

DECLARATION OF PERFORMANCE

CONF-DOP_HZA-PS-12-22

No. H01-17/0728

1.	Unique identification code of the product-type	HALFEN Anchor channel HZA-PS
2.	Type, batch or serial number or any other element allowing identification of the construction product as required pursuant to Article 11(4)	See ETA-17/0728, 09.12.2022, Annex A2 and A4
3.	Intended use or uses of the construction product, in accordance with the applicable harmonized technical specification, as foreseen by the manufacturer:	
	Generic type and use	Cast-in, C-shaped serrated anchor channel with at least 2 metal anchors fixed on the profile back in combination with HALFEN serrated channel bolts
	Product size covered (anchor channels and corresponding screws)	HZA-PS 29/20 mit HALFEN Zahnschrauben HZS 29/20 M12 HZA-PS 38/23 mit HALFEN Zahnschrauben HZS 38/23 M12+M16 HZA-PS 41/27 mit HALFEN Zahnschrauben HZS 38/23 M12+M16 HZA-PS 53/34 mit HALFEN Zahnschrauben HZS 53/34 M16+M20 HZA-PS 64/44 mit HALFEN Zahnschrauben HZS 64/44 M20+M24
	For use in	Cracked and non-cracked concrete C12/15 to C90/105 according to EN 206-1:2000-12
	Anchor material / Screw material and intended use	• Hot-dip galv. steel / electroplated steel for dry internal conditions • Hot-dip galv. steel / hot-dip galv. steel or electroplated steel with special coating also for internal conditions with normal humidity
	Loading	Static, quasi static, and seismic (seismic performance category C1) tension and shear loads perpendicular and parallel to the longitudinal channel axis, as well as fire exposure
4.	Name, registered trade name or registered trademark and contact address of the manufacturer as required pursuant to Article 11(5)	Leviat GmbH, Liebigstraße 14, 40764 Langenfeld, Germany
5.	Where applicable, name and contact address of the authorized representative whose mandate covers the tasks specified in Article 12(2)	-
6.	System or systems of assessment and verification of constancy of performance of the construction product as set out in Annex V	System 1
7.	In case of the declaration of performance concerning a construction product covered by a harmonised standard	-
8.	In case of the declaration of performance concerning a construction product for which a European Technical Assessment has been issued	Deutsches Institut für Bautechnik (DIBt) issued ETA-17/0728 on the basis of EAD 330008-03-0601. The notified body 0432 performed under system 1 (ii) Initial inspection of the manufacturing plant and of factory production control; (iii) Continuous surveillance, assessment and evaluation of factory production control under system 1.

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	Declared performance					
	Essential Characteristics	Design Method	Performance	Harmonized Technical Specification		
9.	Characteristic resistance for tension	EOTA TR 047, EN 1992-4	ETA-17/0728, Annex C1-C2	EAD 330008-04-0601		
	Characteristic resistance for shear perpendicular to the longitudinal axis of the channel		ETA-17/0728, Annex C3-C4			
	Characteristic resistance for shear in direction of the longitudinal axis of the channel		ETA-17/0728, Annex C3			
	Characteristic resistance for combined tension and shear		ETA-17/0728, Annex C4			
	Characteristic resistance of serrated channel bolt for tension and shear		ETA-17/0728, Annex C1 + C4			
	Displacements for serviceability limit state		ETA-17/0728, Annex C2 + C4			
	Char. resistancefor tension and shear (seismic performance category C1)		ETA-17/0728, Annex C5 + C6			
	Characteristic resistance for fire exposure		ETA-17/0728, Annex C7 + C8			
	Where pursuant to Article 37 or 38 in the Specific Technical Documentation has been used, the requirements with which the product complies:		-			
	10.		The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 9.			
This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.						

