

General Building Code Test Certificate

- Translation -

Test Certificate No.: P-5143/478/13 MPA-BS

Test item: Kunex® joint tapes
(normal-flammability joint sealing for concrete members with a high water penetration resistance against pressing and non-pressing water and against ground moisture in compliance with Bauregelliste A, Part 2, No. 1.4)

Client: H-BAU Technik GmbH
Am Güterbahnhof 20
79771 Klettgau-Erzingen

Issued on: 10 June 2013

Valid until: 23 May 2017

Provided the conditions of this General Building Code Test Certificate are met, the above test item can be used as defined by Federal State Building Codes.

This General Building Code Test Certificate (abP) consists of 8 pages and 5 annexes.



A General provisions

- (1) This General Building Code Test Certificate (abP) attests that the construction product can be used within the meaning of federal state building code regulations.
- (2) The General Building Code Test Certificate (abP) does not replace any of the building permits, approvals and certificates required by law for the performance of building projects.
- (3) The General Building Code Test Certificate (abP) is issued without prejudice to the rights of third parties, in particular private property rights.
- (4) Producers and distributors of the construction product shall, without prejudice to any additional regulations set out under the special provisions below, furnish the user of the construction product with copies of the General Building Code Test Certificate (abP), and they shall in addition point out that the General Building Code Test Certificate (abP) must be available at the place of use of the construction product. Copies of the General Building Code Test Certificate (abP) shall be made available to the authorities concerned upon request.
- (5) The General Building Code Test Certificate (abP) may not be copied unless as a complete text. Excerpts of the Certificate may only be published with the prior permission of the Braunschweig Materials Testing Institute (MPA). The wording of, or drawings used in, advertising brochures must not be in conflict with the contents of the General Building Code Test Certificate. Translations of the General Building Code Test Certificate shall bear the note "translation of the German original not checked by the Braunschweig Materials Testing Institute".
- (6) The General Building Code Test Certificate (abP) is subject to revocation. The provisions may be subsequently amended or revised, in particular if and when required as a result of new technical findings.



B Special provisions

1 Test item, field of application, and application requirements

1.1 Test item

This General Building Code Test Certificate (abP) applies to the fabrication and use of the Kunex® joint tapes of H-BAU Technik GmbH.

The joint tapes are made from thermoplastic polyvinyl chloride (PVC-P); they are compatible with bitumen (BV) or non-compatible with bitumen (NB); and are produced in an extrusion process. They are marketed under the designations listed below (the addition "S" referring to steel-reinforced versions) with different widths and with a profiled structure along their full length for different installation conditions (internal and external) and depending on their application in expansion and construction joints in concrete:

Internal construction joint tape:	PVC-P BV/NB A 100 / PVC-P BV/NB A 100 S ¹⁾ PVC-P BV/NB A 150 / PVC-P BV/NB A 150 S ¹⁾ PVC-P BV/NB A 190 / PVC-P BV/NB A 190 S ¹⁾ PVC-P BV/NB A 240 / PVC-P BV/NB A 240 S ¹⁾ PVC-P BV/NB A 320 / PVC-P BV/NB A 320 S ¹⁾ PVC-P BV/NB A 500 / PVC-P BV/NB A 500 S ¹⁾
External construction joint tape:	PVC-P BV/NB AA 190 PVC-P BV/NB AA 240/20 PVC-P BV/NB AA 240/35 PVC-P BV/NB AA 320/20 PVC-P BV/NB AA 320/35 PVC-P BV/NB AA 500
Internal expansion joint tape:	PVC-P BV/NB D 150 PVC-P BV/NB D 190 PVC-P BV/NB D 240 PVC-P BV/NB D 320 PVC-P BV/NB D 500
External expansion joint tape:	PVC-P BV/NB DA 190 PVC-P BV/NB DA 240/20 PVC-P BV/NB DA 240/35 PVC-P BV/NB DA 320/20 PVC-P BV/NB DA 320/35 PVC-P BV/NB DA 500
Joint end tape	PVC-P BV/NB FA 50 PVC-P BV/NB FA 90 PVC-P BV/NB FA 130

¹⁾ With the steel-reinforced versions, a steel core (dimensions: thickness = 1.5 mm, width = 4 mm, length = width of joint tape) is provided perpendicularly to the production direction. The PVC cover is 2 mm thick.



