









# Frame Fixings

MFR		45
HBR		50
R		53
NP		55
USN		58
NPZ		60
BN		61
BDN		61

# Multifunction frame plug MFR



## Advantages



SB TX, zinc plated / A4 / HD



SB SSKS, zinc plated / A4 / HD



FB SSKS, zinc plated / A4



- The multifunction frame plug MFR enables universal mounting of facade substructures as well as wood and metal parts in all common base materials
- The long expansion area and early expansion achieved by lateral bars ensure reliable and secure hold
- Approved by company Hörmann for fire protection doors in solid base materials
- MFR 8: setting depth 50 mm; MFR 10: setting depth 50 mm and 70 mm; MFR 14: setting depth 70 mm
- The flat rim version prevents contact corrosion
- Almost all lengths are pre-assembled
- Also suitable for precast pre-stressed concrete hollow core slabs
- Suitable for windows and door frames installations

## Suitable building materials

### Very suitable



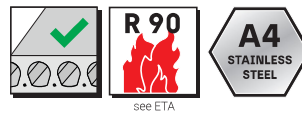
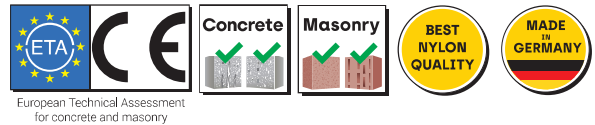
- Concrete
- Solid brick
- Solid sand-lime brick
- Precast pre-stressed hollow core slabs
- Aerated concrete
- Hollow brick



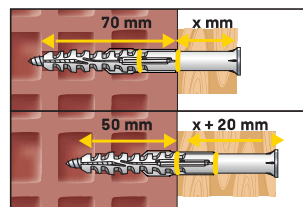
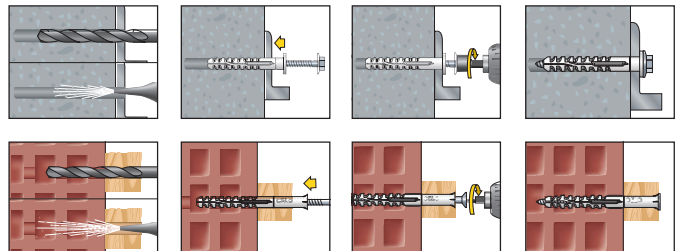
- Hollow sand-lime brick
- Lightweight hollow concrete blocks
- Natural stone
- Lightweight solid concrete blocks



## Approvals and certificates

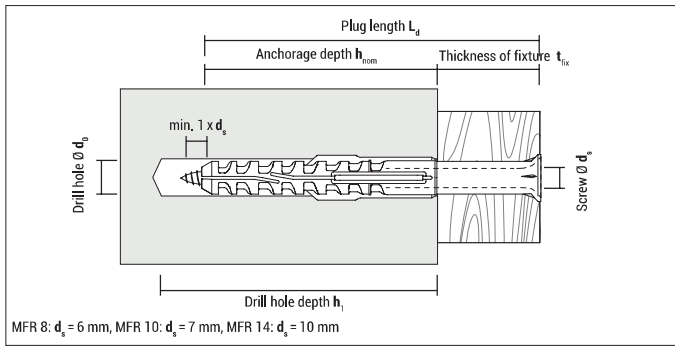


## Mounting



**MFR 10:**  
Now with two setting depths

### Multifunction frame plug MFR



#### MFR SB TX, zinc plated countersunk plug with countersunk screw

Type	Art-No	d <sub>0</sub> [mm]	h <sub>1</sub> ≥ [mm]	h <sub>nom</sub> ≥ [mm]	L <sub>d</sub> [mm]	t <sub>fix</sub> ≤ [mm]	Recess	ETA	€ / 100 pcs	[pcs]	[pcs]
8-60	9860MFRST	8	60	50	60	10	TX 30	●		100	800
8-80	9880MFRST	8	60	50	80	30	TX 30	●		100	800
8-100	98100MFRST	8	60	50	100	50	TX 30	●		50	400
8-120	98120MFRST	8	60	50	120	70	TX 30	●		50	400
10-60 <sup>1)</sup>	91060MFRST	10	60	50	60	10	TX 40	●		50	400
10-80	91080MFRST	10	60 / 80	50 / 70	80	30 / 10	TX 40	●		50	400
10-100	910100MFRST	10	60 / 80	50 / 70	100	50 / 30	TX 40	●		50	400
10-115	910115MFRST	10	60 / 80	50 / 70	115	65 / 45	TX 40	●		50	400
10-135	910135MFRST	10	60 / 80	50 / 70	135	85 / 65	TX 40	●		50	400
10-160	910160MFRST	10	60 / 80	50 / 70	160	110 / 90	TX 40	●		50	400
10-200	910200MFRST50	10	60 / 80	50 / 70	200	150 / 130	TX 40	●		50	-
10-240	910240MFRST50	10	60 / 80	50 / 70	240	190 / 170	TX 40	●		50	-
10-280	910280MFRST50	10	60 / 80	50 / 70	280	230 / 210	TX 40	●		50	-
10-320	910320MFRST50	10	60 / 80	50 / 70	320	270 / 250	TX 40	●		50	-
14-80	91480MFRST	14	85	70	80	10	TX 50	●		25	200
14-110	914110MFRST	14	85	70	110	40	TX 50	●		25	200
14-140	914140MFRST	14	85	70	140	70	TX 50	●		25	200
14-170*	914170MFRST	14	85	70	170	100	TX 50	●		25	200
14-200*	914200MFRST	14	85	70	200	130	TX 50	●		25	200
14-230*	914230MFRST	14	85	70	230	160	TX 50	●		25	200
14-270*	914270MFRST	14	85	70	270	200	TX 50	●		25	-

\* not pre-assembled

<sup>1)</sup> expected to be available in October 2020



#### MFR SB TX, stainless steel A4 countersunk plug with countersunk screw



Type	Art-No	d <sub>0</sub> [mm]	h <sub>1</sub> ≥ [mm]	h <sub>nom</sub> ≥ [mm]	L <sub>d</sub> [mm]	t <sub>fix</sub> ≤ [mm]	Recess	ETA	€ / 100 pcs	[pcs]	[pcs]
8-80 A4	9X880MFRST	8	60	50	80	30	TX 30	●		100	800
8-100 A4	9X8100MFRST	8	60	50	100	50	TX 30	●		50	400
10-80 A4	9X1080MFRST	10	60 / 80	50 / 70	80	30 / 10	TX 40	●		50	400
10-100 A4	9X10100MFRST	10	60 / 80	50 / 70	100	50 / 30	TX 40	●		50	400
10-115 A4	9X10115MFRST	10	60 / 80	50 / 70	115	65 / 45	TX 40	●		50	400
10-135 A4	9X10135MFRST	10	60 / 80	50 / 70	135	85 / 65	TX 40	●		50	400
10-160 A4	9X10160MFRST	10	60 / 80	50 / 70	160	110 / 90	TX 40	●		50	400
10-200 A4	9X10200MFRST	10	60 / 80	50 / 70	200	150 / 130	TX 40	●		50	-

