ETA-Danmark A/S
Göteborg Plads 1
DK-2150 Nordhavn
Tel. +45 72 24 59 00
Fax +45 72 24 59 04
Internet www.etadanmark.dk

Authorised and notified according to Article 29 of the Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011

European Technical Assessment ETA-17/0554 of 06/07/2017

I General Part

Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No 305/2011: ETA-Danmark A/S	
Trade name of the construction product:	Simpson Strong-Tie Joist Connectors See type numbers in section II.1 of the ETA
Product family to which the above construction product belongs:	Three-dimensional nailing plate (timber-to-timber joist connector)
Manufacturer:	SIMPSON STRONG-TIE Int. Ltd For local branch refer to www.strongtie.eu
Manufacturing plant:	SIMPSON STRONG-TIE Manufacturing facilities
This European Technical Assessment contains:	74 pages including 4 annexes which form an integral part of the document
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of:	Guideline for European Technical Approval (ETAG) No. 015 Three Dimensional Nailing Plates, April 2013, used as European Assessment Document (EAD).
This version replaces:	ETA-04/0042 issued on 2012-07-16 and expiring on 2017-07-15

Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and should be identified as such.

II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical description of product and intended use

Technical description of the product
This ETA covers the following joist connector types:
IT, ITT, MIT, LBV, B, BI, HB, ITSE, IU, IUT, IUS, MIU, HU, U, LUS, HUS, IUSE, ITB, HITB, ITBS, IUB, HIUB, IUBS, IUQ, HIUQ, IUC, THM, ZS, LIB, LITB.

Simpson Strong-Tie, IT, ITT, MIT, LBV, B, BI, HB, ITSE, LITB Top Flange Connectors are one-piece non-welded three-dimensional nailing plates, top-flange supported timber-to-timber connectors. Additionally, the connectors can be welded to a steel header. The LITB connector can also be installed on to a Timber Nailer header.

Simpson Strong-Tie IU, IUT, IUS, MIU, HU, U, IUSE and IUC, LIB Face Fix Connectors are one-piece, non-welded three-dimensional nailing plates, face-fix timber-to-timber connectors.

Simpson Strong-Tie LUS, HUS and THM Face Fix Connectors are one-piece, non-welded three-dimensional nailing plates, face-fix timber-to-timber joist to truss connectors.

Simpson Strong-Tie ITB, ITBS, HITB, HIUB and IUBS Connectors are non-welded three-dimensional nailing plates for timber-to-timber connectors, including I-joists, metal web floor trusses and solid timber joists. The ITB, HITB, IUB and HIUB Connectors are one-piece, and the ITBS and IUBS Connectors are two-piece adjustable angle joist connectors.

Simpson Strong-Tie IUQ and HIUQ Face Fix Connectors are non-welded three-dimensional nailing plates, face-fix timber-to-timber joist to SIP panel connectors.

Simpson Strong-Tie ZS Clips are non-welded three-dimensional nailing plates for use with I-joists or solid sawn timbers used as noggins between joists to support floor decks or partitions.

The timber elements are fixed together with a range of fasteners. Typical examples are shown in Annexes and typical installations shown in Annex B, Figure 1.

The connectors are made from zinc-coated steel in accordance with EN 10346:2009 (named “Steel ref 1” in the rest of the document) or ASTM A653 (named “Steel ref 2”) and stainless steel in accordance with EN 10088-2:2005 (named “Steel ref 3”), grade 1.4401 or 1.4404 with a minimum characteristic 0.2% yield stress of 240 MPa, a minimum 1.0% yield stress of 270 MPa and a minimum ultimate strength of 530 MPa, and are available in a range of sizes. Material, dimensions and nails positions are detailed in Annex D and typical installations are detailed in Annex B. By default all the products are made out of this material except when specified.

All joist connectors can also be produced from stainless steel number 1.4401, 1.4404, 1.4521, 1.4301 or 1.4509 according to EN 10088-2 or a stainless steel with a minimum characteristic 0.2% yield stress of 240 MPa, a minimum 1.0% yield stress of 270 MPa and a minimum ultimate tensile strength of 530 MPa If no name is clearly specified, product variant made with stainless steel have generally the same name with a S (as Stainless) at the end.

2 Specification of the intended use in accordance with the applicable EAD

The joist connectors are intended for use in making structural end grain to side-grain joints in timber structures, as a connection between a wood-based joist and a solid-timber or wood-based header, (type IT, ITT, MIT, LBV, B, BI, HB, ITSE can also be used with a steel header), where requirements for mechanical resistance and stability and safety in use in the sense of the Basic Works Requirements 1 and 4 of Regulation (EU) 305/2011 shall be fulfilled.

The joist connectors can be installed as connections between wood based members such as:
- Structural solid timber classified to C16-C40 according to EN 338 / EN 14081
- Glulam classified to GL24-GL36 according to EN 1194 / EN 14080
- LVL according to EN 14374
- I-beams with backer blocks on both sides of the web in the header and web stiffeners in the joist
- Plywood according to EN 636

The connectors are for use in timber structures subject to the dry, internal conditions defined by service classes 1 and 2 of EN 1995-1-1:2004 + A1:2008 (Eurocode 5) and for joints subject to static or quasi-static loading.

Annex C defines the directions of forces and also states the formulas for the characteristic load-carrying capacities of the joist connector connections. The design of the connections shall be in accordance with Eurocode 5 or a similar national Timber Code.

The joist hangers are intended for use for connections subject to static or quasi static loading.

The scope of the hangers regarding resistance to corrosion shall be defined according to national provisions that apply at the installation site considering environmental conditions and in conjunction with the admissible service conditions according to EN 1995-1-1 and the admissible corrosivity category as described and defined in EN ISO 12944-2.

The provisions made in this European Technical

Assessment are based on an assumed intended working life for the three-dimensional nailing plate 50 years.

The indications given on the working life cannot be interpreted as a guarantee given by the producer or Assessment Body, but are to be regarded only as a means for selecting the appropriate product in relation to the expected economically reasonable working life of the works.

3 Characteristics of product and assessment

Characteristic	Assessment of characteristic
3.1 Mechanical resistance and stability*) (BWR1)	
Characteristic load-carrying capacity	See Annex D
Stiffness	No performance assessed (NPA)
Ductility in cyclic testing	No performance Assessed (NPA)
3.2 Safety in case of fire (BWR2)	
Reaction to fire	The connectors are made from steel classified as Euroclass A1 in accordance with Commission Delegated Regulation 2016/364, EN 13501-1 and EC decision 96/603/EC, amended by EC Decision 2000/605/EC
3.3 Hygiene, health and the environment (BWR3)	
Influence on air quality	The product specification has been compared with the dangerous substances detailed in Council Directive 76/769/EEC (as amended) and listed on the database established on the EC construction website to verify that it does not contain such substances above the acceptable limits.
3.7 Sustainable use of natural resources (BWR7)	No performance assessed (NPA)
3.8 General aspects related to the performance of the product	The connectors have been assessed as having satisfactory durability and serviceability when used in timber structures using the timber species (including timbers preserved with organic solvent, boron diffusion and related preservatives) described in Eurocode 5 and subject to the dry, internal conditions defined by service classes 1 and 2.
Identification	Each connector bears the manufacturer's identification mark and the product type. The CE Marking appears on the packaging. See Annex D

*) See additional information in section 3.9 – 3.12.

3.9 Methods of verification

Safety principles and partial factors

The characteristic load-carrying capacities are based on the characteristic values of the nail connections and the joist connectors. To obtain design values the capacities have to be divided by different partial factors for the material properties, the nail connection in addition multiplied with the coefficient k_{mod}.

According to EN 1990 (Eurocode – Basis of design) paragraph 6.3.5 the design value of load-carrying capacity may be determined by reducing the characteristic values of the load-carrying capacity with different partial factors.

3.10 Mechanical resistance and stability

See Annex C for characteristic load-carrying capacities of the joist connectors.

The characteristic capacities of the joist connectors are determined by calculation assisted by testing or only testing as described in the EOTA Guideline 015 clause 5.1.2. They should be used for designs in accordance with Eurocode 5 or a similar national Timber Code.

The design models allow the use of fasteners described in the table in Annex C3:

The characteristic load-carrying capacities of the products shall be calculated in accordance with the manufacturer's design code, extracts of which are given in Annex C4. The design code has been derived in accordance with ETAG 015 and Eurocode 5.
The calculated values should be used for designs in accordance with Eurocode 5 or a similar national Timber Code. These values are based on the assumption that there is a maximum gap of 3 mm between the timber members, the members are laterally restrained and wane is not present in the timber at the joint.

The hangers shall be used with the fasteners specified in Annex C3.

No performance has been determined in relation to the joint's stiffness properties - to be used for the analysis of the serviceability limit state.

No performance has been determined in relation to ductility of a joint under cyclic testing. The contribution to the performance of structures in seismic zones, therefore, has not been assessed.

3.11 Aspects related to the performance of the product

3.11.1 Corrosion protection in service class 1 and 2.
In accordance with ETAG 015 the joist hanger have a zinc coating weight of min Z275. The steel employed is S250 GD with min Z275 according to EN 10346:2009.

3.11.2 Corrosion protection in service class 3.
In accordance with Eurocode 5 the joist connectors are made from stainless steel number 1.4401, 1.4404, 1.4521, 1.4301 or 1.4509 according to EN 10088-2 or a stainless steel with a minimum characteristic 0.2% yield stress of 240 MPa, a minimum 1.0% yield stress of 270 MPa and a minimum ultimate tensile strength of 530 MPa. The nails or screws shall be produced from stainless steel. Joist hangers coated with hot dip galvanisation can also be used in service class 3 according to Eurocode 5

3.12 General aspects related to the use of the product

Simpson Strong-Tie joist hangers types IT, ITT, MIT, LBV, B, BI, HB, ITSE, IU, IUT, IUS, MIU, HU, U, LUS, HUS, IUSE, ITB, HITB, ITBS, IUB, HIUB, IUBS, IUQ, HIUQ, IUC, THM, ZS, LIB, LITB are manufactured in accordance with the provisions of this European Technical Assessment using the manufacturing processes as identified in the inspection of the plant by the notified inspection body and laid down in the technical documentation.

A connector (three-dimensional nailing plate) is deemed fit for its intended use provided:

- the connector capacity is calculated in accordance with the manufacturer's literature
- joints are designed in accordance with Eurocode 5 or an appropriate national code, under the responsibility of an engineer experienced in timber structures
- verifiable calculation, notes and drawings are prepared taking account of the loads to be resisted
- the requirements detailed in part II, section 1, of this ETA, relating to the timber members being joined are taken into account, for example, lateral restraint and wane
- joints are designed for the specified fasteners and grade or type of joist and header
- the actual end bearing capacity of the joist (end grain member) to be used with the connector is checked by the designer of the joist to ensure it is not less than the connector capacity and, if necessary, a connector with a larger end bearing capacity substituted to suit. The end bearing capacity of I-joists with solid sawn timber flanges shall be based on the full connector seat bearing area and the appropriate characteristic stress perpendicular to grain for the particular grade of timber. For I-joists with LVL flanges, the joist bearing area shall be taken as 80% of the full connector seat bearing area.

The assessment of the joint has been made under the following assumptions:

- installation is in accordance with the manufacturer's
- specifications and drawings prepared for that purpose, and the appropriate tools are used
- the specified fasteners and grade or type of joist and

- header are used
- the requirements relating to the timber members being joined are taken into account, e.g.: lateral restraint and wane
- the maximum gap of 3 mm (see Annex B Figure 2)
- between the joist and the header assumed in the
- assessment is not exceeded.

4 Assessment and verification of constancy of performance (AVCP)

4.1 AVCP system

According to the decision 97/638/EC of the European Commission1, as amended, the system(s) of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) is 2+.

5 Technical details necessary for the implementation of the AVCP system, as foreseen in the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at ETA-Danmark prior to CE marking

Issued in Copenhagen on 2017-07-06 by

Thomas Bruun
Manager, ETA-Danmark

ANNEX A
REVISION HISTORY

Modifications and additions to the previous versions of ETA-04/0042	
Issue No.	**Update**
1.0	First release
2.0	Additional manufacturing plant has been added
	Addition of MIT hanger without additional face nail capability
3.0	Additional manufacturing plant has been added
	Update of end bearing capacity of joints
	Addition of footnotes to Annex 2, Tables 1 to 5
4.0	Addition of LBV, B, BI and HB hangers
	Update of end bearing capacity of joints
	Addition of footnotes to Annex 2, Tables 1 to 5
5.0	Addition of ITSE hanger
	Revision of figures in Tables accounting for amended Eurocode 5
	Addition of Annex 3
	Extension of validity
6.0	ETA-04/0042 has been amended to incorporate details of ETA-06/0034 Simpson Strong-Tie IU, IUT, IUS, MIU, HU, U, LUS, HUS, IUSE Face-Fix Hangers and ETA-08/0084 Simpson Strong-Tie ITB, HITB, ITBS, IUB, HIUB, IUBS Hangers for Joists
	Addition of ZS, IUQ, HIUQ, IUC, and MUS products
7.0	Addition of LIB and LITB hangers
	IT – Correction of characteristic uplift load capacity
	ITSE – Correction of fastener specification
	ITSE – Modification of characteristic uplift load capacity
	MIT – Correction of characteristic uplift load capacity
	IUSE – Correction of fastener specification
	HB - Correction of material thickness
	HIUB – Modification of characteristic load capacity
	ZS – Modification of connector height and width range
	ZS – Modification of capacity of connector
	IUQ – Modification of capacity connector
	IUC – Correction of nail specification
	All products – Update of the structure of connector dimensions tables
	All products – Update of the structure of connector capacity tables

ANNEX B
TYPICAL INSTALLATIONS

B1 Typical installation

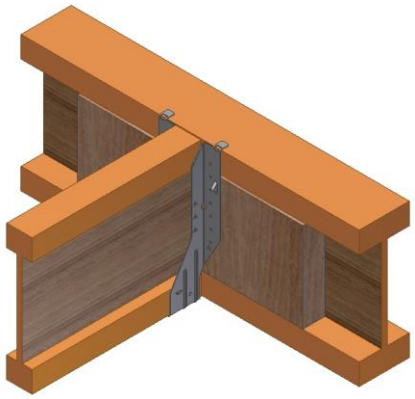


Figure B1 – Standard face fix I-joist to I-joist.

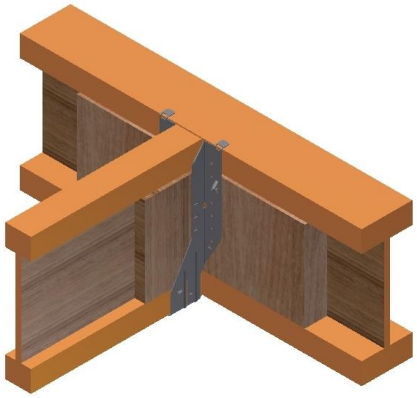


Figure B2 – Enhanced face fix I-joist to I-joist.

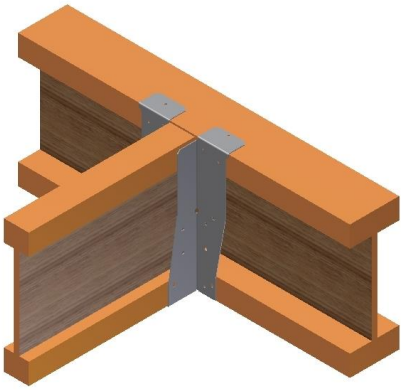


Figure B3 – Standard top fix I-joist to I-joist.

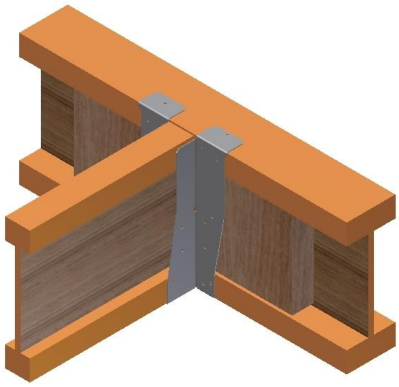


Figure B4 – Enhanced top fix I-joist to I-joist.

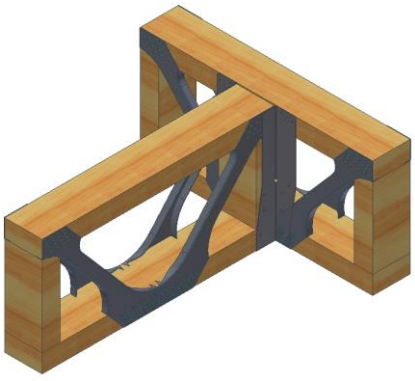


Figure B5 – Face fix metal web to metal web.

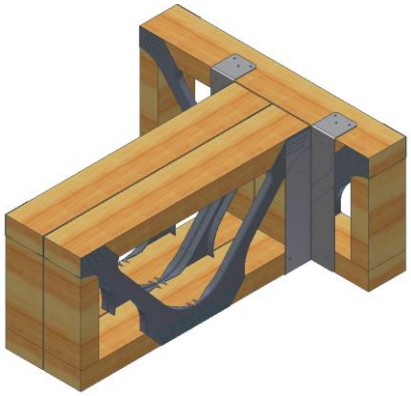


Figure B6 – Top fix metal web to metal web.

