EXPANSION JOINTS

FIP INDUSTRIALE

• DARWIN BRIDGE, EAST FLYOVER - PADUA, ITALY
installation of RAN and GPE series expansion joints

FIP INDUSTRIALE

INTRODUCTION

Thanks to its Research & Development Department, **FIP Industriale** can boast of a wide range of expansion joints. Here, standard models are proposed, nonetheless expansion joints for any displacements can be supplied.

Fifty years of experience in design, production, testing and installation have led to its exclusive. Maintenance is required only after years, this makes possible a simple and inexpensive management.

DESCRIPTION

FIP Industriale expansion joints come in a wide range of formats, each format having a certain movement range to accommodate, with only the types of materials used remaining constant.

Based on a design of reinforced rubber modular elements, **FIP Industriale** expansion joints offer the following advantages:

- simple installation
- simple and cost-effective inspections and maintenance
- minimal noise and vibration
- ultimate comfort for passengers in transit
- smooth running surface
- optimum functioning and durability of all components
- minimal interference with the structure
- format easily adjusted to many shapes to accommodate layout of structure and design engineers' preference
- several different types of anchorage to suit customer requirement

PRODUCTS

1) ROAD JOINTS

Reinforced rubber:	▶ **RAN**	movement range till 50 mm
	▶ **GPE**	movement range from 50 to 400 mm
	▶ **RAN P**	movement range from 400 to 1000 mm
	▶ **ALFA**	longitudinal
Finger:	▶ **SFE 90/65**	movement range till 40 mm
	▶ **GP**	movement range from 50 to 250 mm
	▶ **FE C**	movement range from 300 to 800 mm
Under pavement:	▶ **MS**	
	▶ **P.P.**	
	▶ **SFE 90/65 AS**	
Buffer:	▶ **GTV**	hot viscoelastic buffer joint
	▶ **GTF**	cold polymeric buffer joint

2) RAILWAY JOINTS

▶ **BETA**

CERTIFICATIONS

In 1992, **FIP Industriale** secured CISQ-ICIM certification for its Quality Assurance System in conformance with EN 29001 European Standard (ISO 9001). **FIP Industriale** is proud to be the first Italian manufacturer of structural bearings, anti-seismic devices and expansion joints boasting a Quality Assurance System certified at the highest level - from design to customer service assistance.

Certification has been achieved via rigorous evaluation by an internationally recognized Third Party Organisation, thus internationally validating the Quality Assurance System.

ISO 9001 - Cert. N. 0057

REINFORCED RUBBER ROAD JOINTS

DESCRIPTION

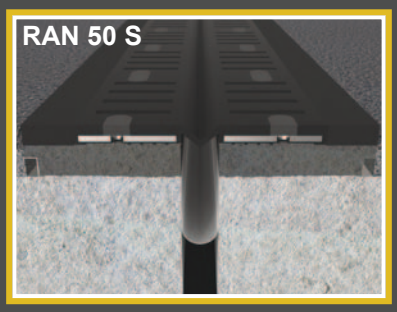
These joints are normally made up of an elastomeric structure in which, by a curing process or other technological process, metal profiles are inserted to change, at set points, the stiffness or bearing capacity of the elastomeric structure.

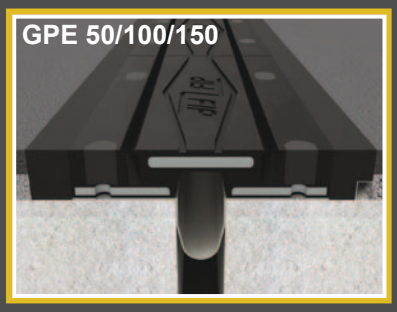
There are two main sub-groups depending on the mechanism which is used to obtain the expansion/shrinkage capacity of the joint, namely:

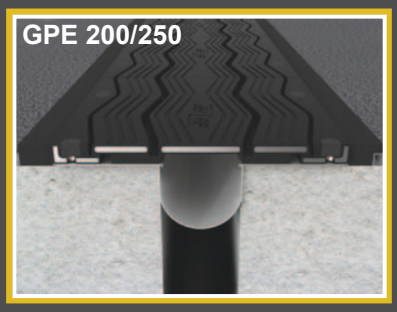
- by elastic deformation, with shear stress, of appropriately prepared suitable elastomeric areas;
- by elastic deformation of the elastomeric profiles the designed geometry of which is changed by normally flexural stresses.

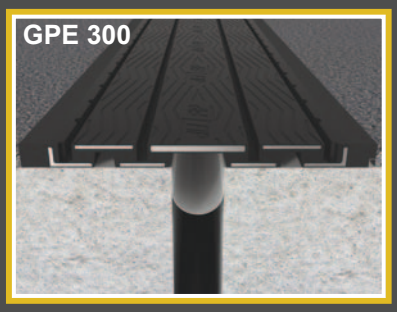
A characteristic of this type of joints is the presence, at the level of the congested surface, of a series of transverse gaps required for the development of the necessary elastic deformations.

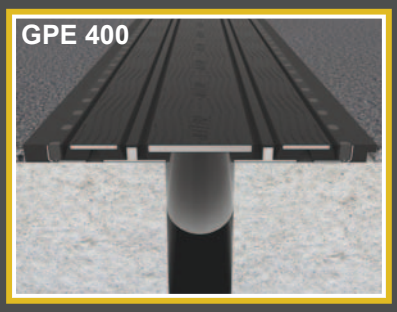
Types:

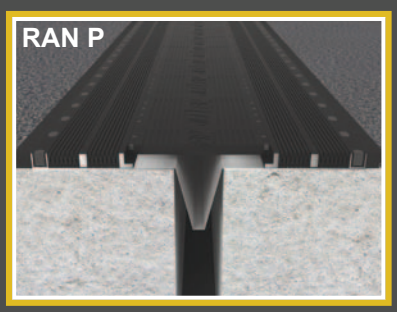


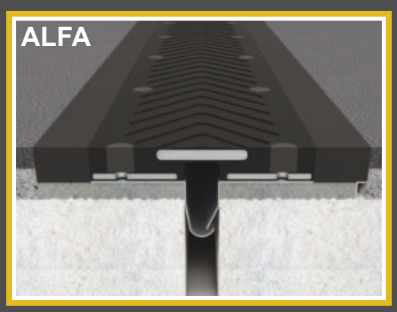










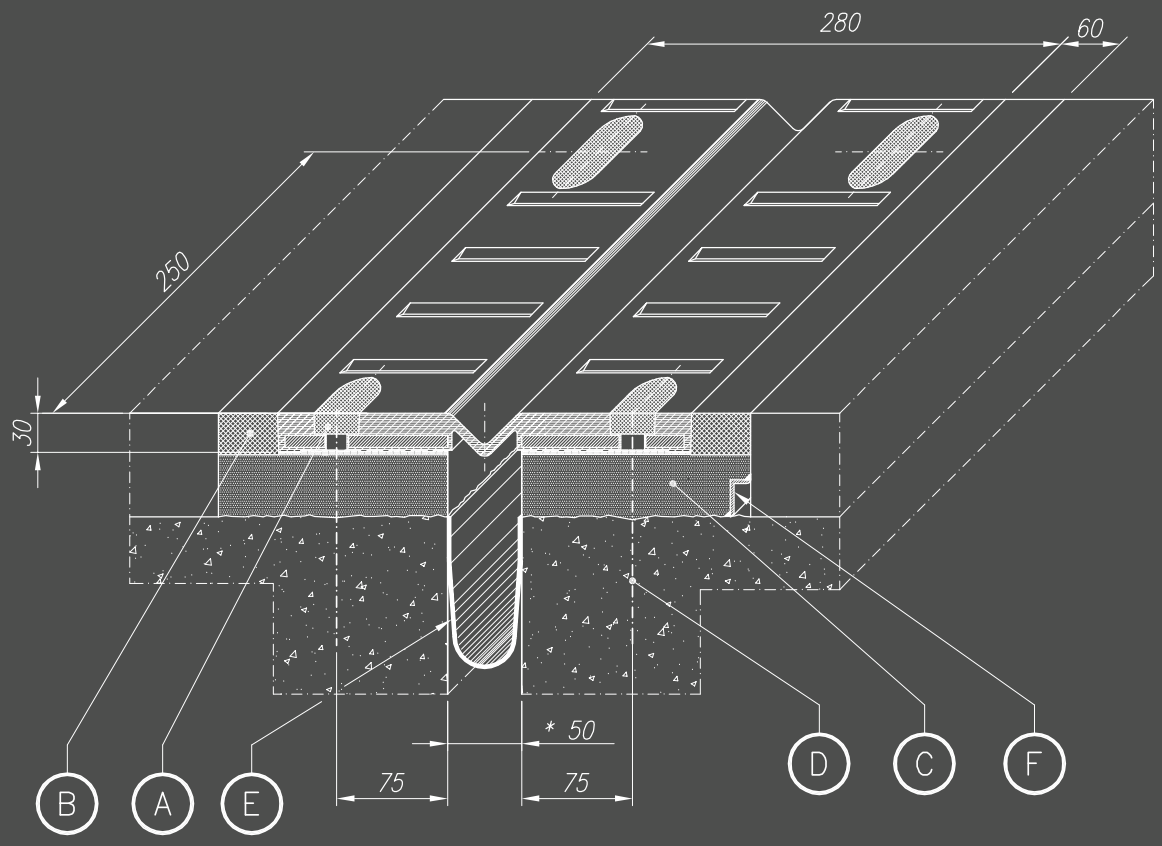


▶RAN

Expansion joint made of:

- CNR 10018/85-compliant modular reinforced rubber pads consisting of two plates vulcanized to a rubber gap cover of seal and disposal of surface waters;
- mechanical anchoring system made of steel rawl bolts or multidirectional clamps and anchor rods or threaded bars, depending on site requirements;
- hypalon gutter;
- “L”-shaped stainless steel profile for under pavement waters drainage;
- epoxy mortar strips connecting the joint elements and the bituminous pavement.