Langenfeld, 12.12.2022

Signed for and on behalf of the manufacturer by



Chris Oberli
(Managing Director | Europe Central)



Dr. Ing. Dirk Albartus
(Prokurist)

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Annex 1:

Table C1: Characteristic resistances under tension load – steel failure
serrated anchor channel

Serrated anchor channel			HZA-PS 29/20	HZA-PS 38/23	HZA-PS 41/27	HZA-PS 53/34	HZA-PS 64/44
Steel failure: Anchor							
Characteristic resistance	$N_{Rk,sa}$	[kN]	24,6	36,9	64,3	80,3	100,0
Partial factor	$\gamma_{Ms,a}$ ¹⁾		1,8		1,59		
Steel failure: Connection between anchor and channel							
Characteristic resistance	$N_{Rk,sc}$	[kN]	71,7	76,4	95,4	117,7	128,4
Partial factor	$\gamma_{Ms,ca}$ ¹⁾		1,8				
Steel failure: Local flexure of the channel lips							
Spacing of serrated channel bolts for $N_{Rk,s,l}^0$	$s_{c,l}$	[mm]	58	76	80	105	128
Characteristic resistance	$N_{Rk,s,l}^0$	[kN]	22,9	39,3	53,6	82,5	106,1
Partial factor	$\gamma_{M5,l}$ ¹⁾		1,8				

¹⁾ In absence of other national regulations

Table C2: Characteristic flexural resistance of channel

Anchor channel			HZA-PS 29/20	HZA-PS 38/23	HZA-PS 41/27	HZA-PS 53/34	HZA-PS 64/44
Steel failure: Flexure of channel							
Characteristic flexural resistance of channel	$M_{Rk,s,flex}$	[Nm]	872	1663	2289	4069	7183
Partial factor	$\gamma_{Ms,flex}$ ¹⁾		1,15				

¹⁾ In absence of other national regulations

Table C3: Characteristic resistance under tension load – steel failure of
HALFEN serrated channel bolt

HALFEN serrated channel bolt thread diameter			M12	M16	M20	M24
Steel failure						
Characteristic resistance	$N_{Rk,s}$	[kN]	67,4	125,6	196,0	282,4
Partial factor	γ_{Ms} ¹⁾		1,50			

¹⁾ In absence of other national regulations

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Annex 2:

Table C4: Characteristic resistances under tension load – concrete failure

Anchor channel			HZA-PS 29/20	HZA-PS 38/23	HZA-PS 41/27	HZA-PS 53/34	HZA-PS 64/44	
Concrete failure: Pull-out failure								
Characteristic resistance in cracked concrete C12/15		N _{Rk,p}	[kN]	37,0	55,5	74,0	92,6	123,4
Characteristic resistance in uncracked concrete C12/15				51,8	77,7	103,7	129,6	172,8
Increasing factor for N _{Rk,p} = N _{Rk,p} (C12/15) · ψ _c	C20/25	ψ _c	[-]	1,67				
	C25/30			2,08				
	C30/37			2,50				
	C35/45			2,92				
	C40/50			3,33				
	C45/55			3,75				
	C50/60			4,17				
	C55/67			4,58				
	≥C60/75			5,00				
Partial factor		γ _{MP} = γ _{MC} ¹⁾		1,5				
Concrete failure: Concrete cone failure								
Product factor k ₁		k _{cr,N}		8,7	8,7	8,7	8,8	8,9
		k _{ser,N}		12,4	12,4	12,5	12,5	12,7
Characteristic edge distance		c _{cr,N}	[mm]	259	260	263	266	269
Characteristic spacing		s _{cr,N}		2,0 c _{cr,N}				
Partial factor		γ _{MC} ¹⁾		1,5				
Concrete failure: Splitting failure								
Characteristic edge distance		c _{cr,sp}	[mm]	456	465	477	498	528
Characteristic spacing		s _{cr,sp}		2,0 c _{cr,sp}				
Partial factor		γ _{Msp} ²⁾		1,5				

¹⁾ In absence of other national regulations

Table C5: Displacements under tension load

Anchor channel			HZA-PS 29/20	HZA-PS 38/23	HZA-PS 41/27	HZA-PS 53/34	HZA-PS 64/44
Tension load	N	[kN]	9,1	14,6	21,3	31,2	39,7
Short-term displacement	δ_{N0}	[mm]	0,5	0,8	0,9	1,5	0,6
Long-term displacement	$\delta_{N\infty}$	[mm]	1,0	1,6	1,8	3,0	1,2

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Annex 3:

Table C6: Characteristic resistances under shear

Anchor channel			HZA-PS 29/20	HZA-PS 38/23	HZA-PS 41/27	HZA-PS 53/34	HZA-PS 64/44
Steel failure: Anchor							
Characteristic resistance	$V_{Rk,s,A,y}$	[kN]	22,9	43,9	53,6	101,1	156,3
Characteristic resistance	$V_{Rk,s,A,x}$	[kN]	14,8	22,2	38,6	48,2	64,3
Partial factor	$\gamma_{Ms,A}^{1)}$		1,5		1,32		
Steel failure: Connection between anchor and channel							
Characteristic resistance	$V_{Rk,s,C,y}$	[kN]	22,9	43,9	53,6	101,1	156,3
	$V_{Rk,s,C,x}$	[kN]	46,7	46,7	58,3	68,0	77,8
Partial factor	$\gamma_{Ms,C}^{1)}$		1,8				
Steel failure: Local flexure of channel lips							
Spacing of serrated channel bolt for $V_{Rk,s,l}$	$s_{l,v}$	[mm]	58	76	80	105	128
Characteristic resistance	$V_{Rk,s,l,y}^2$	[kN]	22,9	43,9	53,6	101,1	156,3
Partial factor	$\gamma_{Ms,l}^{1)}$		1,8				
Steel failure: Connection between channel lips and channel bolt under shear in the direction of longitudinal channel axis							
Characteristic resistance	$V_{Rk,s,l,x}$	[kN]	12,6	25,4	27,2 (M12) 32,1 (M16)	59,0	85,8
Installation factor	γ_{int}		1,0	1,2			
Concrete failure: Pry-out failure							
Product factor	$k_s^{2)}$		2,0				
Partial factor	$\gamma_{Mc}^{1)}$		1,5				
Concrete failure: Concrete edge failure							
Product factor k_{s2}	Cracked concrete	$k_{cr,v}$	6,1	7,5			
	Uncracked concrete	$k_{ucr,v}$	8,5	10,5			
Partial factor	$\gamma_{Mc}^{1)}$		1,5				

¹⁾ In absence of other national regulations

²⁾ Without supplementary reinforcement. In case of supplementary reinforcement factor k_s should be multiplied by 0,75.

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Annex 4:

Table C7: Displacements under shear load

Anchor channel			HZA-PS 29/20	HZA-PS 38/23	HZA-PS 41/27	HZA-PS 53/34	HZA-PS 64/44
Shear load	V_y	[kN]	9,1	17,4	21,3	31,2	62,0
Short-term displacement	δ_{V0}	[mm]	0,9	0,7	0,9	0,9	1,9
Long-term displacement	$\delta_{V\infty}$	[mm]	1,4	1,0	1,4	1,4	2,85
Shear load	V_x	[kN]	5,0	8,4	10,6	19,5	28,4
Short-term displacement	δ_{V0}	[mm]	0,4	0,2	0,2	0,3	0,9
Long-term displacement	$\delta_{V\infty}$	[mm]	0,6	0,3	0,3	0,5	1,4

Table C8: Characteristic resist. under shear load – steel failure of HALFEN serrated channel bolt

HALFEN serrated channel bolt thread diameter			M12	M16	M20	M24
Steel failure						
Characteristic resistance	$V_{Rk,s}$	[kN]	33,7	62,8	98,0	141,2
Characteristic flexure resistance	$M^0_{Rk,s}$	[Nm]	105	266	519	898
Partial safety factor	γ_{Ms} ¹⁾		1,25			

¹⁾ In absence of other national regulations

Table C9: Characteristic resistance under combined tension and shear load

Anchor channel		HZA-PS 29/20	HZA-PS 38/23	HZA-PS 41/27	HZA-PS 53/34	HZA-PS 64/44
Steel failure: Local failure by flexure of channel lips and failure by flexure of channel						
Product factor	k_{13}	Values according to EN 1992-4:2018, Section 7.4.3.1				
Steel failure: Failure of anchor and connection between anchor and channel						
Product factor	k_{14}	Values according to EN 1992-4:2018, Section 7.4.3.1				