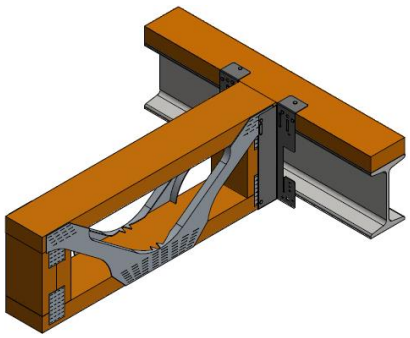


Figure B7 – Top fix metal web to timber nailer.

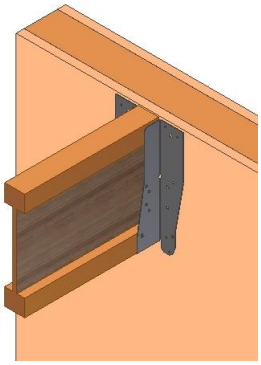


Figure B8 – Standard face fix I-joist to SIP panel.

Figure B9 – Standard ZS installation.

Above are shown all the typical installations. Any other particular installation is described in the Annex D for the specific product.

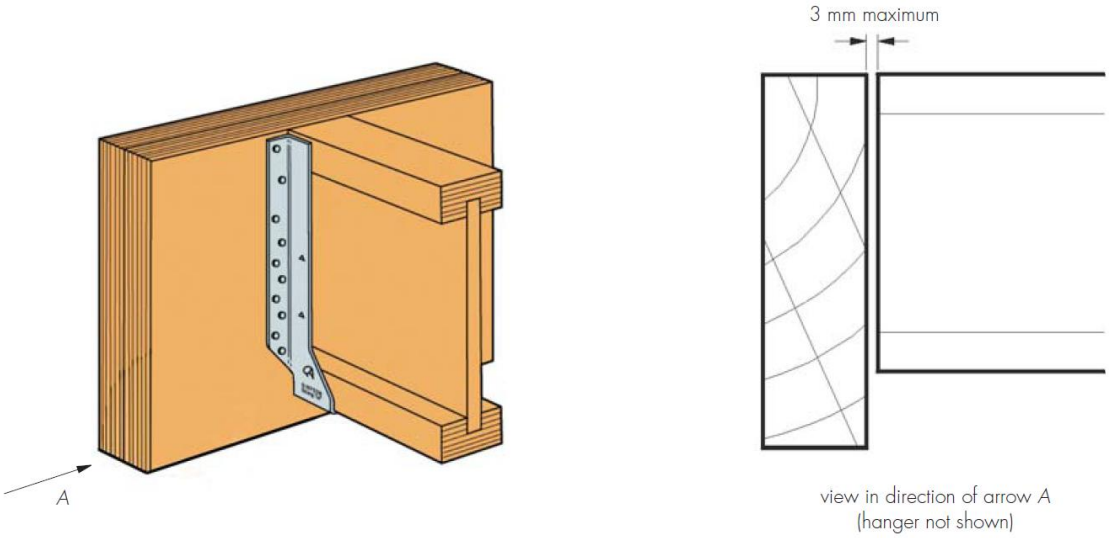


Figure B.10 – Maximum gap of 3mm between the joist and the header.

ANNEX C
BASIS OF DESIGN

C0 Symbols used in the ETA

For the purpose of this ETA, the following symbols apply.

a	Lever arm between centre of compression zone and centre of the header nails effective in tension
e	Eccentricity of loads, equals distance from centre of seat to face of header. For HU and HUS connectors the eccentricity can be reduced by calculating the minimum bearing areas D_{eff} required to achieve the joist capacity and using half this value as the eccentricity.
$F_{v,Rk,j}$	Lateral load-carrying capacity of the side/joist nails (N)
$F_{v,Rk,h}$	Lateral load-carrying capacity of the header nails (N)
$F_{ax,Rk,h}$	Axial load-carrying capacity of the header nails (N)
f_u	Tensile strength of hanger steel (N/mm^2)
n	Factor dependent on nail type: ▪ n = 2 for ring shank nails (CNA) ▪ n = 100 for smooth (plain or square twisted nails)
n_j	Number of effective joist nails
n_h	Number of effective header nails
ρ_k	Characteristic density of header or joist material (kg/m^3)
t	Thickness of side flanges (mm)
S	Minimum width of connector side flanges (mm)

C1 Definition of Force Directions

To determine the characteristic capacities for the timber-to-timber connectors, the load has been applied in F_1 and F_2 directions as shown in Figure C.1.

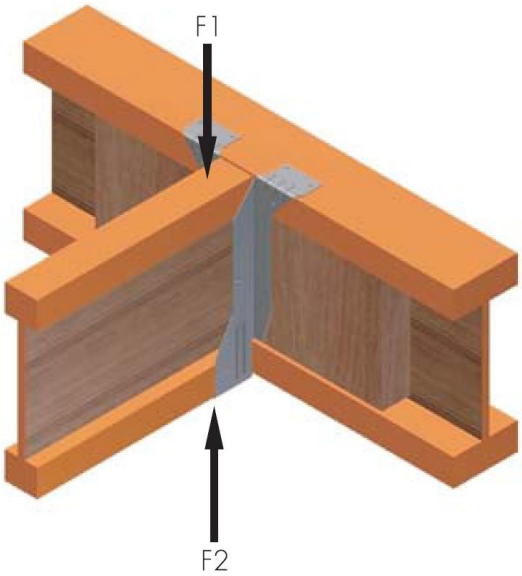


Figure C.1 – Definition of force directions.

C3 Fastener Specification and Capacities

Fastener types and sizes

CNA connector nails and CSA connector screws according to ETA-04/0013.

Nail type	Nail size (mm)		Finish / Material
According to ETA-04/0013 annex A drawing 1 and 2	Diameter	Length	
CNA Connector nail	3.7	50	Electroplated zinc
CNA Connector nail	4.0	35	Electroplated zinc
CNA Connector nail	4.0	40	Electroplated zinc
CNA Connector nail	4.0	50	Electroplated zinc
CNA Connector nail	4.2	35	Electroplated zinc
CNA Connector nail	4.2	50	Electroplated zinc
CNA Connector nail	4.0	40	Stainless steel
CNA Connector nail	4.0	50	Stainless steel
CNA Connector nail	4.0	60	Stainless steel
CSA Connector screw	4.0	30	Electroplated zinc
CSA Connector screw	5.0	50	Electroplated zinc

Other fasteners according to EN 14592.

Fasteners According to EN 14592	Nail size (mm)		Finish / Material
	Diameter	Length	
Annular ring shank nail	3.7	40	Electroplated zinc
Square Twist nail	3.75	30	Hot-dip galvanized/ Sheradized/ Electroplated
Smooth shank nail	3.75	75	Hot-dip galvanized
Round Wire nail	4.0	100	Hot-dip galvanized
SDS coach screw	6.2	63	Stainless steel

Typical Connector and Fastener Type Combinations

Connector type	Type	Fastener diameter (mm)	Length Min – Max (mm)	Finish	Nailing
IT, ITT	ST(1)	3.75	30	Hot-dip galvanized- Sheradized – Electroplated zinc	Standard and enhanced
	SR(2)	3.80	38	Hot-dip galvanized	
	SR(2)	3.75	75	Hot-dip galvanized	
	ARS(3)	3.70 – 4.0	50	Electroplated zinc	
ITSE	ST(1)	3.75	30	Hot-dip galvanized- Sheradized – Electroplated zinc	Standard and enhanced
	SR(2)	3.75	75	Hot-dip galvanized	
	ARS(3)	3.70	50	Hot-dip galvanized	
	ARS(3)	4.0	40-50	Electroplated zinc	
MIT, LBV, B, BI, HB	ST(1)	3.75	30	Hot-dip galvanized- Sheradized – Electroplated zinc	Standard
	SR(2)	3.80	38	Hot-dip galvanized	
	SR(2)	3.75	75	Hot-dip galvanized	
	SR(2)	4.0	100	Hot-dip galvanized	
	ARS(3)	3.70	50	Electroplated zinc	
	ARS(3)	4.0	50	Electroplated zinc	
IU, IUT, IUS, MIU, HU, U, LUS, HUS	ST(1)	3.75	30	Hot-dip galvanized- Sheradized – Electroplated zinc	Standard
IU, IUT, IUS, MIU, HU, U, LUS, HUS IUSE	SR(2)	3.80	38	Hot-dip galvanized	Standard Standard
	SR(2)	3.70	50	Hot-dip galvanized	
	SR(2)	3.75	75	Hot-dip galvanized	
	SR(2)	4.0	100	Hot-dip galvanized	
	ARS(3)	3.70	40-50	Electroplated zinc	
	ARS(3)	4.0	35-50	Electroplated zinc	
	ARS(3)	4.0	40-60	Stainless steel	
	ARS(3)	4.2	35-50	Electroplated zinc	
	ST(1)	3.75	30	Hot-dip galvanized- Sheradized – Electroplated zinc	
IUSE ITB, ITBS	SR(2)	3.75	75	Hot-dip galvanized	Standard Standard and enhanced
	ARS(3)	3.70	50	Electroplated zinc	
	ARS(3)	4.0	40-50	Electroplated zinc - Stainless steel	
	CSA(4)	4.0	30	Electroplated zinc	
	ST(1)	3.75	30	Hot-dip galvanized- Sheradized – Electroplated zinc	
HITB, HIUB, ZS, IUC	ST(1)	3.75	30	Hot-dip galvanized- Sheradized – Electroplated zinc	Standard
IUB, IUBS, LIB	ST(1)	3.75	30	Hot-dip galvanized- Sheradized – Electroplated zinc	Standard and enhanced
IUB, IUBS, LIB IUQ, HIUQ	SDS(5)	6.2	63	Electroplated	Standard and enhanced
	ST(1)	3.75	30	Hot-dip galvanized- Sheradized – Electroplated zinc	
IUQ	CSA(4)	5.0	50	Electroplated zinc	Standard
HIUQ LITB	SDS(5)	6.2	63	Electroplated	Standard and Enhanced
	SS(6)	3.75	75	Hot-dip galvanized	
LITB THM	ST(1)	3.75	30	Hot-dip galvanized- Sheradized – Electroplated zinc	Standard and Enhanced Standard and double shear
	SS(6)	3.75	75	Hot-dip galvanized	
THM	ST(1)	3.75	30	Hot-dip galvanized- Sheradized – Electroplated zinc	Standard and double shear
	SDS(5)	6.2	63	Electroplated	

(1)Square Twist nail
(2)Round Wire nail
(3)Annular Ring Shank nail
(4)Connector screw
(5)SDS Coach screw
(6)Smooth Shank nail

Nail Capacity Tables

Capacities of 3.75 x 30 mm Square Twist Nails

Nail Reference	Nail Shape	Side Length or Diameter (mm)	Nail Length (mm)	Wire Tensile Strength (mm)	Plate Thickness (mm)	Timber Grade	Timber Char. Density (kg/m^3)	$F_{ax,Rk}$ (N)	$F_{v,Rk}$ (N)
3.75 x 30 ST	Square	3.40	30	600	1.2	C16	310	188	899
						C18	320	201	925
						C20	330	213	951
						C22	340	226	978
						C24	350	240	1004
						C27	370	268	1057
						C30	380	283	1083
						SCL	480	451	1353
3.75 x 30 ST	Square	3.40	30	600	1.5	C16	310	186	893
						C18	320	198	919
						C20	330	211	945
						C22	340	224	970
						C24	350	237	996
						C27	370	265	1049
						C30	380	280	1075
						SCL	480	447	1342
3.75 x 30 ST	Square	3.40	30	600	2.0	C16	310	183	882
						C18	320	195	908
						C20	330	207	933
						C22	340	220	959
						C24	350	233	984
						C27	370	261	1035
						C30	380	275	1061
						SCL	480	439	1324

Capacities of Round Wire Nails

Nail Reference	Nail Shape	Side Length or Diameter (mm)	Nail Length (mm)	Wire Tensile Strength (mm)	Plate Thickness (mm)	Timber Grade	Timber Char. Density (kg/m^3)	$F_{ax,Rk}$ (N)	$F_{v,Rk}$ (N)
3.8 x 38 SR	Round	3.80	38	600	1.2	C16	310	269	1145
						C18	320	286	1180
						C20	330	305	1216
						C22	340	323	1251
						C24	350	343	1280
						C27	370	383	1337
						C30	380	404	1365
						SCL	480	644	1653
3.75 x 75 SR	Round	3.75	75	600	1.2	C16	310	532	1309
						C18	320	567	1336
						C20	330	603	1364
						C22	340	640	1391
						C24	350	678	1419
						C27	370	758	1474
						C30	380	799	1502
						SCL	480	1275	1782
4.0 x 100 SR	Round	4.00	100	600	1.2	C16	310	760	1498
						C18	320	809	1531
						C20	330	861	1565
						C22	340	914	1598
						C24	350	968	1632
						C27	370	1082	1699
						C30	380	1141	1733
						SCL	480	1821	2083
3.8 x 38 SR	Round	3.80	38	600	1.5	C16	310	267	1137
						C18	320	284	1172
						C20	330	302	1208
						C22	340	321	1244
						C24	350	340	1275
						C27	370	380	1332
						C30	380	401	1360
						SCL	480	639	1647
3.75 x 75 SR	Round	3.75	75	600	1.5	C16	310	530	1308
						C18	320	564	1336
						C20	330	600	1363
						C22	340	637	1391
						C24	350	675	1418
						C27	370	755	1473
						C30	380	796	1501
						SCL	480	1270	1781

Capacities of Round Wire Nails (continued)

Nail Reference	Nail Shape	Side Length or Diameter (mm)	Nail Length (mm)	Wire Tensile Strength (mm)	Plate Thickness (mm)	Timber Grade	Timber Char. Density (kg/m^3)	$F_{ax,Rk}$ (N)	$F_{v,Rk}$ (N)
4.0 x 100 SR	Round	4.00	100	600	1.5	C16	310	757	1497
						C18	320	807	1531
						C20	330	858	1564
						C22	340	911	1597
						C24	350	965	1631
						C27	370	1079	1699
						C30	380	1138	1733
						SCL	480	1816	2081
3.8 x 38 SR	Round	3.80	38	600	2.0	C16	310	263	1124
						C18	320	280	1159
						C20	330	298	1194
						C22	340	316	1230
						C24	350	335	1265
						C27	370	375	1324
						C30	380	395	1352
						SCL	480	630	1635
3.75 x 75 SR	Round	3.75	75	600	2.0	C16	310	526	1307
						C18	320	561	1335
						C20	330	596	1362
						C22	340	633	1390
						C24	350	671	1417
						C27	370	750	1472
						C30	380	791	1499
						SCL	480	1261	1778
4.0 x 100 SR	Round	4.00	100	600	2.0	C16	310	753	1496
						C18	320	803	1530
						C20	330	854	1563
						C22	340	906	1596
						C24	350	960	1630
						C27	370	1073	1697
						C30	380	1132	1731
						SCL	480	1806	2079

C4 Design Formula where appropriate

Nail capacities
The nail capacities are calculated as follows, and have been validated against connector test data:

- smooth nails (plain or square twisted) — as specified in relevant tables given in Annex C3. These may have an efficiency factor applied as part of the design method validation and are only for use in conjunction with the connectors described in this ETA.
- CNA ring-shank nails — calculated as described in ETA-04/0013
- other ring-shank nails — calculated as described in Eurocode 5.

Top fix connectors (Design Model and performance tables)
The characteristic load-carrying capacities for the IT, ITT, MIT, LBV, B, BI, HB and ITSE connectors are given in the tables in Annex D which have been derived in accordance with ETAG 015:2002. They should be used for designs in accordance with Eurocode 5.

These values are based on the assumption that there is a maximum gap of 3 mm between the timber members, the members are laterally restrained and wane is not present in the timber at the joint. Capacities for intermediate widths can be interpolated. Connector capacity is independent of the connector height.

The connectors shall only be used with the fasteners specified in the relevant table in Annex C. The performance of the fasteners have been determined in accordance with either ETA04/0013 or Eurocode 5 (see also Annex D), using an ultimate tensile strength for the wire used for the production of the nails of 600 MPa.

Face fix connector (Design model and listed variables)
The design method used to determine the characteristic load-carrying capacities for the connectors has been validated by the 'calculation assisted by testing' method as defined in ETAG 015 and is detailed in the technical report entitled 'Approval for IU, IUT, IUS, MIU, HU, U, LUS, HUS and IUSE', which has been substantiated by ETA Danmark as part of the ETA approval process.

Summary of design model, to be used in conjunction with the values listed in Annex D:

Design — Vertical down load capacity (F_1)

The load is transferred from the supported member to the supporting member by:

1. Tension in the lower part of the connector.
2. Load transfer from the connector to the supporting member.

The capacity of the system is the minimum of the above two mechanisms.

Capacity = Min. (F_t, F_h)

Tension in the lower part of the connector (F_t):

$$F_t = 2 \cdot S \cdot t \cdot f_u$$

Load transfer from the connector to the supporting member (F_h):

$$F_h = \left[1/\left[\left(\frac{1}{n_h \cdot F_{v,Rk,h}} \right)^n + \left(\frac{e}{a \cdot n_h \cdot F_{ax,Rk,h}} \right)^n \right] \right]^{1/n}$$

Design — Vertical up load capacity (F_2)

$$F_{uplift} = \min\left\{n_j \cdot F_{v,Rk,j};\ n_h \cdot F_{v,Rk,h}\right\}$$

The connectors shall only be used with the fasteners specified in the relevant table in Annex D. The performance of the fasteners have been determined in accordance with either ETA04/0013 or Eurocode 5 (see also Annex C), using an ultimate tensile strength for the wire used for the production of the nails of 600 MPa.