## Multifunction frame plug MFR



**MFR SB TX, hot-dip galvanized** countersunk plug with countersunk screw

Type	Art-No	d <sub>0</sub> [mm]	h <sub>1</sub> ≥ [mm]	h <sub>nom</sub> ≥ [mm]	L <sub>d</sub> [mm]	t <sub>fix</sub> ≤ [mm]	Recess	€ / 100 pcs	[pcs]	[pcs]
10-100 HD	9HD10100MFRST	10	60 / 80	50 / 70	100	50 / 30	TX 40		50	400
10-135 HD	9HD10135MFRST	10	60 / 80	50 / 70	135	85 / 65	TX 40		50	400
10-160 HD	9HD10160MFRST	10	60 / 80	50 / 70	160	110 / 90	TX 40		50	400

Hot-dip galvanized is not part of the ETA assessment



washer-Ø MFR 8: 17 mm; MFR 10: 19 mm; MFR 14: 22 mm

**MFR SB SSKS, zinc plated** countersunk plug, hex-head screw with integral washer

Type	Art-No	d <sub>0</sub> [mm]	h <sub>1</sub> ≥ [mm]	h <sub>nom</sub> ≥ [mm]	L <sub>d</sub> [mm]	t <sub>fix</sub> ≤ [mm]	Recess		€ / 100 pcs	[pcs]	[pcs]
8-60	9860MFRSB	8	60	50	60	10	SW10/TX 30	●		100	800
8-80	9880MFRSB	8	60	50	80	30	SW10/TX 30	●		100	800
8-100	98100MFRSB	8	60	50	100	50	SW10/TX 30	●		50	400
8-120	98120MFRSB	8	60	50	120	70	SW10/TX 30	●		50	400
10-60 <sup>1)</sup>	91060MFRSB	10	60	50	60	10	SW13/TX 40	●		50	400
10-80	91080MFRSB	10	60 / 80	50 / 70	80	30 / 10	SW13/TX 40	●		50	400
10-100	910100MFRSB	10	60 / 80	50 / 70	100	50 / 30	SW13/TX 40	●		50	400
10-115	910115MFRSB	10	60 / 80	50 / 70	115	65 / 45	SW13/TX 40	●		50	400
10-135	910135MFRSB	10	60 / 80	50 / 70	135	85 / 65	SW13/TX 40	●		50	400
10-160	910160MFRSB	10	60 / 80	50 / 70	160	110 / 90	SW13/TX 40	●		50	400
10-200	910200MFRSB50	10	60 / 80	50 / 70	200	150 / 130	SW13/TX 40	●		50	-
10-240	910240MFRSB50	10	60 / 80	50 / 70	240	190 / 170	SW13/TX 40	●		50	-
14-80	91480MFRSB	14	85	70	80	10	SW17/TX 50	●		25	200
14-110	914110MFRSB	14	85	70	110	40	SW17/TX 50	●		25	200
14-140	914140MFRSB	14	85	70	140	70	SW17/TX 50	●		25	200
14-170*	914170MFRSB	14	85	70	170	100	SW17/TX 50	●		25	200
14-200*	914200MFRSB	14	85	70	200	130	SW17/TX 50	●		25	200
14-230*	914230MFRSB	14	85	70	230	160	SW17/TX 50	●		25	-
14-270*	914270MFRSB	14	85	70	270	200	SW17/TX 50	●		25	-

\* not pre-assembled

<sup>1)</sup> expected to be available in October 2020



washer-Ø MFR 10: 19 mm

**MFR SB SSKS, stainless steel A4** countersunk plug, hex-head screw with integral washer



Type	Art-No	d <sub>0</sub> [mm]	h <sub>1</sub> ≥ [mm]	h <sub>nom</sub> ≥ [mm]	L <sub>d</sub> [mm]	t <sub>fix</sub> ≤ [mm]	Recess		€ / 100 pcs	[pcs]	[pcs]
10-80 A4	9X1080MFRSB	10	60 / 80	50 / 70	80	30 / 10	SW13/TX 40	●		50	400
10-100 A4	9X10100MFRSB	10	60 / 80	50 / 70	100	50 / 30	SW13/TX 40	●		50	400
10-115 A4	9X10115MFRSB	10	60 / 80	50 / 70	115	65 / 45	SW13/TX 40	●		50	400
10-135 A4	9X10135MFRSB	10	60 / 80	50 / 70	135	85 / 65	SW13/TX 40	●		50	400
10-160 A4	9X10160MFRSB	10	60 / 80	50 / 70	160	110 / 90	SW13/TX 40	●		50	400
10-200 A4	9X10200MFRSB	10	60 / 80	50 / 70	200	150 / 130	SW13/TX 40	●		50	-

### Multifunction frame plug MFR



washer-Ø MFR 10: 19 mm

#### MFR SB SSKS, hot-dip galvanized countersunk plug, hex-head screw with integral washer

Type	Art-No	d <sub>0</sub> [mm]	h <sub>1</sub> ≥ [mm]	h <sub>nom</sub> ≥ [mm]	L <sub>d</sub> [mm]	t <sub>fix</sub> ≤ [mm]	Recess	€ / 100 pcs	[pcs]	[pcs]
10-100 HD	9HD10100MFRSB	10	60 / 80	50 / 70	100	50 / 30	SW13/TX 40		50	400
10-135 HD	9HD10135MFRSB	10	60 / 80	50 / 70	135	85 / 65	SW13/TX 40		50	400
10-160 HD	9HD10160MFRSB	10	60 / 80	50 / 70	160	110 / 90	SW13/TX 40		50	400

Hot-dip galvanized is not part of the ETA assessment



washer-Ø MFR 8: 17 mm; MFR 10: 19 mm; MFR 14: 22 mm

#### MFR FB SSKS, zinc plated flat rim plug, hex-head screw with integral washer

Type	Art-No	d <sub>0</sub> [mm]	h <sub>1</sub> ≥ [mm]	h <sub>nom</sub> ≥ [mm]	L <sub>d</sub> [mm]	t <sub>fix</sub> ≤ [mm]	Recess		€ / 100 pcs	[pcs]	[pcs]
8-60	9860MFRFB	8	60	50	60	10	SW10/TX 30	●		100	800
8-80	9880MFRFB	8	60	50	80	30	SW10/TX 30	●		100	800
10-60 <sup>1)</sup>	91060MFRFB	10	60	50	60	10	SW13/TX 40	●		50	400
10-80	91080MFRFB	10	60 / 80	50 / 70	80	30 / 10	SW13/TX 40	●		50	400
10-100	910100MFRFB	10	60 / 80	50 / 70	100	50 / 30	SW13/TX 40	●		50	400
14-80	91480MFRFB	14	85	70	80	10	SW17/TX 50	●		25	200
14-110	914110MFRFB	14	85	70	110	40	SW17/TX 50	●		25	200
14-140	914140MFRFB	14	85	70	140	70	SW17/TX 50	●		25	200

<sup>1)</sup> expected to be available in October 2020



washer-Ø MFR 10: 19 mm



#### MFR FB SSKS, stainless steel A4 flat rim plug, hex-head screw with integral washer

Type	Art-No	d <sub>0</sub> [mm]	h <sub>1</sub> ≥ [mm]	h <sub>nom</sub> ≥ [mm]	L <sub>d</sub> [mm]	t <sub>fix</sub> ≤ [mm]	Recess		€ / 100 pcs	[pcs]	[pcs]
10-80 A4	9X1080MFRFB	10	60 / 80	50 / 70	80	30 / 10	SW13/TX 40	●		50	400
10-100 A4	9X10100MFRFB	10	60 / 80	50 / 70	100	50 / 30	SW13/TX 40	●		50	400



