Designated according to The Construction Products (Amendment etc.) (EU Exit) Regulations 2020

UK Technical Assessment	UKTA-0836-23/6906 of 16/06/2023
Technical Assessment Body issuing the UK Technical Assessment:	British Board of Agrément
Trade name of the construction product:	WELDA(1) (1) Registered trademark
Product family to which the construction product belongs:	FIXINGS
Manufacturer:	PEIKKO GROUP CORPORATION Voimakatu 3 15101 Lahti FINLAND
Manufacturing plant(s):	Peikko manufacturing plants
This UK Technical Assessment contains:	15 pages including 3 Annexes which form an integral part of this assessment
This UK Technical Assessment is issued in accordance with The Construction Products (Amendment etc.) (EU Exit) Regulations 2020 on the basis of:	UKAD 330084-00-0601 *Steel plate with cast-in anchors*

1. Technical description of the product

The WELDA steel plate with welded on anchors consist of steel and stainless steel. The anchors have a shaft diameter of 10, 12, 13, 16, 19, 20, 22 and 25 mm. At one end a head is formed by upset forging. The other end is prepared for drawn arc stud welding with ceramic ferrule or shielding gas (method 783, method 135 and method 138 according to EN ISO 4063 : 2010). The steel plates with welded on anchors are embedded surface-flush in the concrete.

The product description is given in Annex A.

2. Specification of the intended use(s) in accordance with the applicable UK Assessment Document (hereinafter UKAD)

The performances given in Section 3 are only valid if the anchor is used in compliance with the specifications and conditions given in Annex B.

The verifications and assessment methods on which this UK Technical Assessment is based lead to the assumption of a working life of the anchor of at least 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

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

3.1. Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic resistances under static and quasi-static loads and displacements	See Annexes C1 to C2

3.2. Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Anchorages satisfy requirements for Class A1

3.3. Health, hygiene and the environment (BWR 3)

Not relevant.

3.4. Safety and accessibility in use (BWR 4)

Not relevant.

3.5. Protection against noise (BWR 5)

Not relevant.

3.6. Energy economy and heat retention (BWR 6)

Not relevant.

3.7. Sustainable use of natural resources (BWR 7)

No performance assessed.

4. Assessment and verification of constancy of performance (hereinafter AVCP) system applied

4.1. System of assessment and verification of constancy of performance

According to UKAD No. 330084-00-0601 and Annex V of the Construction Products Regulation (Regulation (EU) 305/2011) as brought into UK law and amended, the system of assessment and verification of constancy of performance (AVCP) 1 applies.

5. Technical details necessary for the implementation of the AVCP system, as provided for in the applicable UKAD

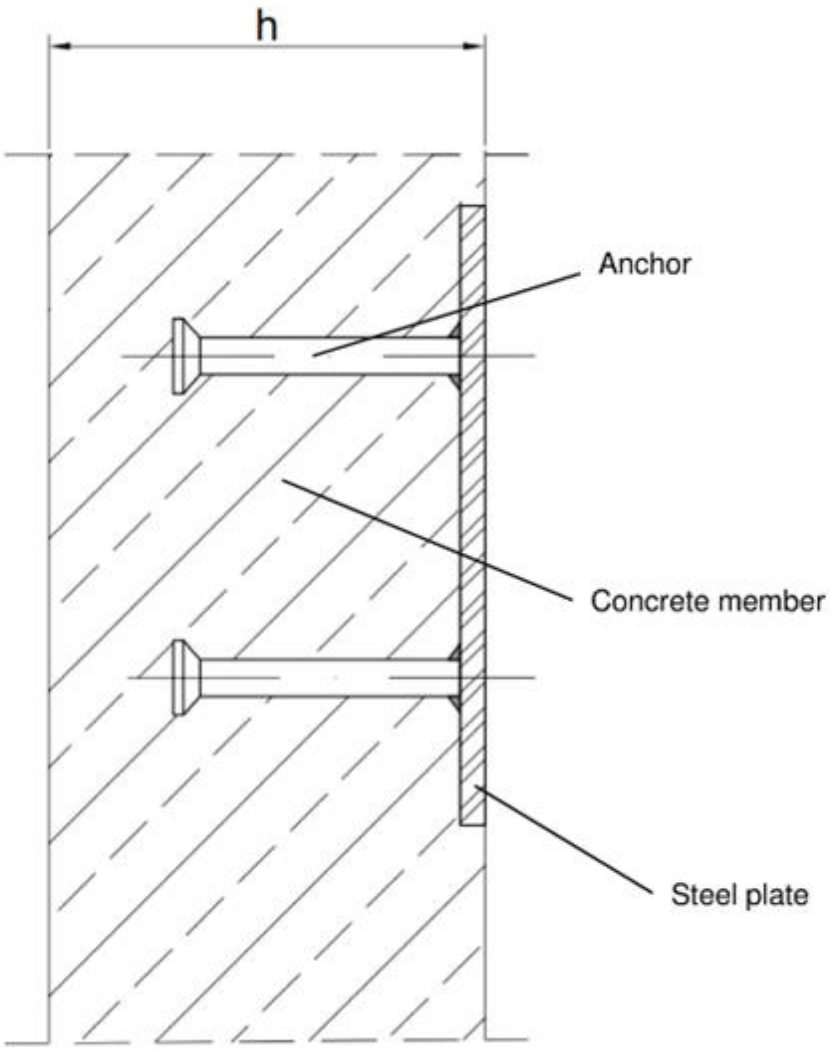
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with the British Board of Agrément and made available to the UK Approved Bodies involved in the conformity attestation process.

