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EOTA Member



www.eota.eu

European Organisation for
Technical Assessment
Organisation Européenne
pour l'évaluation technique

Valutazione Tecnica Europea

ETA 19/0535 of 21/10/2019

PARTE GENERALE

Nome commerciale del prodotto da costruzione

Famiglia di prodotto alla quale appartiene il prodotto da costruzione

Produttore

Stabilimento di produzione

Questa Valutazione Tecnica Europea contiene:

Questa Valutazione Tecnica Europea viene rilasciata in accordo col Regolamento (EU) n° 305/2011, sulla base di

SIPA NAILING PLATES

- Joist Hangers (104 prodotti)
- Hold Downs (5 prodotti)
- Angle Brackets (8 prodotti)
- Restraint Plates (6 prodotti)
- Restraint Straps (2 prodotti)

PAC 13: PRODOTTI/ELEMENTI E ACCESSORI IN LEGNO PER STRUTTURE
Piastre di acciaio tridimensionali di collegamento con connettori a gambo cilindrico

Sipa s.r.l.
Via dell'Artigianato, 16/18/20
36027 San Pietro di Rosà (VI) - Italia

Sipa s.r.l.
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148 pagine, inclusi 144 Allegati che costituiscono parte integrante di questa valutazione

ETAG 015 Edizione Novembre 2012 – Three-dimensional nailing plates

Questa Valutazione Tecnica Europea è rilasciata da STC in lingua italiana e inglese. Eventuali traduzioni in altre lingue devono corrispondere esattamente al documento originale rilasciato e devono essere identificate come tali. La comunicazione/trasmisione di questa Valutazione Tecnica Europea, inclusa la trasmissione elettronica, deve avvenire in versione integrale (ad eccezione di eventuali Allegati confidenziali). In ogni caso una parziale riproduzione può essere fatta con il consenso scritto di STC (TAB che rilascia). In questo caso la riproduzione parziale deve essere indicata come tale.



PARTI SPECIFICHE

1. DESCRIZIONE TECNICA DEL PRODOTTO

Le piastre di collegamento SIPA NAILING PLATES sono classificabili nelle seguenti famiglie: Joist Hangers (JH), Hold-Downs (HD), Angle Brackets (AB), Restraint Plates (RP) e Restraint Strips (RS). Tutti i prodotti sono elencati di seguito mediante codice identificativo di prodotto e dimensioni.

| <i>Face-Mount Heavy JH</i> | <i>Concealed Face-Mount Heavy JH</i> | <i>Face-Mount Light JH</i> | <i>Concealed Face-Mount Light JH</i> |
|----------------------------|--------------------------------------|----------------------------|--------------------------------------|
| JH/1100-100x160x80 | JH/1140-100x160x80 | JH/373-45x108x80 | JH/655-90x145x80 |
| JH/1101-100x200x80 | JH/1141-100x200x80 | JH/375-60x130x80 | JH/656-80x120x80 |
| JH/1102-100x240x80 | JH/1142-100x240x80 | JH/377-70x125x80 | JH/657-100x140x80 |
| JH/1103-100x280x80 | JH/1143-100x280x80 | JH/379-90x145x80 | JH/1081-51x65x80 |
| JH/1104-100x300x80 | JH/1144-100x300x80 | JH/381-60x100x80 | JH/1082-51x105x80 |
| JH/1105-100x320x80 | JH/1145-100x320x80 | JH/382-80x120x80 | JH/1083-51x135x80 |
| JH/1106-120x120x80 | JH/1146-120x120x80 | JH/383-100x140x80 | JH/1084-51x165x80 |
| JH/1107-120x140x80 | JH/1147-120x140x80 | JH/1050-41x70x80 | JH/1085-60x60x80 |
| JH/1108-120x160x80 | JH/1148-120x160x80 | JH/1051-41x100x80 | JH/1086-60x100x80 |
| JH/1109-120x180x80 | JH/1149-120x180x80 | JH/1052-41x110x80 | JH/1087-60x130x80 |
| JH/1110-120x240x80 | JH/1150-120x240x80 | JH/1053-41x140x80 | JH/1088-60x160x80 |
| JH/1111-120x280x80 | JH/1151-120x280x80 | JH/1054-41x170x80 | JH/1089-70x125x80 |
| JH/1112-120x300x80 | JH/1152-120x300x80 | JH/1055-45x68x80 | JH/1090-70x155x80 |
| JH/1113-120x320x80 | JH/1153-120x320x80 | JH/1056-45x98x80 | JH/1091-80x80x80 |
| JH/1114-140x140x80 | JH/1154-140x140x80 | JH/1057-45x138x80 | JH/1092-80x150x80 |
| JH/1115-140x160x80 | JH/1155-140x160x80 | JH/1058-45x167x80 | JH/1093-100x100x80 |
| JH/1116-140x200x80 | JH/1156-140x200x80 | JH/1060-51x65x80 | |
| JH/1117-140x240x80 | JH/1157-140x240x80 | JH/1061-51x105x80 | |
| JH/1118-140x280x80 | JH/1158-140x280x80 | JH/1062-51x135x80 | |
| JH/1119-140x300x80 | JH/1159-140x300x80 | JH/1063-51x165x80 | |
| JH/1120-140x320x80 | JH/1160-140x320x80 | JH/1064-60x60x80 | |
| JH/1121-160x160x80 | JH/1161-160x160x80 | JH/1065-60x160x80 | |
| JH/1548-160x200x80 | JH/1549-160x200x80 | JH/1066-70x155x80 | |
| JH/1122-160x240x80 | JH/1162-160x240x80 | JH/1067-80x80x80 | |
| JH/1123-160x280x80 | JH/1163-160x280x80 | JH/1068-80x150x80 | |
| JH/1124-160x320x80 | JH/1164-160x320x80 | JH/1069-100x100x80 | |
| JH/1125-180x240x80 | JH/1165-180x240x80 | | |
| JH/1126-180x280x80 | JH/1166-180x280x80 | | |
| JH/1127-180x320x80 | JH/1167-180x320x80 | | |
| JH/1128-200x200x80 | JH/1168-200x200x80 | | |
| JH/1129-200x280x80 | JH/1169-200x280x80 | | |