#### Single label, MFR SB TX, zinc plated

countersunk plug with countersunk screw

Type	Art-No	d <sub>0</sub> [mm]	h <sub>1</sub> ≥ [mm]	h <sub>nom</sub> ≥ [mm]	L <sub>d</sub> [mm]	t <sub>fix</sub> ≤ [mm]	Recess		€ / pc	[pcs]
10-80	11080MFRST	10	60 / 80	50 / 70	80	30 / 10	TX 40	●		50
10-100	110100MFRST	10	60 / 80	50 / 70	100	50 / 30	TX 40	●		50
10-115	110115MFRST	10	60 / 80	50 / 70	115	65 / 45	TX 40	●		50
10-135	110135MFRST	10	60 / 80	50 / 70	135	85 / 65	TX 40	●		50
10-160	110160MFRST	10	60 / 80	50 / 70	160	110 / 90	TX 40	●		50
10-200	110200MFRST	10	60 / 80	50 / 70	200	150 / 130	TX 40	●		50

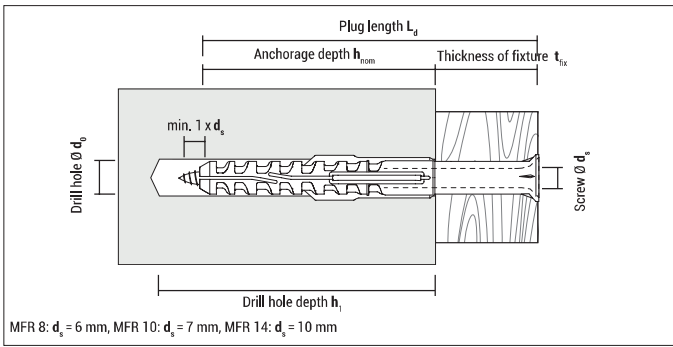


#### Single label, MFR FB SSKS, zinc plated

flat rim plug, hex-head screw with integral washer (washer-Ø MFR 10: 19 mm)

Type	Art-No	d <sub>0</sub> [mm]	h <sub>1</sub> ≥ [mm]	h <sub>nom</sub> ≥ [mm]	L <sub>d</sub> [mm]	t <sub>fix</sub> ≤ [mm]	Recess		€ / pc	[pcs]
10-80	11080MFRFB	10	60 / 80	50 / 70	80	30 / 10	SW13/TX40	●		50
10-100	110100MFRFB	10	60 / 80	50 / 70	100	50 / 30	SW13/TX40	●		50

### Multifunction frame plug MFR



### Loads MFR $F_{per}$

Type	Anchorage depth $h_{nom}$ [mm]	Concrete		Solid brick		Solid sand-lime brick		Hollow brick	Hollow sand-lime brick	Hollow concrete block	Aerated concrete			Precast pre-stressed hollow core slabs	Permissible bending moment for zinc plated screws $M_{per}$ [Nm]
		$\geq C16/20$	$N_{per}$ [kN]	$V_{per}$ [kN]	Mz 10 $F_{per}$ [kN]	Mz 20 $F_{per}$ [kN]	KS 10 $F_{per}$ [kN]	KS 20 $F_{per}$ [kN]	HLz 12 $F_{per}$ [kN]	KSL 12 $F_{per}$ [kN]	Hbn 25 $F_{per}$ [kN]	AAC2 $F_{per}$ [kN]	AAC4 $F_{per}$ [kN]	AAC6 $F_{per}$ [kN]	
MFR 8	50	0,99	3,31	0,26	0,43	0,57	0,86	0,14	0,21	0,34	–	–	–	1,39	5,03
MFR 10	50	0,99	4,86	0,71	1,00	0,71	1,14	0,34	0,43	0,71	–	–	–	–	8,74
MFR 10	70	1,59	4,86	0,57	0,86	0,57	0,86	0,21	0,26	0,21	0,14	0,43	0,71	0,48	8,74
MFR 14	70	1,79	8,69	0,86	1,29	0,86	1,29	0,21	0,34	–	0,11	0,43	0,71	–	20,97

Permissible load in all directions,  $N_{per}$  = permissible tension load,  $V_{per}$  = permissible shear load according to ETA assessment for zinc plated screws

(For MFR with hot-dip galvanized screw: These values can be used as recommended loads)

Values apply to an average temperature range in the wall of max. + 24° C (temporarily + 40° C).

If the sustained average temperature is +50° C (temporarily +80° C) load capacities are reduced. In this case, refer to the assessment.

For further information regarding masonry (brick types and sizes) please refer to the assessment.

### Spacing and edge distance

Type	Anchorage depth $h_{nom}$ [mm]	Distances	Concrete	Solid brick Mz/ Solid brick KS		Hollow brick HLz/ Hollow sand-lime brick KSL		Aerated concrete							
			$\geq C16/20$ [mm]	single plug [mm]	group of plugs [mm]	single plug [mm]	group of plugs [mm]	AAC2		AAC4		AAC6			
								single plug [mm]	group of plugs [mm]	single plug [mm]	group of plugs [mm]	single plug [mm]	group of plugs [mm]	single plug [mm]	group of plugs [mm]
MFR 8	50	Spacing a / $s_{2,min}$ parallel to edge	50	250	400	250	400	–	–	–	–	–	–	–	–
MFR 10	50		50	250	400	250	200	–	–	–	–	–	–	–	–
MFR 10	70		50	250	400	250	400	250	200	250	300	250	250	400	400
MFR 14	70		100	250	400	250	480*/400	250	200	250	300	250	300	250	400
MFR 8	50	Spacing a / $s_{1,min}$ perpendicular to edge	50	250	200	250	200	–	–	–	–	–	–	–	–
MFR 10	50		50	250	200	250	200	–	–	–	–	–	–	–	–
MFR 10	70		50	250	200	250	200	250	100	250	150	250	250	200	–
MFR 14	70		100	250	200	250	240*/200	250	100	250	150	250	150	250	200
MFR 8	50	Min. edge distance $c_{min}$	60	100	100	100	100	–	–	–	–	–	–	–	–
MFR 10	50		50	65	100	100	100	–	–	–	–	–	–	–	–
MFR 10	70		60	100	100	100	100	50	50	75	75	100	100	100	100
MFR 14	70		100	100	100	120*/100	120*/100	50	50	75	75	100	100	100	100
MFR 8	50	Min. thickness of structural part $h_{min}$	100					–	–	–	–	–	–	–	–
MFR 10	50		100	depending on brick format		depending on brick format		–	–	–	–	–	–	–	–
MFR 10	70		110					100	100	100	100	100	100	100	100
MFR 14	70		120					100	100	100	100	100	100	100	100

\* Value applies to HLz

# Hollow block frame plug HBR



## Advantages



HBR without screw

HBR with countersunk screw PZ

HBR with countersunk screw TX

HBR with hex-head screw with integral washer (SW13/TX40)