5.1. UKCA marking for the product/ system must contain the following information:

- Identification number of the Approved Body
- Name/ registered address of the manufacturer of the product/ system
- Marking including date of Marking and the intended use as stated in the Designated technical specification
- Unique identification code of the product type
- The reference number of the Declaration of Performance
- The level or class of the performance declared
- The reference to the Designated technical specification applied
- UKTA number.

On behalf of the British Board of Agrément 	
Date of Issue: 16 June 2023	**Hardy Giesler** Chief Executive Officer

British Board of Agrément,
1st Floor Building 3,
Hatters Lane,
Croxley Park
Watford
WD18 8YG



h = **thickness of concrete member**

WELDA = **Steel plate with welded on anchors made of steel or stainless steel**

WELDA	**Annex A1**
Product description Installation condition	

WELDA

Table 1: Materials, welding processes

Part	Designation	Type	Material	Mechanical properties
Plate	Steel plate See below	P1	Steel S235JR, S235J0 S235J2, S355JR, S355JO, S355J2, S355K2 EN 10025-2 : 2019	According to EN 10025-2:2019
		P2	Stainless steel 1.4301 1.4303, 1.4306, 1.4307 EN 10088-1 : 2014	According to EN 10088-1:2014
		P3	Stainless steel 1.4401, 1.4404, 1.4432, 1.4436, 1.4439, 1.4571 EN 10088-1 : 2014	According to EN 10088-1:2014
Anchor	Headed studs EN ISO 13918 : 2018 + A1 : 2021 Types SD1, SD3 Welding process 783 according to EN ISO 4063 : 2010	W1	SD1, Material group 1 with the limits: C ≤ 0,2 %; CEV ≤ 0,35; Al ≥ 0,02 % ISO/TR 15608 : 2017	f_{uk} ≥ 450 N/mm² f_{yk} ≥ 350 N/mm²
		W2	SD3, Stainless steel 1.4301, 1.4303 EN 10088-1 : 2014	f_{uk} ≥ 500 N/mm² f_{yk} ≥ 350 N/mm²
	Anchor bolts with smooth shaft provided with an anchor head Welding process 135 and 138 according to EN ISO 4063 : 2010	W3	Steel S235J2, S355J2 EN 10025-2 : 2019	f_{uk} ≥ 450 N/mm² f_{yk} ≥ 350 N/mm²
		W4	Stainless steel 1.4301 1.4303, 1.4306, 1.4307 EN 10088-1 : 2014	f_{uk} ≥ 450 N/mm² f_{yk} ≥ 350 N/mm²
		W5	Stainless steel 1.4401, 1.4404, 1.4432, 1.4436, 1.4439, 1.4571 EN 10088-1 : 2014	f_{uk} ≥ 450 N/mm² f_{yk} ≥ 350 N/mm²
	Anchor bolts of ribbed reinforcing steel provided with an anchor head Welding process 135 and 138 according to EN ISO 4063 : 2010	W6	Reinforcing steel B500B EN 1992-1-1 : 2004 + A1 : 2014	f_{uk} ≥ 550 N/mm² f_{yk} ≥ 550 N/mm²