RAN 50 S



* average gap

POS.	DESCRIPTION	MATERIAL
A	Sealant	EPOBLOCK ME BINDER
B	Transition strip	EPOBLOCK ME 3C
C	Mortar bedding	Fiber-reinforced cement mortar
D	M12 Anchoring system	
E	Gutter	Hypalon
F	“L”-shaped drainage profile	X5 CrNi 1810-UNI 8317

REINFORCED RUBBER ROAD JOINTS

▶GPE

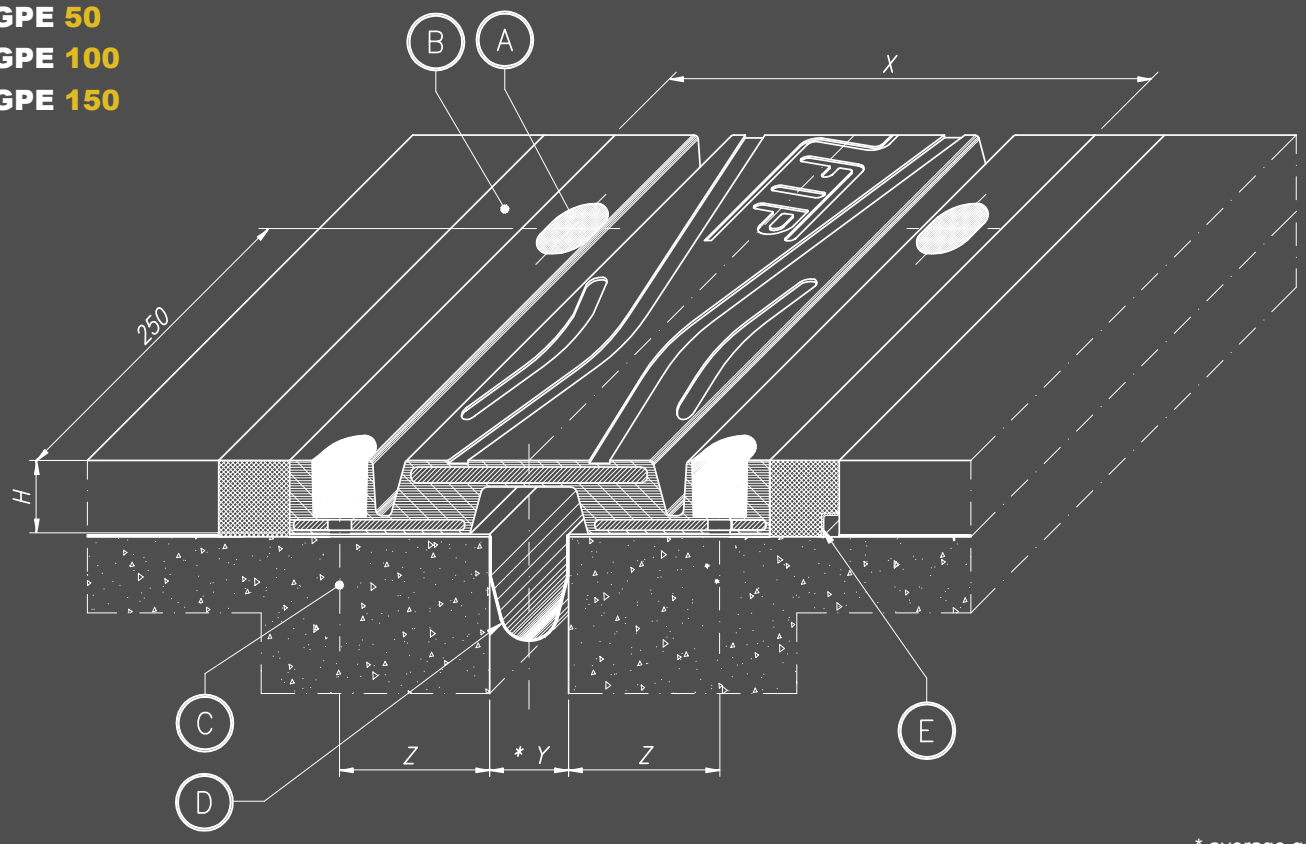
Expansion joint made of:

- CNR 10018/85-compliant modular reinforced rubber pads consisting of a central bridging plate and side bearing elements vulcanized to stainless steel plates;
- mechanical anchoring system consisting of threaded bars or, as an alternative, multidirectional clamps and anchor rods, depending on site requirements;
- hypalon gutter;
- “L”-shaped stainless steel profile for under pavement waters drainage;
- epoxy mortar strips connecting the joint elements and the bituminous pavement.

JOINT TYPE	TOTAL MOVEMENT (mm)	HEIGHT	WIDTH	GAP	ANCHORS
		H (mm)	X (mm)	Y (mm)	Z (mm)
GPE 50	50	42	250	* 35	75
GPE 100	100	56	366	* 60	115
GPE 150	150	83	555	* 85	190

length of modular element = 2000 mm

GPE 50
GPE 100
GPE 150



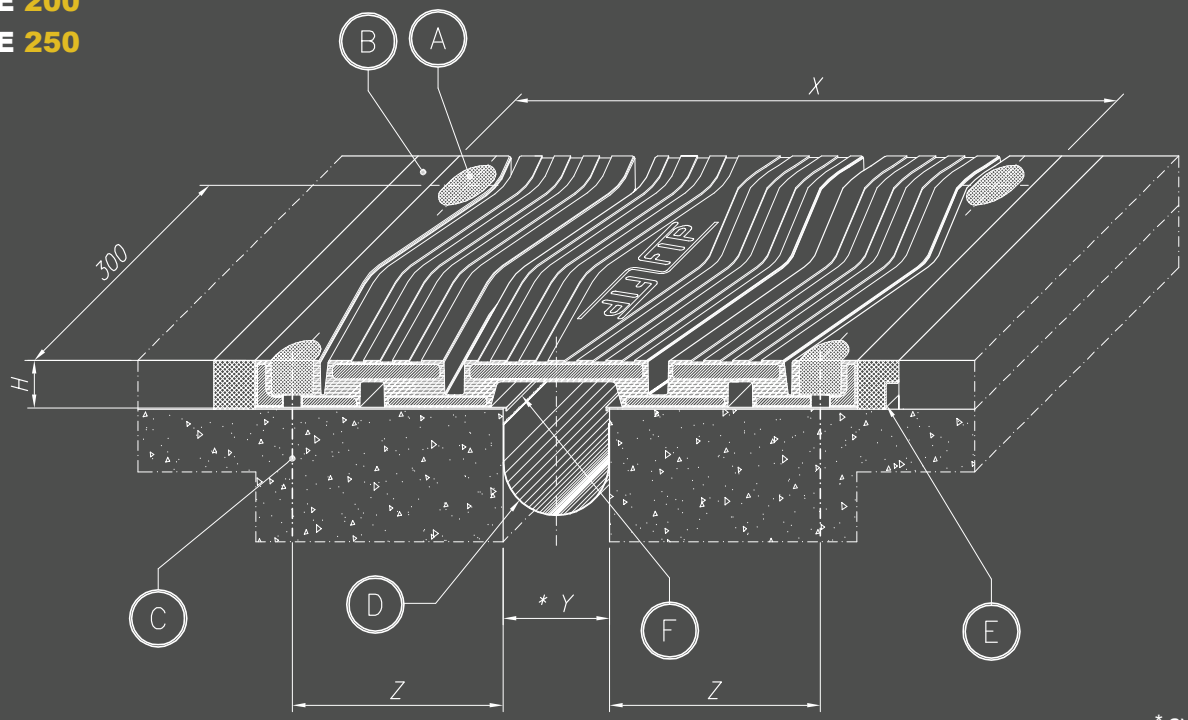
* average gap

POS.	DESCRIPTION	MATERIAL
A	Sealant	EPOBLOCK ME Granulate
B	Transition strip	EPOBLOCK ME 3C
C	M16 Anchoring system	
D	Gutter	Hypalon
E	“L”-shaped drainage profile	X5 CrNi 1810-UNI 8317

