	4,8 x 220	200
WDB-T-48240-D	4,8 x 240	220

Washer dimension

Product marking - steel washer		KD washer dimensions [mm]
KD-01	[round]	ø 70
KD-02-W-5.5	[round]	ø 70
KD-03-P	[oval]	80 x 40
KD-03-W5	[oval]	80 x 40
KD-03-W7	[oval]	80 x 40
KD-03-WW7	[oval]	80 x 40
KD-04-W5	[round]	ø 40
KD-05	[round]	ø 50
KD-07-WW	[round]	ø 70

Steel washer KD + WDB-T-4,8
FOR STEEL SHEETS PROFILE 0,50-0,75 MM THICKNESS
KD STEEL WASHERS + SELF-TAPPING FASTENER WDB-T-4,8

TECHNICAL DATA

Parameter	Unit	KD-01	KD-02-W-5,5	KD-03-P	KD-03-W5	KD-03-W7	KD-03-WW7	KD-04-W5	KD-05	KD-07-WW	WDB-T-4,8
Washer/fastener diameter	D_p / d_w [mm]	ø 70	ø 70	80 x 40	80 x 40	80 x 40	80 x 40	ø 40	ø 50	ø 70	4,8
Washer hole diameter	d_p [mm]	5,0	5,5	5,5	5,0	7,0	7,0	5,0	5,0	6,5	x
Fastener head diameter	D_w [mm]	x	x	x	x	x	x	x	x	x	9,0
Fastener drive	x	x	x	x	x	x	x	x	x	x	TX-20
Substrate / steel sheets thickness	x	x	x	x	x	x	x	x	x	x	steel sheet 0,50 - 0,75 mm
Washer material	x	steel	steel	steel	steel	steel	steel	steel	steel	steel	x
Fastener material	x	x	x	x	x	x	x	x	x	x	steel
Approval	x	ETA-15/0578									

PULL-OUT RESISTANCE [kN]

Substrate	KD + WDB-T
Characteristic resistance [kN]	
Steel sheet th 0,50 mm	0,78
Steel sheet th 0,63 mm	0,99
Steel sheet th 0,75 mm	1,17
Design resistance [kN] $\gamma M=2.0^*$	
Steel sheet th 0,50 mm	0,39
Steel sheet th 0,63 mm	0,50
Steel sheet th 0,75 mm	0,59

Steel grade S 280 GD by EN-10346

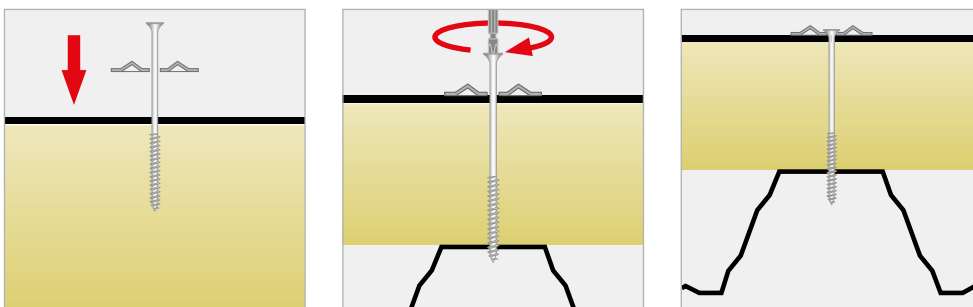
* - national safety factor shall be applied, in its absence apply 2,0

SUBSTRATE, MINIMUM THICKNESS, DISTANCE

Substrate	Min. steel sheet thickness h_{min} [mm]	Min. edge distance c_{min} [mm]	Min. spacing L_{os} [mm]
Steel sheet	0,50 - 0,75	30	120

Steel grade S 280 GD by EN-10346

MOUNTING METHOD



LINO + WSR-T-4,8

FOR STEEL SHEETS PROFILE 0,50 - 1,25 MM THICKNESS

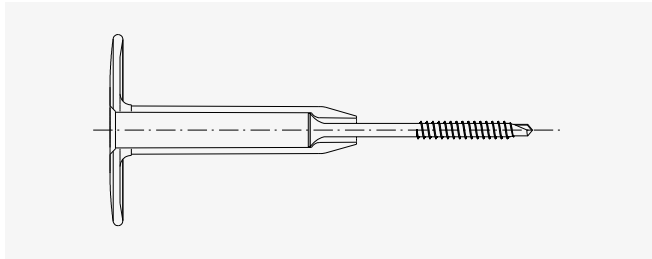
PLASTIC SLEEVE + SELF-DRILLING FASTENER WSR-T-4,8

Substrate: Profiled steel sheet 0,50 ± 1,25 mm

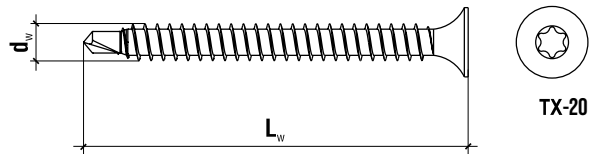


LINO 13 PA

LINO K 13 PA



WSR-T-4,8



Fastener dimension

Code	Fastener dimension WSR-T d _w x L _w [mm]
WSR-T-48050-D	4,8 x 50
WSR-T-48060-D	4,8 x 60
WSR-T-48070-D	4,8 x 70
WSR-T-48080-D	4,8 x 80
WSR-T-48090-D	4,8 x 90
WSR-T-48100-D	4,8 x 100
WSR-T-48120-D	4,8 x 120
WSR-T-48140-D	4,8 x 140
WSR-T-48160-D	4,8 x 160
WSR-T-48180-D	4,8 x 180
WSR-T-48200-D	4,8 x 200
WSR-T-48220-D	4,8 x 220
WSR-T-48240-D	4,8 x 240
WSR-T-48260-D	4,8 x 260
WSR-T-48300-D	4,8 x 300

Clamping range table

Product marking - plastic sleeve		Sleeve length [mm]	Min. insulation thickness t _{fix} [mm]
PA-poliamid	PA-poliamid		
LINO13035PA(200)	LINOK13035PA(200)	35	50
LINO13055PA(200)	LINOK13055PA(200)	55	70
LINO13085PA(200)	LINOK13085PA(200)	85	100
LINO13105PA(200)	LINOK13105PA(200)	105	120
LINO13135PA(200)	LINOK13135PA(200)	135	150
LINO13155PA(200)	LINOK13155PA(200)	155	170
LINO13185PA(200)	LINOK13185PA(200)	185	200
LINO13235PA(100)	LINOK13235PA(100)	235	250
LINO13285PA(100)	LINOK13285PA(100)	285	300

LINO + WSR-T-4,8

FOR STEEL SHEETS PROFILE 0,50 - 1,25 MM THICKNESS

PLASTIC SLEEVE + SELF-DRILLING FASTENER WSR-T-4,8

TECHNICAL DATA

Parameter	Unit	LINO 13	LINO K 13	WSR-T-4,8
Sleeve/fastener diameter	d_k / d_w [mm]	13	13	4,8
Hole in the sleeve	d_h [mm]	6,3	6,3	x
Collar of the sleeve/head fastener diameter	D_k / D_w [mm]	50	50	9,0
Fastener drive	x	x	x	TX-20
Substrate/ Steel sheets thickness	x	x	x	steel sheet 0,50-1,25 mm
Max. drilling capacity	x	x	x	2 x 1,25 mm
Sleeve material	x	PA	PA	x
Fastener material	x	x	x	stal
Approval		ETA-15/0578		

PULL-OUT RESISTANCE [kN]

Substrate	LINO 13 LINO K 13 WSR-T
Characteristic resistance [kN]	
Steel sheet th 0,50 mm	0,84
Steel sheet th 0,63mm	1,03
Steel sheet th 0,75 mm	1,20
Steel sheet th 0,88 mm	1,53
Steel sheet th 1,00 mm	1,61
Design resistance [kN] $\gamma M=2.0^*$	
Steel sheet th 0,50 mm	0,42
Steel sheet th 0,63mm	0,52
Steel sheet th 0,75 mm	0,60
Steel sheet th 0,88 mm	0,77
Steel sheet th 1,00 mm	0,81

Steel grade S 280 GD by EN-10346

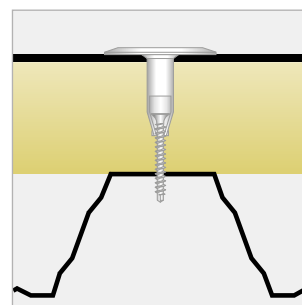
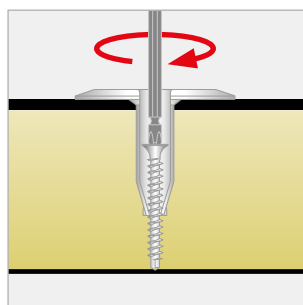
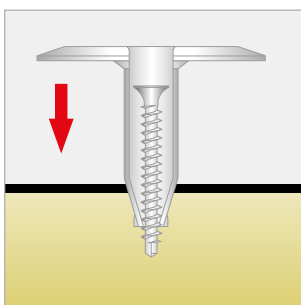
* - national safety factor shall be applied, in its absence apply 2,0

SUBSTRATE, MINIMUM THICKNESS, DISTANCE

Substrate	Min. steel sheet thickness h_{min} [mm]	Min. edge distance c_{min} [mm]	Min. spacing L_{es} [mm]
Steel sheet	0,50 - 1,25	30	120