Table 2: Dimensions

WELDA Anchor Type		**W1 – W5**								**W6**		
Nominal size diameter of shafts	**d [mm]**	**10**	**12**	**13**	**16**	**19**	**20**	**22**	**25**	**16**	**20**	**25**
Minimum nominal diameter of anchor head	Minimum d_h [mm]	19	24	25	32	32	40	35	40	38	46	55
Thickness of the anchor head (Headed studs)	t_h [mm]	7	8	8	8	10	10	10	12	-	-	-
Thickness of the anchor head (Anchor bolts)	t_h [mm]	3	3	-	4	-	5	-	-	4	4	4
Nominal length of anchor	Minimum h_{nom} [mm]	50	50	50	50	75	75	75	75	50	75	75
	Maximum h_{nom} [mm]	200	200	400	525	525	525	525	525	800	800	1000

WELDA

Product description
Dimensions, welding processes, materials

Annex A2

Table 3: Steel plate and anchor combinations

	Product name	Plate	Anchors
1	WELDA	P1	W1/W3
2	WELDA R	P2	W1/W3
3	WELDA Rr	P2	W2/W4
4	WELDA A	P3	W1/W3
5	WELDA Ar	P3	W2/W4
6	WELDA Aa	P3	W5
7	WELDA Strong	P1	W6
8	WELDA Strong R	P2	W6
9	WELDA Strong A	P3	W6

Marking of product
Products are marked with identifying mark of producer with a product name on the visible face of steel plate

Example from marking

peikko group

WELDA 150 x 150 Aa

WELDA	Annex A3
Product description Steel plate and anchor combinations, Product Marking	

Specifications of intended use

Loading of steel plate with welded on anchors subject to:

- Static and quasi-static loads in tension and shear.

Base materials:

- Reinforced normal weight concrete according to EN 206 : 2013 + A2 : 2021.
- Strength classes C20/25 to C90/105 according to EN 206 : 2013 + A2 : 2021.
- Cracked or non-cracked concrete.

Use conditions (Environmental conditions):

- Structures subject to dry internal conditions:
  => Steel plates and anchors according to Annex A3, Table 3, Lines 1-9
- Structures subject to external atmospheric exposure or damp internal conditions if no particularly aggressive conditions such as permanent or alternate immersion in seawater or the splash zone of seawater, chloride atmosphere of indoor swimming pools or atmosphere with extreme chemical pollution (e.g. in desulphurisation plants or road tunnels, where de-icing materials are used) exist.
  => Steel plates and anchors according to Annex A3, Table 3, Line 6

Design:

- Steel plate with cast-in anchors is designed under the responsibility of an engineer experienced in anchorages and concrete work.
- Verifiable calculation notes and drawings are prepared taking account of the loads to be anchored. The position of the anchors is indicated on the design drawings (e.g. position of the anchor relative to the reinforcement or to supports).
- For static and quasi-static loading the steel plate with cast-in anchors are designed in accordance with CEN/TS 1992-4-2 : 2009.
- It is generally assumed that the concrete is cracked and that the occurring splitting forces are resisted by the reinforcement. The required cross section of the minimum reinforcement is determined according to CEN/TS 1992-4-2 : 2009 section 6.2.6.2 b).

Installation:

<u>Placing steel plates into concrete</u>

- The installation of anchors is carried out by appropriately qualified personnel under the supervision of the person responsible for the technical matters on site.
- Use of the product only as supplied by the manufacturer.
- Installation in accordance with the manufacturer's specifications given in Annexes B4 and B5.
- The anchorages are fixed on the formwork, reinforcement or auxiliary construction such that no movement of the product will occur during the time of laying the reinforcement and of placing and compacting the concrete.
- The concrete under the head of the anchors is properly compacted.
- For large fixtures (steel plate > 400 mm x 400 mm), vent openings are provided, specified in the design drawings.