JOINT TYPE	TOTAL MOVEMENT (mm)	HEIGHT	WIDTH	GAP	ANCHORS
		H (mm)	X (mm)	Y (mm)	Z (mm)
GPE 200	200	64	839	* 120	315
GPE 250	250	74	914	* 145	340

length of modular element = 900 mm

GPE 200
GPE 250



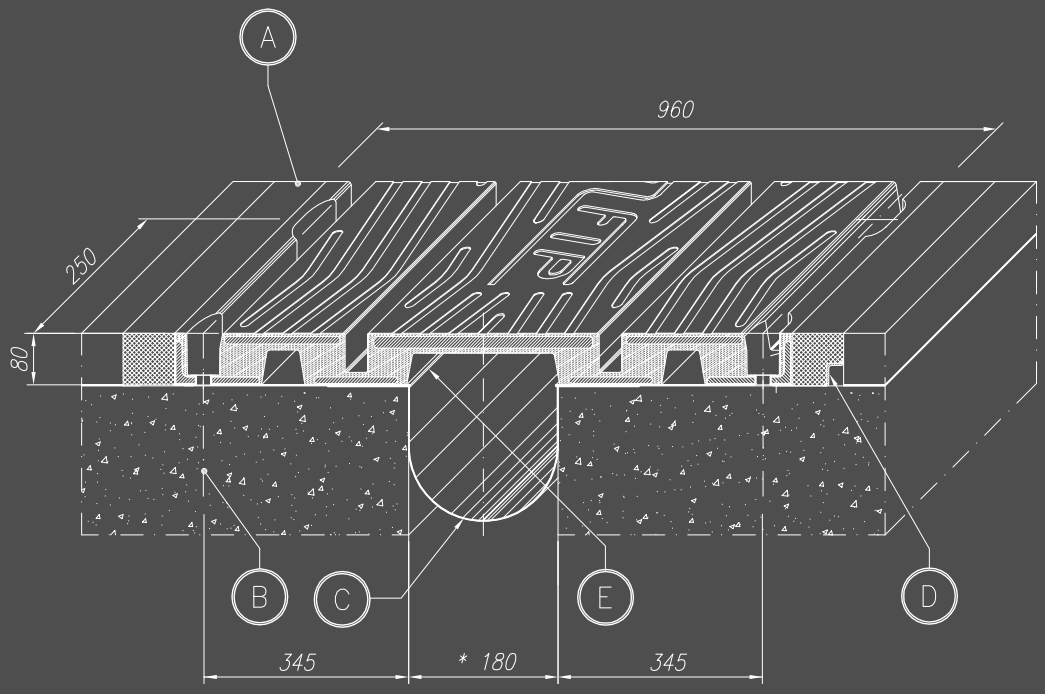
* average gap

POS.	DESCRIPTION	MATERIAL
A	Sealant	EPOBLOCK ME Granulate
B	Transition strip	EPOBLOCK ME 3C
C	M20 Anchoring system	
D	Gutter	Hypalon
E	"L"-shaped drainage profile	X5 CrNi 1810-UNI 8317
F	Sliding sheet	X5 CrNi 1810-UNI 8317

• SS. 3 FLAMINIA - ROME, ITALY -- **installation of GPE 300 series joint**

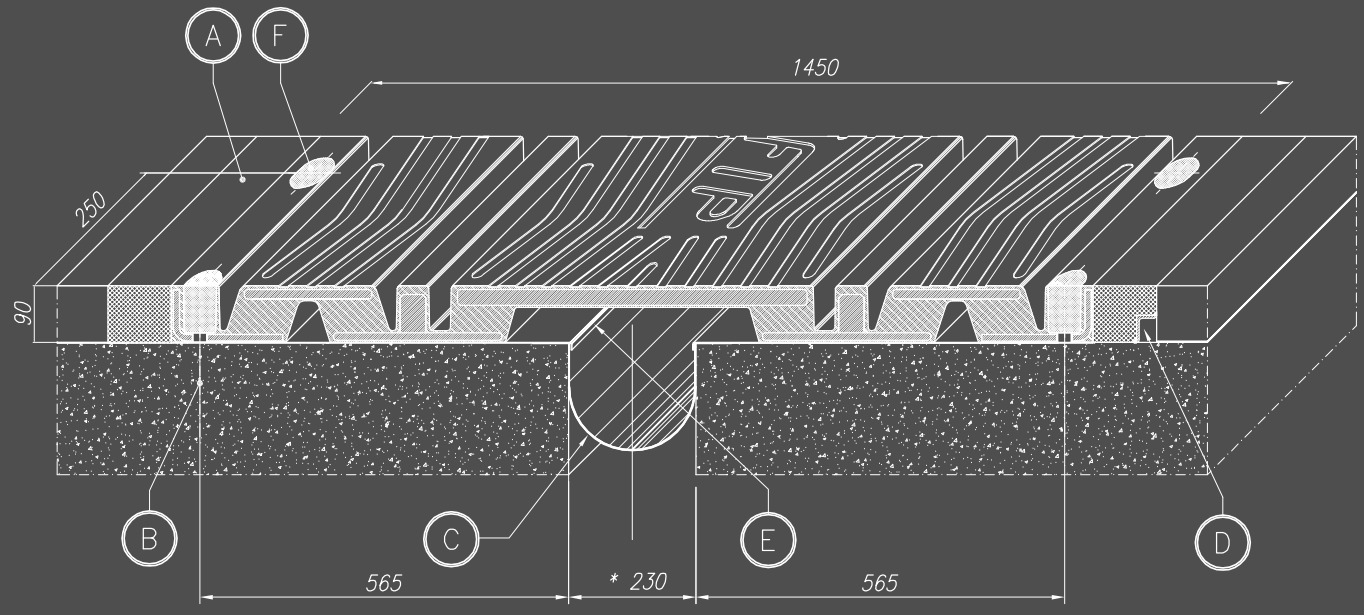
REINFORCED RUBBER ROAD JOINTS

GPE 300



* average gap

GPE 400



* average gap

POS.	DESCRIPTION	MATERIAL
A	Transition strip	EPOBLOCK ME 3C
B	M20 Anchoring system	
C	Gutter	Hypalon
D	"L"-shaped drainage profile	X5 CrNi 1810-UNI 8317
E	Sliding sheet	X5 CrNi 1810-UNI 8317
F	Sealant	EPOBLOCK ME Granulate

lenght of modular element = 1000 mm

▶RAN P

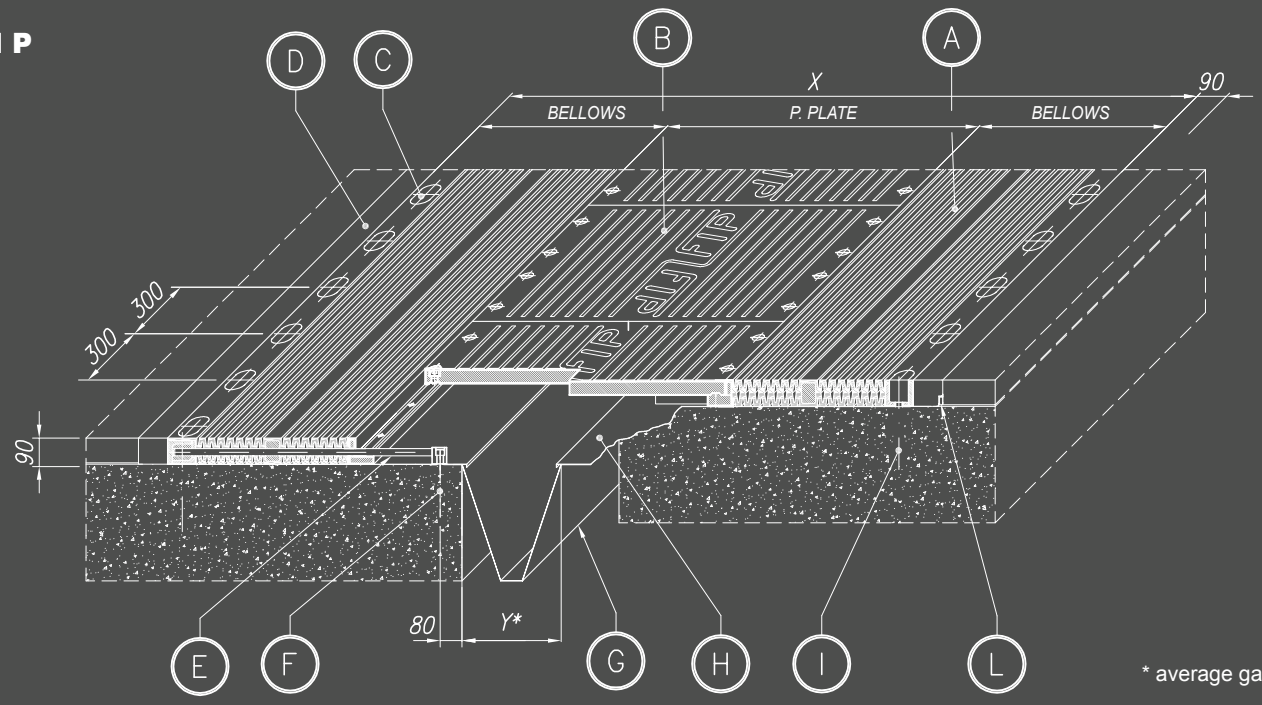
Water-proof expansion joint consisting of:

- CNR 10018/85-compliant modular reinforced rubber pads consisting of a central bridging plate and two side bellows equipped with anti-lift bar, free to move along stainless steel plates, assembled *in situ*;
- mechanical anchoring system consisting of threaded bars or, as an alternative, multidirectional clamps and anchor rods, depending on site requirements;
- stainless steel gutter;
- "L"-shaped stainless steel profile for under pavement waters drainage;
- epoxy mortar strips connecting the joint elements and the bituminous pavement.

Upon request, the bridging plates can be treated with the "anti-skid" surface treatment.