- ETA approved specialised frame plug for perforated building materials like hollow bricks and blocks
- Setting depth 90 mm: High pull out loads due to long expansion area and high expansion ability in perforated bricks
- The HBR is suitable for facade installations, fixing of doors and windows, wall cabinets and frames in general
- The HBR 10 is approved only in conjunction with the CELO safety screws

## Suitable building materials

### Very suitable



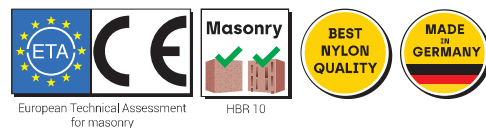
- Hollow brick
- Hollow sand-lime brick
- Solid sand-lime brick
- Lightweight hollow concrete blocks
- Lightweight solid concrete blocks
- Aerated concrete

### Suitable

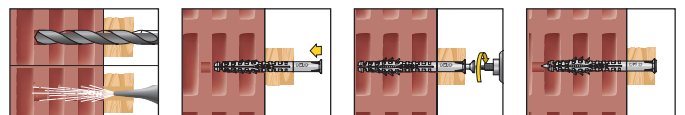


- Concrete

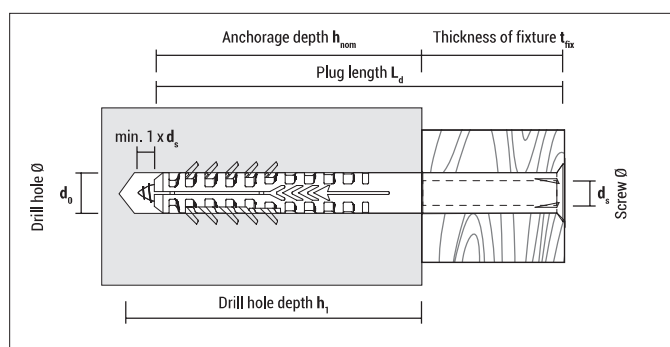
## Approvals and certificates



## Mounting



## Hollow block frame plug HBR



**HBR** without screw

Type	Art-No	d <sub>0</sub> [mm]	h <sub>1</sub> ≥ [mm]	h <sub>nom</sub> ≥ [mm]	L <sub>d</sub> [mm]	t <sub>fix</sub> ≤ [mm]	d <sub>s</sub> [mm]	€/ 100 pcs	[pcs]	[pcs]
8-80*	9880HBR	8	80	65	80	15	5-6		50	900
10-100	910100HBR	10	100	90	100	10	6-7		100	800
10-115	910115HBR	10	100	90	115	25	6-7		100	800
10-135	910135HBR	10	100	90	135	45	6-7		50	400
10-160	910160HBR	10	100	90	160	70	6-7		50	400
10-200	910200HBR	10	100	90	200	110	6-7		50	400
10-240	910240HBR	10	100	90	240	150	6-7		50	400

\* Not part of the assessment; HBR 10 approved only in conjunction with CELO safety screw



**HBR SP, zinc plated** with countersunk screw (HBR 8: PZ 3, HBR 10: PZ4)

Type	Art-No	d <sub>0</sub> [mm]	h <sub>1</sub> ≥ [mm]	h <sub>nom</sub> ≥ [mm]	L <sub>d</sub> [mm]	t <sub>fix</sub> ≤ [mm]	d <sub>s</sub> [mm]		€/ 100 pcs	[pcs]	[pcs]
8-80 SP	9880HBR SZ	8	80	65	80	15	5,5	–		25	450
10-100 SSP	910100HBR SZ	10	100	90	100	10	7	●		50	400
10-115 SSP	910115HBR SZ	10	100	90	115	25	7	●		50	400
10-135 SSP	910135HBR SZ	10	100	90	135	45	7	●		50	400
10-160 SSP	910160HBR SZ	10	100	90	160	70	7	●		50	400



**HBR 10 TX, zinc plated** with countersunk screw (TX 40)

Type	Art-No	d <sub>0</sub> [mm]	h <sub>1</sub> ≥ [mm]	h <sub>nom</sub> ≥ [mm]	L <sub>d</sub> [mm]	t <sub>fix</sub> ≤ [mm]	d <sub>s</sub> [mm]		€/ 100 pcs	[pcs]	[pcs]
10-100 TX	910100HBR ST	10	100	90	100	10	7	●		50	400
10-115 TX	910115HBR ST	10	100	90	115	25	7	●		50	400
10-135 TX	910135HBR ST	10	100	90	135	45	7	●		50	400
10-160 TX	910160HBR ST	10	100	90	160	70	7	●		50	400
10-200 TX	910200HBR ST	10	100	90	200	110	7	●		25	200
10-240 TX	910240HBR ST	10	100	90	240	150	7	●		25	200



### Hollow block frame plug HBR



washer-Ø HBR 10: 19 mm

**HBR 10 SSK, zinc plated** with hex-head screw with integral washer (SW13/TX40)

Type	Art-No	d <sub>0</sub> [mm]	h <sub>1</sub> ≥ [mm]	h <sub>nom</sub> ≥ [mm]	L <sub>d</sub> [mm]	t <sub>fix</sub> ≤ [mm]	d <sub>s</sub> [mm]	ETA	€/100 pcs	[pcs]	[pcs]
10-100 SSK	910100HBR SB	10	100	90	100	10	7	●		50	400
10-115 SSK	910115HBR SB	10	100	90	115	25	7	●		50	400
10-135 SSK	910135HBR SB	10	100	90	135	45	7	●		50	400
10-160 SSK	910160HBR SB	10	100	90	160	70	7	●		50	400
10-200 SSK	910200HBR SB	10	100	90	200	110	7	●		25	200
10-240 SSK	910240HBR SB	10	100	90	240	150	7	●		25	-



**Blister HBR, zinc plated** incl. safety screw



Type	Art-No	d <sub>0</sub> [mm]	h <sub>1</sub> ≥ [mm]	h <sub>nom</sub> ≥ [mm]	L <sub>d</sub> [mm]	t <sub>fix</sub> ≤ [mm]	d <sub>s</sub> x L <sub>s</sub> [mm]	Type of screw	ETA	€/Blister	[pcs]	[Blister]
10-100 TX	510100HBR ST5	10	100	90	100	10	7,0 x 107	← ⊕	●		5	10
10-100 SSK	510100HBR SK5	10	100	90	100	10	7,0 x 107	← ⊗	●		5	10
10-135 TX	510135HBR ST5	10	100	90	135	45	7,0 x 142	← ⊕	●		5	10
10-135 SSK	510135HBR SK5	10	100	90	135	45	7,0 x 142	← ⊗	●		5	10
10-160 TX	510160HBR ST5	10	100	90	160	70	7,0 x 167	← ⊕	●		5	10
10-160 SSK	510160HBR SK3	10	100	90	160	70	7,0 x 167	← ⊗	●		3	10

### Loads F<sub>per</sub> and F<sub>rec</sub>

Type	Solid sand-lime brick ≥ KS 12		Hollow brick ≥ HLz 12		Hollow sand-lime brick ≥ KSL 12		Hollow concrete blocks Hbl 2		Lightweight solid concrete blocks V2		Permissible bending moment for zinc plated screws M <sub>per</sub> [Nm]
	F <sub>per</sub> [kN]	F <sub>rec</sub> [kN]	F <sub>per</sub> [kN]	F <sub>rec</sub> [kN]	F <sub>per</sub> [kN]	F <sub>rec</sub> [kN]	F <sub>per</sub> [kN]	F <sub>rec</sub> [kN]	F <sub>per</sub> [kN]	F <sub>rec</sub> [kN]	
HBR 8	-	1,30	-	0,40	-	0,50	-	0,37	-	0,37	4,5
HBR 10	0,86	-	0,34	-	0,21	-	0,11	-	-	0,25	13,0

F<sub>per</sub>: Permissible load in all directions according to ETA assessment

F<sub>rec</sub>: Recommended load in all directions incl. safety factor

Values apply to an average temperature range in the wall of max. + 24° C (temporarily + 40° C).