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Annex 5

For seismic performance category C1

Table C10: Characteristic resistances under seismic tension load
– steel failure serrated anchor channel

Anchor channel			HZA-PS 29/20	HZA-PS 38/23	HZA-PS 41/27	HZA-PS 53/34	HZA-PS 64/44
Steel failure: Anchor							
Characteristic resistance	$N_{Rk,s,a,eq}$	[kN]	- ²⁾	36,9	- ²⁾	80,3	- ²⁾
Partial factor	$\gamma_{Ms,a}$ ¹⁾		1,8		1,59		
Steel failure: Connection between anchor and channel							
Characteristic resistance	$N_{Rk,s,c,eq}$	[kN]	- ²⁾	76,4	- ²⁾	117,7	- ²⁾
Partial factor	$\gamma_{Ms,ca}$ ¹⁾		1,8				
Steel failure: Local flexure of the channel lips							
Spacing of serrated channel bolts for $N^0_{Rk,s,l,eq}$	$s_{l,N}$	[mm]		76		105	
Characteristic resistance	$N^0_{Rk,s,l,eq}$	[kN]	- ²⁾	39,3	- ²⁾	82,5	- ²⁾
Partial factor	$\gamma_{Ms,l}$ ¹⁾		1,8				

¹⁾ In absence of other national regulations

²⁾ No performance assessed

Table C11: Characteristic flexural resistance of channel under seismic tension load

Anchor channel			HZA-PS 29/20	HZA-PS 38/23	HZA-PS 41/27	HZA-PS 53/34	HZA-PS 64/44
Steel failure: Flexure of channel							
Characteristic flexural resistance of channel	$M_{Rk,s,flex,eq}$	[Nm]	- ²⁾	1663	- ²⁾	4069	- ²⁾
Partial factor	$\gamma_{Ms,flex}$	¹⁾	1,15				

¹⁾ In absence of other national regulations

²⁾ No performance assessed

Table C12: Characteristic resistance under seismic tension load –
steel failure of HALFEN serrated channel bolt

HALFEN serrated channel bolt thread diameter			M12	M16	M20	M24
Steel failure						
Characteristic resistance	$N_{Rk,s,eq}$	[kN]	67,4	125,6	196,0	282,4
Partial factor	γ_{Ms}	¹⁾	1,50			

¹⁾ In absence of other national regulations

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Annex 6

Table C13: Characteristic resistances under seismic shear load

Anchor channel			HZA-PS 29/20	HZA-PS 38/23	HZA-PS 41/27	HZA-PS 53/34	HZA-PS 64/44
Steel failure: Anchor							
Characteristic resistance	$V_{Rk,s,a,y,eq}$	[kN]	- ²⁾	43,9	- ²⁾	101,1	- ²⁾
Characteristic resistance	$V_{Rk,s,a,x,eq}$	[kN]	- ²⁾	22,2	- ²⁾	48,2	- ²⁾
Partial factor	$\gamma_{Ms,a}$ ¹⁾			1,5		1,32	
Steel failure: Connection between anchor and channel							
Characteristic resistance	$V_{Rk,s,c,y,eq}$	[kN]	- ²⁾	43,9	- ²⁾	101,1	- ²⁾
	$V_{Rk,s,c,x,eq}$	[kN]	- ²⁾	46,7	- ²⁾	68,0	- ²⁾
Partial factor	$\gamma_{Ms,ca}$ ¹⁾			1,8			
Steel failure: Local flexure of channel lips under shear load perpendicular to the longitudinal axis of the channel							
Spacing of serrated channel bolt for $V_{Rk,s,l,eq}$	$S_{l,v}$	[mm]	- ²⁾	76	- ²⁾	105	- ²⁾
Characteristic resistance	$V_{Rk,s,l,y,eq}^0$	[kN]	- ²⁾	43,9	- ²⁾	101,1	- ²⁾
Partial factor	$\gamma_{Ms,l}$ ¹⁾			1,8			
Steel failure: Connection between channel lips and channel bolt under shear in the direction of longitudinal channel axis							
Characteristic resistance	$V_{Rk,s,l,x,eq}$	[kN]	- ²⁾	25,4	- ²⁾	59,0	- ²⁾
Installation factor	γ_{inst}		1,0		1,2		