JOINT TYPE	TOTAL MOVEMENT (mm)	X (mm)	*Y (mm)	B. PLATE	BELLOWS	
		min-max	medium	(mm)		
RAN P 400	400	1650 - 2050	250	800	DOUBLE +	SINGLE
RAN P 500	500	1990 - 2490	300	900	DOUBLE +	DOUBLE
RAN P 600	600	2090 - 2690	350	1000	DOUBLE +	DOUBLE
RAN P 700	700	2430 - 3130	400	1100	TRIPLE +	DOUBLE
RAN P 800	800	2850 - 3650	450	1200	TRIPLE +	TRIPLE
RAN P 1000	1000	2970 - 3970	550	1400	TRIPLE +	TRIPLE

RAN P



* average gap

POS.	DESCRIPTION	MATERIAL
A	Bellows	70±5 Sh/A-S235JR Rubber
B	Bridging plate	70±5 Sh/A-S355J2G3 Rubber
C	Sealant	EPOBLOCK ME Granulate
D	Transition strip	EPOBLOCK ME 3C
E	Anti-lift bar	X5 CrNi 1810-UNI 8317
F	M20 Anchoring system	
G	Gutter	X5 CrNi 1810-UNI 8317
H	Sliding sheet	X5 CrNi 1810-UNI 8317
I	M24 Anchoring system	
L	"L"-shaped drainage profile	X5 CrNi 1810-UNI 8317

REINFORCED RUBBER ROAD JOINTS

• A31 VALDASTICO HIGHWAY, BRIDGE OVER ADIGE RIVER - ITALY
installation of RAN P series joint

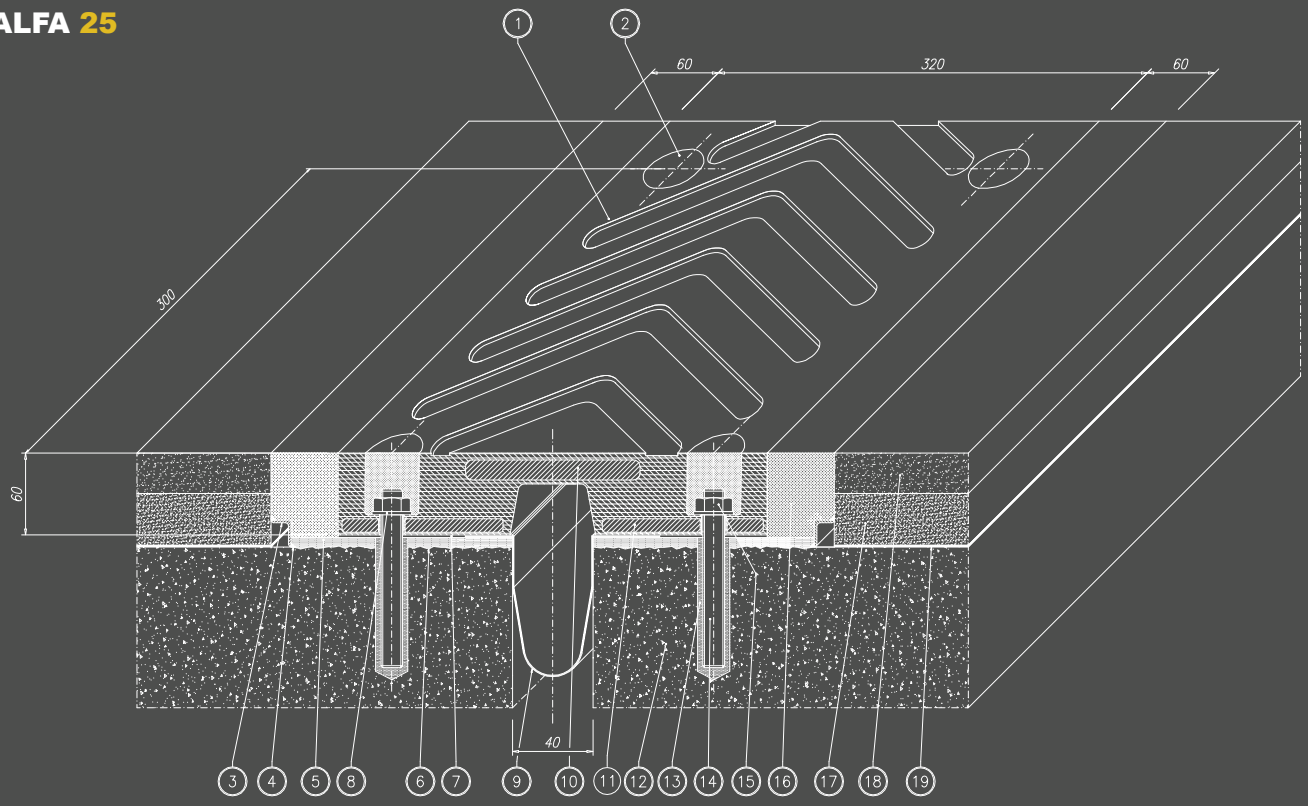
▶ALFA 25

Longitudinal type expansion joint, capable of absorbing longitudinal displacements of 50 (±25) (mm) and vertical deformation of 40 (±20) mm. It consists of:

- modular reinforced rubber pads consisting of a central bridging plate and two side bearing elements;
- mechanical anchoring system consisting of threaded bars and epoxy resin;
- 1.2 mm thick hypalon gutter;
- “L”-shaped stainless steel profile for under pavement waters drainage;
- “Epoblock ME 3C” epoxy mortar strips connecting the joint elements and the bituminous pavement.

Upon request, it is possible to perform an “anti-skid” surface treatment, by laying “Primer MEC EP” epoxy binder, mixed with synthetic granulates of chrome mineral (final thickness of 5 mm).

ALFA 25



POS.	DESCRIPTION	MATERIAL
1	Modular element	60±5 Sh/A Vulcanized rubber
2	Sealant	EPOBLOCK ME Granulate
3	“L”-shaped drainage profile	X5 CrNi 1810 EN 10088
4	Grouting	S FIP 180
5	Mortar bedding	EPOBLOCK ME 3C
6	Bush hammering and tack coat	Primer 150 Clamp
7	Grouting	S FIP 180
8	Slotted washer	C40
9	Drainage gutter - sp. mm 1,2	Hypalon
10	Bridging plate	S355J2G3 EN 10025
11	Plate	S235JR EN 10025
12	Slab head	
13	Anchoring resine	Primer 150 Clamp
14	M16x166 Threaded bar	B7 ASTM Class
15	M16 UNI 5588 Nut	BG Class
16	Transition strip	EPOBLOCK ME 3C
17	Blinder	
18	Wearing course	
19	Pank proofing	

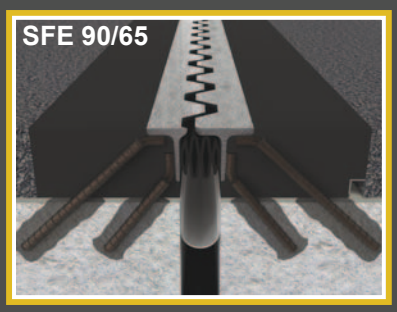
FINGER ROAD JOINTS

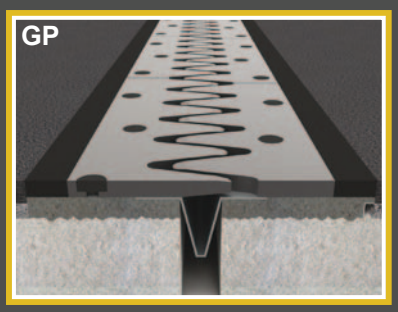
DESCRIPTION

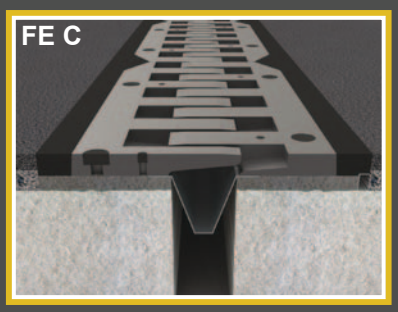
These joints are obtained by opposing two finger-shaped metal elements: each is fixed to its head, thus ensuring, thanks to a suitable interpenetration, continuity of the carriageway in case of expansion/shrinkage.

Their static layout can act as a beam on two bearings when the finger rests on both heads or as a shelf when it overhangs a head. A specific device is needed, usually a gutter, to ensure the gap watertightness.

Special attention should be paid to the alignment during the installation phase and to the head anchoring, especially in the case of shelf layout. Except for special arrangements, this type of joint permits limited transverse displacements.





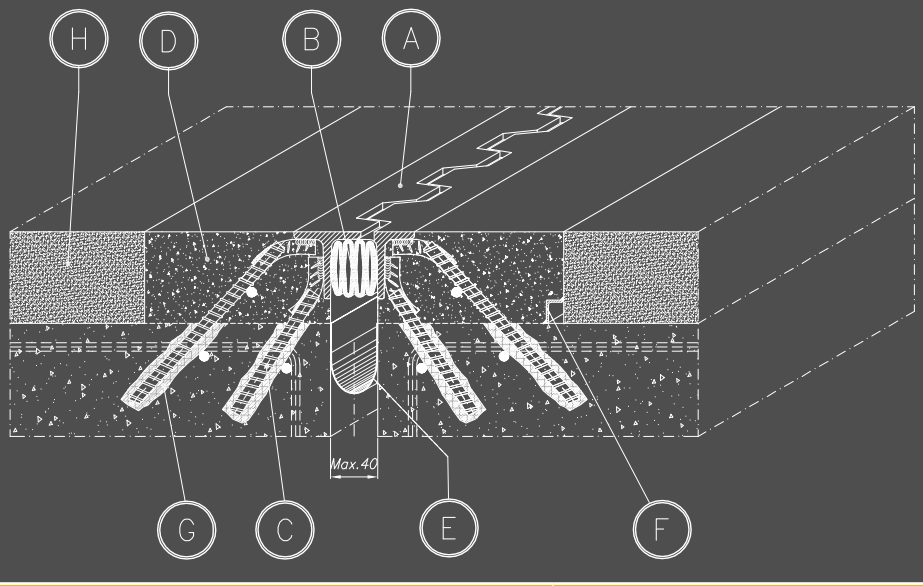


▶SFE 90/65

Expansion joint specifically designed for highway use within structures creating longitudinal movements of ± 15 (mm), vertical movements up to 10mm. It consists of an extruded rubber bellows, vulcanized to two 80x80x9 mm “T”-profiles and anchored to the slab by clamps of suitable diameter, placed at a centre distance of 240 mm.