The shapes and dimensions of the above joint tapes are shown in annexes 1 to 5.

1.2 Field of application

The joint tapes listed in 1.1 above correspond to Bauregelliste A, Part 2, section 1.4. They are used for sealing joints in in-situ concrete structures with a high water penetration resistance against pressing and non-pressing water and against ground moisture (waterproof concrete basement systems).

Joint tapes, ≥ 240 mm wide, and joint end tapes are dimensioned in accordance with DIN 18197, section 5.4.2 (April 2011) and the selection diagrams included in that standard. The water pressures that are permitted in accordance with DIN 18197 have to be multiplied by a reduction factor of 0.85. Joint tapes < 240 mm wide are dimensioned in accordance with table 1.

Table 1: Application range for joint tapes < 240 mm wide

Tape width [mm]	$200 < b < 240$	$160 < b \leq 200$	$120 < b \leq 160$	$80 < b \leq 120$	80
Maximum permissible water pressure in m WC	1.8	1.4	1.0	0.1	0,1 ¹⁾

¹⁾ When using a pre-feed mix with 8 mm maximum grain size, minimum anchoring depth 30 mm

The joint tapes are suited for zones with changing water levels, and they comply with utilisation-class A requirements for application classes 1 and 2 as set forth in the regulations for watertight structures (WU-Richtlinie) ¹.

1.3 Application requirements

NB tapes must not be used when in contact with bitumen.
BV tapes are type approved for contact with bitumen.

2 Provisions concerning the construction product

2.1 Properties and characteristic values

The joint tapes have the characteristic values that are shown in table 2.

The fitness for use of the joint tapes has been demonstrated in compliance with the test principles for issuing general building code test certificates (ABZ) for joint sealants in concrete members with a high water penetration resistance against pressing and non-pressing water and against ground moisture; status: June 2011.

Joints that are sealed with the sealing material

- provide adequate stability
- provide adequate adhesive strength
- are adequately impervious to water
- provide adequate age resistance
for the fields of application mentioned in section 1.2 above.

The reaction to fire of the construction product conforms with the class-E requirements in DIN EN 13501-1.

¹German committee for RC directive "Wasserundurchlässige Bauwerke aus Beton" (watertight structures made from concrete), November 2003



2.2 Production, packaging, transport, storage, identification

- (1) The PVC-P joint tapes are produced industrially. The Testing Laboratory shall be notified without delay of any changes in the formulation used for the product, or changes regarding the supplying plant.
- (2) The PVC-P joint tapes have to be packed, handled and stored so their fitness for use will not be adversely affected. The instructions provided by the manufacturer must be complied with.
- (3) The information provided on the packaging regarding other legal areas shall be observed.
- (4) The manufacturer shall mark the delivery note or packaging for the PVC-P joint tapes with the conformity mark (Ü mark) in compliance with the conformity marking regulations of the Federal States. This marking may be provided only, if the conditions set forth in section 3 below (declaration of conformity) are complied with. The contents of section 1.3 (application requirements) shall be shown on the delivery note (if applicable and without comments).

2.3 Conformity mark

- (1) The manufacturer shall mark the construction products with the conformity mark (Ü mark) in compliance with the conformity marking regulations of the federal states. The conformity mark with the details that have to be provided on the packaging:
 - Name of manufacturer
 - Number of the General Building Code Test Certificate (abP)

shall be shown on the packaging or, if this should not be possible, in the package leaflet. This marking may be provided only if the conditions set forth in section 3 below are complied with.

- (2) The following details must be shown on the packaging of the construction product or in the package leaflet:
 - Product name
 - Batch number
 - Intended use
 - Reference to application requirements

3 Declaration of conformity

- (1) General

In accordance with Bauregelliste A Part 2, No. 1.4, conformity of the construction product with the requirements set forth in this General Building Code Test Certificate (abP) is demonstrated by the manufacturer's declaration of conformity (ÜHP), which shall be issued on the basis of factory production control (FPC) and construction product inspection before the conformity (initial type test) is confirmed by an inspection body approved for such inspections.