If the sustained average temperature is +50° C (temporarily +80° C) load capacities are reduced. In this case, refer to the assessment.

For further information regarding masonry (brick types and sizes) please refer to the assessment.

### Spacing and edge distance

Type	Distances	Solid sand-lime brick KS		Hollow brick HLz		Hollow sand-lime brick KSL		Hollow concrete blocks Hbl		
		single plug [mm]	group of plugs [mm]	single plug [mm]	group of plugs [mm]	single plug [mm]	group of plugs [mm]	single plug [mm]	group of plugs [mm]	
HBR 10	Spacing parallel to edge	a or s <sub>2</sub>	250	400	250	320	250	360	250	200
HBR 10	Spacing perpendicular to edge	a or s <sub>1</sub>	250	200	250	160	250	180	250	100
HBR 10	Min. edge distance	c <sub>min</sub>	100	-	80	-	80	-	50	-
HBR 10	Min. thickness of structural part	h <sub>min</sub>	175	175	175	175	175	175	240	240

\* Applies to the installation on the long side of the stone

# Frame plug R



## Advantages



R 8 without screw



R 10 without screw



R with countersunk screw PZ



R with countersunk screw TX



R with hex-head screw with integral washer (SW13/TX40)

- Special frame plug for solid building materials
- Setting depth only 50 mm (R8 only 40 mm)
- Suitable for facade installations, fixing of doors and windows, wall cabinets and frames in general
- The distinctive anti-rotation wings prevent effectively spinning during the installation

## Suitable building materials

### Very suitable



- Concrete
- Solid sand-lime brick
- Natural stone
- Solid brick
- Lightweight solid concrete blocks

### Suitable to a limited extent

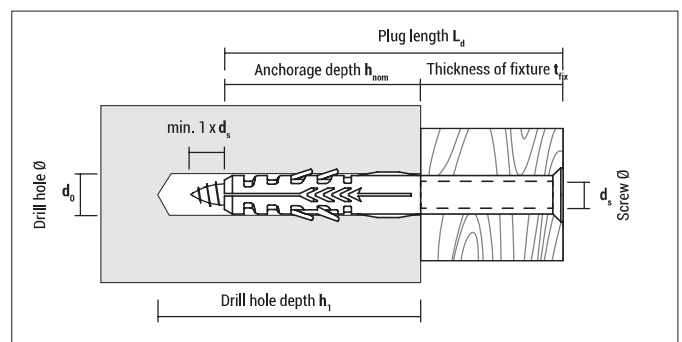
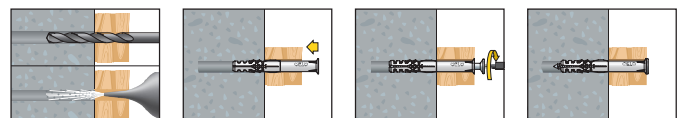


- Hollow brick
- Hollow sand-lime brick
- Aerated concrete
- Lightweight hollow concrete blocks

## Approvals and certificates



## Mounting





**R SP/SSP, zinc plated** with countersunk wood screw (R 8: PZ 3; R 10: PZ 4)

Type	Art-No	d <sub>o</sub> [mm]	h <sub>1</sub> ≥ [mm]	h <sub>nom</sub> ≥ [mm]	L <sub>d</sub> [mm]	t <sub>fix</sub> ≤ [mm]	d <sub>s</sub> [mm]	€/ 100 pcs	[pcs]	[pcs]
8-60 SP	9860RSZ	8	55	40	60	20	5,5		25	450
8-80 SP	9880RSZ	8	55	40	80	40	5,5		25	450
8-100 SP	98100RSZ	8	55	40	100	60	5,5		50	400
10-80 SSP	91080RSZ	10	60	50	80	30	7		100	800
10-100 SSP	910100RSZ	10	60	50	100	50	7		50	400
10-115 SSP	910115RSZ	10	60	50	115	65	7		50	400
10-135 SSP	910135RSZ	10	60	50	135	85	7		50	400

discontinued article; delivery while stocks last



**R TX, zinc plated** with countersunk screw (TX 40)

Type	Art-No	d <sub>o</sub> [mm]	h <sub>1</sub> ≥ [mm]	h <sub>nom</sub> ≥ [mm]	L <sub>d</sub> [mm]	t <sub>fix</sub> ≤ [mm]	d <sub>s</sub> [mm]	€/ 100 pcs	[pcs]	[pcs]
10-80 TX	91080RST	10	60	50	80	30	7		100	800
10-100 TX	910100RST	10	60	50	100	50	7		50	400
10-115 TX	910115RST	10	60	50	115	65	7		50	400
10-135 TX	910135RST	10	60	50	135	85	7		50	400
10-160 TX	910160RST	10	60	50	160	110	7		50	400
10-200 TX	910200RST	10	60	50	200	150	7		25	200

discontinued article; delivery while stocks last



**R SSK, zinc plated** with hex-head screw with integral washer (SW13/TX40)

Type	Art-No	d <sub>o</sub> [mm]	h <sub>1</sub> ≥ [mm]	h <sub>nom</sub> ≥ [mm]	L <sub>d</sub> [mm]	t <sub>fix</sub> ≤ [mm]	d <sub>s</sub> [mm]	€/ 100 pcs	[pcs]	[pcs]
10-60 SSK	91060RK	10	60	50	60	10	7		100	800
10-80 SSK	91080RK	10	60	50	80	30	7		100	800
10-115 SSK	910115RK	10	60	50	115	65	7		50	400
10-135 SSK	910135RK	10	60	50	135	85	7		50	400
10-200 SSK	910200RK	10	60	50	200	150	7		25	200
10-240 SSK	910240RK	10	60	50	240	190	7		25	200

discontinued article; delivery while stocks last

**Loads F<sub>rec</sub>**

Type	Concrete ≥ C12/15 F <sub>rec</sub> [kN]	Solid brick Mz 12 F <sub>rec</sub> [kN]	Solid sand-lime brick KS 12 F <sub>rec</sub> [kN]	Hollow brick HLz 12 F <sub>rec</sub> [kN]	Hollow sand-lime brick KSL 12 F <sub>rec</sub> [kN]	Lightweight solid concrete blocks V2 F <sub>rec</sub> [kN]	Bending moment for zinc plated screws* [Nm]
R 8	0,85	0,75	0,75	0,45	0,45	–	4,5
R 10*	0,80	0,60	0,60	–	–	0,25	8,7