Other hangers determined by test method (performance tables)
The characteristic load-carrying capacities for the connectors IUQ, HIUQ, IUC, IUBS, THM, ZS, IUB, HIUB, ITBS, ITB and HITB LIB, LITB are given in the tables in Annex D which have been derived in accordance with 'Test Only' method in accordance with ETAG 015:2002. They should be used for designs in accordance with Eurocode 5.

These values are based on the assumption that there is a maximum gap of 3 mm between the timber members, the members are laterally restrained and wane is not present in the timber at the joint. Capacities for intermediate widths can be interpolated. Connector capacity is independent of the connector height.

The connectors shall only be used with the fasteners specified in the relevant table in Annex C3. The performance of the fasteners have been determined in accordance with either ETA04/0013 or Eurocode 5 (see also Annex 4), using an ultimate tensile strength for the wire used for the production of the nails of 600 MPa.

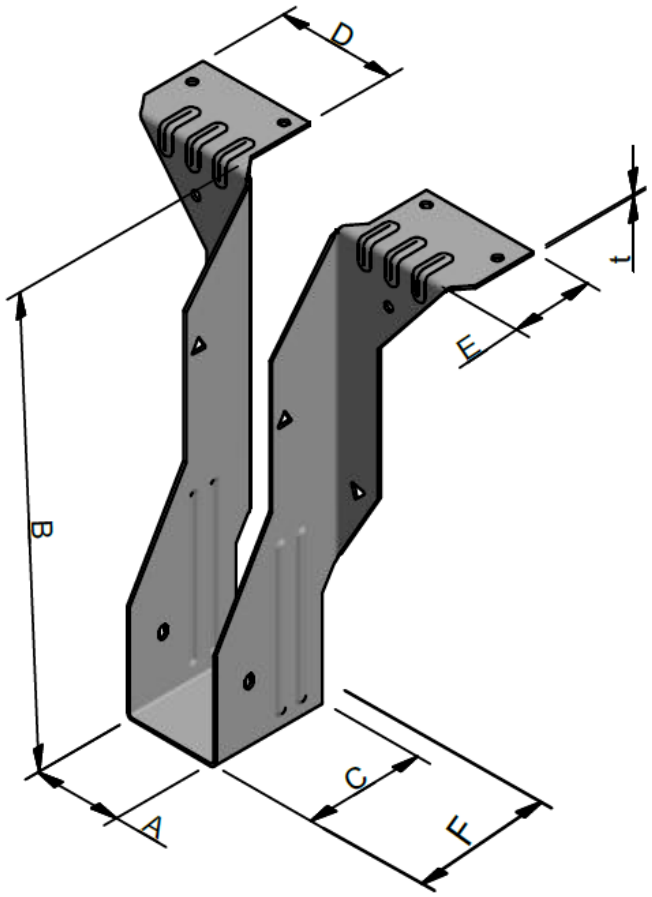
ANNEX D
PRODUCT DEFINITION AND CAPACITIES

D1 Connector type IT

Product Name	Material reference acc. to clause II-1	Alternative Names
IT	Steel ref 1	-

Product dimensions

Item	Product dimensions [mm]									Header holes			Joist holes	
	A		B		C	D	E	F	t	Top	Face		Pan hole 6x4	Triangular inside Ø4
	Min	Max	Min	Max						Ø4	Ø4	Triangular inside Ø4		
IT	40	91	140	600	51	51	35	59	1.2	4	2	2	2	2



Product capacities – standard installation

Item	Fasteners			Characteristic capacities [kN] – Timber C24						
	Header		Joist	$R_{1,k}$					$R_{2,k}$	
	Top	Face		3,75x30 ST	3,80x38 SR	3,75x75 SR	CNA3,70x50	CNA4,0x50	3,75x30 ST	3,80x38 SR
IT(B)/(A)	4	2	2	6.5	8.0	8.7	11.5	12.5	1.8	2.3

Product capacities – enhanced installation

Item	Fasteners			Characteristic capacities [kN] - Timber C24						
	Header		Joist	$R_{1,k}$					$R_{2,k}$	
	Top	Face		3,75x30 ST	3,80x38 SR	3,75x75 SR	CNA3,70x50	CNA4,0x50	3,75x30 ST	3,80x38 SR
IT(B)/(A)	4	4(1)	2	8.0	10.2	11.1	15.0	16.4	1.8	2.3

(1) Additional face nails in triangular holes.

Notes on standard and enhanced installation:

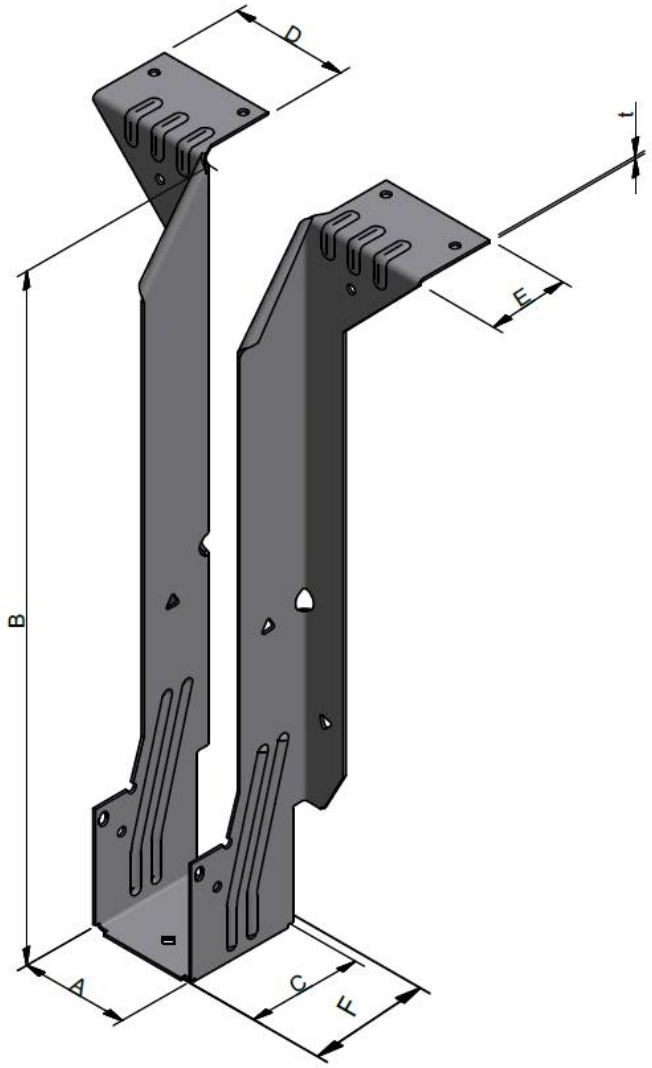
- Web stiffeners are to be fitted in accordance with the I-Joist manufacturer's recommendations – for enhanced installation only.
- When I-joists with solid timber flanges are used as headers, the capacity of the Connector is the same as the capacity when connected to a solid timber header of the same grade as the I-joist flanges.
- Connectors can only be used on I-joist headers in conjunction with Type ST 3.75 x 30 and SR 3.8 x 38 nails.
- The values in the tables are Connector capacities and do not take account of the joist (end grain member) capacity which shall be checked by the joist designer.

D2 Connector type ITT

Product Name	Material reference acc. to clause II-1	Alternative Names
ITT	Steel ref 1 – Steel ref 2	-

Product dimensions

Item	Product dimensions [mm]									Header holes			Joist holes	
	A		B		C	D	E	F	t	Top	Face		Ø4x5,5	Triangular inside Ø4
	Min	Max	Min	Max						Ø4	Ø4	Triangular inside Ø4		
ITT	40	91	140	600	51	51	35	58	1.2	4	2	2	2	2



Product capacities – standard installation

Item	Fasteners			Characteristic capacities [kN] – Timber C24						
	Header		Joist	$R_{1,k}$					$R_{2,k}$	
	Top	Face		3,75x30 ST	3,80x38 SR	3,75x75 SR	CNA3,70x50	CNA4,0x50	3,75x30 ST	3,80x38 SR
ITT(B)/(A)	4	2	2	6.6	8.1	8.8	11.6	12.6	1.0	1.0

Product capacities – enhanced installation

Item	Fasteners			Characteristic capacities [kN] - Timber C24						
	Header		Joist	$R_{1,k}$					$R_{2,k}$	
	Top	Face		3,75x30 ST	3,80x38 SR	3,75x75 SR	CNA3,70x50	CNA4,0x50	3,75x30 ST	3,80x38 SR
ITT(B)/(A)	4	4(1)	2	8.2	10.3	11.2	15.1	16.5	1.0	1.0

(1) Additional face nails in triangular holes.

Notes on standard and enhanced installation:

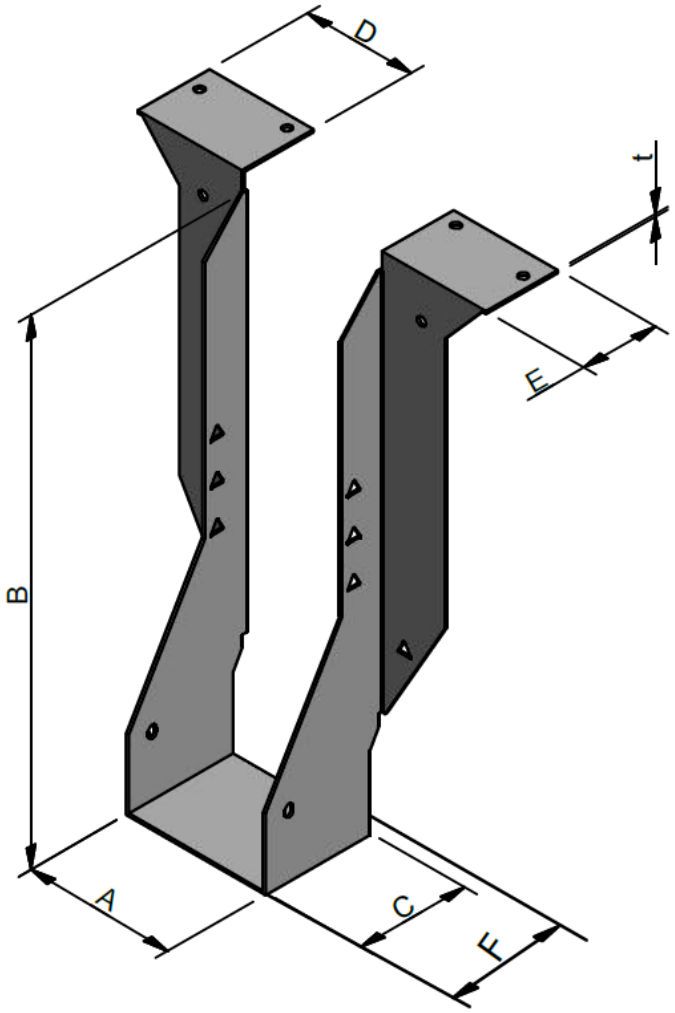
- Web stiffeners are to be fitted in accordance with the I-Joist manufacturer's recommendations – for enhanced installation only.
- When I-joists with solid timber flanges are used as headers, the capacity of the Connector is the same as the capacity when connected to a solid timber header of the same grade as the I-joist flanges.
- Connectors can only be used on I-joist headers in conjunction with Type ST 3.75 x 30 and SR 3.8 x 38 nails.
- The values in the tables are Connector capacities and do not take account of the joist (end grain member) capacity which shall be checked by the joist designer.

D3 Connector type ITSE

Product Name	Material reference acc. to clause II-1	Alternative Names
ITSE	Steel ref 1	-

Product dimensions

Item	Product dimensions [mm]									Header holes			Joist holes	
	A		B		C	D	E	F	t	Top	Face		Ø4x6	Triangular inside Ø4.1
	Min	Max	Min	Max						Ø4	Ø4	Triangular inside Ø4.1		
ITSE	40	100	140	600	51	51	34	58	1.2	4	2	2	2	6



Product capacities – standard installation

Item	Fasteners			Characteristic capacities [kN] – Timber C24						
	Header		Joist	$R_{1,k}$					$R_{2,k}$	
	Top	Face		3,75x30 ST	3,80x38 SR	CNA3,75x50	CNA4,00x40	CNA4,0x50	3,75x30 ST	3,80x38 SR
ITSE(B)/(A)	4	2	2	6.6	8.8	12.8	8.7	10.2	1.8	2.3
ITSE(B)/(A)	4	2	8	6.6	8.8	12.8	8.7	10.2	7.2	9.2

Product capacities – enhanced installation

Item	Fasteners			Characteristic capacities [kN] - Timber C24						
	Header		Joist	$R_{1,k}$					$R_{2,k}$	
	Top	Face		3,75x30 ST	3,80x38 SR	3,75x75 SR	CNA3,70x50	CNA4,0x50	3,75x30 ST	3,80x38 SR
ITSE(B)/(A)	4	4(1)	2	8.2	11.2	16.8	11.0	13.2	1.8	2.3
ITSE(B)/(A)	4	4(1)	8	8.2	11.2	16.8	11.0	13.2	7.2	9.2

(1) Additional face nails in triangular holes.

Notes on standard and enhanced installation:

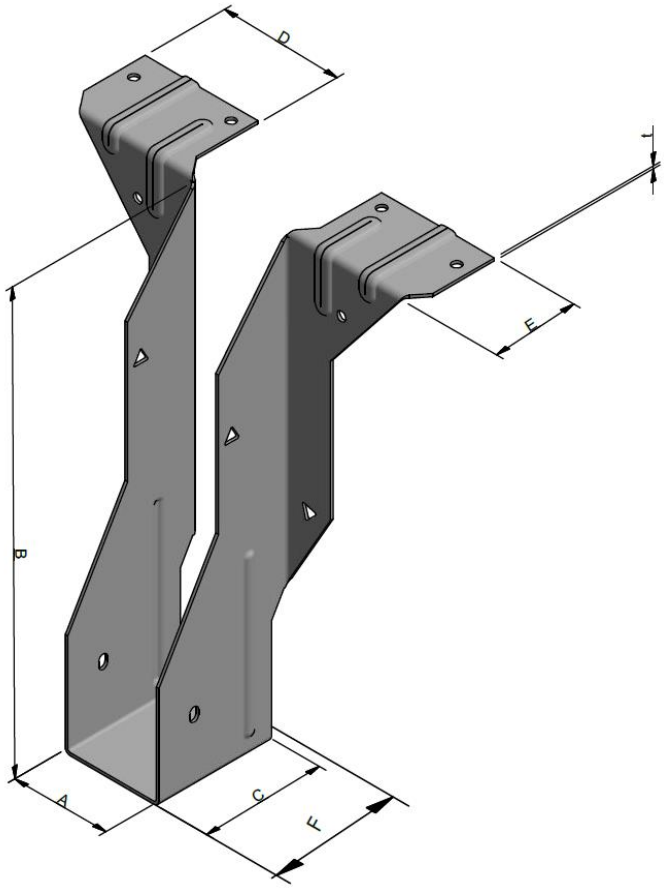
- Web stiffeners are to be fitted in accordance with the I-Joist manufacturer's recommendations – for enhanced installation only.
- When I-joists with solid timber flanges are used as headers, the capacity of the Connector is the same as the capacity when connected to a solid timber header of the same grade as the I-joist flanges.
- Connectors can only be used on I-joist headers in conjunction with Type ST 3.75 x 30 and SR 3.8 x 38 nails.
- ITSE Connectors can be used without joist nails, but uplift loads cannot be applied.

D4 Connector type MIT

Product Name	Material reference acc. to clause II-1	Alternative Names
MIT	Steel ref 2	-

Product dimensions

Item	Product dimensions [mm]									Header holes		Joist holes	
	A		B		C	D	E	F	t	Top	Face	Ø4x6	Triangular inside Ø4
	Min	Max	Min	Max						Ø4	Ø4		
MIT	40	125	140	600	63.5	64	59	70	1.5	4	4	2	2



Product capacities

Item	Fasteners			Characteristic capacities [kN] – Timber C24							
	Header		Joist	$R_{1,k}$						$R_{2,k}$	
	Top	Face		3,75x30 ST	3,80x38 SR	3,75x75 SR	4,00x90 SR	CNA3,70x50	CNA4,0x50	3,75x30 ST	3,80x38 SR
MIT(B)/(A)	4	2	2	8.5	10.0	10.8	11.6	13.6	14.6	1.8	2.3

Notes:

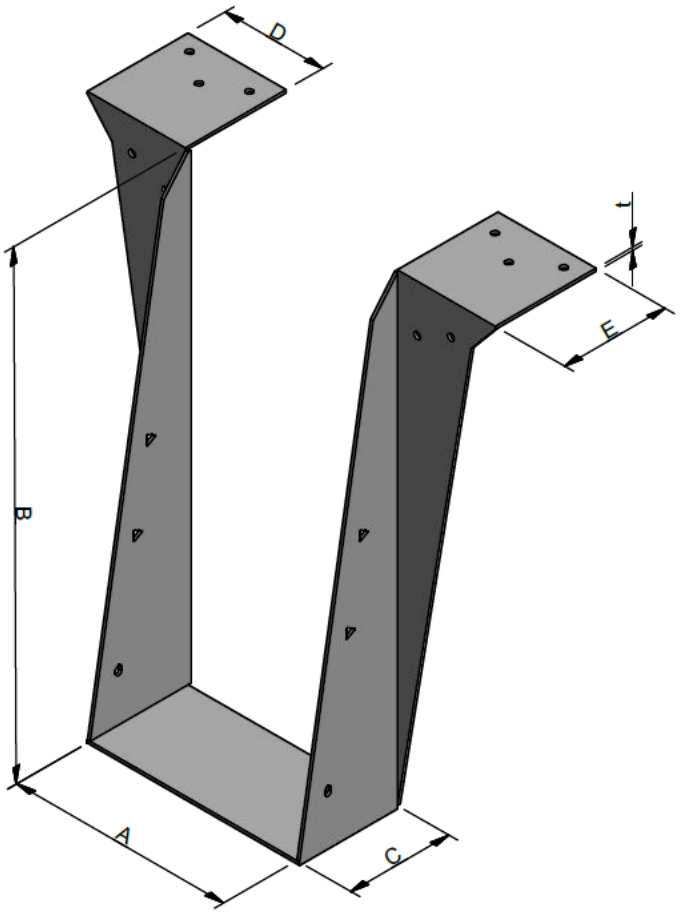
- Web stiffeners are to be fitted in accordance with the I-Joist manufacturer's recommendations – for enhanced installation only.
- When I-joists with solid timber flanges are used as headers, the capacity of the Connector is the same as the capacity when connected to a solid timber header of the same grade as the I-joist flanges.
- Connectors can only be used on I-joist headers in conjunction with Type ST 3.75 x 30 and SR 3.8 x 38 nails.
- The values in the tables are Connector capacities and do not take account of the joist (end grain member) capacity which shall be checked by the joist designer.