(2) Initial type test of the construction product performed by an approved inspection body

For initial type testing, the characteristic values must be verified on the basis of table 2. The obtained values must not differ from reference values by more than the tolerances shown in that table.

An initial type test is not required for the product, when the samples used for testing were taken from a normal production run in the production plant as part of the general type approval procedure.

If the conditions under which the product is manufactured should change, an initial type test must be made again.

(3) Factory production control

DIN 18200 requires that factory production control (FPC) be established for, and be performed in the production plant.

Factory production control must be performed in compliance with the specifications shown in table 2, which reflect the special features of the product and the conditions for producing this product. The requirements made are based on the results of the initial type test.

The results of factory production control must be recorded and evaluated by the manufacturer. The records must include the following details as a minimum:

- Name of the product
- Type of test or inspection
- Date when produced and date of test
- Test results and comparison with requirements
- Signature of person in charge of factory production control

The records must be kept for a minimum of five years and must be presented upon request.

Should testing supply inadequate results, the manufacturer must take immediate action to remedy any deficiencies noted. Non-conforming construction products must be handled so that confusion with conforming and faultless construction products is positively prevented. Once the deficiency has been corrected, the required test must be repeated to the extent that is necessary to prove adequate correction.



Table 2: Type and frequency of tests to be performed as part of factory production control; requirements

Properties	Tested in acc. with DIN 18541-2 Section	Frequency	Requirements
General characteristics	4.2	Once per production day	No blisters, cracks and shrinkage cavities
Dimensional stability	4.3	Once per production day	Min.dimensions acc. to annexes 1 to 5 to be complied with
Shore hardness	4.4	Once per production day	(67 ± 5) Shore A
Tensile strength	4.5	Once per production day	$k \geq 9.0$ MPa
Elongation at rupture	4.5	Once per production day	$k \geq 230$ %
Tear propagation resistance	4.6	Twice per year	$k \geq 20$ N/mm
Reaction to low temperatures Elongation at rupture at -20 °C	4.7	Twice per year	$k \geq 120$ %
Weldability	4.12	Once per production week	$f \geq 0.6$

k = lowest individual value f = jointing factor

4 Execution

Joint tape execution is subject to the DIN 18197 planning principles and execution instructions and the manufacturer's technical data sheets.

5 Legal basis

This General Building Code Test Certificate (abP) is issued on the basis of article 19 of the building code of Baden-Württemberg (LBO) in conjunction with Bauregelliste A, Part 2, No. 1.4.

6 Legal remedy

This General Building Code Test Certificate (abP) is subject to objection. Objections must be lodged in writing or stated orally on the record of the management of Materialprüfanstalt für das Bauwesen, Beethovenstraße 52, 38106 Braunschweig within a period of one month after it has been issued. The date on which the Testing Laboratory receives the notice of objection shall decide on whether the objection was made timely.



This document is the translated version of General Building Code Test Certificate No. P-5143/478/13 MPA-BS dated 10/06/2013. The legally binding text is the aforementioned German General Building Code Test Certificate.



Dr.-Ing. K. Herrmann
Head of Testing Laboratory



i. A.



M. Pankalla
Engineer/official in charge

Internal construction joint tape (type A):