WELDA	**Annex B1**
Intended use Specifications	

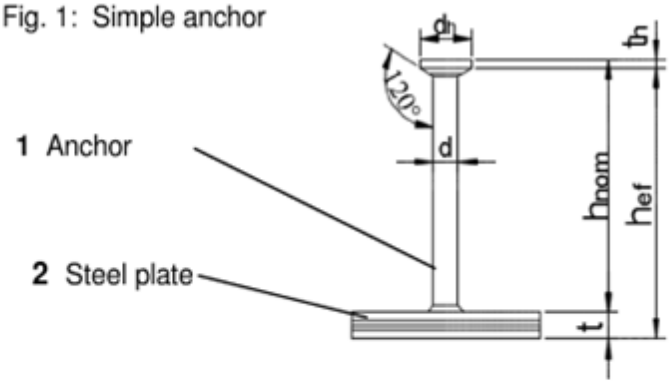
Table 4: Installation parameters

WELDA Anchor Type		W1 – W5								W6		
Nominal size d [mm]		**10**	**12**	**13**	**16**	**19**	**20**	**22**	**25**	**16**	**20**	**25**
Anchorage depth	Minimum h_{ef} [mm]	50	50	50	50	75	75	75	75	50	75	75
Minimum spacing	^{s}min [mm]	50	50	50	50	70	70	70	70	50	70	70
Minimum edge distance	^{c}min [mm]	50	50	50	50	70	70	70	70	50	70	70
Minimum thickness of concrete member	^{h}min [mm]	$h_{ef} + t_h + c_{nom}$(1)										

(1) c_{nom} = required concrete cover according to national regulations

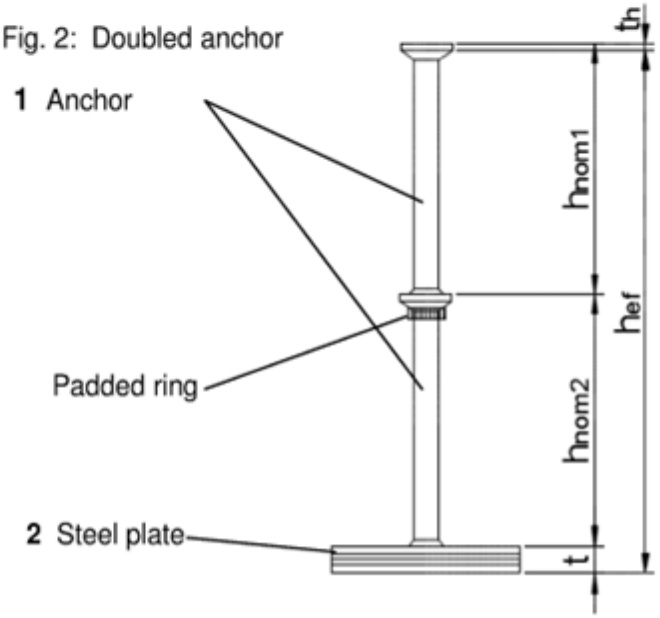
WELDA	**Annex B2**
Intended use Installation parameters	

Fig. 1: Simple anchor



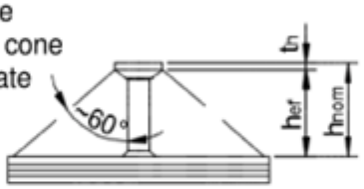
$$h_{ef} = h_{nom} - t_h + t \qquad (1)$$

Fig. 2: Doubled anchor



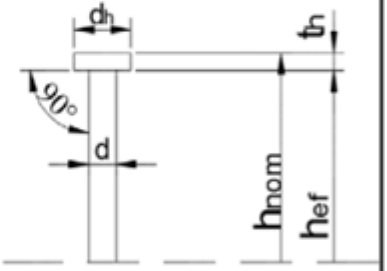
$$h_{ef} = h_{nom1} + h_{nom2} - t_{h2} + t \qquad (2)$$

Fig. 3: Short anchor, if the theoretic concrete cone meets the steel plate at angle of ~ 60° or $t \geq 0{,}2h_{nom}$



$$h_{ef} = h_{nom} - t_h \qquad (3)$$

Alternative head form:

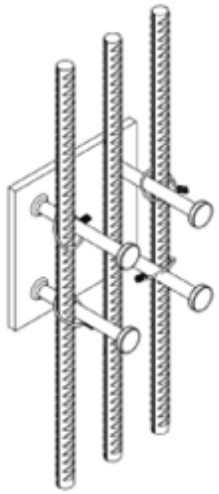


d = diameter of shaft
d_h = diameter of head
h_{ef} = effective embedment depth
h_{nom} = nominal length of the anchor (after welding)
t_h = thickness of the head
t = thickness of the steel plate