D5 Connector type LBV, B, BI and HB

Product Name	Material reference acc. to clause II-1	Alternative Names
LBV, B, BI, HB	Steel ref 1 - Steel ref 2	-

Product dimensions

Item	Product dimensions [mm]										Header holes				Joist holes			
	A		B		C		D		E	t	Top		Face					
	Min	Max	Min	Max	Min	Max	Min	Max			Ø4.3	Ø4.1	Ø4.3	Ø4.1	Pan hole 4.4x6.4	Triangular inside Ø4.3	Ø3.8	Ø4.3
LBV	38	125	140	450	64	76	64	76	64	2	6	-	4	-	2	4	-	-
B	40	190	130	450	64	89	64	89	64	2.5	-	6	-	8	-	-	6	-
BI	40	190	130	450	51	89	64	89	64	2.5	-	6	-	8	-	-	6	-
HB	40	225	90	450	89	127	89	127	89	3	6	-	16	-	-	-	-	10



Product capacities

Item	Connector width	Fasteners			Characteristic capacities [kN] - Timber C24							
		Header		Joist	$R_{1,k}$				$R_{2,k}$			
		Top	Face		3,75x30 ST	3,80x38 SR	CNA 3,70x50	CNA4,0x50	3,75x75 SR	4,00x90 SR	3,75x30 ST	3,80x38 SR
LBV(B)/(A)	38-125	6	4	2	10.2	12.8	15.4	16.3	16.2	17.9	-	-
LBV(B)/(A)	40-125	6	4	2	10.2	12.8	15.4	16.3	16.2	17.9	1.5	2.1
B(B)/(A) - BI(B)/(A)	40-190	6	8	6	13.5	17.2	21.2	22.3	22.3	24.7	-	-
B(B)/(A) - BI(B)/(A)	150-181	6	8	6	13.5	17.2	21.2	22.3	22.3	24.7	3.5	4.9
HB(B)/(A)	40-225	6	16	10	19.0	24.8	31.3	32.8	33.3	37.1	5.6	7.9

Notes:

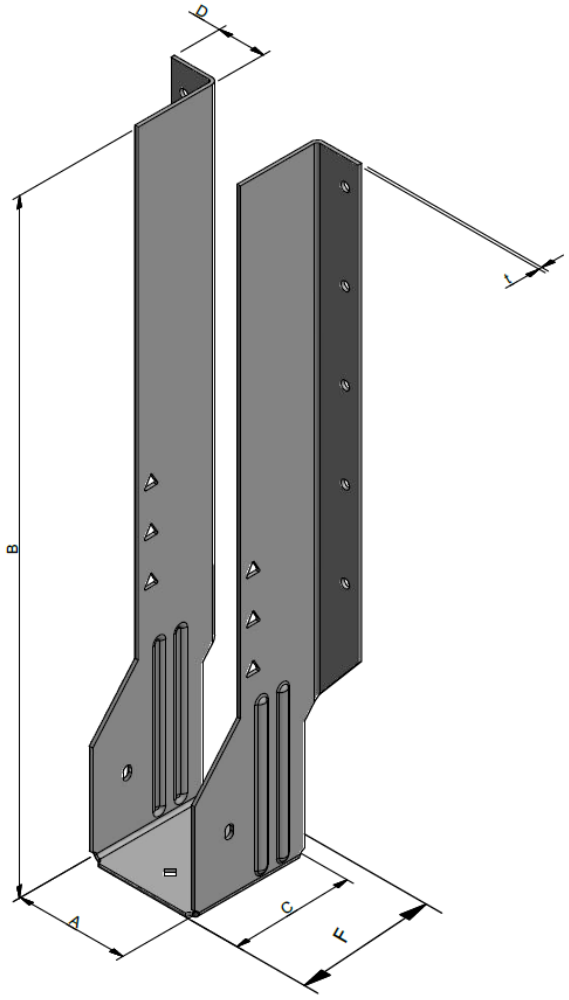
- Web stiffeners are to be fitted in accordance with the I-Joist manufacturer's recommendations.
- When I-joists with solid timber flanges are used as headers, the capacity of the Connector is the same as the capacity when connected to a solid timber header of the same grade as the I-joist flanges.
- Connectors can only be used on I-joist headers in conjunction with Type ST 3.75 x 30 and SR 3.8 x 38 nails.
- The values in the tables are Connector capacities and do not take account of the joist (end grain member) capacity which shall be checked by the joist designer.

D6 Connector type IU

Product Name	Material reference acc. to clause II-1	Alternative Names
IU	Steel ref 1 - Steel ref 3	-

Product dimensions

Item	Product dimensions [mm]								Header holes		Joist holes		
	A		B		C	D	F	t	Face		Pan hole 6x4	Triangular inside Ø4	
	Min	Max	Min	Max					Ø4				
									Min	Max		Min	Max
IU	40	91	90	550	51	19	56.3	1.2	6	18	2	2	6



Product capacities

Hanger Size [mm]			Item	Lever arm a (mm)	Ecc e (mm)	No of Header nail (n_h)	No of Joist nail (n_j)	Side Flange S (mm)	Steel Thickness t (mm)	Steel Strength f_u (MPa)
A	B	C								
40 to 91	142	51	IU142/(A)	105	31.5	6	2	32	1.2	270
40 to 91	192	51	IU192/(A)	125	31.5	10	2	32	1.2	270
40 to 91	217	51	IU217/(A)	138.3	31.5	12	2	32	1.2	270
40 to 91	280	51	IU280/(A)	150.7	31.5	14	2	32	1.2	270
40 to 91	330	51	IU330/(A)	165	31.5	16	2	32	1.2	270
40 to 91	380	51	IU380/(A)	181.7	31.5	18	2	32	1.2	270

Notes:

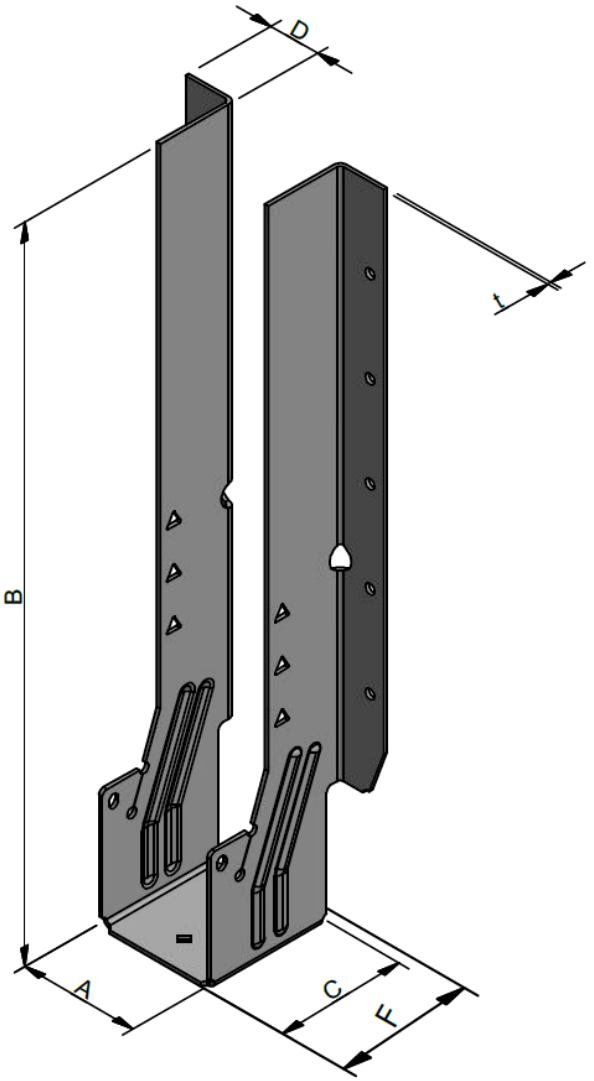
- Web stiffeners are to be fitted in accordance with the I-Joist manufacturer's recommendations – for enhanced installation only.
- For nail capacities refer to Annex C3.

D7 Connector type IUT

Product Name	Material reference acc. to clause II-1	Alternative Names
IUT	Steel ref 1 - Steel ref 2 - Steel ref 3	-

Product dimensions

Item	Product dimensions [mm]								Header holes		Joist holes	
	A		B		C	D	F	t	Face		Ø4x5.5	Triangular inside Ø4
	Min	Max	Min	Max					Ø4			
									Min	Max		
IUT	40	91	90	550	51	19	57	1.2	10	18	2	6



Product capacities

Hanger Size [mm]			Item	Lever arm a (mm)	Ecc e (mm)	No of Header nail (n_h)	No of Joist nail (n_j)	Side Flange S (mm)	Steel Thickness t (mm)	Steel Strength f_u (MPa)
A	B	C								
40 to 91	192	51	IUT192/(A)	125	31.5	10	2	32	1.2	270
40 to 91	217	51	IUT217/(A)	138.3	31.5	12	2	32	1.2	270
40	235	51	IUT29	138	31.5	8	2	32	1.2	262
46	235	51	IUT9	138	31.5	8	2	32	1.2	262
52	235	51	IUT2.06/9	138	31.5	8	2	32	1.2	262
60	235	51	IUT3510	138	31.5	8	2	32	1.2	262
90	235	51	IUT410	138	31.5	8	2	32	1.2	262
40 to 91	280	51	IUT280/(A)	150.7	31.5	14	2	32	1.2	270
40	285	51	IUT211	160.2	31.5	10	2	32	1.2	262
46	285	51	IUT11	160.2	31.5	10	2	32	1.2	262
52	285	51	IUT2.06/11	160.2	31.5	10	2	32	1.2	262
60	285	51	IUT3512	160.2	31.5	10	2	32	1.2	262
90	285	51	IUT412	160.2	31.5	10	2	32	1.2	262
40 to 91	330	51	IUT330/(A)	165	31.5	16	2	32	1.2	270
40	350	51	IUT214	204.7	31.5	14	2	32	1.2	262
46	350	51	IUT14	204.7	31.5	14	2	32	1.2	262
52	350	51	IUT2.06/14	204.7	31.5	14	2	32	1.2	262
60	350	51	IUT3514	204.7	31.5	14	2	32	1.2	262
90	350	51	IUT414	204.7	31.5	14	2	32	1.2	262
40 to 91	380	51	IUT380/(A)	181.7	31.5	18	2	32	1.2	270

Notes:

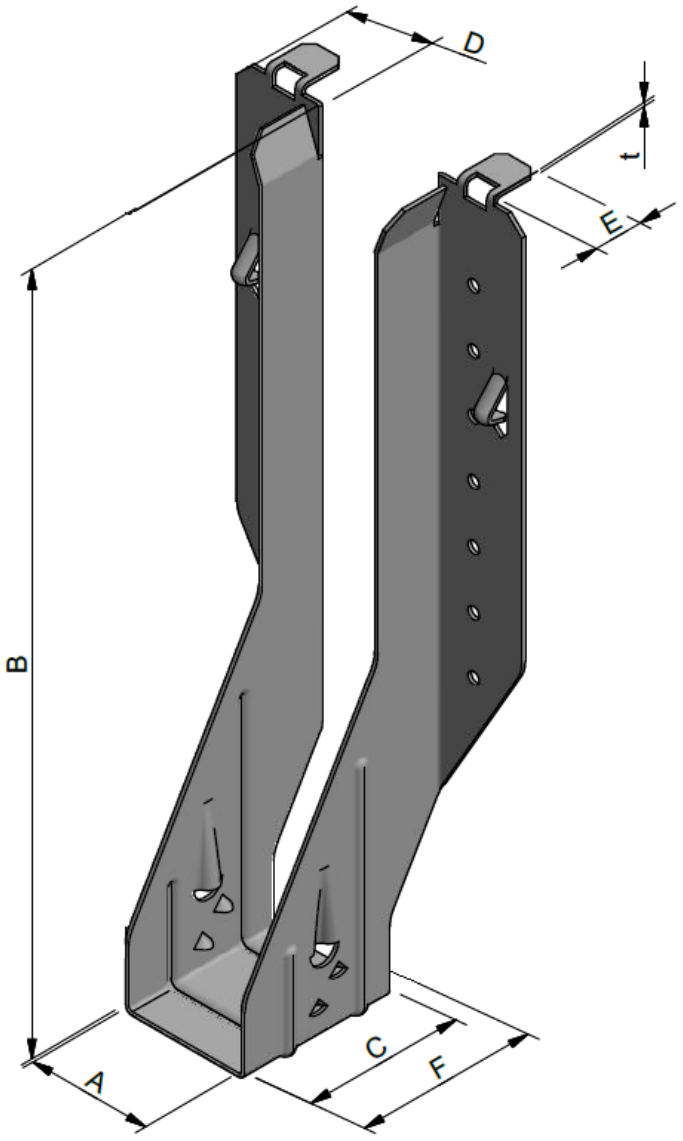
- Web stiffeners are to be fitted in accordance with the I-Joist manufacturer's recommendations – for enhanced installation only.
- For nail capacities refer to Annex C3.

D8 Connector type IUS

Product Name	Material reference acc. to clause II-1	Alternative Names
IUS	Steel ref 2	-

Product dimensions

Item	Product dimensions [mm]									Header holes		Joist holes
	A		B		C	D	E	F	t	Face		
	Min	Max	Min	Max						Ø4.3		Triangular inside Ø4.3
										Min	Max	
IUS	40	92	241	406	51	29	19	57	1.2	8	12	2



Product capacities

Hanger Size [mm]			Item	Lever arm a (mm)	Ecc e (mm)	No of Header nail (n_h)	No of Joist nail (n_j)	Side Flange S (mm)	Steel Thickness t (mm)	Steel Strength f_u (MPa)
A	B	C								
40	241	51	IUS1.56/9.5	164.5	31.5	8	0	30	1.2	262
45	241	51	IUS1.81/9.5	164.5	31.5	8	0	30	1.2	262
62	241	51	IUS2.37/9.5	164.5	31.5	8	0	30	1.2	262
40	302	51	IUS1.56/11.88	202.8	31.5	10	0	30	1.2	262
45	302	51	IUS1.81/11.88	202.8	31.5	10	0	30	1.2	262
62	302	51	IUS2.37/11.88	202.8	31.5	10	0	30	1.2	262
92	302	51	IUS3.56/11.88	194.7	31.5	12	0	30	1.2	262

Notes:

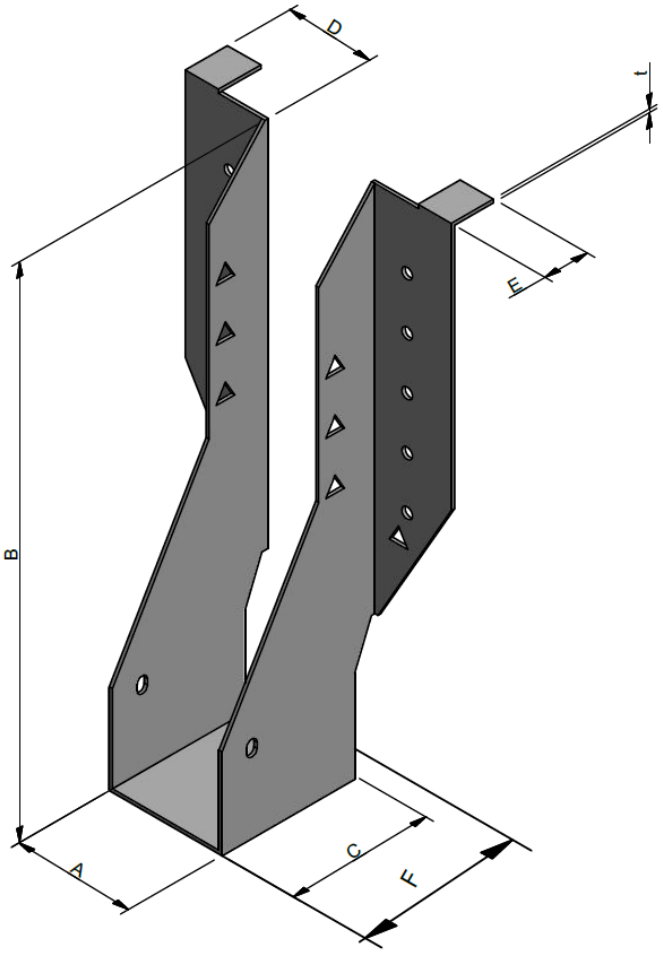
- For nail capacities refer to Annex C3.