Steel grade S 280 GD by EN-10346

MOUNTING METHOD

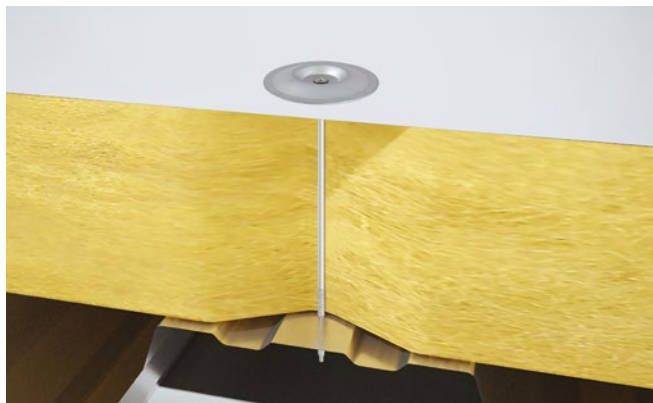
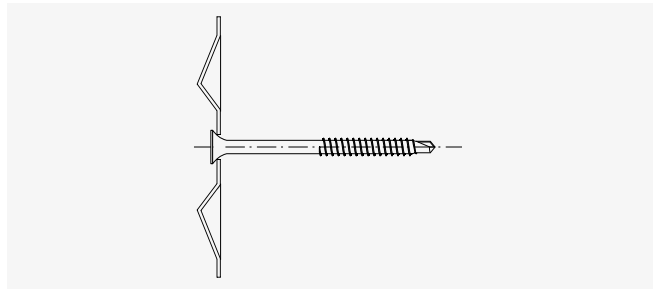
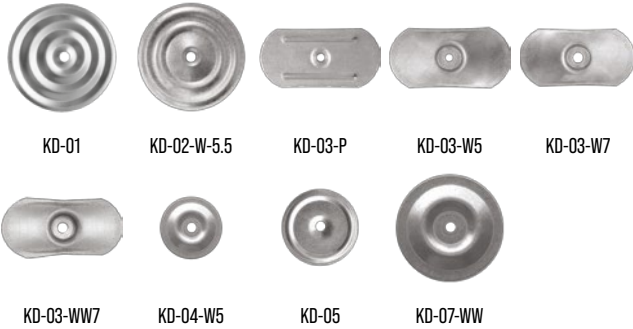


Steel washer KD + WSR-T-4,8

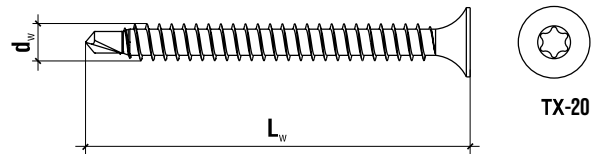
FOR STEEL SHEETS PROFILE 0,50 - 1,25 MM THICKNESS

KD STEEL WASHERS + SELF-DRILLING FASTENER WSR-T-4,8

Substrate: Profiled steel sheet 0,50 ± 1,25 mm



WSR-T-4,8



Fastener dimension

Code	Fastener dimension WSR-T $d_w \times L_w$ [mm]	MAX insulation thickness t_{fix} [mm]
WSR-T-48040-D	4,8 x 40	20
WSR-T-48050-D	4,8 x 50	30
WSR-T-48060-D	4,8 x 60	40
WSR-T-48070-D	4,8 x 70	50
WSR-T-48080-D	4,8 x 80	60
WSR-T-48090-D	4,8 x 90	70
WSR-T-48100-D	4,8 x 100	80
WSR-T-48120-D	4,8 x 120	100
WSR-T-48140-D	4,8 x 140	120
WSR-T-48160-D	4,8 x 160	140
WSR-T-48180-D	4,8 x 180	160
WSR-T-48200-D	4,8 x 200	180
WSR-T-48220-D	4,8 x 220	200
WSR-T-48240-D	4,8 x 240	220
WSR-T-48260-D	4,8 x 260	240
WSR-T-48300-D	4,8 x 300	280

Washer dimension

Product marking - steel washer		KD washer dimensions [mm]
KD-01	[round]	∅ 70
KD-02-W-5.5	[round]	∅ 70
KD-03-P	[oval]	80 x 40
KD-03-W5	[oval]	80 x 40
KD-03-W7	[oval]	80 x 40
KD-03-WW7	[oval]	80 x 40
KD-04-W5	[round]	∅ 40
KD-05	[round]	∅ 50
KD-07-WW	[round]	∅ 70

Steel washer KD + WSR-T-4,8
FOR STEEL SHEETS PROFILE 0,50 - 1,25 MM THICKNESS
KD STEEL WASHERS + SELF-DRILLING FASTENER WSR-T-4,8

TECHNICAL DATA

Parameter	Unit	KD-01	KD-02-W-5,5	KD-03-P	KD-03-W5	KD-03-W7	KD-03-WW7	KD-04-W5	KD-05	KD-07-WW	WSR-T-4,8
Washer/fastener diameter	D_p / d_w [mm]	ø 70	ø 70	80 x 40	80 x 40	80 x 40	80 x 40	ø 40	ø 50	ø 70	4,8
Washer hole diameter	d_p [mm]	5,0	5,5	5,5	5,0	7,0	7,0	5,0	5,0	6,5	x
Fastener head diameter	D_w [mm]	x	x	x	x	x	x	x	x	x	9,0
Fastener drive	x	x	x	x	x	x	x	x	x	x	TX-20
Substrate / steel sheets thickness	x	x	x	x	x	x	x	x	x	x	steel shet 0,50 -1,25 mm
Washer material	x	steel	steel	steel	steel	steel	steel	steel	steel	steel	x
Fastener material	x	x	x	x	x	x	x	x	x	x	steel
Approval	x	ETA-15/0578									

PULL-OUT RESISTANCE [kN]

Substrate	KD... + WSR-T
Characteristic resistance [kN]	
Steel sheet th 0,50 mm	0,84
Steel sheet th 0,63 mm	1,03
Steel sheet th 0,75 mm	1,20
Steel sheet th 0,88 mm	1,53
Steel sheet th 1,00 mm	1,61
Design resistance [kN] γ M=2.0*	
Steel sheet th 0,50 mm	0,42
Steel sheet th 0,63 mm	0,52
Steel sheet th 0,75 mm	0,60
Steel sheet th 0,88 mm	0,77
Steel sheet th 1,00 mm	0,81

Steel grade S 280 GD by EN-10346

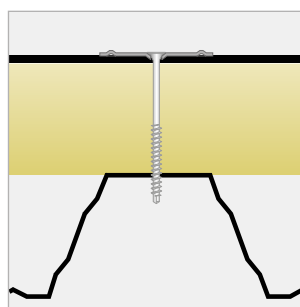
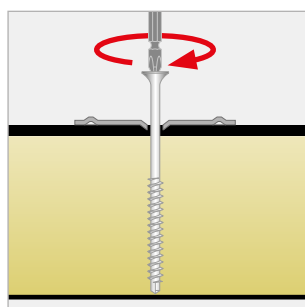
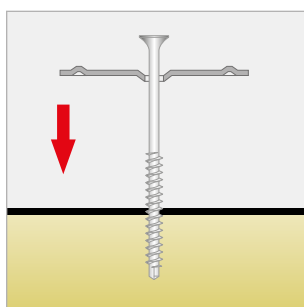
* - national safety factor shall be applied, in its absence apply 2,0

SUBSTRATE, MINIMUM THICKNESS, DISTANCE

Substrate	Min. steel sheet thickness h_{min} [mm]	Min. edge distance c_{min} [mm]	Min. spacing L_{os} [mm]
Steel sheet	0,50 - 1,25	30	120

Steel grade S 280 GD by EN-10346

MOUNTING METHOD



LINO + WBSW-6,3

FOR CONCRETE SUBSTRATES

PLASTIC SLEEVE + SELF-TAPPING FASTENER WBSW-6,3

Substrate: concrete



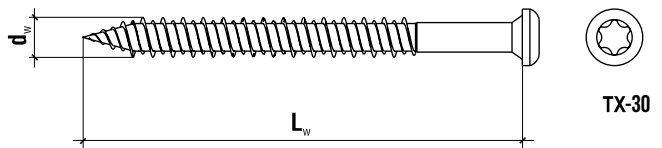
LINO 13 PA



LINO K 13 PA

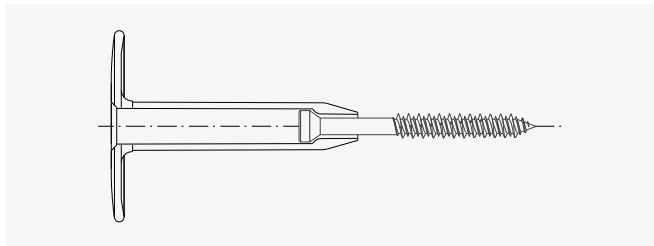


WBSW-6,3



Fastener dimension

Code	Fastener dimension WBSW $d_w \times L_w$ [mm]
WBSW-63060-D	6,3 x 60
WBSW-63070-D	6,3 x 70
WBSW-63080-D	6,3 x 80
WBSW-63090-D	6,3 x 90
WBSW-63100-D	6,3 x 100
WBSW-63120-D	6,3 x 120
WBSW-63140-D	6,3 x 140
WBSW-63160-D	6,3 x 160
WBSW-63180-D	6,3 x 180
WBSW-63200-D	6,3 x 200
WBSW-63220-D	6,3 x 220
WBSW-63240-D	6,3 x 240
WBSW-63300-D	6,3 x 300



Clamping range table

Product marking - plastic sleeve		Sleeve length [mm]	Min. insulation thickness t_{fix} [mm]
PA-poliamid	PA-poliamid		
LINO13035PA(200)	LINOK13035PA(200)	35	50
LINO13055PA(200)	LINOK13055PA(200)	55	70
LINO13085PA(200)	LINOK13085PA(200)	85	100
LINO13105PA(200)	LINOK13105PA(200)	105	120
LINO13135PA(200)	LINOK13135PA(200)	135	150
LINO13155PA(200)	LINOK13155PA(200)	155	170
LINO13185PA(200)	LINOK13185PA(200)	185	200
LINO13235PA(100)	LINOK13235PA(100)	235	250
LINO13285PA(100)	LINOK13285PA(100)	285	300