The extruded rubber, together with the steel profiles it is vulcanized to, makes up a water-tight system and seamlessly covers the entire width of the road bed. Water-tight capacity around the areas close to the joint is ensured by appropriate water-proof materials.

SFE 90/65



POS.	DESCRIPTION	MATERIAL
A	65x80x9 Finger “T” profile	S235JR EN 10025
B	Vulcanized rubber profile	CR 65 Sh/A CNR 10018
C	A.M. clamp Ø 16x150÷200	FeB 44K
D	Construction joint	Fibre-reinforced cement mortar
E	Gutter	Hypalon
F	“L”-shaped drainage profile	X5 CrNi 1810-UNI 8317
G	Exposy-resin mortar	
H	Road surface	

▶GP

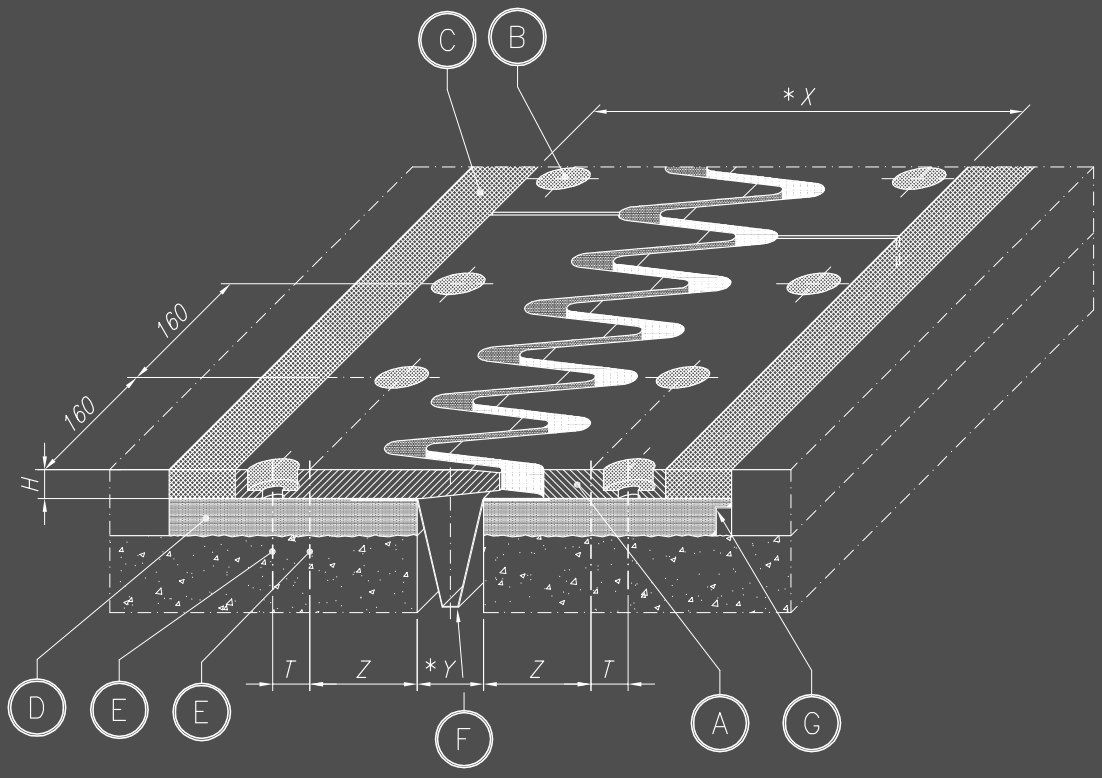
Water-proof expansion steel finger joints suitable to absorb deck displacements of up to 250 mm (+ l 25) consisting of:

- anchoring/support system made of patented anchor rods of suitable section and length;
- suitably dimensioned and shaped stainless steel gutter;
- active upper part consisting of an overhung metal finger system obtained by the processing of COR-TEN steel plates equipped with bolts, nuts, washers etc.;
- under-pavement waters drainage consisting of stainless steel “L”-shaped profile.

JOINT TYPE	TOTAL MOVEMENT (mm)	HEIGHT	WIDTH	GAP	ANCHORS		Ø ANCHORS
		H (mm)	*X (mm)	*Y (mm)	Z (mm)	T (mm)	(mm)
GP 50	50	30	400	60	80	45	M16
GP 100	100	30	470	80	105	45	M16
GP 150	150	35	545	105	130	45	M20
GP 200	200	40	620	130	155	45	M24
GP 250	250	45	820	155	180	45	M24

lenght of finger element = 480 mm
* average gap

GP



POS.	DESCRIPTION	MATERIAL
A	Finger element	S355J2WP EN 10025
B	Sealant	EPOBLOCK ME Binder
C	Transition strip	EPOBLOCK ME 3C
D	Bedding	EPOBLOCK ME 3C / Beton FIP
E	Anchors	
F	Gutter	X5 CrNi 1810-UNI 8317
G	“L”-shaped drainage profile	X5 CrNi 1810-UNI 8317

FINGER ROAD JOINTS

▶FE C

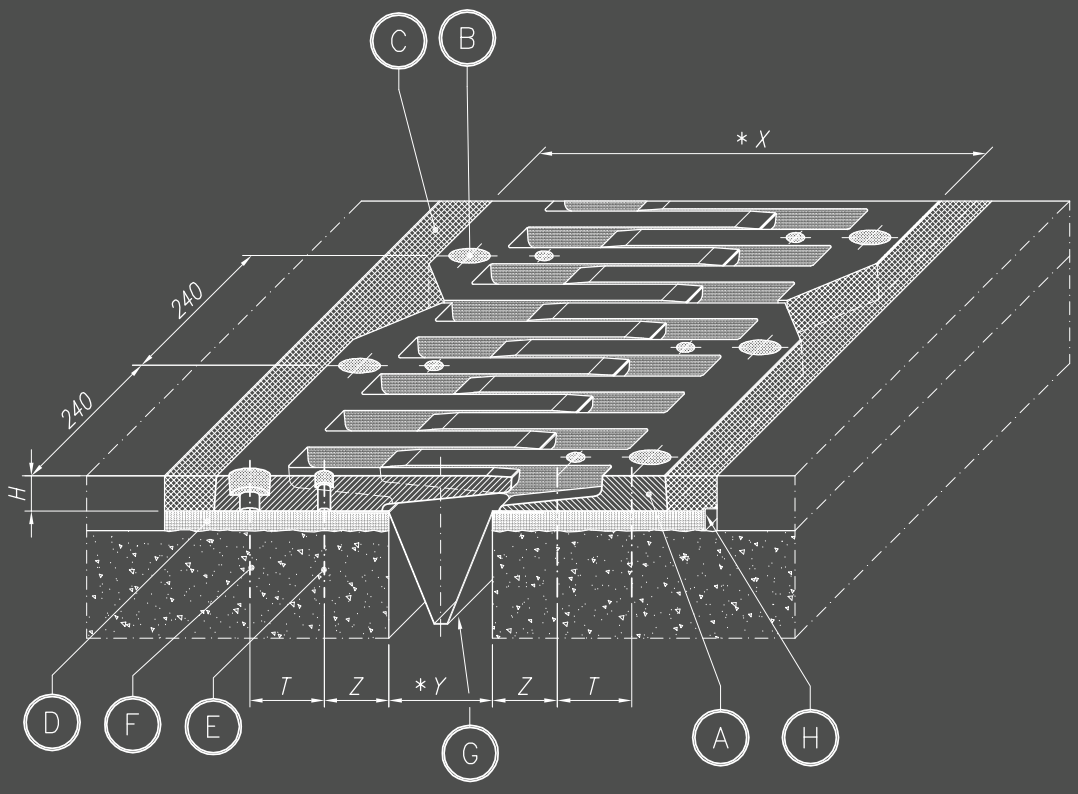
Water-proof expansion finger joints suitable to absorb decks displacements from 300 mm (± 150) to 600 mm (± 300) consisting of:

- overhung finger elements of COR-TEN steel;
- mechanical anchoring system consisting of multidirectional clamps and anchor rods;
- stainless steel gutter;
- “L”-shaped stainless steel profile for under pavement waters drainage;
- epoxy mortar strips connecting the joint elements and the bituminous pavement.