| <i>Angle Brackets (AB)</i> | <i>Restraint Plates (RP)</i> | <i>Hold Downs (HD)</i> | <i>Restraint Straps (RS)</i> |
|----------------------------|------------------------------|------------------------|------------------------------|
| AB/756-65x85x85 | RP/394-65x170 | HD/1645-40x160x60 | RS/758-40x20000 |
| AB/757-90x100x100 | RP/396-90x200 | HD/746-65x95x90 | RS/759-60x20000 |
| AB/397-90x100x100 | RP/1676-40x100 | HD/747-65x135x90 | |
| AB/395-65x85x85 | RP/1677-40x140 | HD/748-65x285x90 | |
| AB/1616-40x60x80 | RP/1678-40x180 | HD/749-65x450x90 | |
| AB/1617-40x70x70 | RP/1679-40x220 | | |
| AB/1618-40x110x110 | | | |
| AB/1619-40x60x120 | | | |
| AB/756-65x85x85 | | | |

Le SIPA NAILING PLATES sono piastre di collegamento tridimensionali di acciaio mono-blocco piegate a freddo non saldate e fissate alla superficie di elementi per connessioni legno-legno o legno-calcestruzzo o legno-acciaio (escluse le famiglie Restraint Plates e Strips che sono usate solo per le connessioni tra elementi in legno). Tali piastre vengono connesse a elementi in legno o a

base di legno mediante connettori a gambo cilindrico (chiodi o viti filettate) in accordo all' EN 14592:2012. Le piastre Joist Hanger sono costituite da lamiera in acciaio di spessore pari a 2.0 mm (Light) o 2.5 mm (Heavy). Le piastre Hold Down sono caratterizzati da lamiera in acciaio di spessore variabile tra i 3.0 mm e i 4.0 mm. Lo spessore delle lamiere che costituiscono le piastre Angle Bracket, Restraint Plate e Strap varia tra i 2.0 mm e i 3.0 mm.

Tutti i prodotti in oggetto sono costituiti dalle seguenti tipologie di acciaio:

- S250GD (acciaio rivestito di zinco a caldo in accordo all'EN 10346:2015) con $R_{p0,2}/R_{eH} \geq 250$ MPa e $R_m \geq 330$ MPa. In particolare, sono adottati diversi spessori di rivestimento in zinco (da Z100 a Z275, come specificato nell'Allegato A);
- S235JR (secondo l'EN 10025-2:2005) con $R_{eH} \geq 235$ MPa e $R_m \geq 360$ MPa.

I fori e le costole di irrigidimento sono ottenuti mediante stampaggio a freddo delle lamiere in acciaio. I disegni dettagliati e le specifiche dei prodotti sono forniti nell'Allegato A.

2. INDIVIDUAZIONE DELL'USO PREVISTO IN ACCORDO CON L'ETAG 015 USATO COME DOCUMENTO PER LA VALUTAZIONE EUROPEA (EAD nel seguito)

Le SIPA NAILING PLATES vengono utilizzate nelle strutture portanti in legno come connessione legno-legno o legno-calcestruzzo o legno-acciaio soggette a carichi statici o quasi-statici, per le quali la rigidità e la resistenza vanno valutate per specifiche configurazioni di connettori.

Gli elementi in legno possono essere in legno massiccio, legno lamellare incollato e similari, o elementi strutturali a base di legno, con densità caratteristica tra 290 e 490 kg/m³. °In particolare, possono essere adoperati i seguenti materiali:

- Legno massiccio classificato come C14 - C50 secondo le norme EN 338:2016 e EN 14081:2016
- Legno lamellare incollato classificato come GL20 – GL32 secondo la EN 14080:2013
- Legno massiccio incollato secondo la EN 14080:2013
- Legno lamellare incrociato (XLAM) secondo la EN16351:2015
- Legno micro-lamellare (LVL) secondo la EN 14374:2005
- Compensato secondo la EN 636:2015
- Legno a scaglie orientate o Oriented Strand Board (OSB) secondo la EN 13986:2015

Per quanto riguarda l'imballaggio, il trasporto e l'immagazzinamento del prodotto, è responsabilità del produttore adottare le misure appropriate e consigliare i propri clienti sul trasporto e l'immagazzinamento, che ritiene necessari per raggiungere le prestazioni dichiarate.