D9 Connector type IUSE

Product Name	Material reference acc. to clause II-1	Alternative Names
IUSE	Steel ref 1 - Steel ref 3	-

Product dimensions

Item	Product dimensions [mm]									Header holes		Joist holes		
	A		B		C	D	E	F	t	Face		Ø4		Ø4x6
	Min	Max	Min	Max						Ø4.3				
										Min	Max	Min	Max	
IUSE	40	100	90	550	51	29.5	15	59	1.2	6	22	2	8	2



Product capacities

Hanger Size [mm]			Item	Lever arm a (mm)	Ecc e (mm)	No of Header nail (n_h)	No of Joist nail (n_j)	Side Flange S (mm)	Steel Thickness t (mm)	Steel Strength f_u (MPa)	Width factor k_w
A	B	C									
40 to 91	144	51	IUSE144/(A)	110	31.5	6	2 or 8	49	1.2	330	1
40 to 91	179	51	IUSE179/(A)	120	31.5	8	2 or 8	49	1.2	330	1
40 to 91	194	51	IUSE194/(A)	130	31.5	10	2 or 8	49	1.2	330	1
40 to 91	199	51	IUSE199/(A)	130	31.5	10	2 or 8	49	1.2	330	1
40 to 91	219	51	IUSE219/(A)	143	31.5	12	2 or 8	49	1.2	330	1
40 to 91	224	51	IUSE224/(A)	143	31.5	12	2 or 8	49	1.2	330	1
40 to 91	234	51	IUSE234/(A)	143	31.5	12	2 or 8	49	1.2	330	1
40 to 91	237	51	IUSE237/(A)	143	31.5	12	2 or 8	49	1.2	330	1
40 to 91	239	51	IUSE239/(A)	156	31.5	14	2 or 8	49	1.2	330	1
40 to 91	244	51	IUSE244/(A)	156	31.5	14	2 or 8	49	1.2	330	1
40 to 91	249	51	IUSE249/(A)	156	31.5	14	2 or 8	49	1.2	330	1
40 to 91	254	51	IUSE254/(A)	156	31.5	14	2 or 8	49	1.2	330	1
40 to 91	269	51	IUSE269/(A)	156	31.5	14	2 or 8	49	1.2	330	1
40 to 91	284	51	IUSE284/(A)	170	31.5	16	2 or 8	49	1.2	330	1
40 to 91	289	51	IUSE289/(A)	170	31.5	16	2 or 8	49	1.2	330	1
40 to 91	294	51	IUSE294/(A)	170	31.5	16	2 or 8	49	1.2	330	1
40 to 91	299	51	IUSE299/(A)	170	31.5	16	2 or 8	49	1.2	330	1
40 to 91	319	51	IUSE319/(A)	186	31.5	18	2 or 8	49	1.2	330	1
40 to 91	324	51	IUSE324/(A)	186	31.5	18	2 or 8	49	1.2	330	1
40 to 91	329	51	IUSE329/(A)	186	31.5	18	2 or 8	49	1.2	330	1
40 to 91	349	51	IUSE349/(A)	186	31.5	18	2 or 8	49	1.2	330	1
40 to 91	355	51	IUSE355/(A)	186	31.5	18	2 or 8	49	1.2	330	1
40 to 91	359	51	IUSE359/(A)	186	31.5	18	2 or 8	49	1.2	330	1
40 to 91	379	51	IUSE379/(A)	186	31.5	18	2 or 8	49	1.2	330	1
40 to 91	389	51	IUSE389/(A)	186	31.5	18	2 or 8	49	1.2	330	1
40 to 91	399	51	IUSE399/(A)	186	31.5	18	2 or 8	49	1.2	330	1
40 to 91	405	51	IUSE405/(A)	186	31.5	18	2 or 8	49	1.2	330	1
92 to 100	144	51	IUSE144/(A)	110	31.5	6	2 or 8	49	1.2	330	0.7
92 to 100	179	51	IUSE179/(A)	120	31.5	8	2 or 8	49	1.2	330	0.7
92 to 100	194	51	IUSE194/(A)	130	31.5	10	2 or 8	49	1.2	330	0.7

Hanger Size [mm]			Item	Lever arm a (mm)	Ecc e (mm)	No of Header nail (n_h)	No of Joist nail (n_j)	Side Flange S (mm)	Steel Thickness t (mm)	Steel Strength f_u (MPa)	Width factor k_w
A	B	C									
92 to 100	199	51	IUSE199/(A)	130	31.5	10	2 or 8	49	1.2	330	0.7
92 to 100	219	51	IUSE219/(A)	143	31.5	12	2 or 8	49	1.2	330	0.7
92 to 100	224	51	IUSE224/(A)	143	31.5	12	2 or 8	49	1.2	330	0.7
92 to 100	234	51	IUSE234/(A)	143	31.5	12	2 or 8	49	1.2	330	0.7
92 to 100	237	51	IUSE237/(A)	143	31.5	12	2 or 8	49	1.2	330	0.7
92 to 100	239	51	IUSE239/(A)	156	31.5	14	2 or 8	49	1.2	330	0.7
92 to 100	244	51	IUSE244/(A)	156	31.5	14	2 or 8	49	1.2	330	0.7
92 to 100	249	51	IUSE249/(A)	156	31.5	14	2 or 8	49	1.2	330	0.7
92 to 100	254	51	IUSE254/(A)	156	31.5	14	2 or 8	49	1.2	330	0.7
92 to 100	269	51	IUSE269/(A)	156	31.5	14	2 or 8	49	1.2	330	0.7
92 to 100	284	51	IUSE284/(A)	170	31.5	16	2 or 8	49	1.2	330	0.7
92 to 100	289	51	IUSE289/(A)	170	31.5	16	2 or 8	49	1.2	330	0.7
92 to 100	294	51	IUSE294/(A)	170	31.5	16	2 or 8	49	1.2	330	0.7
92 to 100	299	51	IUSE299/(A)	170	31.5	16	2 or 8	49	1.2	330	0.7
92 to 100	319	51	IUSE319/(A)	186	31.5	18	2 or 8	49	1.2	330	0.7
92 to 100	324	51	IUSE324/(A)	186	31.5	18	2 or 8	49	1.2	330	0.7
92 to 100	329	51	IUSE329/(A)	186	31.5	18	2 or 8	49	1.2	330	0.7
92 to 100	349	51	IUSE349/(A)	186	31.5	18	2 or 8	49	1.2	330	0.7
92 to 100	355	51	IUSE355/(A)	186	31.5	18	2 or 8	49	1.2	330	0.7
92 to 100	359	51	IUSE359/(A)	186	31.5	18	2 or 8	49	1.2	330	0.7
92 to 100	379	51	IUSE379/(A)	186	31.5	18	2 or 8	49	1.2	330	0.7
92 to 100	389	51	IUSE389/(A)	186	31.5	18	2 or 8	49	1.2	330	0.7
92 to 100	399	51	IUSE399/(A)	186	31.5	18	2 or 8	49	1.2	330	0.7
92 to 100	405	51	IUSE405/(A)	186	31.5	18	2 or 8	49	1.2	330	0.7

Notes:

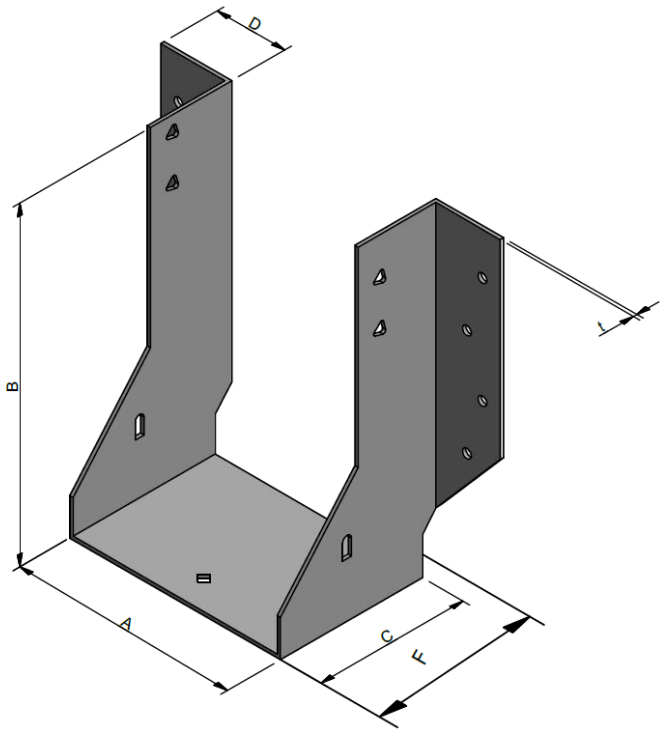
- Web stiffeners are to be fitted in accordance with the I-Joist manufacturer's recommendations – for enhanced installation only.
- For nail capacities refer to Annex C3.

D10 Connector type MIU

Product Name	Material reference acc. to clause II-1	Alternative Names
MIU	Steel ref 1 - Steel ref 2 - Steel ref 3	-

Product dimensions

Item	Product dimensions [mm]								Header holes		Joist holes	
	A		B		C	D	F	t	Face		Pan hole 8x4	Triangular inside Ø4.1
	Min	Max	Min	Max					Ø4			
									Min	Max		
MIU	40	200	140	550	64	29	70	1.5	8	28	2	4



Product capacities

Hanger Size [mm]			Item	Lever arm a (mm)	Ecc e (mm)	No of Header nail (n_h)	No of Joist nail (n_j)	Side Flange S (mm)	Steel Thickness t (mm)	Steel Strength f_u (MPa)	Width factor k_w
A	B	C									
40 to 130	142	64	MIU142/(A)	82	38	8	2	48	1.5	270	1
40 to 130	192	64	MIU192/(A)	112	38	16	2	48	1.5	270	1
40 to 130	217	64	MIU217/(A)	126.8	38	22	2	48	1.5	270	1
40 to 130	280	64	MIU280/(A)	145	38	22	2	48	1.5	270	1
40 to 130	330	64	MIU330/(A)	156.3	38	24	2	48	1.5	270	1
40 to 130	380	64	MIU380/(A)	174	38	28	2	48	1.5	270	1
40 to 130	430	64	MIU430/(A)	184.6	38	28	2	48	1.5	270	1
131 to 200	142	64	MIU142/(A)	82	38	8	2	48	1.5	270	0.72
131 to 200	192	64	MIU192/(A)	112	38	16	2	48	1.5	270	0.72
131 to 200	217	64	MIU217/(A)	126.8	38	22	2	48	1.5	270	0.72
131 to 200	280	64	MIU280/(A)	145	38	22	2	48	1.5	270	0.72
131 to 200	330	64	MIU330/(A)	156.3	38	24	2	48	1.5	270	0.72
131 to 200	380	64	MIU380/(A)	174	38	28	2	48	1.5	270	0.72
131 to 200	430	64	MIU430/(A)	184.6	38	28	2	48	1.5	270	0.72

Notes:

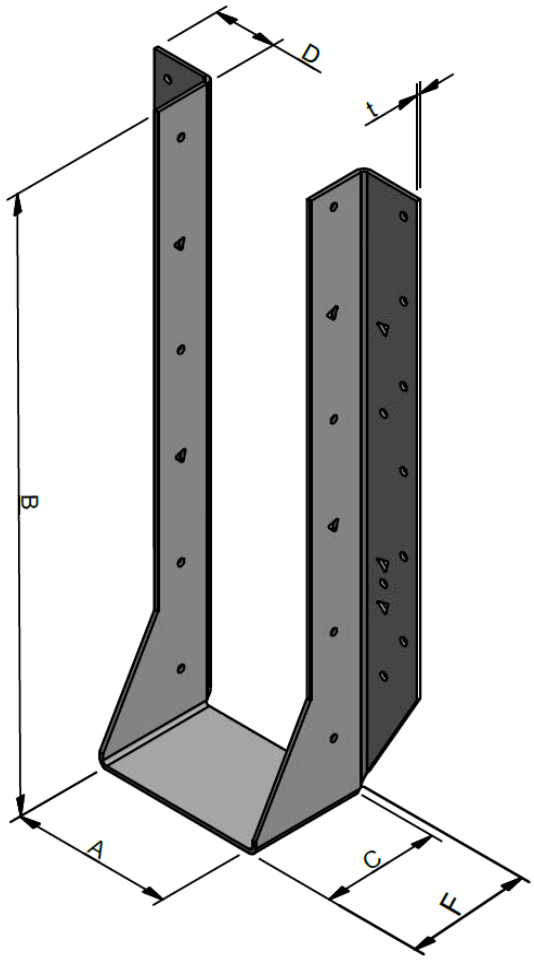
- Web stiffeners are to be fitted in accordance with the I-Joist manufacturer's recommendations – for enhanced installation only.
- For nail capacities refer to Annex C3.

D11 Connector type HU

Product Name	Material reference acc. to clause II-1	Alternative Names
HU	Steel ref 1 - Steel ref 2 - Steel ref 3	-

Product dimensions

Item	Product dimensions [mm]										Header holes				Joist holes			
	A		B		C		D	F		t	Face				Triangular inside Ø4.5		Ø4	
											Ø5.5		Triangular inside Ø4.5					
	Min	Max	Min	Max	Min	Max		Min	Max		Min	Max	Min	Max	Min	Max	Min	Max
HU	40	200	75	406	57	63.5	32	59	66	2	4	28	4	8	2	6	2	8



Product capacities

Hanger Size [mm]			Item	Lever arm a (mm)	Ecc e (mm)	No of Header nail	No of Joist nail	Side Flange S	Steel Thickness t	Steel Strength f_u (MPa)
A	B	C								
40	78	57	HU26	43	28	4	2	49	2	262
79	78	63	HU24-2	43	32	4	2	49	2	262
79	137	63	HU26-2	72	32	8	4	49	2	262
79	137	63	HU26-2	72	32	12	6	49	2	262
180	150	63	HU480/180	78	32	10	4	49	2	270
180	150	63	HU480/180	78	32	14	6	49	2	270
90	173	63	HU48	90	32	10	4	49	2	262
90	173	63	HU48	90	32	14	6	49	2	262
180	175	63	HU530/180	93	32	14	6	49	2	270
79	178	63	HU28-2	93	32	10	4	49	2	262
79	178	57	HU28-2	93	32	14	6	49	2	262
38	198	63	HU210	95	32	8	4	49	2	262
46	170	63	HU7	100	32	12	4	49	2	262
46	170	63	HU7	100	32	16	8	49	2	262
135	196	63	HU5.31/9	115	32	14	6	49	2	262
135	196	63	HU5.31/9	115	32	18	8	49	2	262
90	219	63	HU410	115	32	14	6	49	2	262
90	219	63	HU410	115	32	18	10	49	2	262
79	224	63	HU210-2	115	32	14	6	49	2	262
79	224	63	HU210-2	115	32	18	10	49	2	262
181	231	63	HU410-2	120	32	14	6	49	2	262
181	231	63	HU410-2	120	32	18	8	49	2	262
70	229	63	HU2.75/10	129	32	14	6	49	2	262
70	229	63	HU2.75/10	129	32	18	10	49	2	262
46	235	63	HU9	135	32	18	6	49	2	262
46	235	63	HU9	135	32	24	10	49	2	262
135	240	63	HU5.31/11	135	32	16	6	49	2	262
135	240	63	HU5.31/11	135	32	22	8	49	2	262
90	262	63	HU412	135	32	16	6	49	2	262
90	262	63	HU412	135	32	22	10	49	2	262
79	268	63	HU212-2	138	32	16	6	49	2	262
79	268	63	HU212-2	138	32	22	10	49	2	262
181	282	63	HU412-2	145	32	16	6	49	2	262
181	282	63	HU412-2	145	32	22	8	49	2	262
70	273	63	HU2.75/12	151	32	16	6	49	2	262
70	273	63	HU2.75/12	151	32	22	10	49	2	262
46	279	63	HU11	155	32	22	6	49	2	262
46	279	63	HU11	155	32	30	10	49	2	262
135	297	63	HU5.31/14	163	32	18	8	49	2	262
135	297	63	HU5.31/14	163	32	24	12	49	2	262
135	324	63	HU5.31/16	177	32	20	8	49	2	262

Hanger Size [mm]			Item	Lever arm a (mm)	Ecc e (mm)	No of Header nail	No of Joist nail	Side Flange S	Steel Thickness t	Steel Strength f_u (MPa)
A	B	C								
135	324	63	HU5.31/16	177	32	26	12	49	2	262
70	330	63	HU2.75/14	169	32	18	8	49	2	262
70	330	63	HU2.75/14	169	32	24	14	49	2	262
90	346	63	HU416	177	32	20	8	49	2	262
90	346	63	HU416	177	32	26	12	49	2	262
181	352	63	HU414-2	180	32	20	8	49	2	262
181	352	63	HU414-2	180	32	26	12	49	2	262
70	357	63	HU2.75/16	182	32	20	8	49	2	262
70	357	63	HU2.75/16	182	32	26	14	49	2	262
46	346	63	HU14	189	32	28	8	49	2	262
46	346	63	HU14	189	32	36	14	49	2	262

Notes:

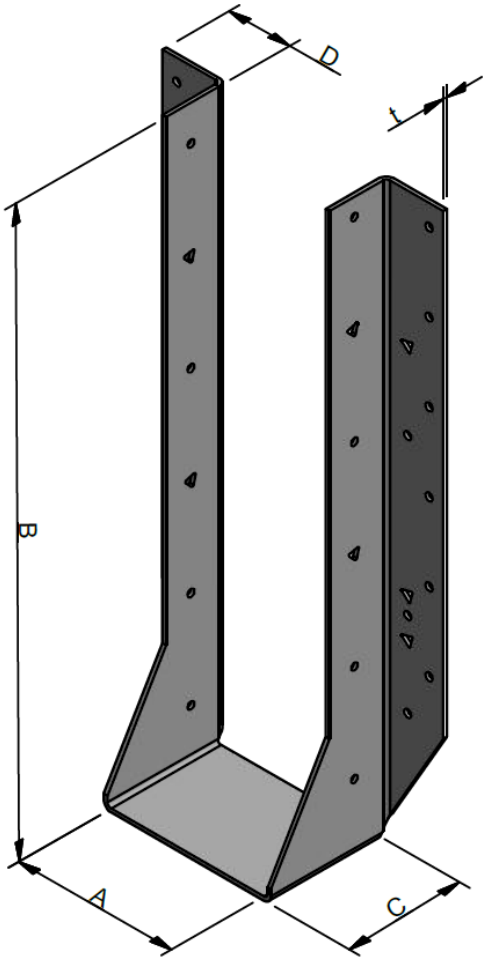
- Web stiffeners are to be fitted in accordance with the I-Joist manufacturer's recommendations.
- For nail capacities refer to Annex C3.