JOINT TYPE	TOTAL MOVEMENT (mm)	HEIGHT	WIDTH	GAP	ANCHORS	
		H (mm)	*X (mm)	*Y (mm)	Z (mm)	T (mm)
FE C 300	300	55	760	220	100	115
FE C 400	400	65	890	270	105	150
FE C 500	500	75	1040	320	110	195
FE C 600	600	85	1210	370	130	235
FE C 700	700	115	1310	420	145	250
FE C 800	800	120	1470	470	150	300

length of finger element = 480 mm
* average gap

FE C



POS.	DESCRIPTION	MATERIAL
A	Finger element	S355J2WP EN 10025
B	Sealant	EPOBLOCK ME Binder
C	Transition strip	EPOBLOCK ME 3C
D	Bedding	EPOBLOCK ME 3C / Beton FIP
E	M16 Anchoring system	
F	M24 Anchoring system	
G	Gutter	X5 CrNi 1810-UNI 8317
H	“L”-shaped drainage profile	X5 CrNi 1810-UNI 8317

UNDER PAVEMENT ROAD JOINTS

▶MS

This type of joint was specifically designed for highway use within structures creating horizontal movements up to 15 mm and vertical movements up to 5 mm.

Due to its characteristics, it can be fitted on any type of structure, whether it is made of reinforced concrete, prestressed concrete or steel.

It consists of:

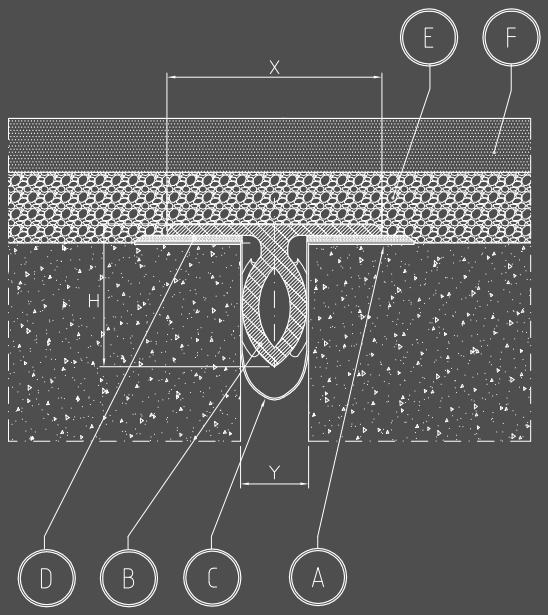
- a hypalon gutter, ending at its extremes with a mesh securing it to the slab;
- a neoprene ribbed bulb, of suitable section, resting onto its upper wings on the edges of the slab heads, recessed within the gap.

The hypalon gutter ensures watertightness of the deck and drainage of waters outside of the road bed. It is a seamless type of gutter and it covers the entire road bed with the right slope and it is fixed to the slab by means of a mesh with epoxy adhesive and primer.

The function of the neoprene bulb is to support the overhanging pavement.

JOINT TYPE	HEIGHT	WIDTH	GAP
	H (mm)	X (mm)	Y (mm)
Small bulb	43	45	Max 20
Medium bulb	77	80	Max 40
Max bulb	90	130	Max 50

MS



POS.	DESCRIPTION	MATERIAL
A	Epoxy plaster	S Fip 180
B	Bulb	"EPDM"
C	Gutter	Hypalon
D	Exposy plaster	S Fip 180
E	Binder	
F	Road surface	

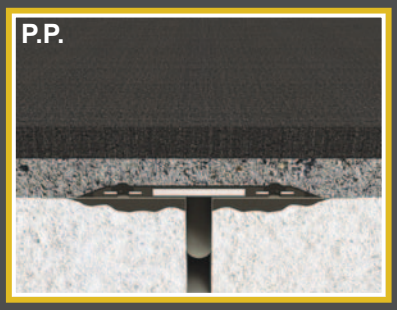
UNDER PAVEMENT ROAD JOINTS

▶P.P.

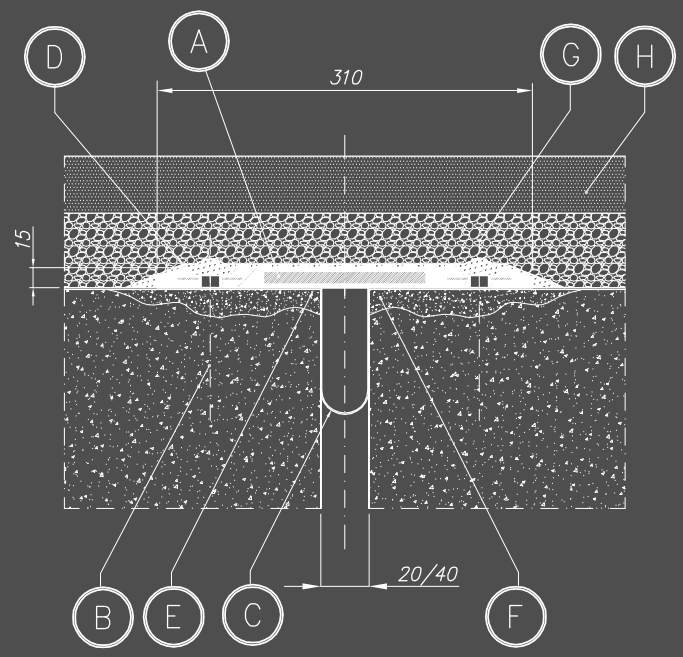
This water-proof expansion joint is suitable to absorb longitudinal and transverse displacements of the decks with span up to 25 metres and covering gaps of up to 50 mm.

It consists of:

- anchoring system consisting of steel anchor clamps (anchor rods) of suitable dimensions and section;
- CNR 10018/85-compliant reinforced rubber elements, to be fixed to the slabs, consisting of central bridging plate and two steel bearing elements, subject to prior laying of epoxy resin bedding;
- hypalon gutter, fixed to the two slab heads by epoxy plaste.



P.P.



POS.	DESCRIPTION	MATERIAL
A	Gap-covering plate	Dielectric vulcanized rubber
B	M12 Anchoring system	
C	Gutter	Hypalon
D	Pouring of modified bitumen	
E	Epoxy plaster	S Fip 180
F	Restoring of base plane	Fibre-reinforced cement mortar
G	Binder	
H	Road surface	

▶SFE 90/65 AS

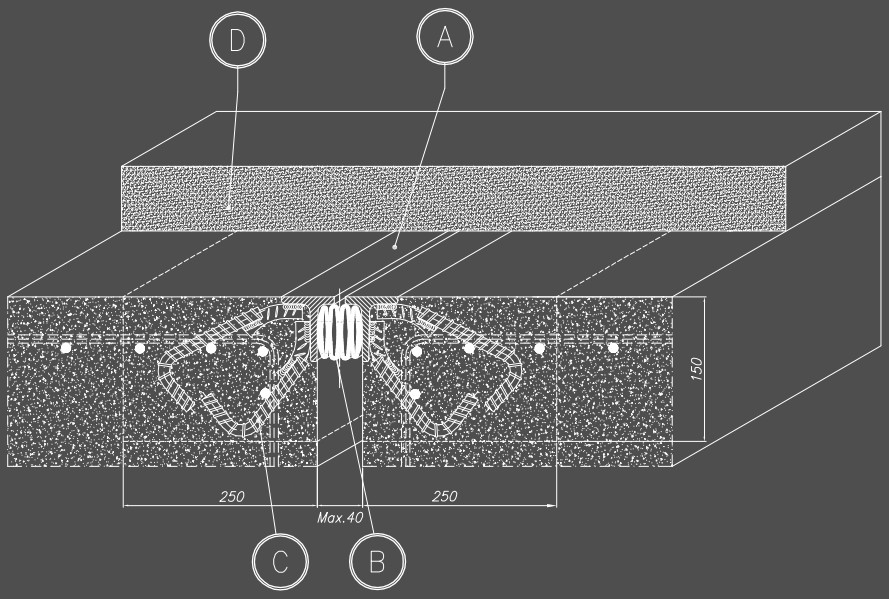
Joint 90/65 AS (levelled wings) was specifically designed for highway use within structures creating longitudinal movements of ± 15 (mm), vertical movements up to 10 mm.

It consists of an extruded rubber bellows, vulcanized to two 65x80x9 mm “T”-profiles and anchored to the slab by clamps of suitable diameter, placed at centre distance of 240 mm.

The extruded rubber, together with the steel profiles it is vulcanized to, makes up a water-tight system and seamlessly covers the entire width of the road bed.

Water-tight capacity around the areas close to the joint is ensured by appropriate water-proof materials.

SFE 90/65 AS



POS.	DESCRIPTION	MATERIAL
A	80x80x9 “T” profile	S235JR EN 10025
B	Vulcanized rubber profile	CR 65 Sh/A CNR 10018
C	A.M. clamp Ø16X15 ÷200	FeB 44K
D	Pavement	

• GUAMÀ BRIDGE - BRASIL
supply of GPE 330 S series expansion joint

BUFFER ROAD JOINTS

DESCRIPTION

They are recommended for applications on road engineering structures with span up to 20-25 metres, except for special cases. The recommended limit considers, as a precaution, impulsive vertical and rotational movements of the slab heads and relevant temperature ranges.