Le informazioni sull'installazione sono fornite con la documentazione tecnica del produttore e si presume che il prodotto sarà installato in base ad essa o (in assenza di tali istruzioni) secondo la prassi abituale dei professionisti dell'edilizia.

Le specifiche e le condizioni fornite dal produttore sono sintetizzate nell'Allegato B.

Le prestazioni contenute in questa Valutazione Tecnica Europea, secondo l'EAD applicabile, si basano su una vita utile prevista presunta di almeno 50 anni, a condizione che siano soddisfatte le condizioni per l'installazione, l'imballaggio, il trasporto, lo stoccaggio, l'installazione e l'uso, la manutenzione e la riparazione appropriati.

Le indicazioni fornite sulla vita utile non possono essere interpretate come una garanzia fornita dal produttore, ma devono essere considerate solo come un mezzo per scegliere i prodotti in relazione alla vita utile prevista, economicamente ragionevole, delle opere.

3. PRESTAZIONI DEL PRODOTTO E RIFERIMENTO AI METODI USATI PER LA SUA VALUTAZIONE

La valutazione delle prestazioni delle piastre di collegamento SIPA NAILING PLATES sono state eseguite in accordo all'EAD, secondo i metodi di prova e i criteri di calcolo ivi riportati.

3.1 RESISTENZA MECCANICA E STABILITÀ (BWR1)

| # | Caratteristica essenziale | Prestazione |
|---|-----------------------------------|---|
| 1 | Resistenza del collegamento | Vedi Allegato C |
| 2 | Rigidità del collegamento | Vedi Allegato C |
| 3 | Resistenza alle azioni sismiche | Nessuna prestazione valutata |
| 4 | Resistenza a corrosione e degrado | I prodotti realizzati in acciaio S250GD rivestito di zinco per immersione a caldo in continuo sono caratterizzate da masse di rivestimento Z100, Z140, Z180, Z200, Z225, Z275. In accordo all'EAD per i prodotti realizzati con lamiere di acciaio S250GD rivestito di zinco per immersione a caldo in continuo con masse di rivestimento Z275 e spessore inferiore o al più uguale a 3.0 mm si può assumere sufficiente durabilità a lungo termine in classe di servizio 2. |

3.2 SICUREZZA IN CASO DI INCENDIO (BWR 2)

| # | Caratteristica essenziale | Prestazione |
|---|---------------------------|---|
| 5 | Reazione al fuoco | Si considera che le piastre di collegamento in acciaio tridimensionali soddisfino i requisiti di prestazione Classe A1 per la caratteristica di reazione al fuoco in accordo alla Decisione dell'Unione Europea 2000/605/EC, senza necessità di ulteriori prove sperimentali, nelle ipotesi che esse rispettino le condizioni e gli usi previsti riportate in tale Decisione |
| 6 | Resistenza al fuoco | Nessuna prestazione valutata |

4. SISTEMA APPLICATO DI VALUTAZIONE E VERIFICA DELLA COSTANZA DI PRESTAZIONE (AVCP), CON RIFERIMENTO ALLE SUE BASI LEGISLATIVE

In accordo con l'EAD l'atto giuridico europeo applicabile è la **Decisione 1997/638/EC**.
Il sistema di valutazione e verifica della costanza di prestazione (AVCP) da applicare è: **2+**, per tutti gli usi previsti.

5. DETTAGLI TECNICI NECESSARI PER L'IMPLEMENTAZIONE DEL SISTEMA AVCP, COME PREVISTI DALL' EAD

I dettagli tecnici necessari per l'implementazione del sistema AVCP sono definiti nel piano dei controlli, depositato presso ITC-CNR.

Rilasciata a Roma, Italia on 21/10/2019
da STC - CSLP



Consiglio Superiore dei Lavori Pubblici
Servizio Tecnico Centrale
Divisione 2°
Via Nomentana, 2
00161 Roma (Italia)

Il dirigente

Ing. Antonio Lucchese

A handwritten signature in blue ink, appearing to read 'A. Lucchese', written over the printed name.



Il presidente del
Consiglio Superiore dei Lavori Pubblici
Prof. Ing. Donato Carlea