D12 Connector type U

Product Name	Material reference acc. to clause II-1	Alternative Names
U	Steel ref 2	-

Product dimensions

Item	Product dimensions [mm]							Header holes		Joist holes
	A		B		C	D	t	Face		
								Ø4.3		Ø4.3
	Min	Max	Min	Max				Min	Max	
U	40	200	75	406	51	32	1.5	14	16	6



Product capacities

Hanger Size [mm]			Item	Lever arm a (mm)	Ecc e (mm)	No of Header nail	No of Joist nail	Side Flange S	Steel Thickness t	Steel Strength f_u (MPa)
A	B	C								
59	228	51	U3510/14	116	25.4	14	6	32	1.5	262
79	216	51	U210-2	116	25.4	14	6	32	1.5	262
90	213	51	U410	116	25.4	14	6	32	1.5	262
62	268	51	U3516/20	128	25.4	16	6	32	1.5	262
90	254	51	U414	128	25.4	16	6	32	1.5	262
120	286	51	U3512-2	128	25.4	16	6	32	1.5	262

Notes:

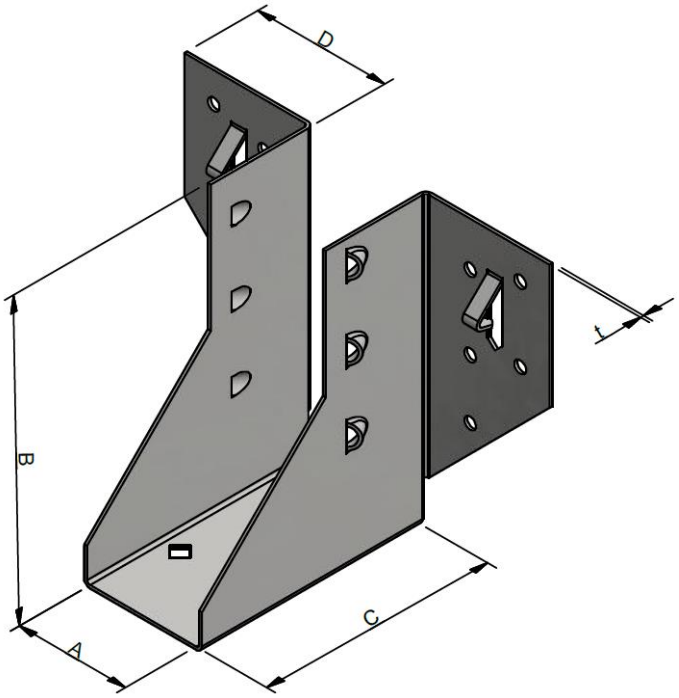
- Web stiffeners are to be fitted in accordance with the I-Joist manufacturer's recommendations – for enhanced installation only.
- For nail capacities refer to Annex C3.

D13 Connector type LUS, HUS

Product Name	Material reference acc. to clause II-1	Alternative Names
LUS	Steel ref 1– Steel ref 3	-
HUS	Steel ref 1– Steel ref 3	-

Product dimensions

Item	Product dimensions [mm]							Header Holes	Joist holes
	A		B		C	D	t	Ø4	Ø4 Pan Hole
	Min	Max	Min	Max					
LUS	38	50	51	96	51	25.6	1.0	10	6
HUS	38	50	76	100	75	28.6	1.2	30	10



Product capacities – Standard installation – Timber to Timber

Item	Hanger Size [mm]			Lever arm a [mm]	Ecc e [mm]	No of header nails n_h	No of joist nails n_j	Side flange S [mm]	Steel thickness t [mm]	Steel strength f_u [N/mm^2]
	A	B	C							
LUS230/38	38	241	30	66	15	10	6	33	1.0	270
LUS230/44	44	302	30	63	15	10	6	33	1.0	270
LUS230/50	50	302	30	60	15	10	6	33	1.0	270
HUS230/38	38	241	30	66	15	10	6	33	1.2	270
HUS230/44	44	302	30	63	15	10	6	33	1.2	270
HUS230/50	50	302	30	60	15	10	6	33	1.2	270

Note:

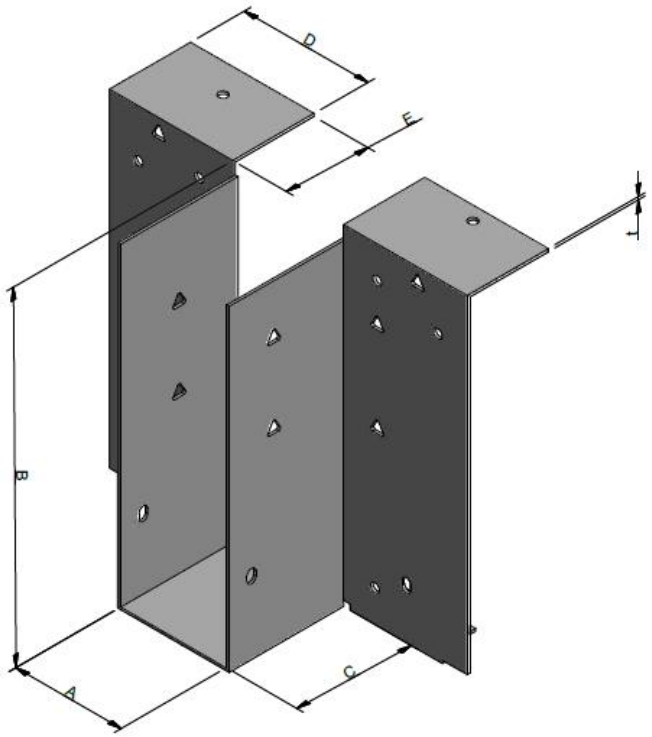
- For nail capacities refer to Annex C3.

D14 Connector type ITB

Product Name	Material reference acc. to clause II-1	Alternative Names
ITB	Steel ref 1	-

Product dimensions

Item	Product dimensions [mm]								Header holes			Joist holes	
	A		B		C	D	E	t	Top & Bottom	Face		Ø6x4	Triangular inside Ø4
	Min	Max	Min	Max					Ø4	Ø4	Triangular inside Ø4		
ITB	40	100	195	302	51	55	35	1.2	6	8	6	2	4



Product capacities – Standard installation

Item	Type	Fasteners						Characteristic capacities [kN] - Timber C24	
		Header				Joist		$R_{1,k}$	$R_{2,k}$
		Top & Bottom	Type	Face	Type	Qty	Type		
ITB(B)/(A)	< 35 mm LVL flange	4	3,75x30 ST	8	3,75x30 ST	2	3,75x30 ST	10.8	1.1
ITB(B)/(A)	≥ 35 mm LVL flange	4	3,75x30 ST	8	3,75x30 ST	2	3,75x30 ST	9.2	1.2
ITB(B)/(A)	≥ 45 mm C24 flange	4	3,75x30 ST	8	3,75x30 ST	2	3,75x30 ST	6.7	1.1

Product capacities - Enhanced installation

Item	Type	Fasteners						Characteristic capacities [kN] - Timber C24	
		Header				Joist		$R_{1,k}$	$R_{2,k}$
		Top & Bottom	Type	Face	Type	Qty	Type		
ITB(B)/(A)	< 35 mm LVL flange	4	3,75x30 ST	14	3,75x30 ST	6	3,75x30 ST	17.4	9.3
ITB(B)/(A)	≥ 35 mm LVL flange	4	3,75x30 ST	14	3,75x30 ST	6	3,75x30 ST	17.4	7.6
ITB(B)/(A)	≥ 45 mm C24 flange	4	3,75x30 ST	14	3,75x30 ST	6	3,75x30 ST	17.9	8.0

Note:
• Enhanced installation refers to I-joists headers with backer blocks.
• Web stiffeners are to be fitted in accordance with the I-Joist manufacturer's recommendations – for enhanced installation only.

D15 Connector type ITBS

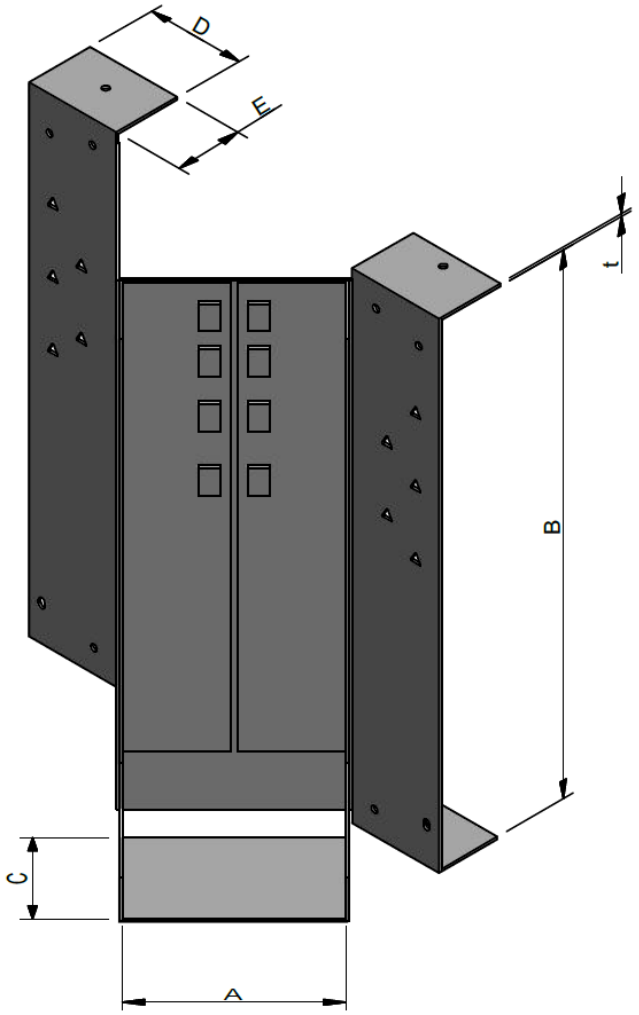
Product Name	Material reference acc. to clause II-1	Alternative Names
ITBS	Steel ref 1	-

Product dimensions

Item	Product dimensions [mm]								Header holes			Joist holes	
	A		B		C	D	E	t	Top & Bottom	Face		Ø6x4	Triangular inside Ø4
	Min	Max	Min	Max					Ø4.1	Ø4.1	Triangular inside Ø4		
ITBS	40	100	195	302	51	55	35	1.5	4	6	10	2	4

Note:

- Standard 45° skew, with site adjustable skew from 5° to 67.5°.



Product capacities – Standard installation

Item	Type	Fasteners						Characteristic capacities [kN] - Timber C24	
		Header				Joist		$R_{1,k}$	$R_{2,k}$
		Top & Bottom	Type	Face	Type	Qty	Type		
ITBS(B)/(A)	<35 mm LVL flange	4	3.75 x 30 ST	8	3.75 x 30 ST	1	3.75 x 30 ST	7.5	1.5
ITBS(B)/(A)	≥35 mm LVL flange	4	3.75 x 30 ST	8	3.75 x 30 ST	1	3.75 x 30 ST	10.2	1.5
ITBS(B)/(A)	≥45 mm C24 flange	4	3.75 x 30 ST	8	3.75 x 30 ST	1	3.75 x 30 ST	7.4	1.5

Product capacities - Enhanced installation

Item	Type	Fasteners						Characteristic capacities [kN] - Timber C24	
		Header				Joist		$R_{1,k}$	$R_{2,k}$
		Top & Bottom	Type	Face	Type	Qty	Type		
ITBS(B)/(A)	<35 mm LVL flange	4	3.75 x 30 ST	18	3.75 x 30 ST	3	3.75 x 30 ST	13.5	1.5
ITBS(B)/(A)	≥35 mm LVL flange	4	3.75 x 30 ST	18	3.75 x 30 ST	3	3.75 x 30 ST	15.0	1.5
ITBS(B)/(A)	≥45 mm C24 flange	4	3.75 x 30 ST	18	3.75 x 30 ST	3	3.75 x 30 ST	12.8	1.5

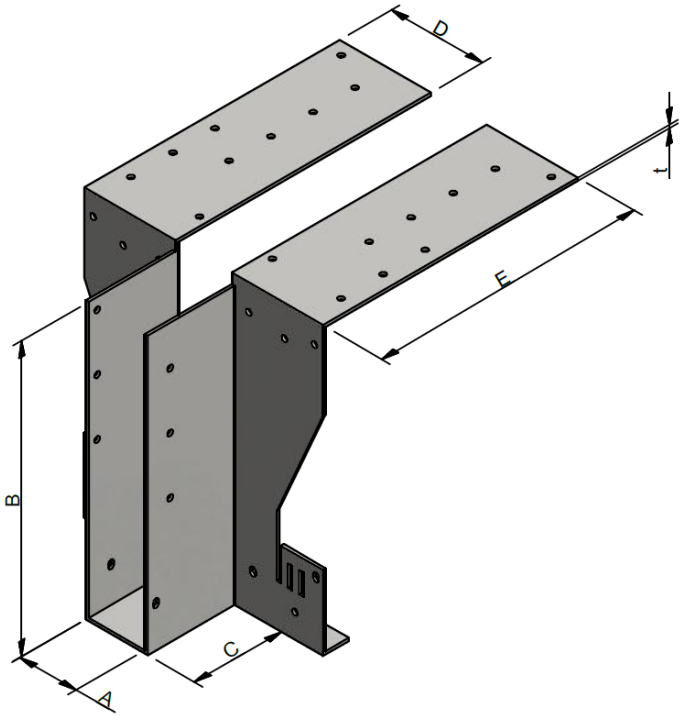
Note:
• Enhanced installation refers to I-joists headers with backer blocks.
• Web stiffeners are to be fitted in accordance with the I-Joist manufacturer's recommendations – for enhanced installation only.

D16 Connector type HITB

Product Name	Material reference acc. to clause II-1	Alternative Names
HITB	Steel ref 1	-

Product dimensions

Item	Product dimensions [mm]								Header holes				Joist holes	
	A		B		C	D	E	t	Top	Bottom	Face		Ø6x4	Ø4
	Min	Max	Min	Max					Ø4	Ø4	Ø4	Ø6x4		
HITB	40	100	195	302	60	65	180	2	18	2	8	4	2	6



Product capacities – Standard installation

Item	Type	Fasteners								Characteristic capacities [kN] - Timber C24	
		Header						Joist		$R_{1,k}$	$R_{2,k}$
		Top	Type	Bottom	Type	Face	Type	Qty	Type		
HITB(B)/(A)	< 35 mm LVL flange	8	3.75 x 30 ST	2	3.75 x 30 ST	12	3.75 x 30 ST	8	3.75 x 30 ST	15.6	11.4
HITB(B)/(A)	≥ 35 mm LVL flange	8	3.75 x 30 ST	2	3.75 x 30 ST	12	3.75 x 30 ST	8	3.75 x 30 ST	17.5	11.4
HITB(B)/(A)	≥ 45 mm C24 flange	8	3.75 x 30 ST	2	3.75 x 30 ST	12	3.75 x 30 ST	8	3.75 x 30 ST	19.1	11.1

Note:

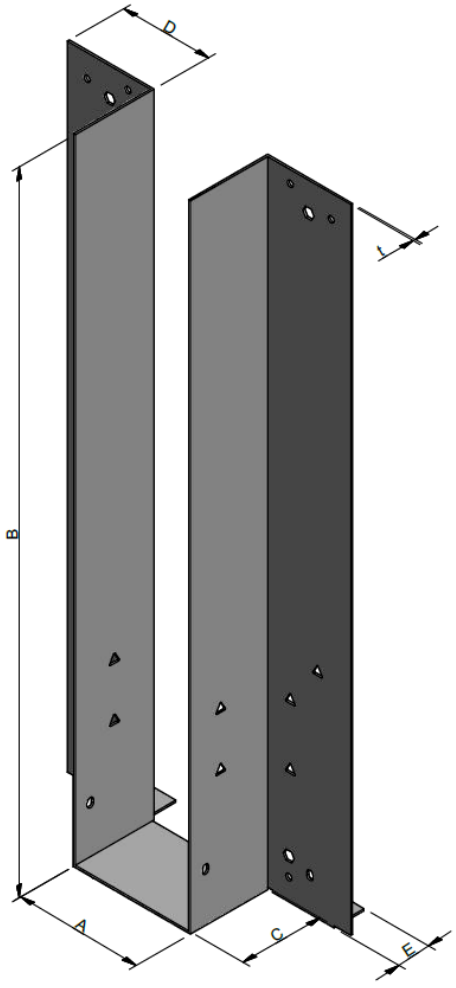
- Web stiffeners are to be fitted in accordance with the I-Joist manufacturer's recommendations.