LINO + WBSW-6,3
FOR CONCRETE SUBSTRATES

PLASTIC SLEEVE + SELF-TAPPING FASTENER WBSW-6,3

TECHNICAL DATA

Parameter	Unit	LINO 13	LINO K 13	WBSW - 6,3
Sleeve/fastener diameter	d_k / d_w [mm]	13	13	6,3
Hole in the sleeve	d_h [mm]	6,3	6,3	x
Collar of the sleeve / head fastener diameter	D_k / D_w [mm]	50	50	9,0
Drill hole	d_0 [mm]	x	x	5,0
Substrate / min. anchorage depth	x	x	x	concrete min. 50 mm
Depth of drilled hole	x	x	x	concrete min. 40 mm
Fastener drive	x	x	x	TX-30
Sleeve material	x	PA	PA	x
Fastener material		x	x	steel
Approval		ETA-15/0578		

PULL-OUT RESISTANCE [kN]

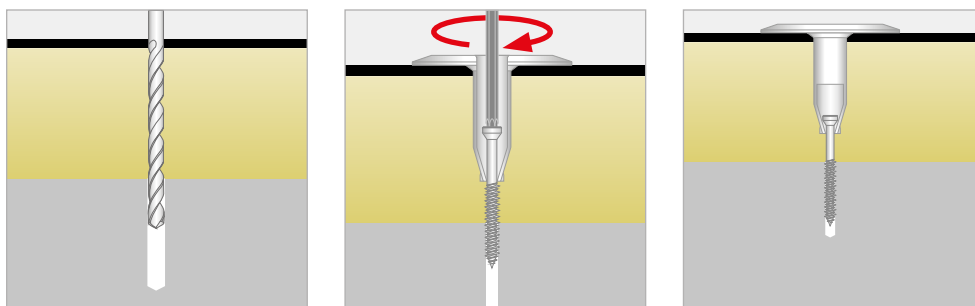
Substrate	LINO 13 LINO K 13 + WBSW - 6,3
Characteristic resistance [kN]	
Concrete C12/15 $h_{eff}=30$ mm	1,64
Concrete C20/25 $h_{eff}=30$ mm	2,12
Thin concrete slabs C20/25	1,92
Design resistance [kN] $\gamma M=2.0^*$	
Concrete C12/15 $h_{eff}=30$ mm	0,82
Concrete C20/25 $h_{eff}=30$ mm	1,06
Thin concrete slabs C20/25	0,96

*- national safety factor shall be applied, in its absence apply 2.0

SUBSTRATE, MINIMUM THICKNESS, DISTANCE

Substrate	Min. steel sheet thickness h_{min} [mm]	Min. edge distance c_{min} [mm]	Min. spacing L_{os} [mm]
Concrete C12/15	50	30	120
Concrete C20/25	50	30	120
Thin concrete slabs	20	30	120

MOUNTING METHOD



Steel washer KD + WBSW-6,3 FOR CONCRETE SUBSTRATES

KD STEEL WASHERS + SELF-TAPPING FASTENER WBSW-6,3

Substrate: concrete



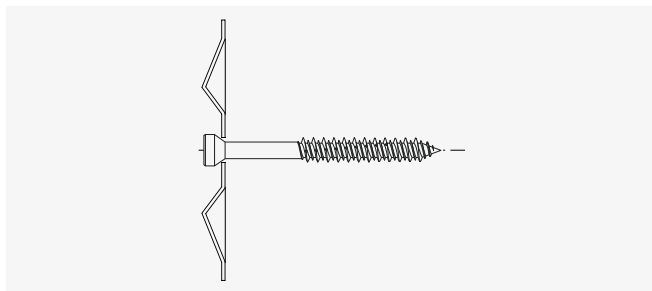
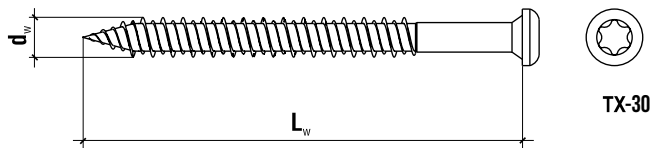
KD-03-W9

KD-03-WW7

KD-07-WW



WBSW-6,3



Fastener dimension

Code	Fastener dimension WBSW $d_w \times L_w$ [mm]	MAX insulation thickness t_{fix} [mm]
WBSW-63060-D	6,3 x 60	30
WBSW-63070-D	6,3 x 70	40
WBSW-63080-D	6,3 x 80	50
WBSW-63090-D	6,3 x 90	60
WBSW-63100-D	6,3 x 100	70
WBSW-63120-D	6,3 x 120	90
WBSW-63140-D	6,3 x 140	110
WBSW-63160-D	6,3 x 160	130
WBSW-63180-D	6,3 x 180	150
WBSW-63200-D	6,3 x 200	170
WBSW-63220-D	6,3 x 220	190
WBSW-63240-D	6,3 x 240	210
WBSW-63300-D	6,3 x 300	270

Washer dimension

Product marking - steel washer		KD washer dimensions [mm]
KD-03-W7	(oval)	80 x 40
KD-03-WW7	(oval)	80 x 40
KD-07-WW	(round)	\varnothing 70

Steel washer KD + WBSW-6,3 FOR CONCRETE SUBSTRATES

KD STEEL WASHERS + SELF-TAPPING FASTENER WBSW-6,3

TECHNICAL DATA

Parameter	Unit	KD-03-W7	KD-03-WW7	KD-07-WW	WBSW-6,3
Washer/fastener diameter	D_p / d_w [mm]	80 x 40	80 x 40	∅ 70	6,3
Washer hole diameter	d_p [mm]	7,0	7,0	6,5	x
Fastener head diameter	D_w [mm]	x	x	x	9,0
Drill hole/fastener diameter	d_0 [mm]	x	x	x	5,0
Substrate / min. anchorage depth	x	x	x	x	concrete min. 50 mm
Depth of drilled hole	h_0 [mm]	x	x	x	concrete min. 40 mm
Fastener drive	x	x	x	x	TX-30
Washer material	x	steel	steel	steel	x
Fastener material	x	x	x	x	steel
Approval	x	ETA-15/0578			

PULL-OUT RESISTANCE [kN]

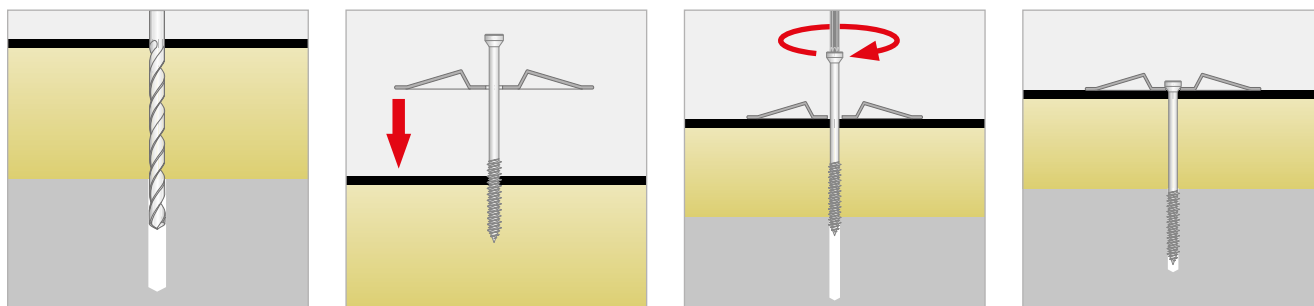
Substrate	KD + WBSW
Characteristic resistance [kN]	
Concrete C12/15 $h_{eff}=30$ mm	1,64
Concrete C20/25 $h_{eff}=30$ mm	2,12
Thin concrete slabs C20/25	1,92
Design resistance [kN] γ M=2.0*	
Concrete C12/15 $h_{eff}=30$ mm	0,82
Concrete C20/25 $h_{eff}=30$ mm	1,06
Thin concrete slabs C20/25	0,96

* - national safety factor shall be applied, in its absence apply 2.0

SUBSTRATE, MINIMUM THICKNESS, DISTANCE

Substrate	Min. steel sheet thickness h_{min} [mm]	Min. edge distance c_{min} [mm]	Min. spacing L_{es} [mm]
Concrete C12/15	50	30	120
Concrete C20/25	50	30	120
Thin concrete slabs	20	30	120

MOUNTING METHOD



LINO + WDB-T-4,8 + KNX-8x50

FOR CONCRETE SUBSTRATES

PLASTIC SLEEVE LINO + SELF-TAPPING FASTENER WDB-T-4,8 + KNX-8X50 SLEEVE

Substrate: concrete

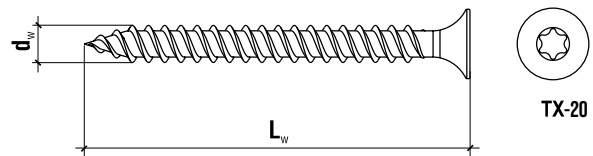


LINO 13 PA

LINO K 13 PA

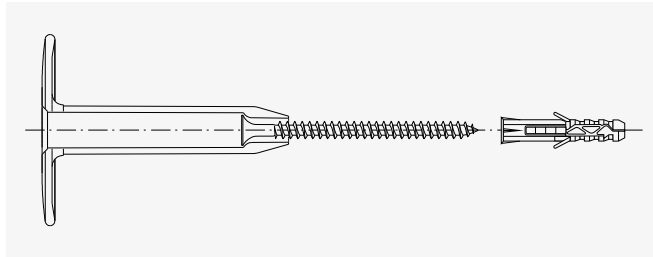


WDB-T-4,8 + KNX-8x50



Fastener dimension

Code	Fastener dimension WDB-T $d_w \times L_w$ [mm]	Plug dimension KNX-8x50 $d_x \times L_x$ [mm]
WDB-T-48080-D	4,8 x 80	8,0 x 50
WDB-T-48090-D	4,8 x 90	8,0 x 50
WDB-T-48100-D	4,8 x 100	8,0 x 50
WDB-T-48120-D	4,8 x 120	8,0 x 50
WDB-T-48140-D	4,8 x 140	8,0 x 50
WDB-T-48160-D	4,8 x 160	8,0 x 50
WDB-T-48180-D	4,8 x 180	8,0 x 50
WDB-T-48200-D	4,8 x 200	8,0 x 50
WDB-T-48220-D	4,8 x 220	8,0 x 50
WDB-T-48240-D	4,8 x 240	8,0 x 50