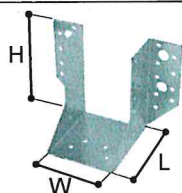


Table A1: Face-Mount Light Joist Hangers – Descrizione del Prodotto

| Product ID | Dimensions | | | Thickness | Steel and Coating specification | |
|------------|------------|------|------|-----------|---------------------------------|---------|
| | W | H | L | t | Type 1 | Type 2* |
| (-) | (mm) | (mm) | (mm) | (mm) | (-) | (-) |
| JH/373 | 45 | 108 | 80 | 2,0 | S235JR | S250GD |
| JH/375 | 60 | 130 | 80 | 2,0 | S235JR | S250GD |
| JH/377 | 70 | 125 | 80 | 2,0 | S235JR | S250GD |
| JH/379 | 90 | 145 | 80 | 2,0 | S235JR | S250GD |
| JH/381 | 60 | 100 | 80 | 2,0 | S235JR | S250GD |
| JH/382 | 80 | 120 | 80 | 2,0 | S235JR | S250GD |
| JH/383 | 100 | 140 | 80 | 2,0 | S235JR | S250GD |
| JH/1050 | 41 | 70 | 80 | 2,0 | S235JR | S250GD |
| JH/1051 | 41 | 100 | 80 | 2,0 | S235JR | S250GD |
| JH/1052 | 41 | 110 | 80 | 2,0 | S235JR | S250GD |
| JH/1053 | 41 | 140 | 80 | 2,0 | S235JR | S250GD |
| JH/1054 | 41 | 170 | 80 | 2,0 | S235JR | S250GD |
| JH/1055 | 45 | 68 | 80 | 2,0 | S235JR | S250GD |
| JH/1056 | 45 | 98 | 80 | 2,0 | S235JR | S250GD |
| JH/1057 | 45 | 138 | 80 | 2,0 | S235JR | S250GD |
| JH/1058 | 45 | 167 | 80 | 2,0 | S235JR | S250GD |
| JH/1060 | 51 | 65 | 80 | 2,0 | S235JR | S250GD |
| JH/1061 | 51 | 105 | 80 | 2,0 | S235JR | S250GD |
| JH/1062 | 51 | 135 | 80 | 2,0 | S235JR | S250GD |
| JH/1063 | 51 | 165 | 80 | 2,0 | S235JR | S250GD |
| JH/1064 | 60 | 60 | 80 | 2,0 | S235JR | S250GD |
| JH/1065 | 60 | 160 | 80 | 2,0 | S235JR | S250GD |
| JH/1066 | 70 | 155 | 80 | 2,0 | S235JR | S250GD |
| JH/1067 | 80 | 80 | 80 | 2,0 | S235JR | S250GD |
| JH/1068 | 80 | 150 | 80 | 2,0 | S235JR | S250GD |
| JH/1069 | 100 | 100 | 80 | 2,0 | S235JR | S250GD |

* Per acciaio "Type 2" vengono applicati diversi spessori di rivestimenti in zinco: Z100, Z140, Z180, Z200, Z225, Z275.

SIPA NAILING PLATES

Descrizione del Prodotto:
Face-Mount Light Joist Hangers

Allegato A1
dell'ETA N° 19/0535

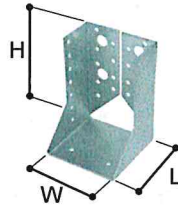


Table A2: Concealed Face-Mount Light Joist Hangers - Descrizione del Prodotto

| Product ID | Dimensions | | | Thickness | Steel and Coating specification | |
|------------|------------|------|------|-----------|---------------------------------|---------|
| | W | H | L | t | Type 1 | Type 2* |
| (-) | (mm) | (mm) | (mm) | (mm) | (-) | (-) |
| JH/655 | 90 | 145 | 80 | 2,0 | S235JR | S250GD |
| JH/656 | 80 | 120 | 80 | 2,0 | S235JR | S250GD |
| JH/657 | 100 | 140 | 80 | 2,0 | S235JR | S250GD |
| JH/1081 | 51 | 65 | 80 | 2,0 | S235JR | S250GD |
| JH/1082 | 51 | 105 | 80 | 2,0 | S235JR | S250GD |
| JH/1083 | 51 | 135 | 80 | 2,0 | S235JR | S250GD |
| JH/1084 | 51 | 165 | 80 | 2,0 | S235JR | S250GD |
| JH/1085 | 60 | 60 | 80 | 2,0 | S235JR | S250GD |
| JH/1086 | 60 | 100 | 80 | 2,0 | S235JR | S250GD |
| JH/1087 | 60 | 130 | 80 | 2,0 | S235JR | S250GD |
| JH/1088 | 60 | 160 | 80 | 2,0 | S235JR | S250GD |
| JH/1089 | 70 | 125 | 80 | 2,0 | S235JR | S250GD |
| JH/1090 | 70 | 155 | 80 | 2,0 | S235JR | S250GD |
| JH/1091 | 80 | 80 | 80 | 2,0 | S235JR | S250GD |
| JH/1092 | 80 | 150 | 80 | 2,0 | S235JR | S250GD |
| JH/1093 | 100 | 100 | 80 | 2,0 | S235JR | S250GD |

* Per acciaio "Type 2" vengono applicati diversi spessori di rivestimenti in zinco: Z100, Z140, Z180, Z200, Z225, Z275.