D17 Connector type IUB

Product Name	Material reference acc. to clause II-1	Alternative Names
IUB	Steel ref 1	-

Product dimensions

Item	Product dimensions [mm]								Header holes					Joist holes	
	A		B		C	D	E	t	Bottom	Face				Ø6x4	Triangular inside Ø4
	Min	Max	Min	Max					Ø4	Ø4	Ø6x4	Hexagonal Ø6.2	Triangular inside Ø4		
IUB	75	150	190	420	51	55	18.5	1.2	2	6	2	4	6	2	4



Product capacities – Standard installation

Item	Fasteners						Characteristic capacities [kN] - Timber C24	
	Header				Joist		$R_{1,k}$	$R_{2,k}$
	Bottom	Type	Face	Type	Qty	Type		
IUB(B)/(A)	2	3,75x30 ST	8	3,75x30 ST	2	3,75x30 ST	8.1	2.0

Product capacities – Enhanced installation

Item	Fasteners						Characteristic capacities [kN] - Timber C24	
	Header				Joist		$R_{1,k}$	$R_{2,k}$
	Bottom	Type	Face	Type	Qty	Type		
IUB(B)/(A)	-	-	4	SDS	2	3,75x30 ST	13.6	2.0
IUB(B)/(A)	-	-	4	SDS	6	3,75x30 ST	13.6	6.0

D18 Connector type IUBS

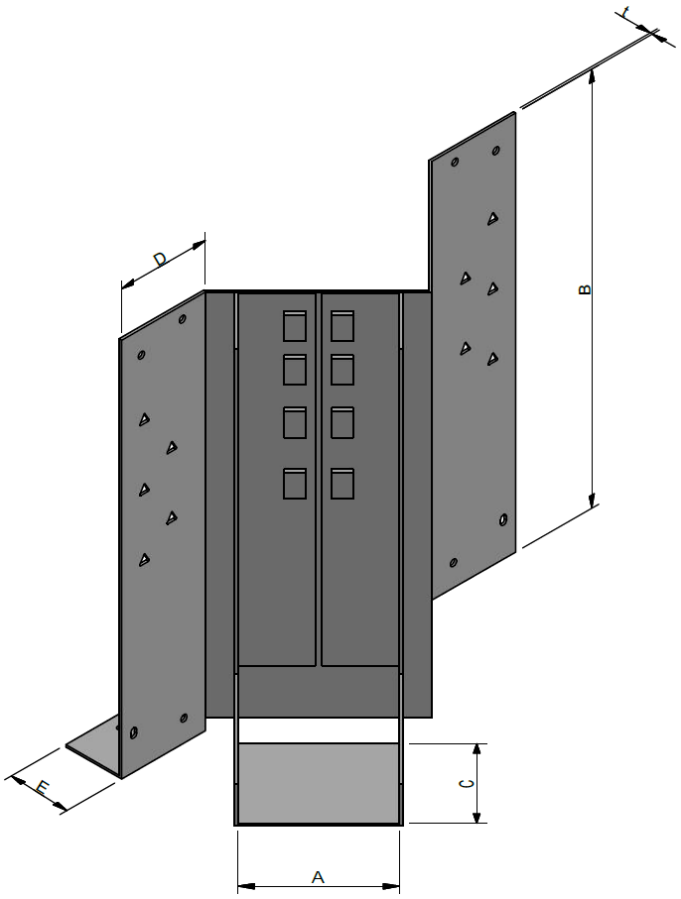
Product Name	Material reference acc. to clause II-1	Alternative Names
IUBS	Steel ref 1	-

Product dimensions

Item	Product dimensions [mm]								Header holes					Joist holes	
	A		B		C	D	E	t	Bottom	Face					
	Min	Max	Min	Max					Ø4.1	Ø4.1	Ø6x4	Hexagonal holes Ø6x4	Triangular inside Ø4	Ø4	Triangular inside Ø4
IUBS	75	100	195	295	64	55	35	1.5	2	4	2	4	4	2	6

Note:

- Standard 45° skew, with site adjustable skew from 5° to 67.5°.



Product capacities – Standard installation

Item	Fasteners						Characteristic capacities [kN] - Timber C24	
	Header				Joist		$R_{1,k}$	$R_{2,k}$
	Bottom	Type	Face	Type	Qty	Type		
IUBS(B)/(A)	2	3,75x30 ST	8	3,75x30 ST	2	3,75x30 ST	12.7	1.3

Product capacities – Enhanced installation

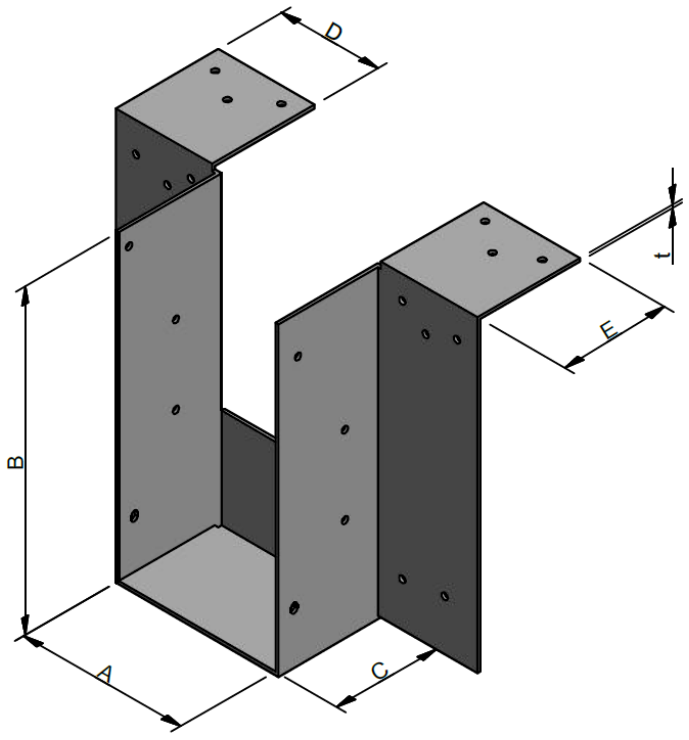
Item	Fasteners						Characteristic capacities [kN] - Timber C24	
	Header				Joist		$R_{1,k}$	$R_{2,k}$
	Bottom	Type	Face	Type	Qty	Type		
IUBS(B)/(A)	-	-	4	SDS	2	3,75x30 ST	17.2	1.3

D19 Connector type HIUB

Product Name	Material reference acc. to clause II-1	Alternative Names
HIUB	Steel ref 1	-

Product dimensions

Item	Product dimensions [mm]								Header holes		Joist holes	
	A		B		C	D	E	t	Top	Face	Ø4	Ø6x4
	Min	Max	Min	Max					Ø4	Ø4		
HIUB	75	300	202	420	63.5	63.5	63.5	2	6	10	6	2



Product capacities – Standard installation

Item	Fasteners						Characteristic capacities [kN] - Timber C27/Tr26	
	Header				Joist		$R_{1,k}$	$R_{2,k}$
	Top	Type	Face	Type	Qty	Type		
HIUB(B)/(A)	6	3,75x30 ST	10	3,75x30 ST	8	3,75x30 ST	19.2	8.0

Product capacities – Enhanced installation

Item	Fasteners						Characteristic capacities [kN] - Timber C27/Tr26	
	Header				Joist		$R_{1,k}$	$R_{2,k}$
	Top	Type	Face	Type	Qty	Type		
HIUB(B)/(A)	6	3,75x30 ST	10	3,75x30 ST	8	3,75x30 ST	23.4	8.0

Note:

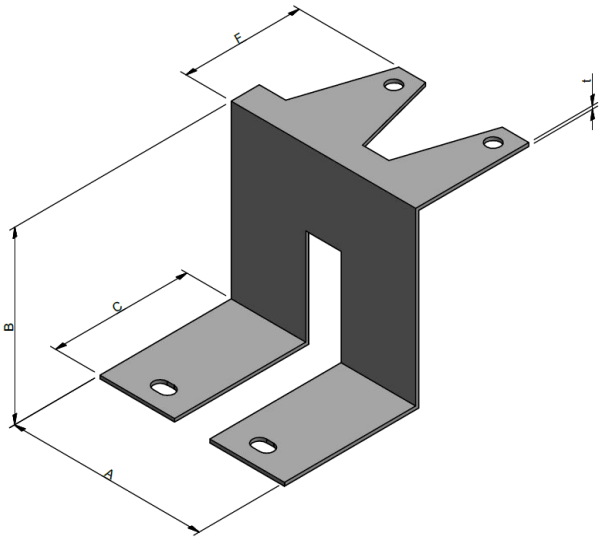
- For enhanced installation, a timber blocking piece is to be fixed between the top and bottom flanges of Metal Web Floor Trusses.

D19 Connector type ZS

Product Name	Material reference acc. to clause II-1	Alternative Names
ZS	Steel ref 1	-

Product Dimensions

Item	Product dimensions [mm]							Header holes		Joist holes
	A	B		C		F	t	Top		Ø6x4
		Min	Max	Min	Max			Ø4	Triangular inside Ø4	
ZS	52	30	47	37	54	31	0.9	2	1	2



Product capacities – Standard installation

Item	Fasteners				Characteristic capacities [kN] - Timber C24	
	Header		Joist		Timber C24 - $R_{1,k}$	I-Joists - $R_{1,k}$
	Qty	Type	Qty	Type		
ZS(B)N	2	3.75 x 30 ST	2	3.75 x 30 ST	3.6	3.9

Notes:

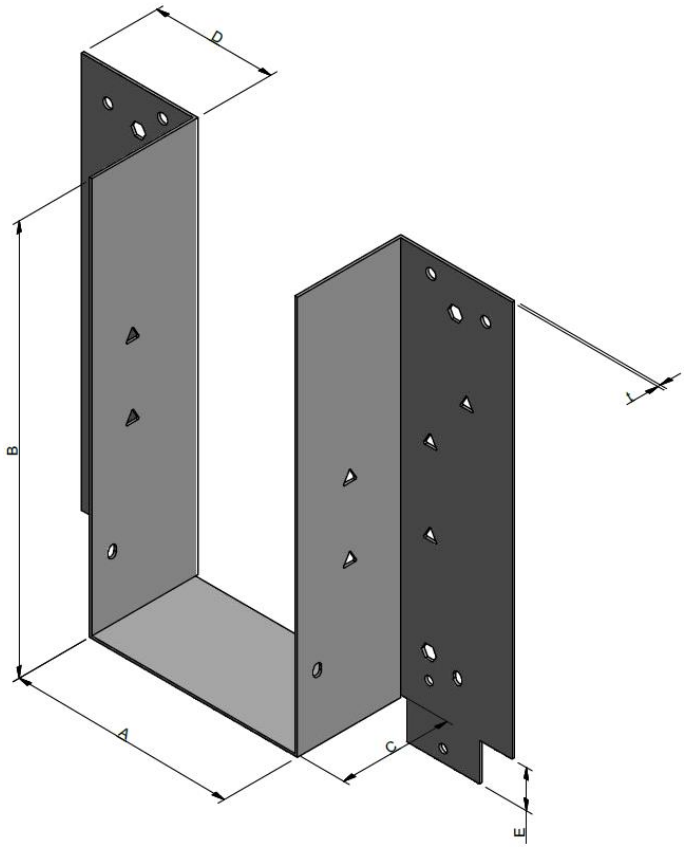
- Loads given are per noggin – not per Z – Clip.
- When I-joists with solid timber flanges are used as headers, the capacity of the Connector is the same as the capacity when connected to a solid timber header of the same grade as the I-joist flanges.
- Connectors can only be used on I-joist headers in conjunction with Type ST 3.75 x 30 nails.
- The values in the tables are Connector capacities and do not take account of the joist (end grain member) capacity which shall be checked by the joist designer.

D20 Connector type IUQ

Product Name	Material reference acc. to clause II-1	Alternative Names
IUQ	Steel ref 1	-

Product dimensions

Item	Product dimensions [mm]								Header holes					Joist holes	
	A		B		C	D	E	t	Ø4.1	Ø5	Ø6x4	Triangular inside Ø4	Hexagonal Holes	Ø6x4	Triangular inside Ø4
	Min	Max	Min	Max											
IUQ	40	100	190	450	51	55	18.5	1.2	4	4	2	6	4	2	4



Product capacities – Standard installation

Item	Fasteners				Characteristic capacities [kN] - Timber C24	
	Header		Joist		$R_{1,k}$	$R_{2,k}$
	Qty	Type	Qty	Type		
IUQ(B)/(A)	4	CSA 5.0 x 50	2	3.75 x 30 ST	13.8	2.0

Note:

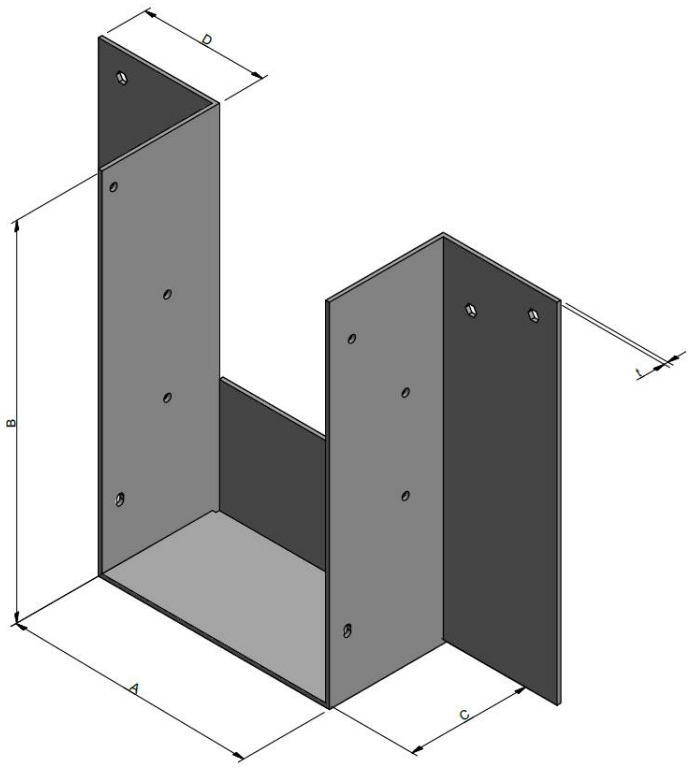
- Web stiffeners are to be fitted in accordance with the I-Joist manufacturer's recommendations – for enhanced installation only.

D21 Connector type HIUQ

Product Name	Material reference acc. to clause II-1	Alternative Names
HIUQ	Steel ref 1	-

Product Dimensions

Item	Product dimensions [mm]								Header Holes	Joist holes	
	A		B		C	D	E	t	Hexagonal Holes Ø6.2	Ø4.1	Ø6x4
	Min	Max	Min	Max							
HIUQ	40	300	190	450	63.5	63.5	63.5	2.0	4	6	2



Product capacities – Standard installation

Item	Fasteners				Characteristic capacities [kN] - Timber C24	
	Header		Joist		$R_{1,k}$	$R_{2,k}$
	Qty	Type	Qty	Type		
HIUQ(B)/(A)	4	SDS	8	3.75 x 30 ST	19.5	2.0

Note:

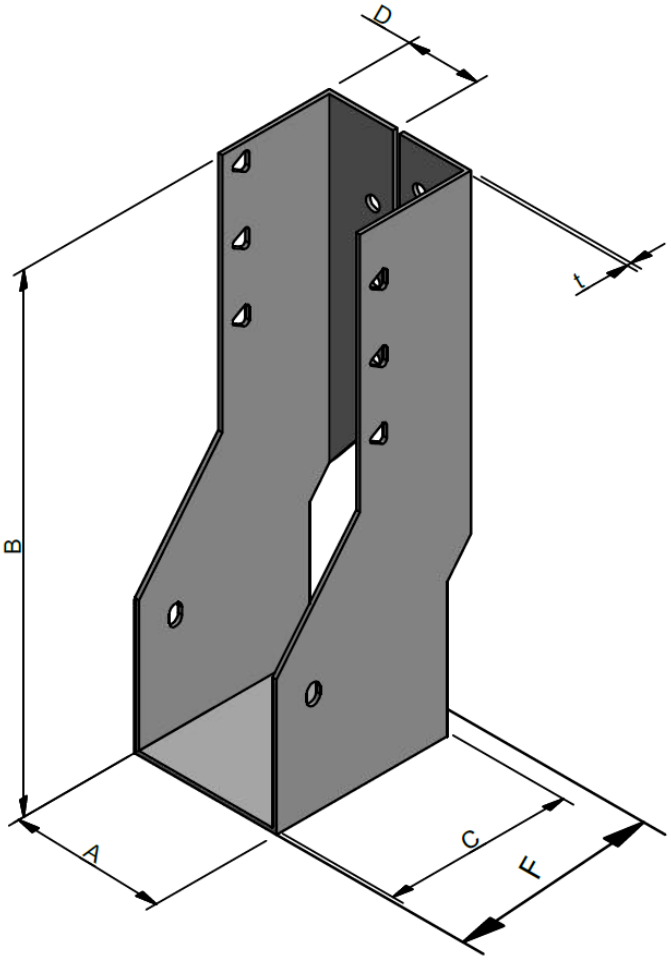
- Web stiffeners are to be fitted in accordance with the I-Joist manufacturer's recommendations – for enhanced installation only.