F<sub>rec</sub>: Recommended loads in all directions incl. safety factors

\* Recommended loads in all directions according to former German approval by DIBt

**Spacing and edge distance** values for R10 according to former German approval by DIBt

Type	Concrete ≥ C12/15					Solid brick ≥ Mz 12, Solid sand-lime brick ≥ KS 12				
	Spacing		Edge distance		Thickness of structural part h <sub>min</sub> [mm]	Spacing distance α ≥ [mm]	Edge distance		without load α <sub>r</sub> [mm]	Min. thickness of structural part h <sub>min</sub> [mm]
	single plug α ≥ [mm]	pair of plugs α <sub>g</sub> ≥ [mm]	single plug α <sub>r</sub> ≥ [mm]	pair of plugs α <sub>r</sub> [mm]			with load, to joint without mortar α <sub>r</sub> ≥ [mm]	with load, to joint with mortar α <sub>r</sub> ≥ [mm]		
R 8	100	50	50	150	100	100/250	100	30	250	115
R 10	100	50	50	150	100	100/250	100	30	250	115

# Nail plug NP



## Advantages



Countersunk plug NPC 5, NPC 6 and NP 8



Flat rim plug NP 5 and NP 6



Countersunk plug NP 6 and NP 8 with metric thread

- For the quick fixing of frames, slats, channels, foils, electrical clamps, etc.
- Also suitable for window and door frame installation
- An accurate tuning between plug and nailscrew results in optimal expansion and thus high pull out loads
- Integral barrier prevents premature expansion
- Protection of the nailscrew head during hammering-in by a raised ring
- All nailscrews with PZ recess, so screwing in and out is also possible

## Suitable building materials

### Very suitable



- Concrete
- Natural stone
- Solid brick
- Solid sand-lime brick
- Lightweight solid concrete blocks

### Suitable

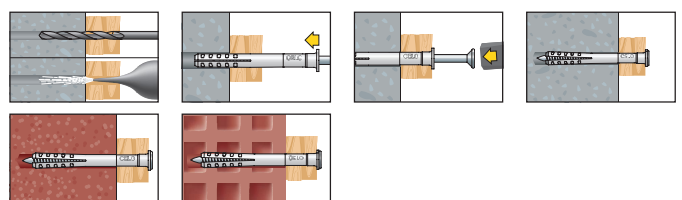


- Hollow brick HLz
- Hollow sand-lime brick KSL
- Lightweight hollow concrete blocks
- Aerated concrete

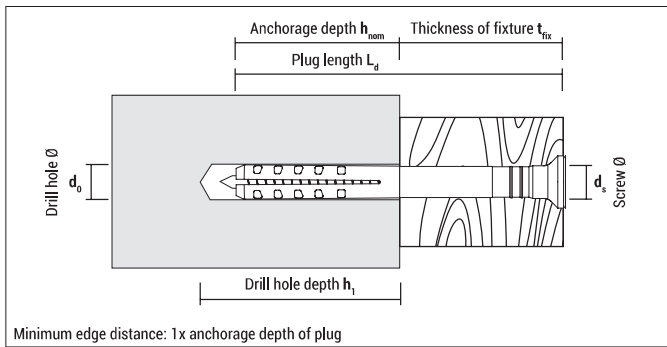
## Approvals and certificates



## Mounting



## Nail plug NP



### NPC and NP, zinc plated countersunk plug with countersunk screw pre-assembled

Type	Art-No	$d_0$ [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	$L_d$ [mm]	$t_{fix} \leq$ [mm]	€ / 100 pcs	[pcs]	[pcs]
NPC 5-35	9535NPC	5	35	25	35	10		100	1.800
NPC 5-50	9550NPC	5	35	25	50	25		100	1.800
NPC 6-35	9635NPC	6	40	30	35	5		100	1.800
NPC 6-40	9640NPC	6	40	30	40	10		100	1.800
NPC 6-50	9650NPC	6	40	30	50	20		50	900
NPC 6-60	9660NPC	6	40	30	60	30		50	900
NPC 6-80	9680NPC	6	40	30	80	50		50	900
NP 8-60	9860NP	8	50	40	60	20		50	600
NP 8-60 <sup>1)</sup>	9860NP100	8	50	40	60	20		100	800
NP 8-80	9880NP	8	50	40	80	40		50	600
NP 8-80 <sup>1)</sup>	9880NP100	8	50	40	80	40		100	800
NP 8-100	98100NP	8	50	40	100	60		50	600
NP 8-100 <sup>1)</sup>	98100NP100	8	50	40	100	60		100	800
NP 8-120	98120NP	8	50	40	120	80		50	400
NP 8-120 <sup>1)</sup>	98120NP100	8	50	40	120	80		100	800
NP 8-135	98135NP	8	50	40	135	95		50	400

<sup>1)</sup>Craftsman pack (box without viewing window)



### NP, zinc plated flat rim plug with countersunk screw, pre-assembled

Type	Art-No	$d_0$ [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	$L_d$ [mm]	$t_{fix} \leq$ [mm]	€ / 100 pcs	[pcs]	[pcs]
NP 5-25	9525NP	5	25	23	25	2		200	3.600
NP 5-35	9535NP	5	35	25	35	10		100	1.800
NP 5-50	9550NP	5	35	25	50	25		100	1.800
NP 6-35	9635NP	6	40	30	35	5		100	1.800
NP 6-40	9640NP	6	40	30	40	10		100	1.800
NP 6-40 <sup>1)</sup>	9640NP300	6	40	30	40	10		300	2.400
NP 6-50	9650NP	6	40	30	50	20		50	900
NP 6-60	9660NP	6	40	30	60	30		50	900
NP 6-60 <sup>1)</sup>	9660NP250	6	40	30	60	30		250	2.000
NP 6-70	9670NP	6	40	30	70	40		50	900
NP 6-80	9680NP	6	40	30	80	50		50	900
NP 6-80 <sup>1)</sup>	9680NP200	6	40	30	80	50		200	1.600

<sup>1)</sup>Craftsman pack (box without viewing window)

### Nail plug NP



**NP, stainless steel A2 flat rim plug with countersunk screw**, pre-assembled

Type	Art-No	d <sub>0</sub> [mm]	h <sub>1</sub> ≥ [mm]	h <sub>nom</sub> ≥ [mm]	L <sub>d</sub> [mm]	t <sub>fix</sub> ≤ [mm]	€ / 100 pcs	[pcs]	[pcs]
NP 5-35 A2	9X535NP	5	35	25	35	10		100	1.800
NP 5-50 A2	9X550NP	5	35	25	50	25		100	1.800
NP 6-40 A2	9X640NP	6	40	30	40	10		100	1.800
NP 6-60 A2	9X660NP	6	40	30	60	30		50	900
NP 6-80 A2	9X680NP	6	40	30	80	50		50	900



**NP, stainless steel A2 countersunk plug with countersunk screw**, pre-assembled

Type	Art-No	d <sub>0</sub> [mm]	h <sub>1</sub> ≥ [mm]	h <sub>nom</sub> ≥ [mm]	L <sub>d</sub> [mm]	t <sub>fix</sub> ≤ [mm]	€ / 100 pcs	[pcs]	[pcs]
NP 8-60 A2	9X860NP	8	50	40	60	20		50	600
NP 8-80 A2	9X880NP	8	50	40	80	40		50	600