SIPA NAILING PLATES

Descrizione del Prodotto:
Concealed Face-Mount Light Joist Hangers

Allegato A2
dell'ETA N° 19/0535

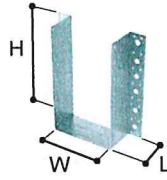


Table A3: Face-Mount Heavy Joist Hangers – Descrizione del Prodotto

| Product ID | Dimensions | | | Thickness | Steel and Coating specification | |
|------------|------------|------|------|-----------|---------------------------------|---------|
| | W | H | L | t | Type 1 | Type 2* |
| (-) | (mm) | (mm) | (mm) | (mm) | (-) | (-) |
| JH/1100 | 100 | 160 | 80 | 2,5 | S235JR | S250GD |
| JH/1101 | 100 | 200 | 80 | 2,5 | S235JR | S250GD |
| JH/1102 | 100 | 240 | 80 | 2,5 | S235JR | S250GD |
| JH/1103 | 100 | 280 | 80 | 2,5 | S235JR | S250GD |
| JH/1104 | 100 | 300 | 80 | 2,5 | S235JR | S250GD |
| JH/1105 | 100 | 320 | 80 | 2,5 | S235JR | S250GD |
| JH/1106 | 120 | 120 | 80 | 2,5 | S235JR | S250GD |
| JH/1107 | 120 | 140 | 80 | 2,5 | S235JR | S250GD |
| JH/1108 | 120 | 160 | 80 | 2,5 | S235JR | S250GD |
| JH/1109 | 120 | 180 | 80 | 2,5 | S235JR | S250GD |
| JH/1110 | 120 | 240 | 80 | 2,5 | S235JR | S250GD |
| JH/1111 | 120 | 280 | 80 | 2,5 | S235JR | S250GD |
| JH/1112 | 120 | 300 | 80 | 2,5 | S235JR | S250GD |
| JH/1113 | 120 | 320 | 80 | 2,5 | S235JR | S250GD |
| JH/1114 | 140 | 140 | 80 | 2,5 | S235JR | S250GD |
| JH/1115 | 140 | 160 | 80 | 2,5 | S235JR | S250GD |
| JH/1116 | 140 | 200 | 80 | 2,5 | S235JR | S250GD |
| JH/1117 | 140 | 240 | 80 | 2,5 | S235JR | S250GD |
| JH/1118 | 140 | 280 | 80 | 2,5 | S235JR | S250GD |
| JH/1119 | 140 | 300 | 80 | 2,5 | S235JR | S250GD |
| JH/1120 | 140 | 320 | 80 | 2,5 | S235JR | S250GD |
| JH/1121 | 160 | 160 | 80 | 2,5 | S235JR | S250GD |
| JH/1548 | 160 | 200 | 80 | 2,5 | S235JR | S250GD |
| JH/1122 | 160 | 240 | 80 | 2,5 | S235JR | S250GD |
| JH/1123 | 160 | 280 | 80 | 2,5 | S235JR | S250GD |
| JH/1124 | 160 | 320 | 80 | 2,5 | S235JR | S250GD |
| JH/1125 | 180 | 240 | 80 | 2,5 | S235JR | S250GD |
| JH/1126 | 180 | 280 | 80 | 2,5 | S235JR | S250GD |
| JH/1127 | 180 | 320 | 80 | 2,5 | S235JR | S250GD |
| JH/1128 | 200 | 200 | 80 | 2,5 | S235JR | S250GD |
| JH/1129 | 200 | 280 | 80 | 2,5 | S235JR | S250GD |

* Per acciaio "Type 2" vengono applicati diversi spessori di rivestimenti in zinco: Z100, Z140, Z180, Z200, Z225, Z275.

SIPA NAILING PLATES

Descrizione del Prodotto:
Face-Mount Heavy Joist Hangers

**Annex A3
of ETA N° 19/0535**

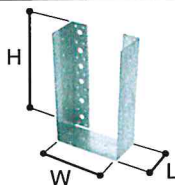


Table A4: Concealed Face-Mount Heavy Joist Hangers – Descrizione del Prodotto

| Product ID | Dimensions | | | Thickness | Steel and Coating specification | |
|------------|------------|------|------|-----------|---------------------------------|---------|
| | W | H | L | t | Type 1 | Type 2* |
| (-) | (mm) | (mm) | (mm) | (mm) | (-) | (-) |
| JH/1140 | 100 | 160 | 80 | 2,5 | S235JR | S250GD |
| JH/1141 | 100 | 200 | 80 | 2,5 | S235JR | S250GD |
| JH/1142 | 100 | 240 | 80 | 2,5 | S235JR | S250GD |
| JH/1143 | 100 | 280 | 80 | 2,5 | S235JR | S250GD |
| JH/1144 | 100 | 300 | 80 | 2,5 | S235JR | S250GD |
| JH/1145 | 100 | 320 | 80 | 2,5 | S235JR | S250GD |
| JH/1146 | 120 | 120 | 80 | 2,5 | S235JR | S250GD |
| JH/1147 | 120 | 140 | 80 | 2,5 | S235JR | S250GD |
| JH/1148 | 120 | 160 | 80 | 2,5 | S235JR | S250GD |
| JH/1149 | 120 | 180 | 80 | 2,5 | S235JR | S250GD |
| JH/1150 | 120 | 240 | 80 | 2,5 | S235JR | S250GD |
| JH/1151 | 120 | 280 | 80 | 2,5 | S235JR | S250GD |
| JH/1152 | 120 | 300 | 80 | 2,5 | S235JR | S250GD |
| JH/1153 | 120 | 320 | 80 | 2,5 | S235JR | S250GD |
| JH/1154 | 140 | 140 | 80 | 2,5 | S235JR | S250GD |
| JH/1155 | 140 | 160 | 80 | 2,5 | S235JR | S250GD |
| JH/1156 | 140 | 200 | 80 | 2,5 | S235JR | S250GD |
| JH/1157 | 140 | 240 | 80 | 2,5 | S235JR | S250GD |
| JH/1158 | 140 | 280 | 80 | 2,5 | S235JR | S250GD |
| JH/1159 | 140 | 300 | 80 | 2,5 | S235JR | S250GD |
| JH/1160 | 140 | 320 | 80 | 2,5 | S235JR | S250GD |
| JH/1161 | 160 | 160 | 80 | 2,5 | S235JR | S250GD |
| JH/1549 | 160 | 200 | 80 | 2,5 | S235JR | S250GD |
| JH/1162 | 160 | 240 | 80 | 2,5 | S235JR | S250GD |
| JH/1163 | 160 | 280 | 80 | 2,5 | S235JR | S250GD |
| JH/1164 | 160 | 320 | 80 | 2,5 | S235JR | S250GD |
| JH/1165 | 180 | 240 | 80 | 2,5 | S235JR | S250GD |
| JH/1166 | 180 | 280 | 80 | 2,5 | S235JR | S250GD |
| JH/1167 | 180 | 320 | 80 | 2,5 | S235JR | S250GD |
| JH/1168 | 200 | 200 | 80 | 2,5 | S235JR | S250GD |
| JH/1169 | 200 | 280 | 80 | 2,5 | S235JR | S250GD |