Clamping range table

Product marking - plastic sleeve		Sleeve length [mm]	Min. insulation thickness t_{tx} [mm]
PA-poliamid	PA-poliamid		
LINO13035PA(200)	LINOK13035PA(200)	35	50
LINO13055PA(200)	LINOK13055PA(200)	55	70
LINO13085PA(200)	LINOK13085PA(200)	85	100
LINO13105PA(200)	LINOK13105PA(200)	105	120
LINO13135PA(200)	LINOK13135PA(200)	135	150
LINO13155PA(200)	LINOK13155PA(200)	155	170
LINO13185PA(200)	LINOK13185PA(200)	185	200
LINO13235PA(100)	LINOK13235PA(100)	235	250
LINO13285PA(100)	LINOK13285PA(100)	285	300

LINO + WDB-T-4,8 + KNX-8x50

FOR CONCRETE SUBSTRATES

PLASTIC SLEEVE LINO + SELF-TAPPING FASTENER WDB-T-4,8 + KNX-8x50 SLEEVE

TECHNICAL DATA

Parameter	Unit	LINO 13	LINO K 13	WDB-T-4,8	KNX-8x50
Sleeve/fastener/plug diameter	d_k / d_w [mm]	13	13	4,8	8,0
Hole in the sleeve	d_h [mm]	6,3	6,3	x	x
Collar of the sleeve/ head fastener diameter	D_k / D_w [mm]	50	50	9,0	x
Fastener drive	x	x	x	TX-20	x
Drill hole	d_o [mm]	x	x	x	8,0
Depth of drilled hole	h_o [mm]	x	x	x	60
Anchorage depth	h_{eff} [mm]	x	x	x	50
Sleeve material	x	PA	PA	x	PA
Fastener material	x	x	x	stal	x
Approval		ETA-15/0578			

PULL-OUT RESISTANCE [kN]

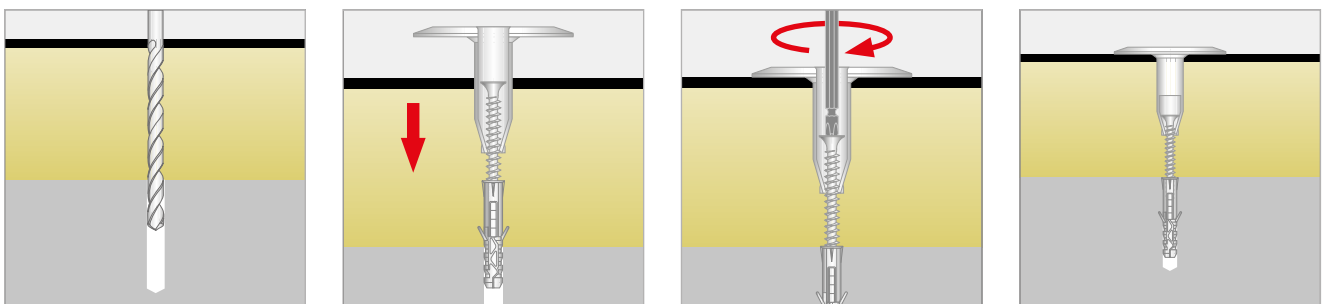
Substrate	LINO 13 LINO K 13 WDB-T+ KNX
Characteristic resistance [kN]	
Concrete C12/15	1,12
Concrete C20/25	1,45
Thin concrete slabs C20/25	1,20
Design resistance [kN] γ M=2.0*	
Concrete C12/15	0,56
Concrete C20/25	0,73
Thin concrete slabs C20/25	0,60

* - national safety factor shall be applied, in its absence apply 2.0

SUBSTRATE, MINIMUM THICKNESS, DISTANCE

Substrate	Min. steel sheet thickness h_{min} [mm]	Min. edge distance c_{min} [mm]	Min. spacing L_{os} [mm]
Concrete C12/15	60	30	120
Concrete C20/25	60	30	120
Thin concrete slabs	20	30	120

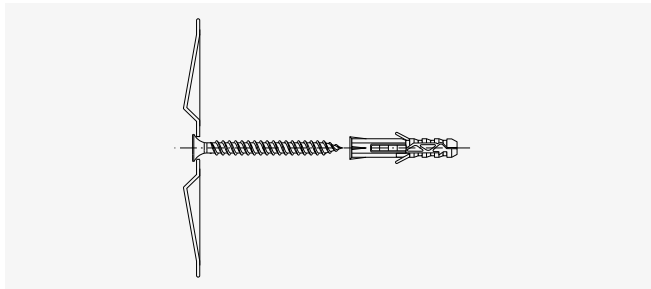
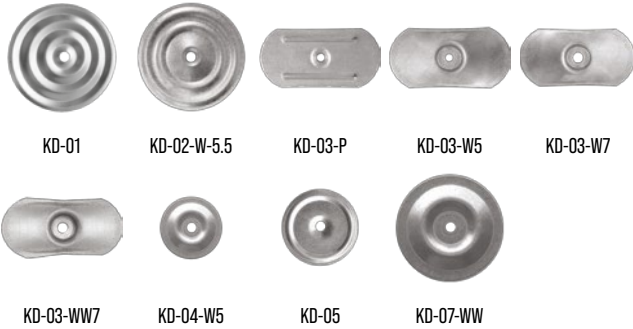
MOUNTING METHOD



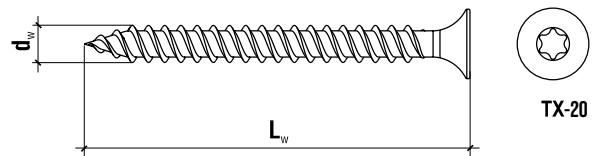
Steel washer KD + WDB-T-4,8 + KNX-8x50 FOR CONCRETE SUBSTRATE

KD STEEL WASHERS + SELF-TAPPING FASTENER WDB-T+ KNX 8 SLEEVE

Substrate: concrete



WDB-T-4,8 + KNX-8x50



Fastener dimension

Kod	Fastener dimension WSR-T $d_w \times L_w$ [mm]	Fastener dimension KNX-8x50 $d_k \times L_k$ [mm]	MAX insulation thickness t_{fix} [mm]
WDB-T-48050-D	4,8 x 50	8,0 x 50	0
WDB-T-48060-D	4,8 x 60	8,0 x 50	10
WDB-T-48070-D	4,8 x 70	8,0 x 50	20
WDB-T-48080-D	4,8 x 80	8,0 x 50	30
WDB-T-48090-D	4,8 x 90	8,0 x 50	40
WDB-T-48100-D	4,8 x 100	8,0 x 50	50
WDB-T-48120-D	4,8 x 120	8,0 x 50	70
WDB-T-48140-D	4,8 x 140	8,0 x 50	90
WDB-T-48160-D	4,8 x 160	8,0 x 50	110
WDB-T-48180-D	4,8 x 180	8,0 x 50	130
WDB-T-48200-D	4,8 x 200	8,0 x 50	150
WDB-T-48220-D	4,8 x 220	8,0 x 50	170
WDB-T-48240-D	4,8 x 240	8,0 x 50	190

Washer dimension

Product marking - steel washer		KD washer dimensions [mm]
KD-01	(round)	\varnothing 70
KD-02-W-5.5	(round)	\varnothing 70
KD-03-P	(oval)	80 x 40
KD-03-W5	(oval)	80 x 40
KD-03-W7	(oval)	80 x 40
KD-03-WW7	(oval)	80 x 40
KD-04-W5	(round)	\varnothing 40
KD-05	(round)	\varnothing 50
KD-07-WW	(round)	\varnothing 70

**Steel washer KD + WDB-T-4,8 + KNX-8x50
FOR CONCRETE SUBSTRATE**

KD STEEL WASHERS + SELF-TAPPING FASTENER WDB-T+ KNX 8 SLEEVE

TECHNICAL DATA

Parameter	Unit	KD-01	KD-02-W-5,5	KD-03-P	KD-03-W5	KD-03-W7	KD-03-WW7	KD-04-W5	KD-05	KD-07-WW	WDB-T-4,8	KNX-8x50
Fastener/sleeve diameter	$D_p / d_w / d_k$ [mm]	ø 70	ø 70	80 x 40	80 x 40	80 x 40	80 x 40	ø 40	ø 50	ø 70	4,8	8
Washer hole diameter	d_p [mm]	5,0	5,5	5,5	5,0	7,0	7,0	5,0	5,0	6,5	x	x
Fastener head diameter	D_w [mm]	x	x	x	x	x	x	x	x	x	9,0	x
Fastener drive	x	x	x	x	x	x	x	x	x	x	TX-20	x
Drill hole	d_o [mm]	x	x	x	x	x	x	x	x	x	x	8,0
Depth of drilled hole	h_o [mm]	x	x	x	x	x	x	x	x	x	x	60
Anchorage depth	h_{eff} [mm]	x	x	x	x	x	x	x	x	x	x	50
Wascher / sleeve material		steel	steel	steel	steel	steel	steel	steel	steel	steel	x	PA
Wascher/fastener material		x	x	x	x	x	x	x	x	x	steel	x
Approval		ETA-15/0578										

PULL-OUT RESISTANCE [kN]

