JOKER INDUSTRIAL

Declaration of Performance

DoP No. 1219-CPR-0087 (SSW)

1. Product Type: Anchor Sissy Stud

2. Identification:

Product Code	Length L (mm)	Diameter (mm)	Fixture Thickness (mm)
SSW07LLL	3 last digits of product code	7.5	L-55
SSW10LLL		10.5	L-60
SSW12LLL		12.5	L-70
SSW16LLL		16.5	L-110

3. Intended use:

Generic type:	Concrete Screw Anchor
Base material:	Concrete C20/25-C50/60 (EN206-1) Cracked and Non-cracked
Material:	Carbon Steel, silver ruspert coated and zinc plating
Durability:	Internal Dry conditions
Loading:	Static, Quasi-Static
Fire resistance	F120
Assumed working life:	50 years

4. Manufacturer: **JOKER Industrial Co. Ltd.** **No. 10 Changbin East 7rd., Changbin Industrial District, Hsien His. Hsiang. Changua Hsien Taiwan.**

5. Authorized representative: Not applicable

6. System of assessment of performance: 1

7. Harmonized Standard: Not applicable

8. European Technical Assessment:

Instituo Eduaro Torroja de ciencias de la (IETcc) issued ETA-14/0374 (08/03/2019)

On the basis of EAD330232-00-0601, TR020 -Option 1

The notified body 1219-CPR performed certification of factory production control on the basis of:

- Initial inspection of the manufacturing plant and of factory production control
- Continuous surveillance assessment and evaluation of factory production control

9. Declared performances:

Table B1: Installation parameters

Installation parameters			Performance			
			SS 7.5	SS 10.5	SS 12.5	SS 16.5
d_0	Nominal diameter of drill bit:	[mm]	6	8	10	14
d_f	Diameter of clearance hole in fixture:	[mm]	9	12	14	18
d_s	Outer diameter of the thread	[mm]	7.5	10.5	12.5	16.5
L_{min}	Total length of the anchor	[mm]	60	65	75	115
L_{max}		[mm]	400	400	400	400
h_{min}	Minimum thickness of concrete member:	[mm]	100	100	105	175
h_1	Depth of drilled hole:	[mm]	65	70	85	130
h_{nom}	Overall anchor embedment depth in the concrete:	[mm]	55	60	70	110
h_{ef}	Effective anchorage depth:	[mm]	42	45	52	86
T_{ins}	Installation torque	[Nm]	20	50	80	120
t_{fix}	Thickness of fixture	[mm]	L-55	L-60	L-70	L-110
s_{min}	Minimum allowable spacing:	[mm]	45	50	60	100
c_{min}	Minimum allowable edge distance:	[mm]	45	50	60	100

Table C1: Characteristic values to tension loads of design method A

Characteristic values of resistance to tension loads of design method A			Performance			
			SS 7.5	SS 10.5	SS 12.5	SS 16.5
Tension loads: steel failure						
$N_{Rk,s}$	Tension steel characteristic resistance:	[kN]	18.7	32.7	51.2	115.9
γ_{Ms}	Partial safety factor:*)	[-]	1.5	1.5	1.5	1.5
Tension loads: pull-out failure in concrete						
$N_{Rk,p,\ ucr}$	Tension characteristic resistance in C20/25 uncracked concrete:	[kN]	9	12	20	40
$\psi_{c,ucr}$	C30/37	[-]	1,22	1,09	1,06	1,04
$\psi_{c,ucr}$	C40/45	[-]	1,41	1,07	1,10	1,06
$\psi_{c,ucr}$	C50/60	[-]	1,58	1,22	1,13	1,08
$N_{Rk,p,cr}$	Tension characteristic resistance in C20/25 cracked concrete:	[kN]	6	9	12	30
$\psi_{c,cr}$	C30/37	[-]	1,22	1,09	1,06	1,04
$\psi_{c,cr}$	C40/45	[-]	1,41	1,07	1,10	1,06
$\psi_{c,cr}$	C50/60	[-]	1,58	1,22	1,13	1,08
γ_{inst}	Installation safety factor	[-]	1.2	1.2	1.2	1
Tension loads: concrete cone and splitting failure						
h_{ef}	Effective embedment depth:	[mm]	42	45	52	86
γ_{ins}	Installation safety factor: *)	[-]	1.2	1.2	1.2	1
$s_{cr,N}$	Critical spacing:	[mm]	126	135	156	258
$c_{cr,N}$	Critical edge distance:	[mm]	63	67	78	129
$s_{cr,sp}$	Critica spacing (splitting):	[mm]	126	135	177	292
$c_{cr,sp}$	Critical edge distance (splitting):	[mm]	63	67	88	146