D22 Connector type IUC

Product Name	Material reference acc. to clause II-1	Alternative Names
IUC	Steel ref 1	-

Product dimensions

Item	Product dimensions [mm]								Header holes		Joist holes	
	A		B		C	D	F	t	Ø4		Ø6x4	Triangular inside Ø4
	Min	Max	Min	Max					Min	Max		
IUC	40	100	140	300	51	19	57	1.2	6	14	2	6



Product capacities – Standard installation

Item	Size range [mm]		Fasteners				Characteristic capacities [kN]				
	A	B	Header		Joist		C16 / I-Joist		C24		LVL
			Qty	Type	Qty	Type	$R_{1,k}$	$R_{2,k}$	$R_{1,k}$	$R_{2,k}$	$R_{1,k}$
IUC (B)/(A)	40-91	142	6	3.75 x 30 ST	2	3.75 x 30 ST	3.8	1.8	4.8	2.0	8.1
IUC (B)/(A)		192	10	3.75 x 30 ST	2	3.75 x 30 ST	7.5	1.8	9.5	2.0	13.5
IUC (B)/(A)		217	12	3.75 x 30 ST	2	3.75 x 30 ST	10.0	1.8	12.0	2.0	16.2
IUC (B)/(A)		280	14	3.75 x 30 ST	2	3.75 x 30 ST	12.6	1.8	14.0	2.0	-
IUC (B)/(A)	92-100	142	6	3.75 x 30 ST	2	3.75 x 30 ST	3.5	1.8	4.4	2.0	8.1
IUC (B)/(A)		192	10	3.75 x 30 ST	2	3.75 x 30 ST	6.9	1.8	8.8	2.0	13.5
IUC (B)/(A)		217	12	3.75 x 30 ST	2	3.75 x 30 ST	9.2	1.8	11.0	2.0	16.2
IUC (B)/(A)		280	14	3.75 x 30 ST	2	3.75 x 30 ST	11.6	1.8	12.9	2.0	-

Product capacities – Enhanced installation

Item	Size range [mm]		Fasteners				Characteristic capacities [kN]				
	A	B	Header		Joist		C16 / I-Joist		C24		LVL
			Qty	Type	Qty	Type	$R_{1,k}$	$R_{2,k}$	$R_{1,k}$	$R_{2,k}$	$R_{1,k}$
IUC (B)/(A)	40-91	142	6	3.75 x 75 SS	2	3.75 x 30 ST	7.9	1.8	10.9	2.0	10.7
IUC (B)/(A)		192	10	3.75 x 75 SS	2	3.75 x 30 ST	13.1	1.8	17.8	2.0	17.8
IUC (B)/(A)		217	12	3.75 x 75 SS	2	3.75 x 30 ST	15.7	1.8	20.4	2.0	21.4

Notes:

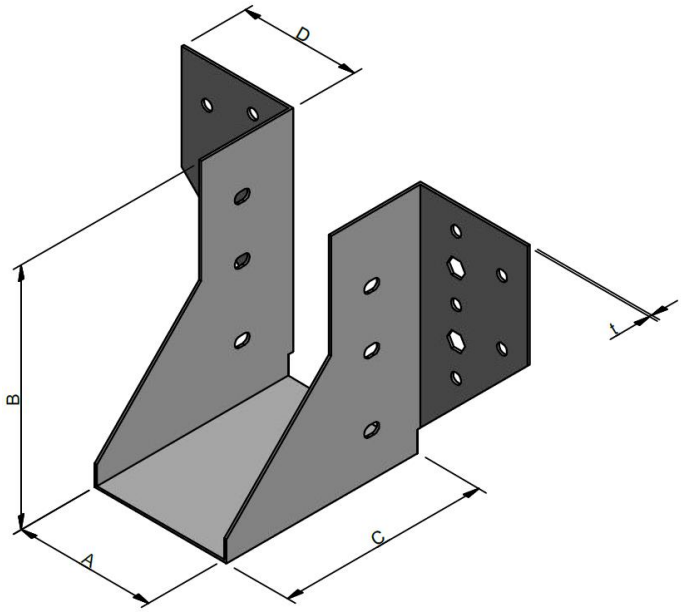
- Web stiffeners are to be fitted in accordance with the I-Joist manufacturer's recommendations – for enhanced installation only.
- When I-joists with solid timber flanges are used as headers. The capacity of the Connector is the same as the capacity when connected to a solid timber header of the same grade as the I-joist flanges.
- Connectors can only be used on I-joist headers in conjunction with Type ST 3.75 x 30 nails
- The values in the tables are Connector capacities and do not take account of the joist (end grain member) capacity which shall be checked by the joist designer.

D23 Connector type THM

Product Name	Material reference acc. to clause II-1	Alternative Names
THM	Steel ref 1	-

Product dimensions

Item	Product dimensions [mm]							Header holes		Joist holes
	A		B		C	D	t	Ø4.1	Hexagonal holes Ø6x4	Ø6x4
	Min	Max	Min	Max						
THM	38	50	90	96	75	42	0.9	10	4	6



Product capacities – Standard installation

Item	Fasteners				Characteristic capacities [kN] - Timber C24
	Header		Joist		$R_{1,k}$
	Qty	Type	Qty	Type	
THM(B)/(A)	10	3,75x30 ST	6	3,75x30 ST	7.3

Product capacities – Double Shear installation

Item	Fasteners				Characteristic capacities [kN] - Timber C24
	Header		Joist		$R_{1,k}$
	Qty	Type	Qty	Type	
THM(B)/(A)	10	3,75x30 ST	6	3,75x75 SS	9.8

Product capacities – Enhanced installation

Item	Fasteners				Characteristic capacities [kN] - Timber C24
	Header		Joist		$R_{1,k}$
	Qty	Type	Qty	Type	
THM(B)/(A)	4	SDS	6	3,75x30 ST	7.4

Notes:

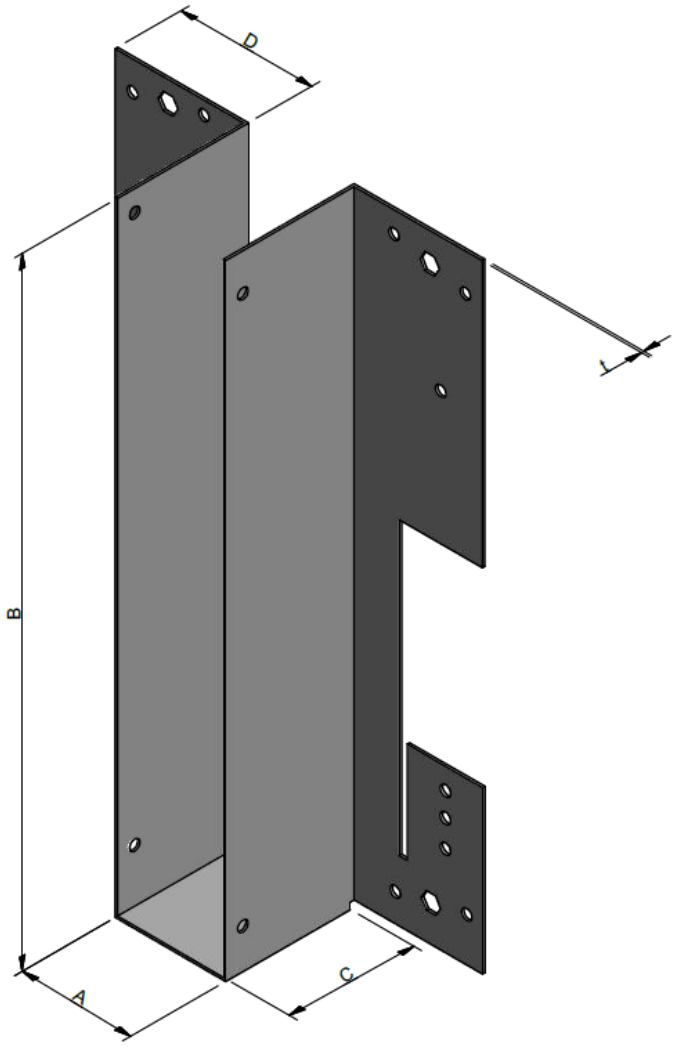
- When I-joists with solid timber flanges are used as headers, the capacity of the Connector is the same as the capacity when connected to a solid timber header of the same grade as the I-joist flanges.
- Connectors can only be used on I-joist headers in conjunction with Type ST 3.75 x 30 nails.
- For double shear connection installation, 3.75 x 75mm smooth shank nails are to be used.
- The values in the tables are Connector capacities and do not take account of the joist (end grain member) capacity which shall be checked by the joist designer.

D24 Connector type LIB

Product Name	Material reference acc. to clause II-1	Alternative Names
LIB	Steel ref 1	-

Product dimensions

Item	Product dimensions [mm]							Header holes		Joist holes
	A		B		C	D	t	Face		Ø4
	Min	Max	Min	Max				Ø4	Hexagonal holes Ø6.4	
LIB	40	200	140	420	48.5	48.5	0.9	16	4	4



Product capacities - Standard installation for I-Joist headers

Item	Type	Dimensions [mm]		Fasteners				Characteristic capacities [kN] - Timber C24	
		A	B	Header		Joist		$R_{1,k}$	$R_{2,k}$
				Qty	Type	Qty	Type		
LIB(B)/(A)	< 35 mm LVL flange	53 - 61	195 - 300	10	3,75x30 ST	4	3,75x30 ST	5.3	3.4
LIB(B)/(A)	≥ 35 mm LVL flange	40 - 200	190 - 300	10	3,75x30 ST	4	3,75x30 ST	7.4	3.4
LIB(B)/(A)	≥ 45 mm C24 flange	47 - 200	140 - 300	10	3,75x30 ST	4	3,75x30 ST	8.9	3.4

Product capacities - Standard installation for Metal Web headers

Item	Type	Dimensions [mm]		Fasteners				Characteristic capacities [kN] - Timber C24	
		A	B	Header		Joist		$R_{1,k}$	$R_{2,k}$
				Qty	Type	Qty	Type		
LIB(B)/(A)	Metal Web joists	47 - 200	195 - 420	8	3,75x30 ST	4	3,75x30 ST	6.6	3.4

Product capacities - Enhanced installation for I-Joist headers

Item	Type	Dimensions [mm]		Fasteners				Characteristic capacities [kN] - Timber C24	
		A	B	Header		Joist		$R_{1,k}$	$R_{2,k}$
				Qty	Type	Qty	Type		
LIB(B)/(A)	< 35 mm LVL flange	53 - 61	195 - 300	14	3,75x30 ST	4	3,75x30 ST	11.2	3.4
LIB(B)/(A)	≥ 35 mm LVL flange	40 - 91	190 - 300	14	3,75x30 ST	4	3,75x30 ST	11.2	3.4
LIB(B)/(A)	≥ 45 mm C24 flange	47 - 100	140 - 300	14	3,75x30 ST	4	3,75x30 ST	13.4	3.4

Product capacities - Enhanced installation for Metal Web headers

Item	Type	Dimensions [mm]		Fasteners				Characteristic capacities [kN] - Timber C24	
		A	B	Header		Joist		$R_{1,k}$	$R_{2,k}$
				Qty	Type	Qty	Type		
LIB(B)/(A)	Metal Web joists	47 - 100	190 - 420	4	SDS	4	3,75x30 ST	8.4	3.4

Note:

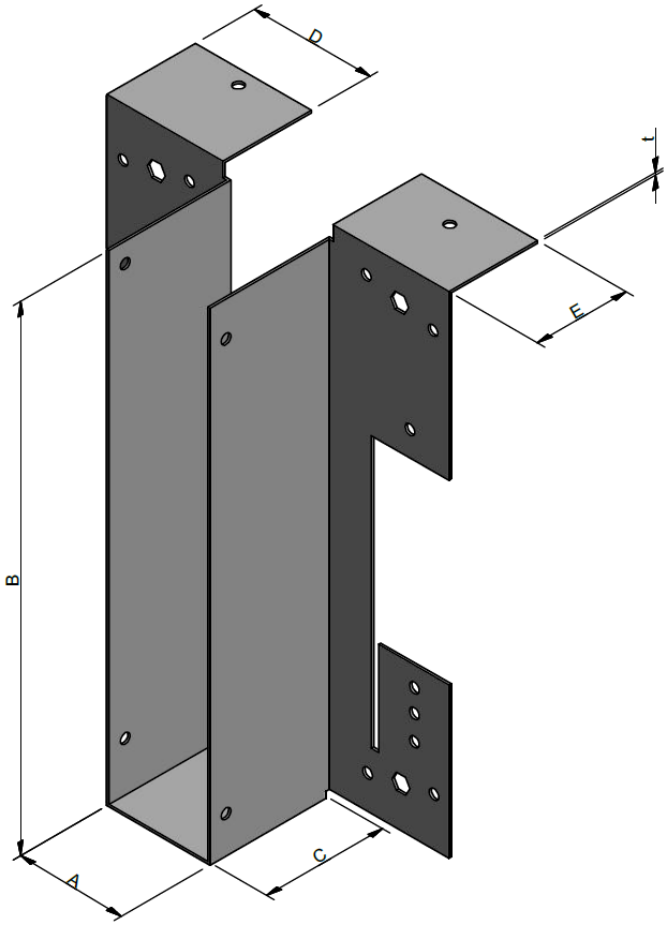
- Standard = Installation without backer blocks
- Enhanced = Installation with backer blocks fitted as per I-Joist manufacturers details

D25 Connector type LITB

Product Name	Material reference acc. to clause II-1	Alternative Names
LITB	Steel ref 1	-

Product Dimensions

Item	Product dimensions [mm]								Header holes			Joist holes
	A		B		C	D	E	t	Top	Face		Ø4
	Min	Max	Min	Max					Ø4	Ø4	Hexagonal holes Ø6.4	
LITB	40	200	145	304	48.5	48.5	35	0.9	2	16	4	4



Product capacities - Standard installation for I-Joist headers

Item	Type	Dimensions [mm]		Fasteners						Characteristic capacities [kN] - Timber C24	
				Header				Joist		$R_{1,k}$	$R_{2,k}$
		A	B	Top	Type	Face	Type	Qty	Type		
LITB(B)/(A)	< 35 mm LVL flange	53 - 61	220 - 300	2	3,75x30 ST	10	3,75x30 ST	4	3,75x30 ST	7.6	3.4
LITB(B)/(A)	≥ 35 mm LVL flange	40 - 200	195 - 300	2	3,75x30 ST	10	3,75x30 ST	4	3,75x30 ST	8.9	3.4
LITB(B)/(A)	≥ 45 mm C24 flange	47 - 200	145 - 300	2	3,75x30 ST	10	3,75x30 ST	4	3,75x30 ST	10.1	3.4

Product capacities - Standard installation for Metal Web headers

Item	Type	Dimensions [mm]		Fasteners						Characteristic capacities [kN] - Timber C24	
				Header				Joist		$R_{1,k}$	$R_{2,k}$
		A	B	Top	Type	Face	Type	Qty	Type		
LITB(B)/(A)	Metal Web joists	47 - 200	195 - 304	2	3,75x30 ST	8	3,75x30 ST	4	3,75x30 ST	11.0	3.4

Product capacities - Standard installation for Timber Nailers

Item	Type	Nailer Depth [mm]	Hanger Width [mm]	Fasteners						Characteristic capacities [kN] - Timber C24	
				Header				Joist		$R_{1,k}$	$R_{2,k}$
				Top	Type	Face	Type	Qty	Type		
LITB(B)/(A)	Timber Nailer	38 - 50	40 - 96	2	3,75x30 ST	4	3,75x30 ST	4	3,75x30 ST	7.9	3.6
LITB(B)/(A)	Timber Nailer	38 - 50	100	2	3,75x30 ST	4	3,75x30 ST	4	3,75x30 ST	9.5	3.6
LITB(B)/(A)	Timber Nailer	75 - 100	40 - 100	2	3,75x30 ST	4	3,75x30 ST	4	3,75x30 ST	11.6	3.6

Product capacities - Enhanced installation for I-Joist headers

Item	Type	Dimensions [mm]		Fasteners						Characteristic capacities [kN] - Timber C24	
				Header				Joist		$R_{1,k}$	$R_{2,k}$
		A	B	Top	Type	Face	Type	Qty	Type		
LITB(B)/(A)	< 35 mm LVL flange	53 - 61	220 - 300	2	3,75x30 ST	16	3,75x30 ST	4	3,75x30 ST	16.1	3.4
LITB(B)/(A)	≥ 35 mm LVL flange	40 - 91	195 - 300	2	3,75x30 ST	16	3,75x30 ST	4	3,75x30 ST	16.1	3.4
LITB(B)/(A)	≥ 45 mm C24 flange	47 - 100	145 - 300	2	3,75x30 ST	16	3,75x30 ST	4	3,75x30 ST	17.2	3.4

Note:

- Standard = Installation without backer blocks
- Enhanced = Installation with backer blocks fitted as per I-Joist manufacturers details