* Per acciaio "Type 2" vengono applicati diversi spessori di rivestimenti in zinco: Z100, Z140, Z180, Z200, Z225, Z275.

SIPA NAILING PLATES

Descrizione del Prodotto:
Concealed Face-Mount Heavy Joist Hangers

**Allegato A4
dell'ETA N° 19/0535**

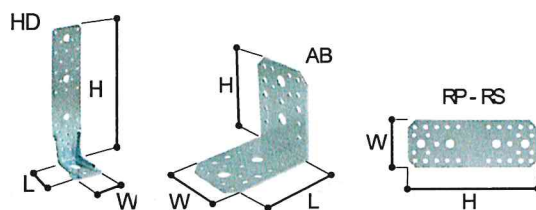


Table A5: Hold-Downs, Angle Brackets, Restraint Plates and Restraint Strips – Descrizione del Prodotto

| Product ID | Dimensions | | | Thickness | Steel and Coating specification | |
|------------|------------|-------|------|-----------|---------------------------------|---------|
| | W | H | L | t | Type 1 | Type 2* |
| (-) | (mm) | (mm) | (mm) | (mm) | (-) | (-) |
| HD/1645 | 40 | 160 | 60 | 3,0 | S235JR | S250GD |
| HD/746 | 65 | 95 | 90 | 4,0 | S235JR | S250GD |
| HD/747 | 65 | 135 | 90 | 4,0 | S235JR | S250GD |
| HD/748 | 65 | 285 | 90 | 4,0 | S235JR | S250GD |
| HD/749 | 65 | 450 | 90 | 4,0 | S235JR | S250GD |
| AB/756 | 65 | 85 | 85 | 2,5 | S235JR | S250GD |
| AB/757 | 90 | 100 | 100 | 2,5 | S235JR | S250GD |
| AB/397 | 90 | 100 | 100 | 2,5 | S235JR | S250GD |
| AB/395 | 65 | 85 | 85 | 2,5 | S235JR | S250GD |
| AB/1616 | 40 | 80 | 60 | 3,0 | S235JR | S250GD |
| AB/1617 | 40 | 70 | 70 | 3,0 | S235JR | S250GD |
| AB/1618 | 40 | 110 | 110 | 3,0 | S235JR | S250GD |
| AB/1619 | 40 | 120 | 60 | 3,0 | S235JR | S250GD |
| RP/394 | 65 | 170 | - | 2,5 | S235JR | S250GD |
| RP/396 | 90 | 200 | - | 2,5 | S235JR | S250GD |
| RP/1676 | 40 | 100 | - | 3,0 | S235JR | S250GD |
| RP/1677 | 40 | 140 | - | 3,0 | S235JR | S250GD |
| RP/1678 | 40 | 180 | - | 3,0 | S235JR | S250GD |
| RP/1679 | 40 | 220 | - | 3,0 | S235JR | S250GD |
| RS/758 | 40 | 20000 | - | 2,0 | S235JR | S250GD |
| RS/759 | 60 | 20000 | - | 2,0 | S235JR | S250GD |

* Per acciaio "Type 2" vengono applicati diversi spessori di rivestimenti in zinco: Z100, Z140, Z180, Z200, Z225, Z275.