*) In absence of other national regulations

Table C2: Displacements under tension loads for Sissy Stud

Displacements under tension loads in uncracked concrete			Performance			
			SS 7.5	SS 10.5	SS 12.5	SS 16.5
N	Service tension load in uncracked concrete C20/25 to C50/60:	[kN]	3.6	4.8	9.5	19.0
δ_{N0}	Short term displacement under tension loads:	[mm]	0.4	0.4	0.4	0.9
$\delta_{N\infty}$	Long term displacement under tension loads:	[mm]	1.0	1.1	1.4	1.4
Displacements under tension loads in cracked concrete			**Performance**			
			SS 7.5	**SS 10.5**	**SS 12.5**	**SS 16.5**
N	Service tension load in cracked concrete C20/25 to C50/60:	[kN]	2.4	3.6	5.7	11.9
δ_{N0}	Short term displacement under tension loads:	[mm]	0.6	0.7	0.5	0.6
$\delta_{N\infty}$	Long term displacement under tension loads:	[mm]	1.4	1.2	1.4	1.2

Table C3: Characteristic values to shear loads of design method A

Characteristic values of resistance to shear loads of design method A			Performance			
			SS 7.5	SS 10.5	SS 12.5	SS 16.5
Shear loads: steel failure without lever arm						
$V_{Rk,s}$	Shear steel characteristic resistance:	[kN]	7.5	16.3	35.6	57.9
γ_{Ms}	Partial safety factor: *)	[-]	1.25	1.25	1.25	1.25
Shear loads: steel failure with lever arm						
$M^0_{Rk,s}$	Characteristic bending moment:	[Nm]	15.2	35.3	69.3	235.
γ_{Ms}	Partial safety factor: *)	[-]	1.25	1.25	1.25	1.25
Shear loads: concrete pryout failure						
K	K factor:	[-]	1	1	1	2
γ_{inst}	Installation safety factor: *)	[-]	1	1	1	1
Shear loads: concrete edge failure						
l_f	Effective anchorage depth under shear loads:	[mm]	42	45	52	86
d_{nom}	Outside anchor diameter:	[mm]	7.5	10.5	12.5	16.5
γ_{inst}	Installation safety factor: *)	[-]	1	1	1	1

*) In absence of other national regulations

Table C4: Displacements under shear loads for Sissy Stud

Displacements under shear loads			Performances			
			SS 7.5	SS 10.5	SS 12.5	SS 16.5
V	Service shear load in cracked and uncracked concrete C20/25 to C50/60:	[kN]	3.0	6.5	12.2	27.6
δ_{V0}	Short term displacement under shear loads:	[mm]	1.3	1.4	1.8	2.3
$\delta_{V\infty}$	Long term displacement under shear loads:	[mm]	2.0	2.1	2.7	3.5

Table D1: Characteristic values to fire resistance

Fire resistance duration = 30 minutes			SS 7.5	SS 10.5	SS 12.5	SS 16.5
Tension loads, steel failure						
$N_{Rk,s,fi,30}$	Characteristic resistance	[kN]	0.23	0.61	1.28	2.90
Pull-out failure						
$N_{Rk,p,fi,30}$	Character. resistance in concrete C20/25 to C50/60	[kN]	1.50	2.25	3.00	7.50
Concrete cone failure **)						
$N_{Rk,c,fi,30}$	Character. resistance in concrete C20/25 to C50/60	[kN]	2.06	2.45	3.51	12.35
Shear loads steel failure without lever arm						
$V_{Rk,s,fi,30}$	Characteristic resistance	[kN]	0.23	0.61	1.28	2.90
Shear loads, steel failure with lever arm						
$M_{Rk,s,fi,60}$	Characteristic bending resistance	[Nm]	0.19	0.66	1.73	5.90