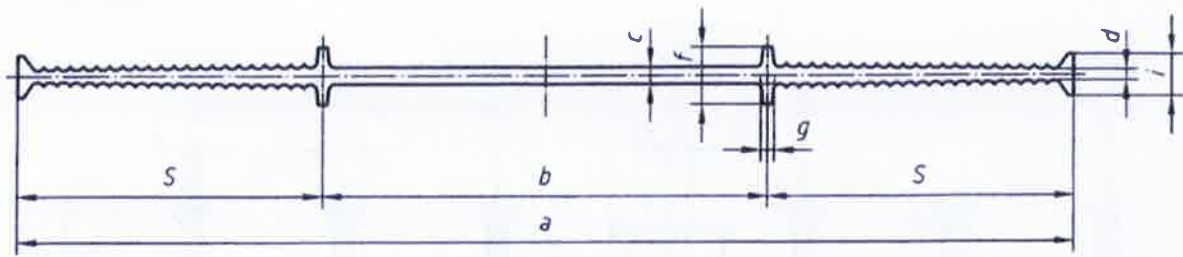


Fig. A1: cross section

Table A1: Actual and (minimum) dimensions [mm] of type A joint tapes, compatible with bitumen (BV) or non-compatible with bitumen (NB)

Identification	Width			Thickness		Profiles		
	a	b	S	c	d	f	g	i
A 100	100	40	30	3.5	3.2	11	2.8	11
A 100 S¹⁾	(100)	(40)	(30)	(3.0)	(3.0)	(11)	(2.5)	(11)
A 150	150	54	47	3.4	2.7	15	4.5	12
A 150 S¹⁾	(150)	(50)	(45)	(3.0)	(2.5)	(15)	(4.0)	(11)
A 190	190	73	58	3.1	2.7	15	4.2	11
A 190 S¹⁾	(190)	(70)	(55)	(3.0)	(2.5)	(15)	(4.0)	(11)
A 240	240	86	77	3.8	2.8	17	5.0	11
A 240 S¹⁾	(240)	(80)	(75)	(3.5)	(2.5)	(15)	(4.5)	(11)
A 320	320	101	110	4.3	2.9	14	3.6	12
A 320 S¹⁾	(320)	(100)	(105)	(4.3)	(2.9)	(14)	(3.6)	(11)
A 500	507	151	178	5.6	3.0	19.2	4.2	11.3
A 500 S¹⁾	(500)	(150)	(173)	(5.6)	(3.0)	(18)	(4.2)	(11)

¹⁾ Joint tape type A also comes with steel reinforcement. With this version, a steel core (dimensions: thickness = 1.5 mm, width = 4 mm, length = width of joint tape) is provided perpendicularly to the production direction. The PVC cover is 2 mm. (identification: e.g. NB A 150 S)

Abbreviations:

Dimensions:

- S: steel reinforced
- a: Overall width
- b: Width of expansion part
- c: Thickness of expansion part at the thinnest point
- d: Thickness of sealing parts at the thinnest point
- f: Height of anchoring ribs, measured on both sides
- g: Thickness of anchoring ribs at the root (tangential intersection point)
- i: Thickness of edge reinforcement
- S: Width of sealing parts



Internal expansion joint tape (type D):

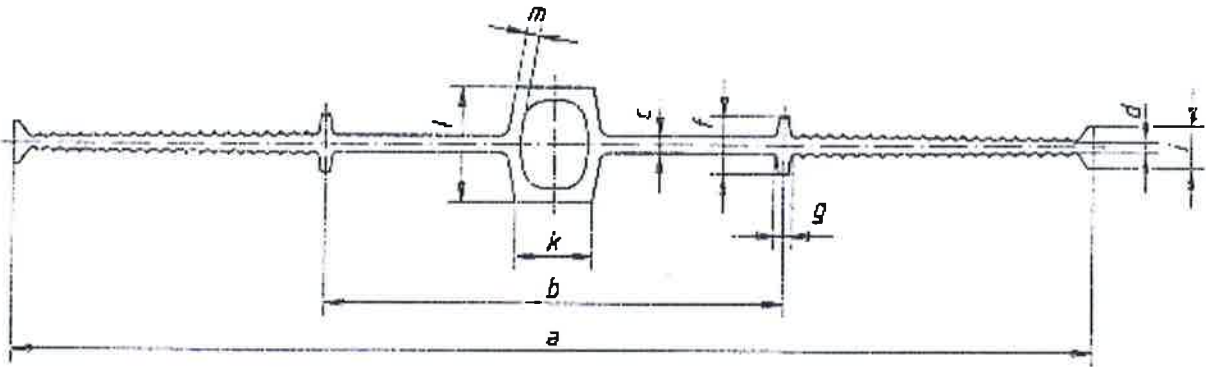


Fig. A2: cross section

Table A2: Actual and (minimum) dimensions [mm] of type D joint tapes, compatible with bitumen (BV) or non-compatible with bitumen (NB)