¹⁾ In absence of other national regulations

²⁾ No performance assessed

Table C14: Characteristic resistances under seismic shear load – steel failure of HALFEN serrated channel bolt

HALFEN serrated channel bolt thread diameter			M12	M16	M20	M24
Steel failure						
Characteristic resistance	$V_{Rk,s,eq}$	[kN]	33,7	62,8	98,0	141,2
Partial factor	γ_{Ms} ¹⁾			1,25		

¹⁾ In absence of other national regulations

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Annex 7

Table C15: Characteristic resistances under tension and shear load under fire exposure
– steel failure

Anchor channel				HZA-PS 29/20	HZA-PS 38/23	HZA-PS 41/27	HZA-PS 53/34	HZA-PS 64/44	
Steel failure: Anchor, Connection anchor / channel, Local flexure of channel lips, Channel bolts									
Characteristic resistances	R30	M12	$N_{Rk,s,fi}$ = $V_{Rk,s,y,fi}$	[kN]	2,7	3,5	3,5	– ²⁾	– ²⁾
		M16			– ²⁾	4,5	4,5	4,5	– ²⁾
		M20			– ²⁾	– ²⁾	– ²⁾	10,3	10,3
		M24			– ²⁾	– ²⁾	– ²⁾	– ²⁾	17,0
	R60	M12			2,1	2,7	2,7	– ²⁾	– ²⁾
		M16			– ²⁾	3,3	3,3	3,3	– ²⁾
		M20			– ²⁾	– ²⁾	– ²⁾	7,8	7,8
		M24			– ²⁾	– ²⁾	– ²⁾	– ²⁾	14,8
	R90	M12			1,5	1,9	1,9	– ²⁾	– ²⁾
		M16			– ²⁾	2,1	2,1	2,1	– ²⁾
		M20			– ²⁾	– ²⁾	– ²⁾	5,3	5,3
		M24			– ²⁾	– ²⁾	– ²⁾	– ²⁾	9,9
	R120	M12			1,3	1,5	1,5	– ²⁾	– ²⁾
		M16			– ²⁾	1,5	1,5	1,5	– ²⁾
		M20			– ²⁾	– ²⁾	– ²⁾	4,0	4,0
		M24			– ²⁾	– ²⁾	– ²⁾	– ²⁾	7,4
Partial factor		$\gamma_{Ms,fi}$ ¹⁾	[-]	1,0					

¹⁾ In absence of other national regulations

²⁾ No performance assessed

Table C16: Minimum edge distance and spacing under fire exposure – concrete failure

Anchor channel			HZA-PS 29/20	HZA-PS 38/23	HZA-PS 41/27	HZA-PS 53/34	HZA-PS 64/44
Concrete failure ¹⁾							
Minimum edge distance	$c_{min,fi}$	[mm]	304	310	318	332	352
Minimum spacing	$s_{min,fi}$		608	620	636	664	704

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Annex 8

Table C17: Characteristic resistances under tension and shear load under fire exposure – min. axis distance of reinforcement

Anchor channel				HZA-PS 29/20	HZA-PS 38/23	HZA-PS 41/27	HZA-PS 53/34	HZA-PS 64/44
Min. axis distance of reinforcement								
Min. axis distance	R30	a	[mm]	35	35	35	40	50
	R60	a		35	35	35	40	50
	R90	a		35	35	35	40	50
	R120	a		50	50	50	50	50

Fig. 1

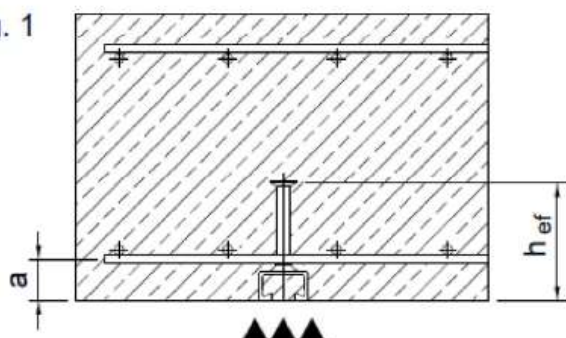


Fig. 2