SIPA NAILING PLATES

Descrizione del Prodotto:
Hold-Downs, Angle Brackets, Restraint Plates and Restraint Strips

Allegato A5
dell'ETA N° 19/0535

Table A6: Valori massimi e minimi di tolleranza

| Tolerances (maximum and minimum values) | | | | | |
|---|-------------|-------------|------------|--------------------------------|--------------------|
| Product typology | Height (mm) | Length (mm) | Width (mm) | Hole position and spacing (mm) | Hole diameter (mm) |
| Joist Hangers | ±0.8 | ±0.8 | ±0.8 | ±0.8 | ±0.5 |
| Angle Brackets | ±1.0 | ±1.0 | - | ±0.7 | ±0.2 |
| Restraint Plates | ±0.3 | - | ±0.4 | ±0.4 | ±0.2 |
| Hold Downs | ±1.0 | ±0.6 | ±0.5 | ±0.5 | ±0.7 |
| Restraint Straps | - | - | - | ±0.4 | ±0.2 |

I valori della resistenza e della rigidezza delle piastre di collegamento in acciaio, come riportato nell'Allegato C, è stato valutato considerando l'uso di connettori Würth Comb Nail (mod. 0681 940040) e Würth Comb Nail (mod. 0681 940075). In accordo all'EAD, per connettori a gambo cilindrico soggetti a carichi laterali o assiali, la valutazione della capacità portante deve essere basata sulle informazioni fornite nella loro Dichiarazione di Prestazione. La seguente tabella riporta le prestazioni dichiarate per i connettori considerati.

Table A7: Specifiche dei connettori

| Fastener typology | Fastener dimensions | | | Material and Finish type |
|----------------------------|---------------------|-------------|----------------------|--------------------------|
| | Diameter (mm) | Length (mm) | Threaded length (mm) | |
| According to EN 14592:2012 | | | | |
| Threaded Nail | 4 | 40 | 32 | Zinc-coated steel |
| Threaded Nail | 4 | 75 | 66 | Zinc-coated steel |

Table A8: Estratto della DoP dei connettori adoperati

| Essential characteristic | Performance | Harmonized technical specification |
|--|-------------------------|------------------------------------|
| Characteristic pull-out parameter | 9.8 N/mm ² | EN 14592 |
| Characteristic head pull-through parameter | 19.0 N/mm ² | EN 14592 |
| Characteristic yield moment | 8461 Nmm | EN 14592 |
| Characteristic tensile strength | 667.0 N/mm ² | EN 14592 |

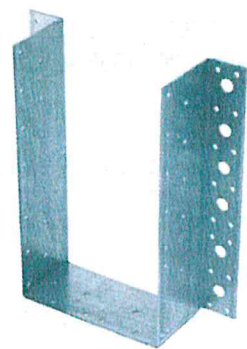
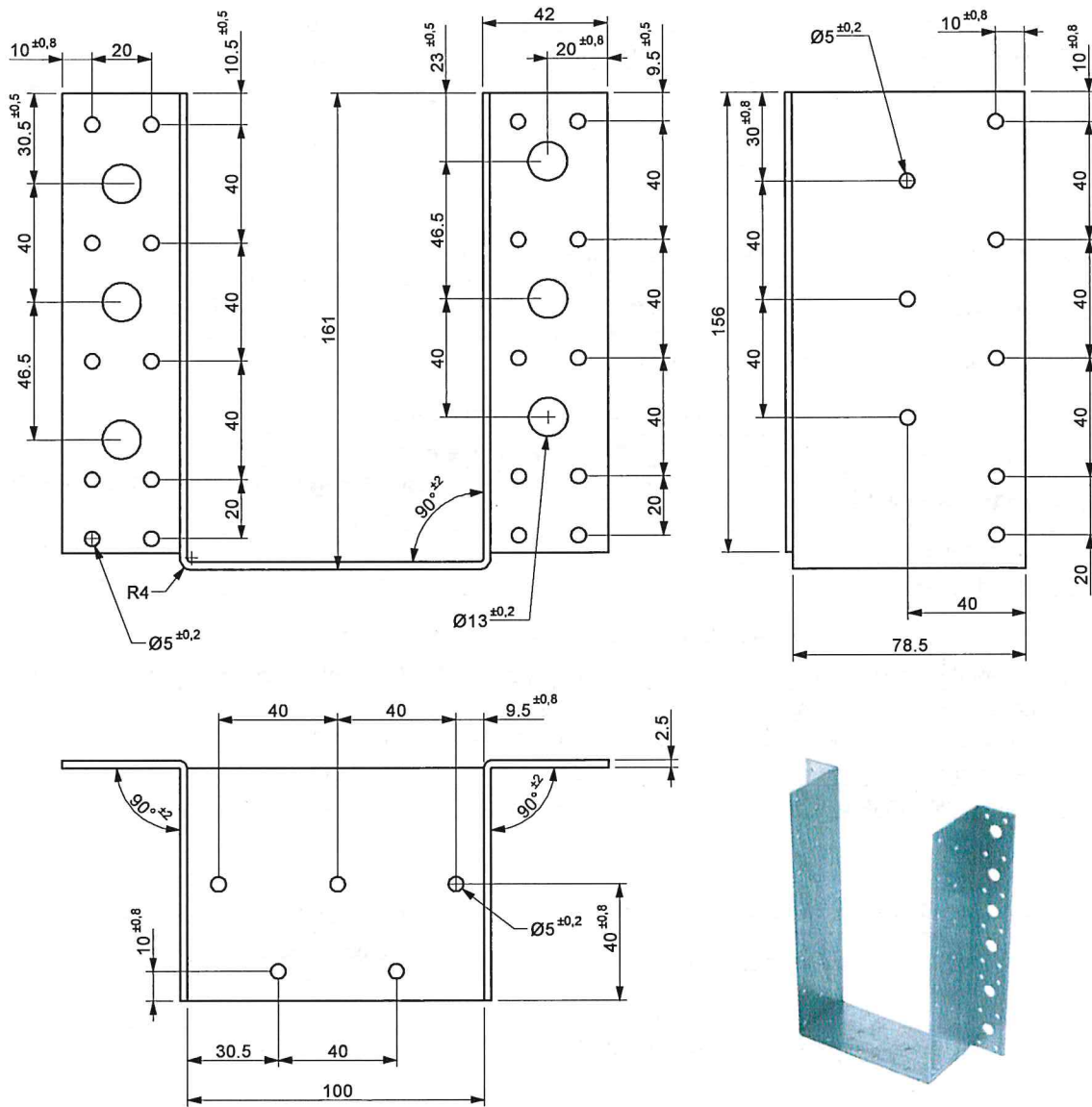
Table A9: Specifiche per fori e ancoraggi metallici per connessioni legno-acciaio o legno-calcestruzzo