Identification	Width		Thickness		Profiles			Hollow part/loop		
	a	b	c	d	f	g	i	k	l	m
D 150	150 (150)	56 (50)	3.5 (3.5)	2.6 (2.5)	15 (15)	4.0 (4.0)	11.5 (11)	10 (10)	25 (25)	2.7 (2.7)
D 190	190 (190)	73 (70)	4.0 (3.5)	3.0 (2.8)	16 (15)	4.5 (4.0)	11 (11)	10 (10)	24 (24)	2.9 (2.9)
D 240	236 (236)	87 (80)	4.3 (4.0)	3.3 (3.0)	16 (15)	5.0 (4.5)	12 (11)	20 (20)	26 (25)	3.4 (3.4)
D 320	320 (320)	104 (100)	6.4 (5.0)	4.3 (4.0)	18 (15)	5.0 (4.5)	12 (11)	21 (20)	35 (35)	4.7 (4.0)
D 500	501 (500)	146 (145)	6.5 (6.0)	4.2 (4.0)	22 (20)	5.5 (5.0)	12 (11)	22 (20)	45 (45)	5.2 (4.5)

Abbreviations: Dimensions:

- a: Overall width
- b: Width of expansion part
- c: Thickness of expansion part at the thinnest point
- d: Thickness of sealing parts at the thinnest point
- f: Height of anchoring ribs, measured on both sides
- g: Thickness of anchoring ribs at the root (tangential intersection point)
- i: Thickness of edge reinforcement
- k: Width of hollow part/loop
- l: Height of hollow part/loop
- m: Wall thickness of hollow part/loop at the thinnest point



External construction joint tape (type AA)

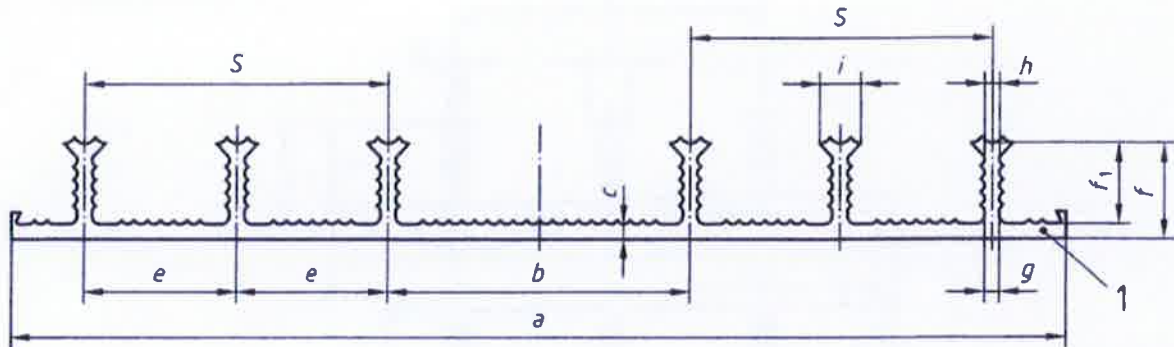


Fig. A3: cross section

Table A3: Actual and (minimum) dimensions [mm] of type AA joint tapes, compatible with bitumen (BV) or non-compatible with bitumen (NB)