WELDA	Annex B3
Intended use Effective embedment depth	

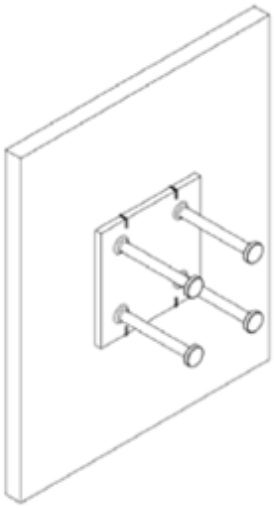
Installation instruction

1a Fixing WELDA to reinforcement



- Fix WELDA to reinforcement or to mounting bars by using wire bindings
- Pay attention strong fixing to avoid moving during pouring

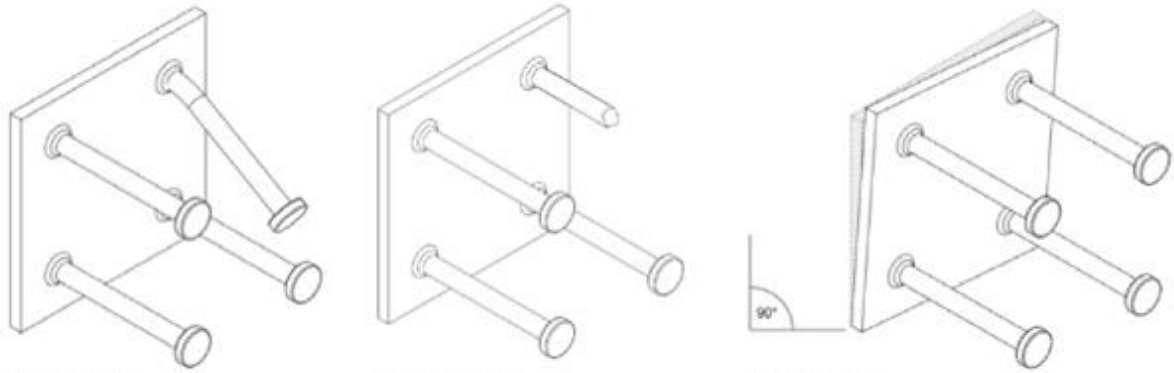
1b Fixing WELDA to formwork



- Fix WELDA directly to formwork by nails, screws, wire or magnets
- Control close contact between plate and formwork
- Pay attention strong fixing to avoid moving during pouring

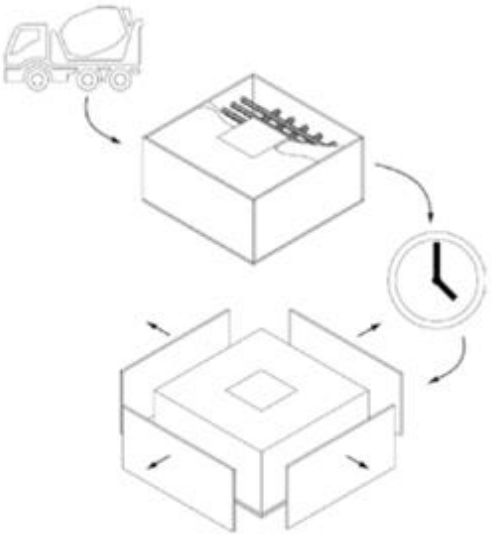
WELDA	Annex B4
Intended use Installation instruction	

2 Check WELDA after installation



Not allowed Not allowed Not allowed

3 Pouring, compacting and curing concrete, remove formwork



- Compact concrete properly around and under the steel plate and anchors
- Avoid contact between the steel plate with anchor and the vibrator to avoid moving of the steel plate during compacting