Fire resistance duration = 60 minutes			SS 7.5	SS 10.5	SS 12.5	SS 16.5
Tension loads, steel failure						
$N_{Rk,s,fi,60}$	Characteristic resistance	[kN]	0.21	0.53	0.96	2.17
Pull-out failure						
$N_{Rk,p,fi,60}$	Character. resistance in concrete C20/25 to C50/60	[kN]	1.50	2.25	3.00	7.50
Concrete cone failure **)						
$N_{Rk,c,fi,60}$	Character. resistance in concrete C20/25 to C50/60	[kN]	2.06	2.45	3.51	12.35
Shear loads, steel failure without lever arm						
$V_{Rk,s,fi,60}$	Characteristic resistance	[kN]	0.21	0.53	0.96	2.17
Shear loads, steel failure with lever arm						
$M_{Rk,s,fi,60}$	Characteristic bending resistance	[Nm]	0.17	0.57	1.30	4.42

Fire resistance duration = 90 minutes			SS 7.5	SS 10.5	SS 12.5	SS 16.5
Tension loads, steel failure						
$N_{Rk,s,fi,90}$	Characteristic resistance	[kN]	0.16	0.41	0.83	1.88
Pull-out failure						
$N_{Rk,p,fi,90}$	Character. resistance in concrete C20/25 to C50/60	[kN]	1.50	2.25	3.00	7.50
Concrete cone failure **)						
$N_{Rk,c,fi,90}$	Character. resistance in concrete C20/25 to C50/60	[kN]	2.06	2.45	3.51	12.35
Shear loads, steel failure without lever arm						
$V_{Rk,s,fi,90}$	Characteristic resistance	[kN]	0.16	0.41	0.83	1.88
Shear loads, steel failure with lever arm						
$M_{Rk,s,fi,90}$	Characteristic bending resistance	[Nm]	0.13	0.44	1.13	3.83

Fire resistance duration = 120 minutes			SS 7.5	SS 10.5	SS 12.5	SS 16.5
Tension loads, steel failure						
$N_{Rk,s,fi,120}$	Characteristic resistance	[kN]	0.12	0.33	0.64	1.45
Pull-out failure						
$N_{Rk,p,fi,120}$	Character. resistance in concrete C20/25 to C50/60	[kN]	1,20	1.80	2.40	6.00
Concrete cone failure **)						
$N_{Rk,c,fi,120}$	Character. resistance in concrete C20/25 to C50/60	[kN]	1.65	1.96	2.81	9.88
Shear loads, steel failure without lever arm						
$V_{Rk,s,fi,120}$	Characteristic resistance	[kN]	0.12	0.33	0.64	1.45
Shear loads, steel failure with lever arm						
$M_{Rk,s,fi,120}$	Characteristic bending resistance	[Nm]	0.10	0.35	0.87	2.95

Spacing and edge distances			SS 7.5	SS 10.5	SS 12.5	SS 16.5
$S_{cr,N}$	Spacing	[mm]	168	180	208	344
S_{min}	Minimum spacing	[mm]	45	50	60	100
$C_{cr,N}$	Edge distance	[mm]	84	90	104	172
C_{min}	Minimum edge distance (one side fire)	[mm]	84	90	104	172
C_{min}	Minimum edge distance (two sides fire)	[mm]	300	300	300	300
γ_{Msp}	Partial safety factor*)	[-]	1.0	1.0	1.0	1.0

*) In absence of other national regulations
**) As a rule, splitting failure can be neglected when cracked concrete and reinforcement is assumed.

Concrete pry-out failure		SS 7.5	SS 10.5	SS 12.5	SS 16.5
K factor	[--]	1	1	1	2
In Eq. (5.6) of EN 1992-4:2018, these values of k factor and the relevant values of $N_{Rk,c,fi}$ given in the above tables have to be considered in the design.					

Concrete edge failure

The characteristic resistance $V^0_{RK,c,fi}$ in C20/25 to C50/60 concrete is determined by:
$V^0_{RK,c,fi} = 0,25 \times V^0_{RK,c}$ (≤ R90) and $V^0_{RK,c,fi} = 0,20 \times V^0_{RK,c}$ (R120)
With $V^0_{RK,c}$ initial value of the characteristic resistance in cracked concrete C20/25 under normal temperature according to EN 1992-4:2018.

10. Declared performances:

The performance of the product identified in point 1 and 2 is in conformity with the declared performance in point 9.

This DoP is issued under sole responsibly of the manufacturer identified in point 4.

Signed on behalf of the manufacturer by:

Ryan Huang, Product Manager

JOKER Industrial Co., LTD