**NP, zinc plated countersunk plug, nail screw with metric thread**, pre-assembled

Type	Art-No	d <sub>0</sub> [mm]	h <sub>1</sub> ≥ [mm]	h <sub>nom</sub> ≥ [mm]	L <sub>d</sub> [mm]	t <sub>fix</sub> ≤ [mm]	€ / 100 pcs	[pcs]	[pcs]
NP 6-40 M6*	9640NPM6	6	40	30	40	10		100	1.800
NP 8-45 M8*	9845NPM8	8	50	40	45	5		50	900

\*Thread length at M6 and M8: 5 mm



**Blister NP, zinc plated** pre-assembled, NP 5 and 6: flat rim plug, NP8: countersunk plug

Type	Art-No	d <sub>0</sub> [mm]	h <sub>1</sub> ≥ [mm]	h <sub>nom</sub> ≥ [mm]	L <sub>d</sub> [mm]	t <sub>fix</sub> ≤ [mm]	€ / Blister	[pcs]	[Blister]
NP 5-35	5535NP20	5	35	25	35	10		20	10
NP 5-50	5550NP20	5	35	25	50	25		20	10
NP 6-40	5640NP15	6	40	30	40	10		15	10
NP 6-60	5660NP15	6	40	30	60	30		15	10
NP 6-80	5680NP10	6	40	30	80	50		10	10
NP 8-60	5860NP10	8	50	40	60	20		10	10
NP 8-80	5880NP10	8	50	40	80	40		10	10
NP 8-100	58100NP10	8	50	40	100	60		10	10
NP 8-120	58120NP5	8	50	40	120	80		5	10
NP 8-135	58135NP5	8	50	40	135	95		5	10

All nailscrews with PZ recess

### Loads F<sub>rec</sub> and F<sub>eff</sub>

Type	Concrete		Solid sand-lime brick KS 12		Aerated concrete AAC2		Aerated concrete AAC4		Hollow brick HLz 12	
	F <sub>rec</sub> [kN]	F <sub>eff</sub> [kN]	F <sub>rec</sub> [kN]	F <sub>eff</sub> [kN]	F <sub>rec</sub> [kN]	F <sub>eff</sub> [kN]	F <sub>rec</sub> [kN]	F <sub>eff</sub> [kN]	F <sub>rec</sub> [kN]	F <sub>eff</sub> [kN]
NP 5	0,20	1,40	0,17	1,20	0,05	0,35	0,09	0,63	0,08	0,56
NP 6	0,21	1,50	0,19	1,33	0,06	0,42	0,10	0,70	0,09	0,63
NP 8	0,29	2,00	0,26	1,80	0,09	0,63	0,13	0,91	0,10	0,70

F<sub>rec</sub>: Recommended loads incl. safety factor of 7

F<sub>eff</sub>: Effective pull out loads excl. safety factors

# Universal Spreading Nail USN



## Advantages



- Innovative direct fastening of wall connection profiles, metal sheets, base protection profiles, cornice covers, motion detectors, small lamps, signs, etc. without thermal bridge
- Suitable in almost all common building materials with good pull-out values
- The elastic V-shaped spring elements ensure a high spreading force
- Spreading nail made out of glass-fibre reinforced nylon with EPDM sealing; ageing, weather and UV-resistant
- Stylish head, different colours and different lengths
- Electrical contact protection through the use of plastics
- Easy disassembly by knocking off or drilling out the head
- For insulated walls use insulation screw IPS or insulation screw plug IPSD

## Approvals and certificates



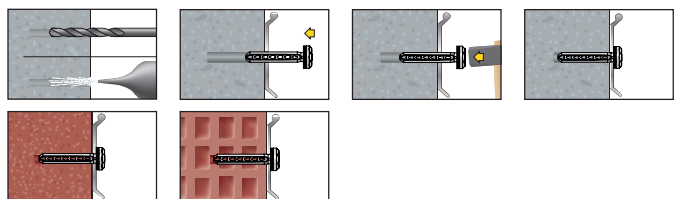
## Suitable building materials

### Very suitable



- Concrete
- Natural stone
- Solid brick
- Solid sand-lime brick
- Lightweight solid concrete blocks
- Aerated concrete (only AAC6)
- Hollow brick
- Hollow sand-lime brick
- Lightweight hollow concrete blocks

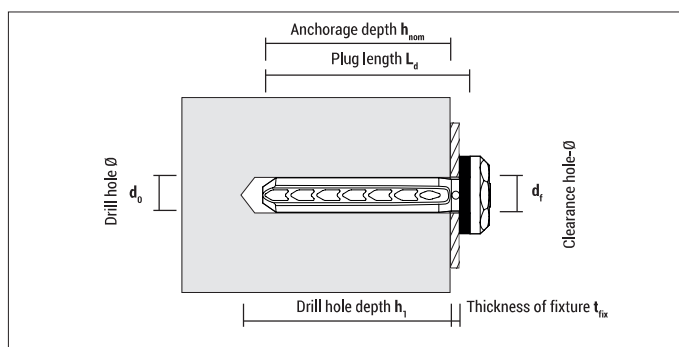
## Mounting



The USN can be removed in two ways:

1. **Knock off the head** using a chisel or a screwdriver.
2. **Drill out the head** with a drill bit that falls apart (The USN has a small notch on the head which helps to guide a drill bit).

## Universal Spreading Nail USN



USN 6-40

**USN 40** with EPDM sealing, head  $\varnothing = 15,0$  mm

Type	Art-No	RAL-Code	$d_0$ [mm]	$L_d$ [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	$t_{fix} \leq$ [mm]	$d_f$ [mm]	€ / 100 pcs	[pcs]	[pcs]
USN 40 Signal white	9140USN	RAL 9003	6	40	40	35	5	8 - 10		100	1.800
USN 40 Telegrey	9GR40USN	RAL 7045	6	40	40	35	5	8 - 10		100	1.800
USN 40 Anthracite grey	9AN40USN	RAL 7016	6	40	40	35	5	8 - 10		100	1.800
USN 40 Traffic black	9440USN	RAL 9017	6	40	40	35	5	8 - 10		100	1.800
USN 40 Copper brown	9CO40USN	RAL 8004	6	40	40	35	5	8 - 10		100	1.800
USN 40 Sepia brown	9M40USN	RAL 8014	6	40	40	35	5	8 - 10		100	1.800
USN 40 Chocolate brown	9MO40USN	RAL 8017	6	40	40	35	5	8 - 10		100	1.800



USN 6-60

**USN 60** with EPDM sealing, head  $\varnothing = 15,0$  mm

Type	Art-No	RAL-Code	$d_0$ [mm]	$L_d$ [mm]	$h_1 \geq$ [mm]	$h_{nom} \geq$ [mm]	$t_{fix} \leq$ [mm]	$d_f$ [mm]	€ / 100 pcs	[pcs]	[pcs]
USN 60 Signal white	9160USN	RAL 9003	6	60	60	35	25	8 - 10		75	1.350
USN 60 Telegrey	9GR60USN	RAL 7045	6	60	60	35	25	8 - 10		75	1.350
USN 60 Anthracite grey	9AN60USN	RAL 7016	6	60	60	35	25	8 - 10		75	1.350
USN 60 Traffic black	9460USN	RAL 9017	6	60	60	35	25	8 - 10		75	1.350
USN 60 Copper brown	9CO60USN	RAL 8004	6	60	60	35	25	8 - 10		75	1.350
USN 60 Sepia brown	9M60USN	RAL 8014	6	60	60	35	25	8 - 10		75	1.350
USN 60 Chocolate brown	9MO60USN	RAL 8017	6	60	60	35	25	8 - 10		75	1.350