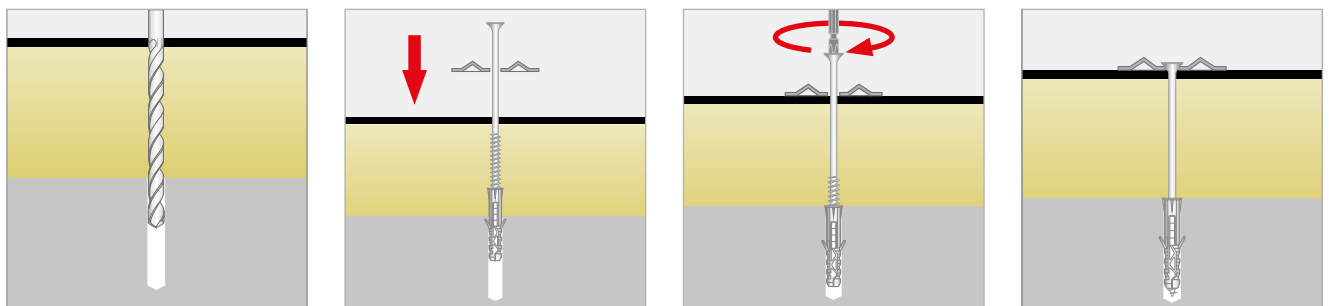
Substrate	KD + WDB-T + KNX
Characteristic resistance [kN]	
Concrete C12/15	1,12
Concrete C20/25	1,45
Thin concrete slabs C20/25	1,20
Design resistance [kN] γ M=2.0*	
Concrete C12/15	0,56
Concrete C20/25	0,73
Thin concrete slabs C20/25	0,60

* - national safety factor shall be applied, in its absence apply 2.0

SUBSTRATE, MINIMUM THICKNESS, DISTANCE

Substrate	Min. concrete thickness h_{min} [mm]	Min. edge distance c_{min} [mm]	Min. spacing L_{os} [mm]
Concrete C12/15	60	30	120
Concrete C20/25	60	30	120
Thin concrete slabs	20	30	120

MOUNTING METHOD



Steel washer KD + WB6-D

FOR CONCRETE SUBSTRATE

KD STEEL WASHERS + SELF-TAPPING FASTENER WB6-6,3-D

Substrate: concrete



KD-03-W7

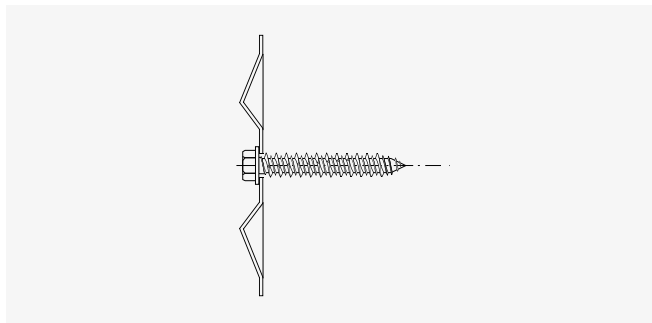
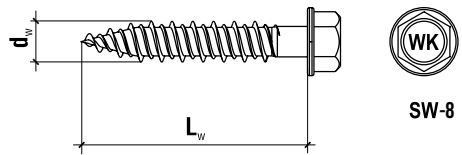
KD-03-WW7

KD-07-WW

KD-03-W9



WB6-D



Clamping range table

Code	Fastener dimensions WB6-6,3-D $d_w \times L_w$ [mm]	MAX Insulation thickness t_{fix} [mm]
WB6-63035-D	6,3 x 35	0
WB6-63045-D	6,3 x 45	10

Washer dimension

Product marking - steel washer		KD washer dimensions [mm]
KD-03-W7	[oval]	80 x 40
KD-03-WW7	[oval]	80 x 40
KD-07-WW	[round]	∅ 70
KD-03-W9	[oval]	80 x 40

Steel washer KD + WB6-D FOR CONCRETE SUBSTRATE

KD STEEL WASHERS + SELF-TAPPING FASTENER WB6-6,3-D

TECHNICAL DATA

Parameter	Unit	KD-03-W7	KD-03-WW7	KD-07-WW	KD-03-W9	WB6-D-6,3
Washer diameter	D_p [mm]	80 x 40	80 x 40	∅ 70	80 x 40	x
Washer hole diameter	d_p [mm]	7,0	7,0	6,5	9,0	x
Fastener diameter	d_w [mm]	x	x	x	x	6,3
Drill hole	d_o [mm]	x	x	x	x	5,0
Depth of drilled hole	h_o [mm]	x	x	x	x	min. 45 mm
Anchorage depth	h_{eff} [mm]	x	x	x	x	min. 35 mm
Washer material	x	steel	steel	steel	steel	x
Fastener material	x	x	x	x		steel
Approval		ETA-15/0578				

PULL-OUT RESISTANCE [kN]

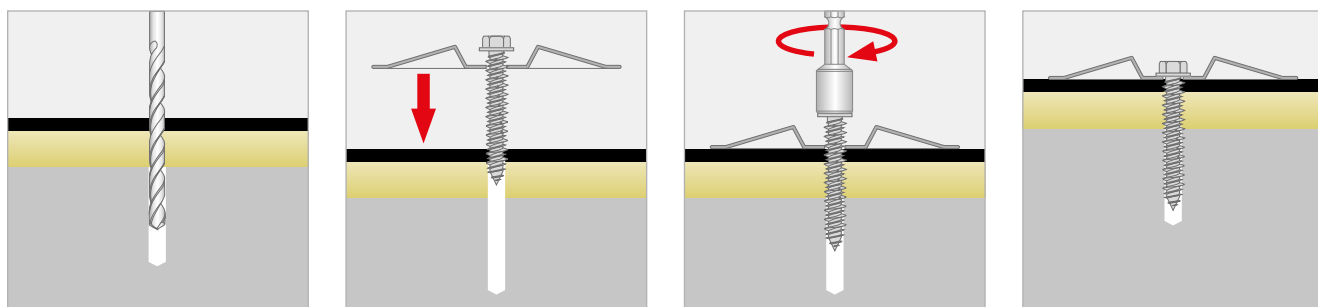
Substrate	KD + WB6-D
Characteristic resistance [kN]	
Concrete C12/15	2,31
Concrete C20/25	2,98
Thin concrete slabs C20/25	2,10
Design resistance [kN] γ M=2.0*	
Concrete C12/15	1,16
Concrete C20/25	1,49
Thin concrete slabs C20/25	1,05

*- national safety factor shall be applied, in its absence apply 2.0

SUBSTRATE, MINIMUM THICKNESS, DISTANCE

Substrate	Min. concrete thickness h_{min} [mm]	Min. edge distance c_{min} [mm]	Min. spacing L_{es} [mm]
Concrete C12/15	60	30	120
Concrete C20/25	60	30	120
Thin concrete slabs	20	30	120

MOUNTING METHOD



Steel washer KD + plug SMN-6x50 FOR CONCRETE SUBSTRATE

KD STEEL WASHERS + PLUG SMN-6X50

Substrate: concrete



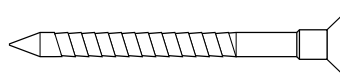
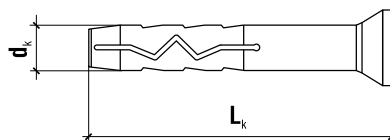
KD-03-W9

KD-03-WW7

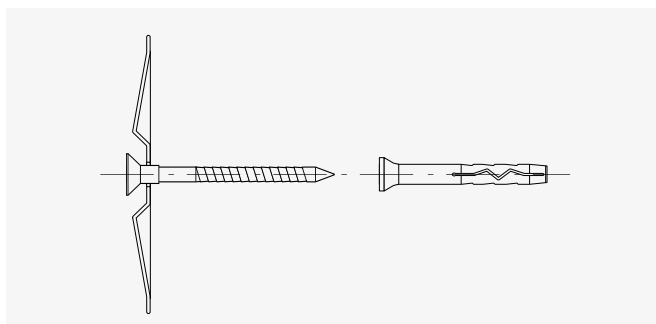
KD-07-WW



SMN-6



PZ 2



Clamping range table

Code	Plug dimension SMN - 6 $d_k \times L_k$ [mm]	MAX Insulation thickness t_{fix} [mm]
SMN-06050	6,0x50	0

Washer dimension

Product marking - steel washer		KD washer dimensions [mm]
KD-03-W7	(round)	80 x 40
KD-03-WW7	(oval)	80 x 40
KD-07-WW	(round)	ø 70

Steel washer KD + plug SMN-6x50 FOR CONCRETE SUBSTRATE

KD STEEL WASHERS + PLUG SMN-6X50

TECHNICAL DATA

Parameter	Unit	KD-03-W7	KD-03-WW7	KD-07-WW	SMN-6 x50
Washer/plug diameter	D_p/d_k [mm]	80 x 40	80 x 40	ø 70	6,0 x 50
Washer hole diameter	d_p [mm]	7,0	7,0	6,5	x
Fastener dimensions	$d_w \times L_w$ [mm]	x	x	x	3,9 x 55
Drill hole	d_o [mm]	x	x	x	6,0
Depth of drilled hole	h_o [mm]	x	x	x	60
Anchorage depth	h_{eff} [mm]	x	x	x	50
Washer/plug material	x	steel	steel	steel	PA
Fastener material SMN	x	x	x	x	steel
Approval	x	ETA-15/0578			

PULL-OUT RESISTANCE [kN]