WELDA	Annex B5
Intended use Installation instruction	

Table 5: Characteristic resistances under tension load

WELDA Anchor Type		**W1 – W5**								**W6**		
Nominal size	d [mm]	**10**	**12**	**13**	**16**	**19**	**20**	**22**	**25**	**16**	**20**	**25**
Steel failure												
Characteristic resistance	$N_{Rk,s}$ [kN]	**35**	**51**	**60**	**90**	**128**	**141**	**171**	**221**	**111**	**173**	**270**
Partial safety factor	γ_{Ms} (1)	1,54								1,4		
Pull-out failure (C20/25) for cracked concrete												
Diameter of anchor head	d_h [mm]	19	24	25	32	32	40	35	40	38	46	55
Characteristic resistance	$N_{Rk,p}$ [kN]	**31**	**51**	**54**	**90**	**78**	**141**	**87**	**115**	**140**	**202**	**283**
Increasing factors Ψ for the	C25/30	1,20										
characteristic pull-out	C30/37	1,48										
resistance	C35/45	1,80										
	C40/50	2,00										
	C45/55	2,40										
	≥ C50/60	2,40										
Partial safety factor	γ_{Mp} (1)	1,5										
Concrete cone failure / splitting due to loading												
Effective embedment depth	h_{ef} [mm]	$h_{nom} - t_h + t$ (3)										
Characteristic spacing	$s_{cr,N} = s_{cr,sp}$ [mm] (2)	$3\ h_{ef}$										
Characteristic edge distance	$c_{cr,N} = c_{cr,sp}$ [mm] (2)	$1{,}5\ h_{ef}$										
Factor for cracked concrete	k_{cr} [-]	8,5										
Factor for non-cracked concrete	k_{ucr} [-]	11,9										
Partial safety factor	γ_{Mc} (1)	1,5										
Blow-out failure												
Partial safety factor	γ_{Mcb} (1)	1,5										

(1) In absence of other national regulations
(2) Reinforcement resists the splitting forces and limits the crack width to $w_w \leq 0.3$ mm
(3) For simple anchors (For doubled anchors and short anchors, see Annex B3, Figure 2 and Figure 3, respectively)

Table 6: Displacement under tensile load

WELDA Anchor Type		**W1 – W5**								**W6**		
Nominal size	d [mm]	10	12	13	16	19	20	22	25	16	20	25
Displacements(1) to 0,9 mm under following loads in [kN]	$N_{0,9mm}$ [kN]	**13**	**19**	**20**	**33**	**50**	**52**	**65**	**85**	**52**	**82**	**128**

(1) The indicated displacements are valid for short term loading; the displacements may increase under long term loading to 1.8 mm

WELDA	**Annex C1**
Performance data Characteristic resistances and displacements under tension load	

Table 7: Characteristic resistances under shear load

WELDA Anchor Type		**W1 – W5**								**W6**		
Nominal size	d [mm]	**10**	**12**	**13**	**16**	**19**	**20**	**22**	**25**	**16**	**20**	**25**
Steel failure												
Characteristic resistance	$V_{Rk,s}$ [kN]	**21**	**31**	**36**	**54**	**77**	**85**	**103**	**133**	**66**	**104**	**162**
Partial safety factor	γ_{Ms}(1)	1,29								1,5		
Concrete pry-out failure												
Factor according to CEN/TS 1992-4-2 : 2009, section 6.3.4 without supplementary reinforcement	K_3(2)	2,0										
Partial safety factor	γ_{Mcp}(1)	1,5										
Concrete edge failure												
Effective length of anchor	$l_f = h_{ef}$ [mm]	$h_{nom} - t_h + t$(3)										
Effective outside diameter	d_{nom} = d [mm]	10	12	13	16	19	20	22	25	16	20	25
Partial safety factor		1,5										

(1) In absence of other national regulations
(2) In case of supplementary reinforcement, the factor k_3 should be multiplied by 0.75
(3) For simple anchors (For doubled anchors and short anchors, see Annex B3, Figure 2 and Figure 3, respectively)

Table 8: Displacements under shear load

WELDA Anchor Type		**W1 – W5**								**W6**		
Nominal size	d [mm]	10	12	13	16	19	20	22	25	16	20	25
Displacements(1) to 1,5 mm under following loads in [kN]	$V_{1,5mm}$ [kN]	11	16	20	29	40	45	54	70	30	45	72

(1) The indicated displacements are valid for short term loading, the displacements can be increased under long term loading to 2.0 mm.

Combined tension and shear load

The factor according to CEN/TS 1992-4-2 : 2009 section 6.4.1.3 : k_7 = 2/3

WELDA	**Annex C2**
Performance data Characteristic resistance and displacements under shear load, combined tension and shear load	

British Board of Agrément,
1st Floor Building 3,
Hatters Lane,
Croxley Park
Watford
WD18 8YG