### Loads and dimensions $F_{rec}$

Type	$h_{nom}$ [mm]	Concrete		Hollow brick HLz 12		Poroton T10		Poroton T8		Aerated concrete AAC6	
		$F_{rec}$ [kN]	$F_{eff}$ [kN]	$F_{rec}$ [kN]	$F_{eff}$ [kN]	$F_{rec}$ [kN]	$F_{eff}$ [kN]	$F_{rec}$ [kN]	$F_{eff}$ [kN]	$F_{rec}$ [kN]	$F_{eff}$ [kN]
USN 40	35	0,14	1,00	0,07	0,50	0,04	0,30	0,06	0,45	0,04	0,30
USN 60	55	0,17	1,20	0,08	0,55	0,04	0,30	0,07	0,50	0,04	0,31

$F_{rec}$ : Recommended load in all directions incl. safety factor of 7

$F_{eff}$ : Effective pull out loads excl. safety factor



# Nail plug NPZ



## Advantages



- Metal nail plug for the fixing of rails, clamps, sheet metal, signs, etc.
- Nail made of hardened steel, zinc plated; plug made of zinc die casting
- Not removable due to flat nail head (theft protection)

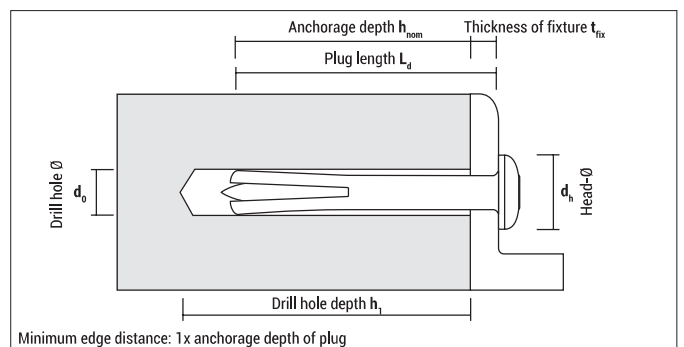
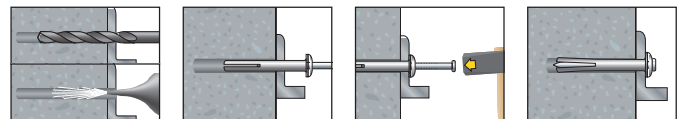
## Suitable building materials

### Very suitable



- Concrete
- Natural stone
- Solid brick
- Solid sand-lime brick
- Lightweight solid concrete blocks

## Mounting



## NPZ

Type	Art-No	d <sub>0</sub> [mm]	h <sub>1</sub> ≥ [mm]	h <sub>nom</sub> ≥ [mm]	L <sub>d</sub> [mm]	t <sub>fix</sub> ≤ [mm]	d <sub>h</sub> [mm]	€/ 100 pcs	[pcs]	[pcs]
NPZ 5-22	9522NPZ	5	22	15	22	7	10,5		100	4.800
NPZ 5-40	9540NPZ	5	25	20	40	20	10,5		100	3.000
NPZ 6-40	9640NPZ	6	25	20	40	20	12,6		100	2.000

## Loads F<sub>rec</sub>

Concrete
F <sub>rec</sub> [kN]
0,60
0,75
1,00

F<sub>rec</sub>: Recommended loads incl. safety factor of 3

# Quick-Fix nail BN



## Advantages



BN



BDN

- Suitable for push-through installation of wooden slats, brackets, climbing lattices, hanging baskets for flowers or the like
- Quick and easy fixing: drill a hole and hammer it in - done
- The quick-fix nail is made of high-quality, galvanized spring steel and offers a secure grip in concrete and masonry
- The design of the product prevents interlocking in the box

## Suitable building materials

### Very suitable



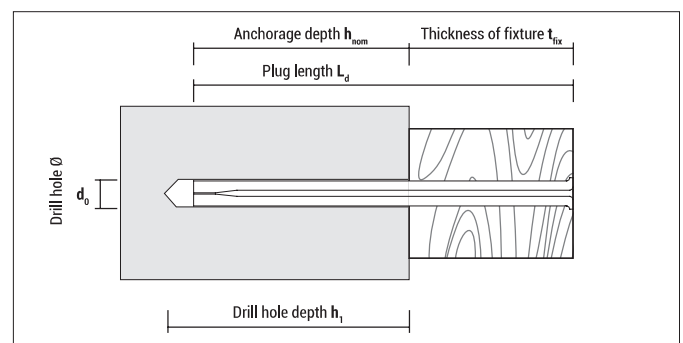
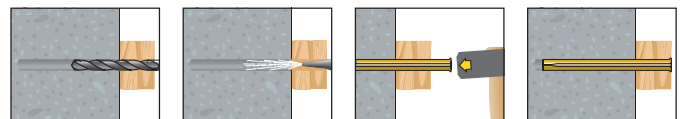
- Concrete
- Solid brick
- Solid sand-lime brick
- Lightweight solid concrete blocks
- Natural stone

### Suitable to a limited extent



- Hollow brick
- Hollow sand-lime brick
- Lightweight hollow concrete blocks

## Mounting



Quick-fix nail BN



BN, zinc plated

Type	Art-No	d <sub>0</sub> [mm]	h <sub>1</sub> ≥ [mm]	h <sub>nom</sub> ≥ [mm]	L <sub>d</sub> [mm]	t <sub>fix</sub> ≤ [mm]	€ / 100 pcs	[pcs]	[pcs]
BN 6-30	9B630BN	6	35	25	30	5		100	2.200
BN 6-60	9B660BN	6	40	30	60	30		100	1.200
BN 6-80	9B680BN	6	40	30	80	50		100	1.200
BN 8-70	9B870BN	8	50	40	70	30		50	1.100
BN 8-90	9B890BN	8	50	40	90	50		50	1.100
BN 8-110	9B8110BN	8	50	40	110	70		50	600
BN 8-130	9B8130BN	8	50	40	130	90		50	600
BN 8-150	9B8150BN	8	50	40	150	110		50	500



BDN, zinc plated Quick-Fix nail with punched hole (Perforation: 20 x 7,6 mm),

Type	Art-No	d <sub>0</sub> [mm]	h <sub>1</sub> ≥ [mm]	h <sub>nom</sub> [mm]	€ / 100 pcs	[pcs]	[pcs]
BDN 8-32	9B832BDN	8	35	32		100	800

Loads F<sub>rec</sub> and F<sub>eff</sub>

Type	Concrete	
	F <sub>rec</sub> [kN]	F <sub>eff</sub> [kN]
BN 6	0,8	2,5
BN 8, BDN	1,1	3,3

F<sub>rec</sub>: Recommended loads incl. safety factor of 3

F<sub>eff</sub>: Effective pull out loads excl. safety factor