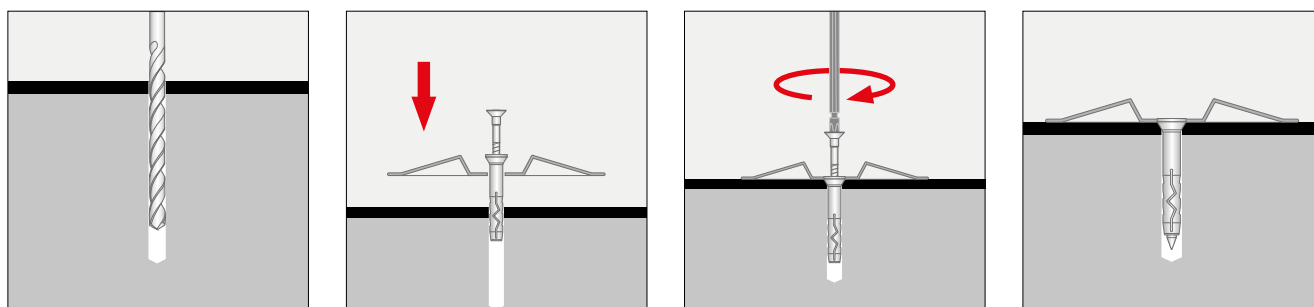
Substrate	KD + SMN-6
Characteristic resistance [kN]	
Concrete C12/15	0,79
Concrete C20/25	1,02
Design resistance [kN] γ M=2.0*	
Concrete C12/15	0,40
Concrete C20/25	0,51

*- national safety factor shall be applied, in its absence apply 2.0

SUBSTRATE, MINIMUM THICKNESS, DISTANCE

Substrate	Min. concrete thickness h_{min} [mm]	Min. edge distance c_{min} [mm]	Min. spacing L_{os} [mm]
Concrete C12/15	60	30	120
Concrete C20/25	60	30	120

MOUNTING METHOD



Steel washer KD + plug SMN-8x60

FOR CONCRETE SUBSTRATE

KD STEEL WASHERS + PLUG SMN-8X60

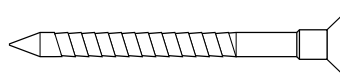
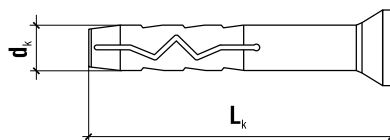
Substrate: concrete



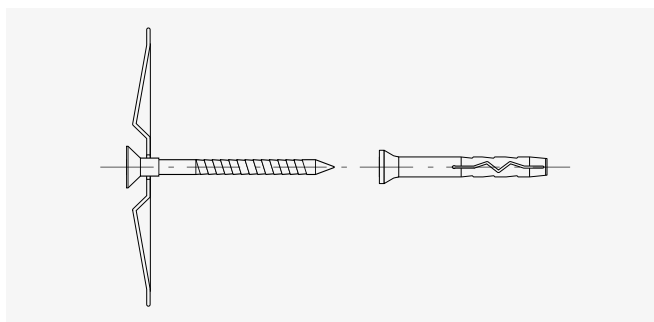
KD-03-W9



SMN-8



PZ 2



Clamping range table

Code	Plug dimension SMN - 8 $d_k \times L_k$ [mm]	MAX Insulation thickness t_{fix} [mm]
SMN-0860	8,0x60	0

Washer dimension

Product marking - steel washer	KD washer dimensions [mm]
KD-03-W9	[oval] 80 x 40

Steel washer KD + plug SMN-8x60 FOR CONCRETE SUBSTRATE

KD STEEL WASHERS + PLUG SMN-8X60

TECHNICAL DATA

Parameter	Unit	KD-03-W9	SMN-8x60
Washer/plug diameter	D_p / d_k [mm]	80 x 40	8,0 x 60
Washer hole diameter	d_p [mm]	9,0	x
Fastener dimensions	$d_w \times L_w$ [mm]	x	4,9 x 65
Drill hole	d_o [mm]	x	8,0
Depth of drilled hole	h_o [mm]	x	70
Anchorage depth	h_{eff} [mm]	x	60
Washer/plug material	x	steel	PA
Fastener material SMN	x	x	steel
Approval	x	ETA-15/0578	

PULL-OUT RESISTANCE [kN]

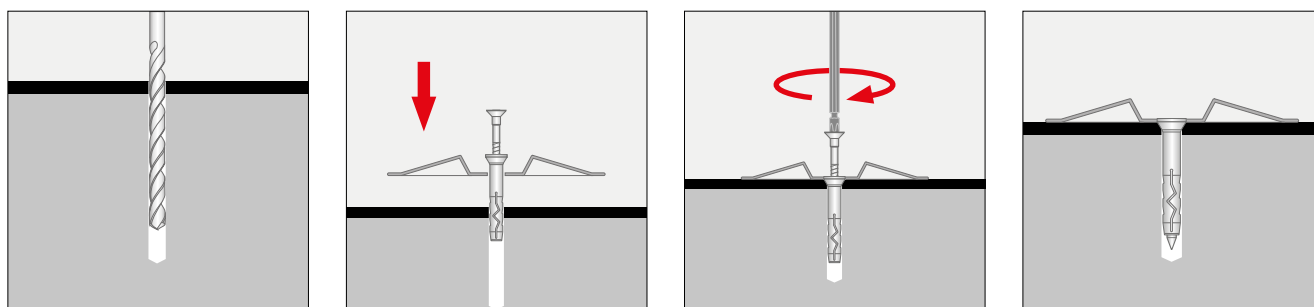
Substrate	KD + SMN-8
Characteristic resistance [kN]	
Concrete C12/15	1,18
Concrete C20/25	1,52
Design resistance [kN] γ M=2.0*	
Concrete C12/15	0,59
Concrete C20/25	0,76

* - national safety factor shall be applied, in its absence apply 2.0

SUBSTRATE, MINIMUM THICKNESS, DISTANCE

Substrate	Min. concrete thickness h_{min} [mm]	Min. edge distance c_{min} [mm]	Min. spacing L_{os} [mm]
Concrete C12/15	70	30	120
Concrete C20/25	70	30	120

MOUNTING METHOD



LINO + WDB-T-4,8

FOR TIMBER SUBSTRATES

PLASTIC SLEEVE + SELF-TAPPING FASTENER WDB-T-4,8

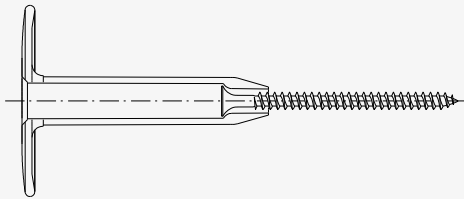
Substrate: timber, OSB board, plywood



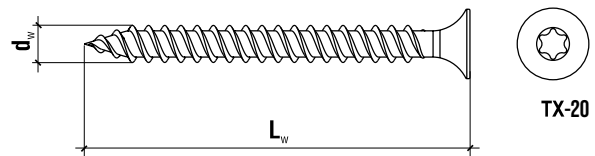
LINO 13 PA



LINO K 13 PA



WDB-T-4,8



Fastener dimension

Code	Fastener dimension WDB-T $d_w \times L_w$ [mm]
WDB-T-48060-D	4,8 x 60
WDB-T-48070-D	4,8 x 70
WDB-T-48080-D	4,8 x 80
WDB-T-48090-D	4,8 x 90
WDB-T-48100-D	4,8 x 100
WDB-T-48120-D	4,8 x 120
WDB-T-48140-D	4,8 x 140
WDB-T-48160-D	4,8 x 160
WDB-T-48180-D	4,8 x 180
WDB-T-48200-D	4,8 x 200
WDB-T-48220-D	4,8 x 220
WDB-T-48240-D	4,8 x 240

Clamping range table

Product marking - plastic sleeve		Sleeve length [mm]	Min. insulation thickness t_{tx} [mm]
PA-poliamid	PA-poliamid		
LINO13035PA(200)	LINOK13035PA(200)	35	50
LINO13055PA(200)	LINOK13055PA(200)	55	70
LINO13085PA(200)	LINOK13085PA(200)	85	100
LINO13105PA(200)	LINOK13105PA(200)	105	120
LINO13135PA(200)	LINOK13135PA(200)	135	150
LINO13155PA(200)	LINOK13155PA(200)	155	170
LINO13185PA(200)	LINOK13185PA(200)	185	200
LINO13235PA(100)	LINOK13235PA(100)	235	250
LINO13285PA(100)	LINOK13285PA(100)	285	300

LINO + WDB-T-4,8
FOR TIMBER SUBSTRATES

PLASTIC SLEEVE + SELF-TAPPING FASTENER WDB-T-4,8

TECHNICAL DATA TECHNICZNE

Parameter	Unit	LINO 13	LINO K 13	WDB-T-4,8
Sleeve/fastener diameter	d_k / d_w [mm]	13	13	4,8
Hole in the sleeve	d_h [mm]	6,3	6,3	x
Collar of the sleeve/head fastener diameter	D_k / D_w [mm]	50	50	9,0
Fastener drive	x	x	x	TX-20
Anchorage depth	h_{eff} [mm]	x	x	30/18/20*
Sleeve material	x	PA	PA	x
Fastener material	x	x	x	steel
Approval	ETA-15/0578			

* - timber C24/OSB board/plywood

PULL-OUT RESISTANCE [kN]

Substrate	LINO 13 LINO K 13 + WDB-T
Characteristic resistance [kN]	
Timber C24 EN 14081 th 30 mm	2,37
OSB board EN 300 th 18 mm	1,06
Plywood EN 313 th 20 mm	0,98
Design resistance [kN] $\gamma M=2.0^{**}$	
Timber C24 EN 14081 th 30 mm	1,19
OSB board EN 300 th 18 mm	0,53
Plywood EN 313 th 20 mm	0,49

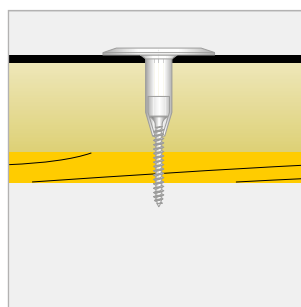
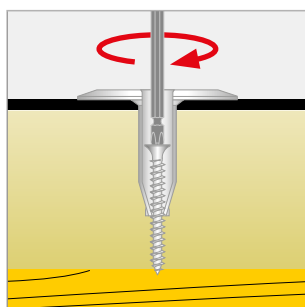
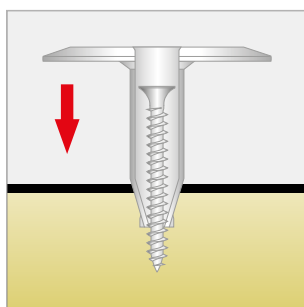
* - timber C24/OSB board/plywood