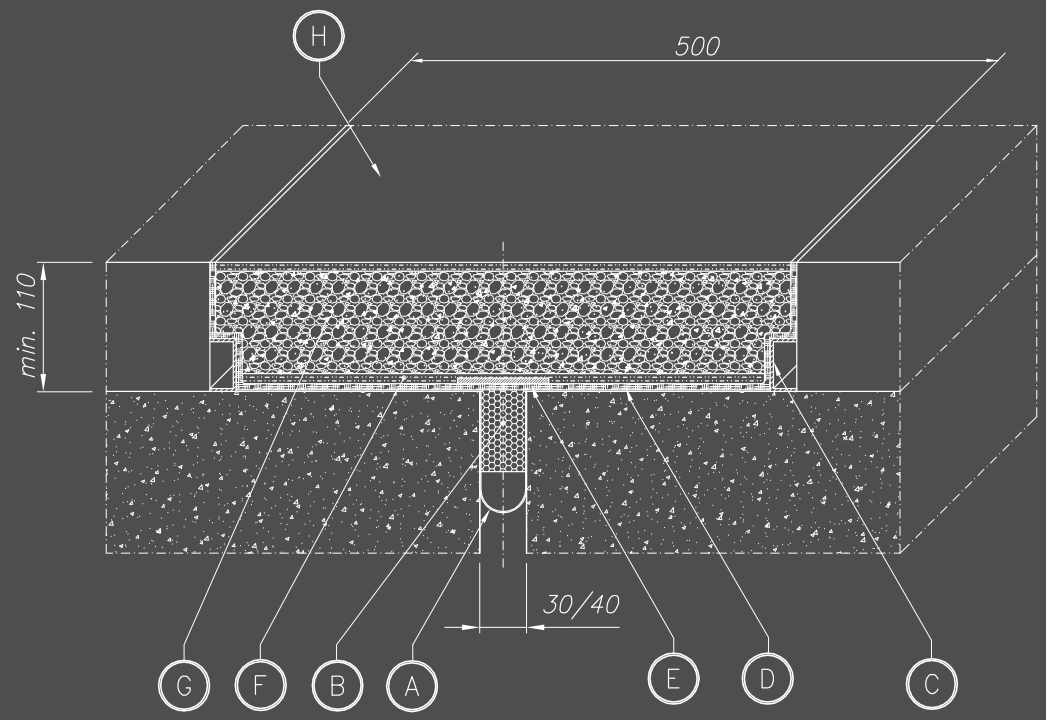
It is also approximate since mobility of slab terminals does not only depend on the span, but also on the total stiffness of the deck, its type and layout, the materials it is made of and finally the intensity of heavy traffic passing on the structure.

▶GTV (hot viscoelastic buffer joints)

These are hot viscoelastic buffer joints, with standard width of 50 cm and thickness of 11 cm. They allow for the setting up, with original **FIP Industriale** materials and subject to prior demolition and removal of the pre-existing pavement in the joint area, of:

- aluminium “C” profile for under pavement waters drainage;
- bituthene HD or elotene gutter;
- polyurethane braid hosing inserted in the gap to contain the first pouring of bitumen;
- sealing of the joint housing with modified bitumen and laying of stainless steel supporting laminate by the gap;
- pouring of one or more layers of viscoelastic buffer with a base of modified bitumen and basaltic gravel to the top of the road surface;
- finish pouring of modified bitumen with rubber granulate for the filling of any possible holes.

GTV

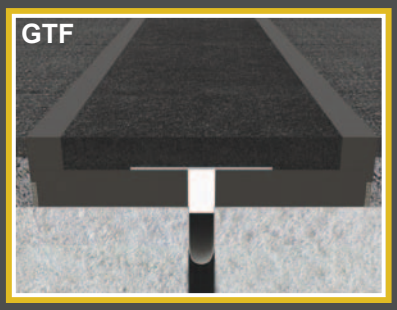


POS.	DESCRIPTION	MATERIAL
A	Gutter	Bituthene HD or Elotene
B	Preformed lift	Polyurethane
C	“C” profile waters drainage	Aluminium
D	Sealing of contact surfaces	Modified bitumen
E	Gap protection	Laminate
F	Laminate cover	Modified bitumen
G	Making of viscoelastic buffer	Bitume + Basaltic gravel
H	Finish pouring	Modified bitumen

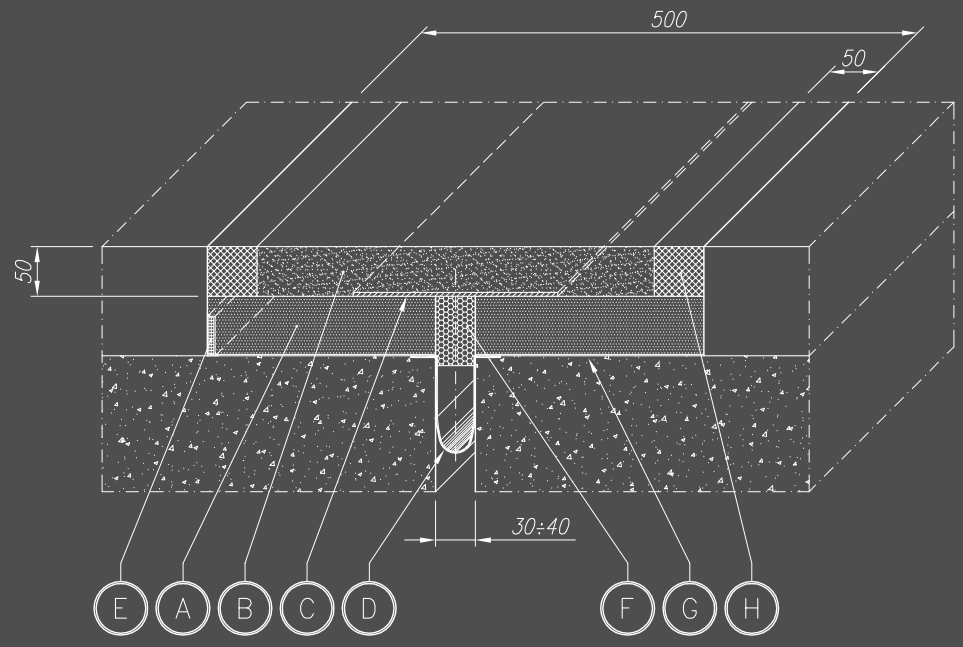
▶GTF (cold polymeric buffer joints)

These are cold polymeric buffer joints, with standard width of 50 cm and thickness of 11 cm. They allow for the setting up, with original **FIP Industriale** materials and subject to prior demolition and removal of the pre-existing pavement in the joint area, of:

- preformed drainage system (PVC + TNT) for the discharge of under pavement waters;
- hypalon gutter;
- polyurethane preformed lift;
- mortar support and connection system of elastopolymer binder and selected inerts;
- PVC disconnection element;
- sound-proof elastopolymer sliding system consisting of elastomeric resin and pre-designed rubber segments;
- pavement elastopolymer transition strip.



GTF



POS.	DESCRIPTION	MATERIAL
A	Polymer supporting system	EPOBLOCK G
B	Elasto-polymer moving system	GTF mortar
C	Disconnect element	PVC
D	Gutter	Hypalon
E	Drainage element	PVC + TNT
F	Preformed anchoring	Polyurethane
G	Anchor primer	PRIMER 150 clamp
H	Transition strip	EPOBLOCK ME 3C

• realization of GTV series joint

REINFORCED RUBBER RAILWAY JOINTS BETA

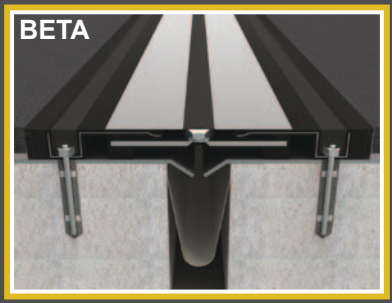
DESCRIPTION

Railway expansion joint rail with water-proof and dielectric characteristics suitable to absorb longitudinal movements of the decks from 100 to 450 mm and vertical deformations up to ± 50 mm.

This type of joint is designed to prevent the ballast penetration in the gap or in any active part of the joint. The RFI-approved series (built according to instruction 44/e) is for displacements from l 00 to 250 mm.

Consisting of:

- CNR 10018/85-compliant reinforced rubber dielectric modular pads consisting of a central bridging plate and two side elements;
- mechanical anchoring system consisting of threaded bars fixed with epoxy resin;
- stainless steel protection and sliding plates;
- hypalon gutter;
- side draining slats for under-ballast infiltration waters;
- epoxy mortar transition strip between the joint and the binder.