Identification	Width		Thickness	Profiles						
	a	b		c	N	e	f	f ₁	g	h
AA 190	190 (190)	78 (75)	3.2 (3.0)	4 (4)	38 (35)	18 (18)	14.8 (14.8)	4.1 (4.0)	4.1 (4.0)	12 (11)
AA 240/20	240 (240)	81 (80)	4.0 (4.0)	4 (4)	57 (55)	20 (20)	16 (16)	4.5 (4.2)	4.6 (4.3)	12 (11)
AA 240/35	240 (240)	80 (78)	4.7 (4.5)	4 (4)	57 (55)	35.7 (35)	31 (31)	7.4 (7.0)	3.4 (3.4)	12 (11)
AA 320/20	323 (320)	101 (100)	4.3 (4.3)	6 (6)	45 (45)	20 (20)	15.7 (15.7)	4.2 (4.0)	4.1 (4.0)	12 (11)
AA 320/35	322 (320)	97 (95)	4.8 (4.8)	6 (6)	45 (45)	34 (33)	29.2 (29)	5.6 (5.3)	4.9 (4.6)	12.2 (11)
AA 500	506 (500)	114 (112)	4.8 (4.8)	8 (8)	57 (55)	35 (35)	30.4 (30.2)	6.9 (6.5)	7.0 (6.5)	14 (11)

Abbreviations: Dimensions:

- a: Overall width
- b: Width of expansion part
- c: Tape thickness
- e: Centre distance of sealing anchors
- f: Height of profile
- f₁: Height of sealing anchors
- g: Thickness of sealing anchors at the root
- h: Thickness of sealing anchors at the thinnest point
- i: Thickness of head reinforcement at the sealing anchors
- N: Number of sealing anchors



External expansion joint tape (type DA)

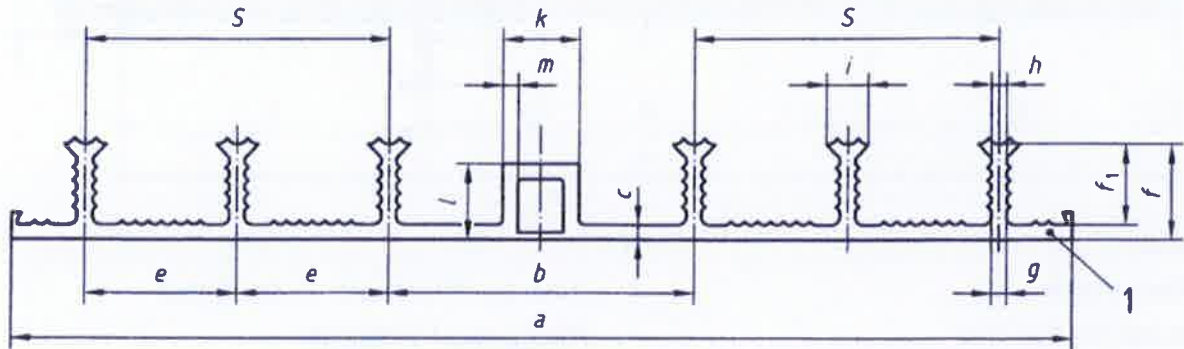


Fig. A4: cross section

Table A4: Actual and (minimum) dimensions [mm] of type DA joint tapes, compatible with bitumen (BV) or non-compatible with bitumen (NB)

Identifi- cation	Width		Thickn ess	Profiles							Loop		
	a	b		c	N	e	f	f ₁	g	h	i	k	l
DA 190	190 (190)	82 (80)	3.7 (3.5)	4 (4)	34 (31)	17 (16)	13.3 (12.5)	4.9 (4.0)	4.2 (4.0)	11 (11)	20 (20)	18 (18)	3.1 (3.0)
DA 240/15	242 (240)	81 (80)	4.2 (4.0)	4 (4)	58 (54)	20 (20)	15.8 (15.8)	5.0 (4.0)	4.4 (4.0)	12.5 (11)	20 (20)	20 (20)	4.7 (4.0)
DA 240/30	240 (240)	85 (84)	5.5 (5.5)	4 (4)	55 (51)	36 (35)	30.5 (30)	7.6 (7.0)	5.5 (5.0)	11.2 (11)	21.8 (20)	21.0 (20)	6.0 (5.0)
DA 320/15	323 (320)	103 (100)	3.7 (3.7)	6 (6)	45 (42)	20 (20)	16.3 (16.3)	4.0 (4.0)	4.0 (4.0)	11 (11)	21 (20)	21 (20)	3.7 (3.5)
DA 320/30	320 (320)	100 (100)	5.0 (4.5)	6 (6)	45 (42)	34.4 (34)	31 (30)	6.0 (6.0)	4.3 (4.0)	12.2 (11)	21.0 (20)	20.0 (20)	4.7 (4.5)
DA 500	515 (500)	120 (120)	4.0 (4.0)	8 (8)	57 (54)	31.8 (31)	27.5 (26)	6.9 (6.0)	3.9 (3.8)	10.3 (11)	20.2 (20)	19.2 (20)	4.2 (4.0)