** - national safety factor shall be applied, in its absence apply 2.0

SUBSTRATE, MINIMUM THICKNESS, DISTANCE

Substrate	Min. timber thickness h_{min} [mm]	Min. edge distance c_{min} [mm]	Min. spacing L_{os} [mm]
Timber C24	30	30	120
OSB board	18	30	120
Plywood	20	30	120

MOUNTING METHOD

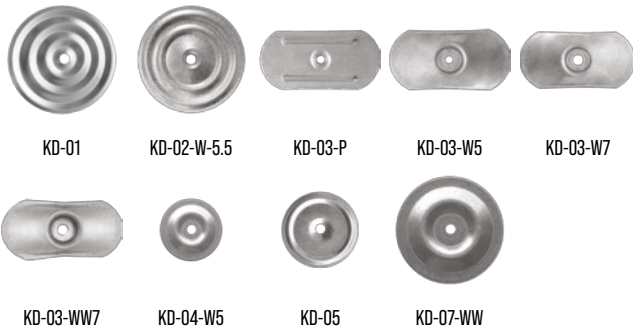


Steel washer KD + WDB-T-4,8

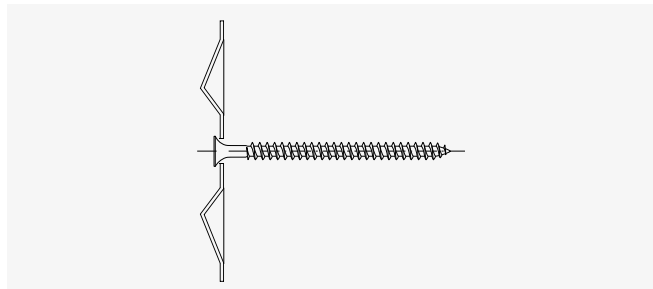
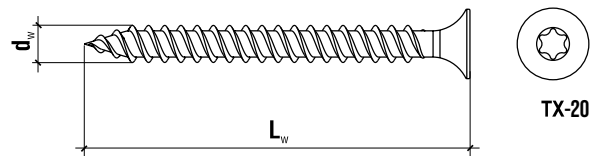
FOR TIMBER SUBSTRATES

KD STEEL WASHER + SELF-TAPPING FASTENER WDB-T-4,8

Substrate: timber, OSB board, plywood



WDB-T-4,8



Fastener dimension

Code	Fastener dimension WDB-T $d_w \times L_w$ [mm]	MAX Insulation thickness t_{tx} [mm]
WDB-T-48040-D	4,8 x 40	10
WDB-T-48050-D	4,8 x 50	20
WDB-T-48060-D	4,8 x 60	30
WDB-T-48070-D	4,8 x 70	40
WDB-T-48080-D	4,8 x 80	50
WDB-T-48090-D	4,8 x 90	60
WDB-T-48100-D	4,8 x 100	70
WDB-T-48120-D	4,8 x 120	90
WDB-T-48140-D	4,8 x 140	110
WDB-T-48160-D	4,8 x 160	130
WDB-T-48180-D	4,8 x 180	150
WDB-T-48200-D	4,8 x 200	170
WDB-T-48220-D	4,8 x 220	190
WDB-T-48240-D	4,8 x 240	210

Washer dimension

Product marking - steel washer		KD washer dimensions [mm]
KD-01	[round]	∅ 70
KD-02-W-5.5	[round]	∅ 70
KD-03-P	[oval]	80 x 40
KD-03-W5	[oval]	80 x 40
KD-03-W7	[oval]	80 x 40
KD-03-WW7	[oval]	80 x 40
KD-04-W5	[round]	∅ 40
KD-05	[round]	∅ 50
KD-07-WW	[round]	∅ 70

Steel washer KD + WDB-T-4,8 FOR TIMBER SUBSTRATES

KD STEEL WASHER + SELF-TAPPING FASTENER WDB-T-4,8

TECHNICAL DATA TECHNICZNE

Parameter	Unit	KD-01	KD-02-W-5,5	KD-03-P	KD-03-W5	KD-03-W7	KD-03-WW7	KD-04-W5	KD-05	KD-07-WW	WDB-T-4,8
Washer/fastener diameter	D_p / d_w [mm]	ø 70	ø 70	80 x 40	80 x 40	80 x 40	80 x 40	ø 40	ø 50	ø 70	4,8
Washer hole diameter	d_p [mm]	5,0	5,5	5,5	5,0	7,0	7,0	5,0	5,0	6,5	x
Fastener head diameter	D_w [mm]	x	x	x	x	x	x	x	x	x	9,0
Fastener drive	x	x	x	x	x	x	x	x	x	x	TX-20
Anchorage depth	h_{eff} [mm]	x	x	x	x	x	x	x	x	x	30/18/20*
Washer material	x	steel	steel	steel	steel	steel	steel	steel	steel	steel	x
Fastener material	x	x	x	x	x	x	x	x	x	x	steel
Approval		ETA-15/0578									

* - timber C24/OSB board/plywood

PULL-OUT RESISTANCE [KN]

Substrate	KD-01 + WDB-T	KD-02-W-5,5	KD-03-P	KD-03-W5	KD-03-W7	KD-03-WW7	KD-04-W5	KD-05	KD-07-WW	
Characteristic resistance [kN]										
Timber C24 EN 14081 th 30 mm	1,67	2,06	2,50	2,84	2,46	3,45	3,23	3,12	2,90	
OSB board EN 300 th 18 mm	1,06	1,06	1,06	1,06	1,06	1,06	1,06	1,06	1,06	
Plywood EN 313 th 20 mm	0,98	0,98	0,98	0,98	0,98	0,98	0,98	0,98	0,98	
Design resistance [kN] $\gamma M=2.0^{**}$										
Timber C24 EN 14081 th 30 mm	0,84	1,03	1,25	1,42	1,23	1,73	1,62	1,56	1,45	
OSB board EN 300 th 18 mm	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53	0,53	
Plywood EN 313 th 20 mm	0,49	0,49	0,49	0,49	0,49	0,49	0,49	0,49	0,49	

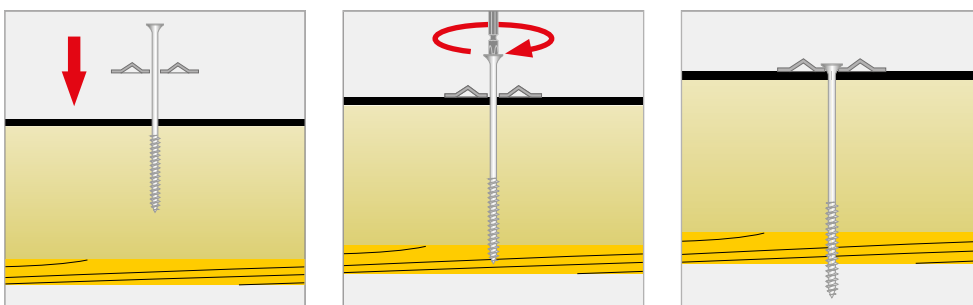
* - timber C24/OSB board/plywood

** - national safety factor shall be applied, in its absence apply 2.0

SUBSTRATE, MINIMUM THICKNESS, DISTANCE

Substrate	Min. timber thickness h_{min} [mm]	Min. edge distance c_{min} [mm]	Min. spacing L_{cs} [mm]
Timber C24	30	30	120
OSB board	18	30	120
Plywood	20	30	120

MOUNTING METHOD



LINO + WBSW-6,3 FOR TIMBER SUBSTRATE

PLASTIC SLEEVE + SELF-TAPPING FASTENER WBSW-6,3

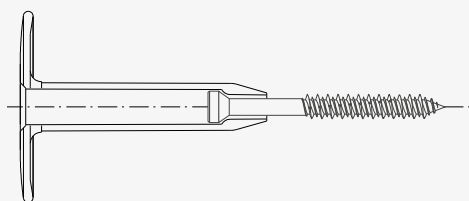
Substrate: timber, OSB board, plywood



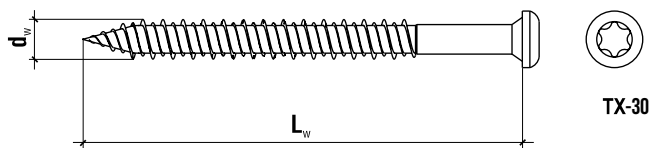
LINOK 13 PA



LINOK K 13 PA



WBSW-6,3



Fastener dimension

Code	Fastener dimension WBSW $d_w \times L_w$ [mm]
WBSW-63060-D	6,3 x 60
WBSW-63070-D	6,3 x 70
WBSW-63080-D	6,3 x 80
WBSW-63090-D	6,3 x 90
WBSW-63100-D	6,3 x 100
WBSW-63120-D	6,3 x 120
WBSW-63140-D	6,3 x 140
WBSW-63160-D	6,3 x 160
WBSW-63180-D	6,3 x 180
WBSW-63200-D	6,3 x 200
WBSW-63220-D	6,3 x 220
WBSW-63240-D	6,3 x 240
WBSW-63300-D	6,3 x 300

Clamping range table

Product marking - plastic sleeve		Sleeve length [mm]	Min. insulation thickness t_{ix} [mm]
PA-poliamid	PA-poliamid		
LIN013035PA(200)	LINOK13035PA(200)	35	50
LIN013055PA(200)	LINOK13055PA(200)	55	70
LIN013085PA(200)	LINOK13085PA(200)	85	100
LIN013105PA(200)	LINOK13105PA(200)	105	120
LIN013135PA(200)	LINOK13135PA(200)	135	150
LIN013155PA(200)	LINOK13155PA(200)	155	170
LIN013185PA(200)	LINOK13185PA(200)	185	200
LIN013235PA(100)	LINOK13235PA(100)	235	250
LIN013285PA(100)	LINOK13285PA(100)	285	300