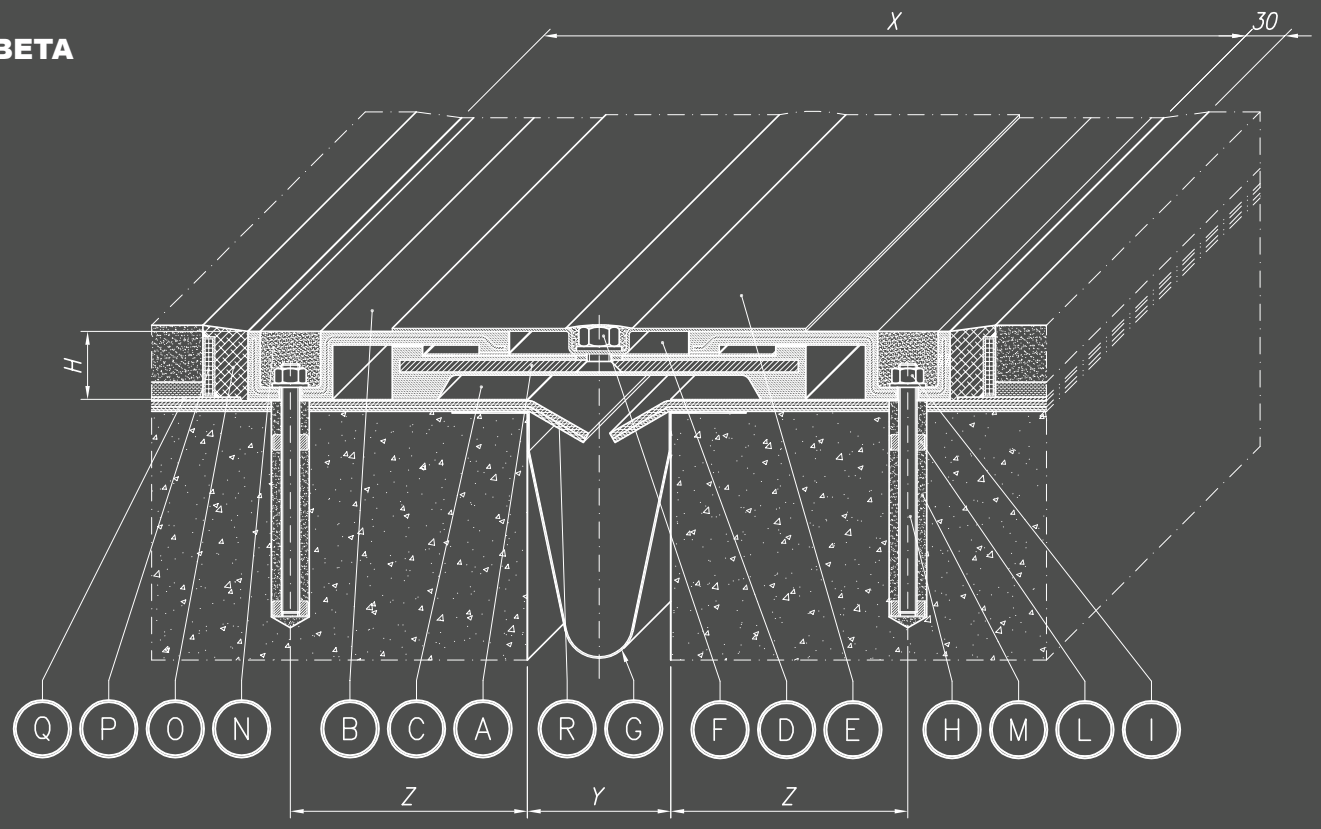
To complete the **Beta** railway joint the sidewalk and ballast joint is available, consisting of:

- reinforced dielectric rubber flange: flat for the sidewalk and shaped for the ballast joint fixed by expansion anchor rods;
- hypalon gutter.

• RAILWAY CARACAS-TUYMEDIO, VENEZUELA
supply of BETA series railway joints

JOINT TYPE	TOTAL MOVE-MENT (mm)	HEIGHT	WIDTH	GAP	ANCHORS
		H (mm)	X (mm)	Y (mm)	Z (mm)
BETA 60/100	100	46	Min. 340 - Max. 440	Min. 20 - Max. 120	132
BETA 60/150	150	46	Min. 390 - Max. 540	Min. 20 - Max. 170	157
BETA 60/200	200	51	Min. 440 - Max. 640	Min. 20 - Max. 220	182
BETA 60/250	250	52	Min. 490 - Max. 740	Min. 20 - Max. 270	207
BETA 60/300	300	62	Min. 610 - Max. 910	Min. 20 - Max. 320	260
BETA 60/450	450	66	Min. 760 – Max.1210	Min. 20 – Max. 470	335
BETA 60/600	600	81	Min. 900 – Max.1500	Min. 20 – Max. 620	410

BETA



POS.	DESCRIPTION	MATERIAL
A	Bridging plate	70±5 Sh/A - S355JR Rubber
B	Side element	70±5 Sh/A - S355JR Rubber
C	Lower sliding sheet	X5 CrNiMo 1712
D	Upper sliding sheet	X5 CrNiMo 1712
E	Cover sheet	X5 CrNiMo 1712
F	Cover sheet fixing nut	A4 - X2 CrNiMo 1712
G	Gutter	Hypalon
H	Threaded bar	A4 - X2 CrNiMo 1712
I	Threaded bar fixing nut	A4 - X2 CrNiMo 1712
L	Centering bush	Dielectric PVC
M	Grouting resin	A FIP 226 Clamp
N	Sealant	EPOBLOCK ME Granulate
O	Transition strip	EPOBLOCK ME 3C
P	Drainage slat	DUROTENE / POLIFELT
Q	Sheath protection sheet	X5 CrNiMo 1712
R	Sealing sheaths	

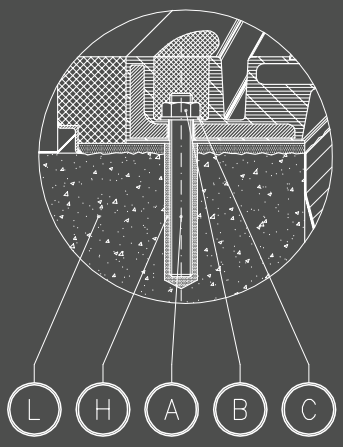
• BRIDGE OVER PO RIVER, TAV RAILWAY MILAN-BOLOGNA
installation of BETA series raliway joints

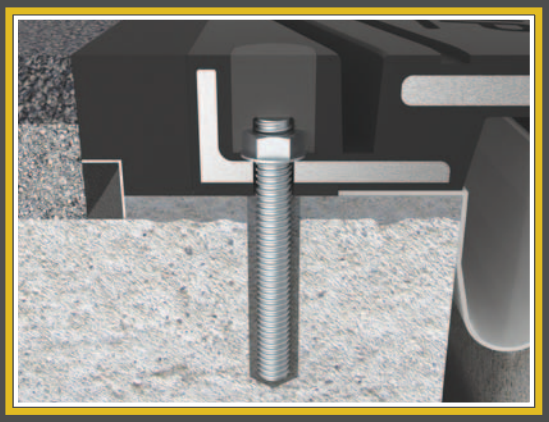
FIP INDUSTRIALE

ANCHORS

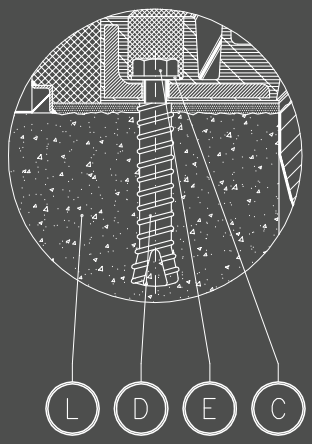
FIP Industriale joints are available with various types of anchors depending on site requirements.

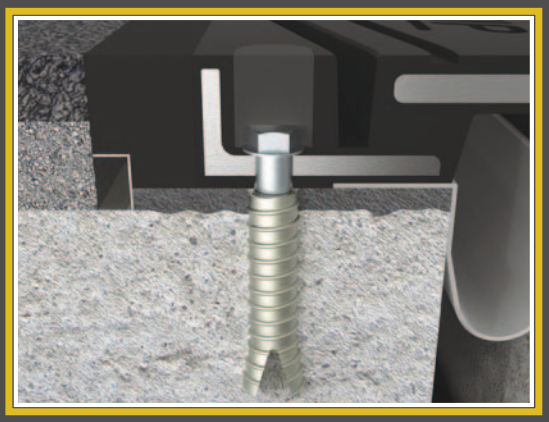
▶THREADED BAR



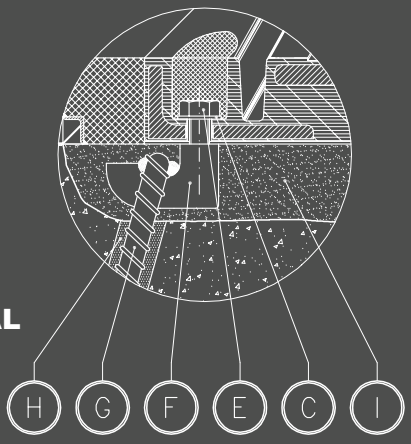


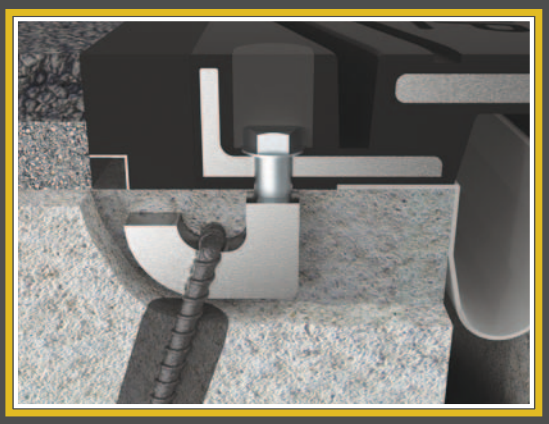
▶ENHANCED ADHESIVE CLAMP





▶MULTIDIRECTIONAL CLAMP





POS.	DESCRIPTION	MATERIAL
A	Threaded bar	Class B7 ASTM
B	UNI 5588 nut	Class 6S
C	UNI 6592 and/or slotted washer	Class 4 / C40
D	Enhanced adhesive clamp	FeB 44K
E	T.E. screw	Class 8.8
F	Multidirectional clamp	S355J2G3 EN 10025
G	A.M. hook clamp	FeB 44K
H	Grouting resin	PRIMER 150 Clamp
I	Construction joint	BetonFip FR
L	Slab head	

MAY 2013

FIP INDUSTRIALE

FIP INDUSTRIALE Spa
via Scapacchiò 41, Casella Postale 97
35030 Selvazzano (PD) • ITALY
T +39 049 8225511 • F +39 049 638567
fip@fip-group.it

FIP INDUSTRIAL UK LTD
PO BOX 504
Cambridge CB1 OAP • UK
T +44 1223 518286 • F +44 1223 518287
fip-uk@fip-group.it

fipindustriale.it