Abbreviations: Dimensions:

- a: Overall width
- b: Width of expansion part
- c: Tape thickness
- e: Centre distance of sealing anchors
- f: Height of profile
- f₁: Height of sealing anchors
- g: Thickness of sealing anchors at the root
- h: Thickness of sealing anchors at the thinnest point
- i: Thickness of head reinforcement at the sealing anchors
- k: Width of hollow part/loop
- l: Height of hollow part/loop
- m: Wall thickness of hollow part/loop at the thinnest point
- N: Number of sealing anchors



Joint end tape (type FA)

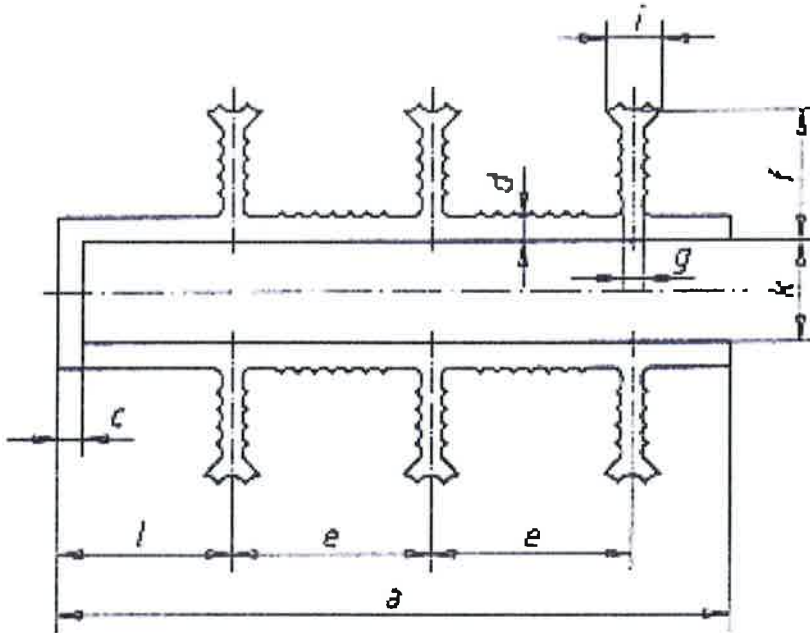


Fig. A5: cross section

Table A5: Actual and (minimum) dimensions [mm] of type FA joint tapes, compatible with bitumen (BV) or non-compatible with bitumen (NB)

Identification	Overall width	Thickness		Profiles					Loop	
	a	c	d	N	e	f	g	i	k	l
FA 50	51	4.7	-	2	-	25	5.3	12	20	36
	(50)	(4.7)	-	(2)	-	(25)	(5.0)	(11)	(20)	(35)
FA 90	90	5.3	6.0	4	35	26	5.8	12	20	36
	(90)	(5.0)	(5.0)	(4)	(35)	(25)	(5.0)	(11)	(20)	(35)
FA 130	125	5.9	6.0	6	36	27	5.2	12	23	36
	(125)	(5.0)	(5.0)	(6)	(35)	(25)	(5.0)	(11)	(20)	(35)

Abbreviations: Dimensions:

- a: Overall width
- c: Thickness of cover
- d: Thickness of tape legs
- e: Centre distance of sealing anchors
- f: Height of sealing anchors
- g: Thickness of sealing anchors at the root
- i: Thickness of head reinforcement at the sealing anchors
- k: Width of hollow part/loop
- l: Height of hollow part/loop
- N: Number of sealing anchors