LINO + WBSW-6,3
FOR TIMBER SUBSTRATE

PLASTIC SLEEVE + SELF-TAPPING FASTENER WBSW-6,3

TECHNICAL DATA

Parameter	Unit	LINO 13	LINO K 13	WBSW - 6,3
Sleeve/fastener diameter	d_k/d_w [mm]	13	13	6,3
Hole in the sleeve	d_h [mm]	6,3	6,3	x
Collar of the sleeve/head fastener diameter	D_k/D_w [mm]	50	50	9,0
Anchorage depth	h_{eff} [mm]	x	x	30/18/20*
Fastener drive	x	x	x	TX-30
Sleeve material	x	PA	PA	x
Fastener material	x	x	x	steel
Approval	x	ETA-15/0578		

* - timber C24/OSB board/plywood

PULL-OUT RESISTANCE [kN]

Substrate	LINO 13 LINO K 13 + WBSW	LINO 15 + WBSW
Characteristic resistance [kN]		
Timber C24 EN 14081 th 30 mm	2,32	2,16
OSB board EN 300 th 18 mm	1,68	1,68
Plywood EN 313 th 20 mm	2,32	2,16
Design resistance [kN] $\gamma M=2.0^{**}$		
Timber C24 EN 14081 th 30 mm	1,16	1,08
OSB board EN 300 th 18 mm	0,84	0,84
Plywood EN 313 th 20 mm	1,16	1,08

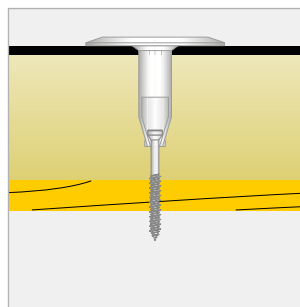
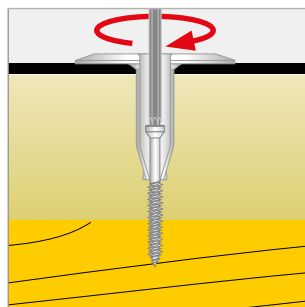
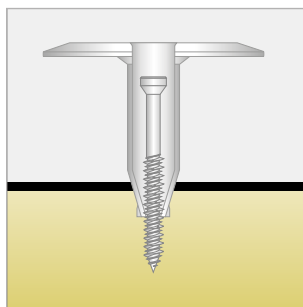
* - timber C24/OSB board/plywood

** - national safety factor shall be applied, in its absence apply 2.0

SUBSTRATE, MINIMUM THICKNESS, DISTANCE

Substrate	Min. timber thickness h_{min} [mm]	Min. edge distance c_{min} [mm]	Min. spacing L_{os} [mm]
Timber C24 EN 14081 th 30 mm	30	30	120
OSB board EN 300 th 18 mm	18	30	120
Plywood EN 313 th 20 mm	20	30	120

MOUNTING METHOD



Steel washer + WBSW-6,3 FOR TIMBER SUBSTRATE

KD STEEL WASHER + SELF-TAPPING FASTENER WBSW-6,3

Substrate: timber, OSB board, plywood



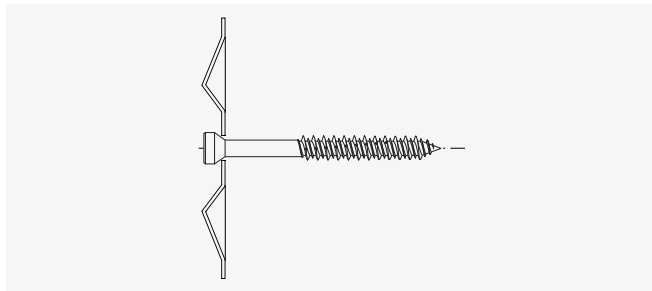
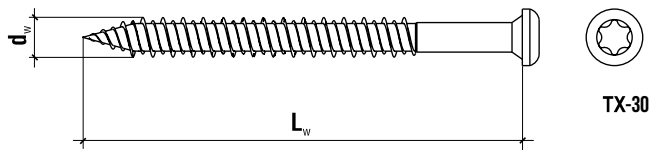
KD-03-W9

KD-03-WW7

KD-07-WW



WBSW-6,3



Fastener dimension

Code	Fastener dimension WSR-T $d_w \times L_w$ [mm]	MAX Insulation thickness t_{ins} [mm]
WBSW-63060-D	6,3 x 60	30
WBSW-63070-D	6,3 x 70	40
WBSW-63080-D	6,3 x 80	50
WBSW-63090-D	6,3 x 90	60
WBSW-63100-D	6,3 x 100	70
WBSW-63120-D	6,3 x 120	90
WBSW-63140-D	6,3 x 140	110
WBSW-63160-D	6,3 x 160	130
WBSW-63180-D	6,3 x 180	150
WBSW-63200-D	6,3 x 200	170
WBSW-63220-D	6,3 x 220	190
WBSW-63240-D	6,3 x 240	210
WBSW-63300-D	6,3 x 300	270

Washer dimension

Product marking - steel washer		KD washer dimensions [mm]
KD-03-W7	(oval)	80 x 40
KD-03-WW7	(oval)	80 x 40
KD-07-WW	(oval)	∅ 70

Steel washer + WBSW-6,3

FOR TIMBER SUBSTRATE

KD STEEL WASHER + SELF-TAPPING FASTENER WBSW-6,3

TECHNICAL DATA

Parameter	Unit	KD-03-W7	KD-03-WW7	KD-07-WW	WBSW-6,3
Washer/fastener diameter	D_p/d_w [mm]	80 x 40	80 x 40	∅70	6,3
Washer hole diameter	d_p [mm]	7,0	7,0	6,5	x
Fastener head diameter	D_w [mm]	x	x	x	9,0
Anchorage depth	h_{eff} [mm]	x	x	x	30/18/20*
Fastener drive	x	x	x	x	TX-30
Washer material	x	stal	stal	stal	x
Fastener material	x	x	x	x	steel
Approval	x	ETA-15/0578			

* - timber C24/OSB board/plywood

PULL-OUT RESISTANCE [kN]

Substrate		KD + WBSW
Characteristic resistance [kN]		
Timber C24 EN 14081	th 30 mm	3,04
OSB board EN 300	th 18 mm	1,68
Plywood EN 313	th 20 mm	3,30
Design resistance [kN] $\gamma M=2.0^{**}$		
Timber C24 EN 14081	th 30 mm	1,52
OSB board EN 300	th 18 mm	0,84
Plywood EN 313	th 20 mm	1,65

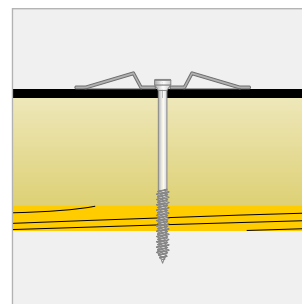
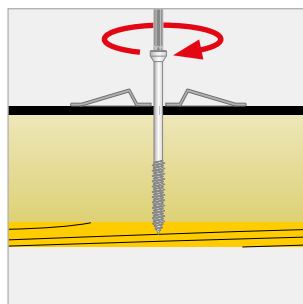
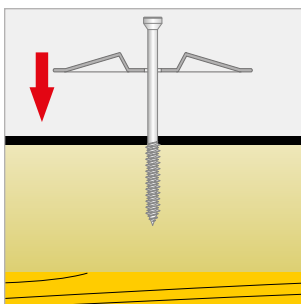
* - timber C24/OSB board/plywood

** - national safety factor shall be applied, in its absence apply 2.0

SUBSTRATE, MINIMUM THICKNESS, DISTANCE

Substrate	Min. timber thickness h_{min} [mm]	Min. edge distance c_{min} [mm]	Min. spacing L_{os} [mm]
Timber C24 EN 14081 th 30 mm	30	30	120
OSB board EN 300 th 18 mm	18	30	120
Plywood EN 313 th 20 mm	20	30	120

MOUNTING METHOD



VAPOUR BARRIER FOIL FBZ-0250



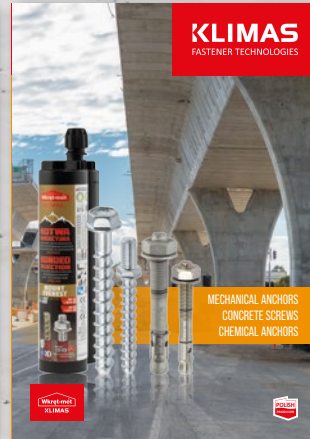
Standard: PN-EN 13984:2013

TECHNICAL DATA

Parameter	Unit	Value
Thickness	[mm]	0,20 +/- 20%
Width x length	S x L [m]	2 x 50
Roll height	H [m]	1,05
Water resistance	kPa	2
Water vapour diffusion resistance coefficient	μ	593432 +/- 10 %
(Nail) tear resistance - average value (longitudinally)	N	≥ 45
(Nail) tear resistance - average value (crosswise)	N	≥ 50
Maximum tensile strength - average value (longitudinally)	N/50 [mm]	≥ 80
Maximum tensile strength - average value (crosswise)	N/50 [mm]	≥ 60
Elongation at break (longitudinally)	[%]	≥ 150
Elongation at break (crosswise)	[%]	≥ 190
Impact strength (A method)	[mm]	≥ 200
Vapour diffusion resistance after artificial aging	[%]	+ /- 50
Straightness along the length	[mm/10 mb]	≥ 75
Reaction to fire	klasa	E
Standard		PN EN 13984:2013

KLIMAS

FASTENER TECHNOLOGIES



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R-KAT-FLAT-ROOFS-ENG

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