| Typology | Corresponding hole diameters (mm) |
|---|-----------------------------------|
| Bolt according to EN 14952 | 10.5 – 13.0 |
| Anchor type specified by the Manufacturer | 10.5 – 13.0 |

SIPA NAILING PLATES

Descrizione del Prodotto:
Tolleranze e specifiche dei connettori

**Allegato A6
dell'ETA N° 19/0535**

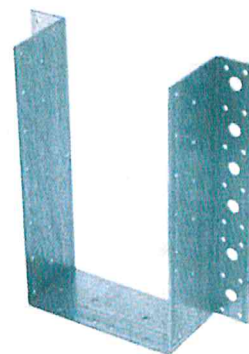
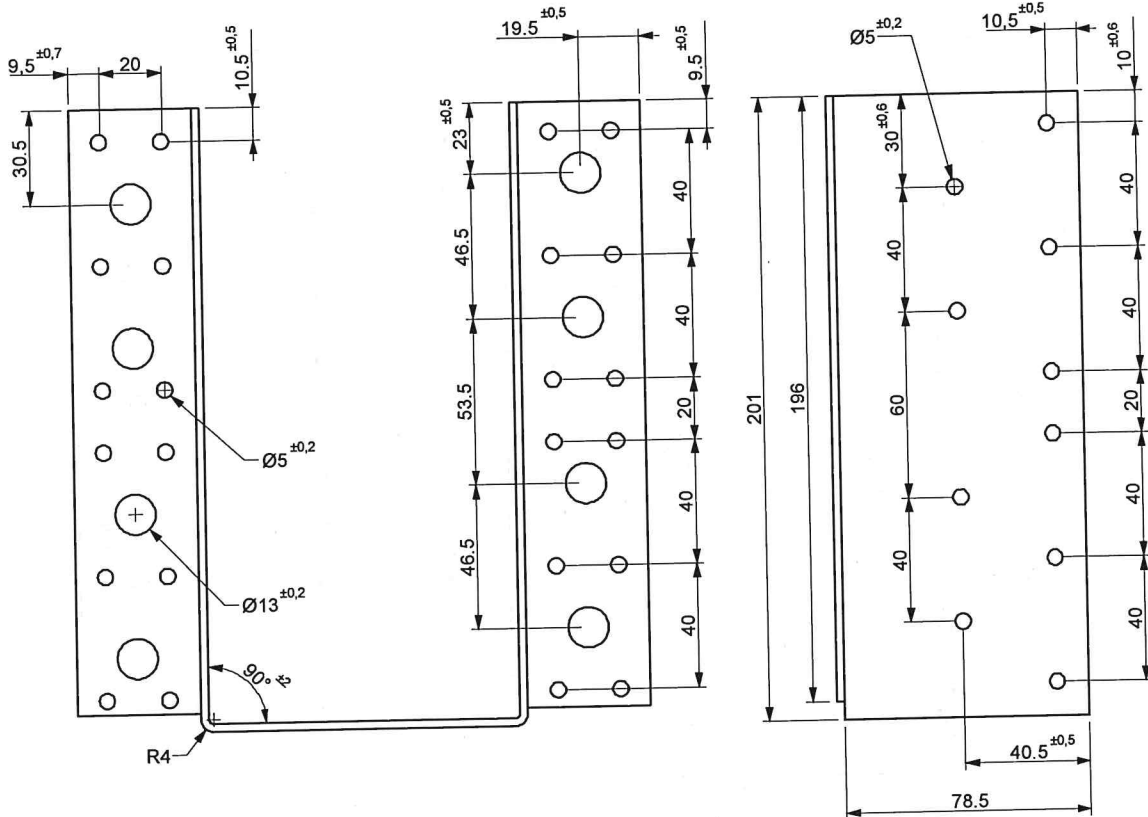


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1100

Allegato A7
dell'ETA N° 19/0535

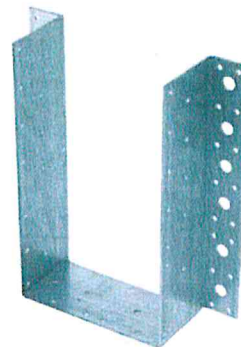
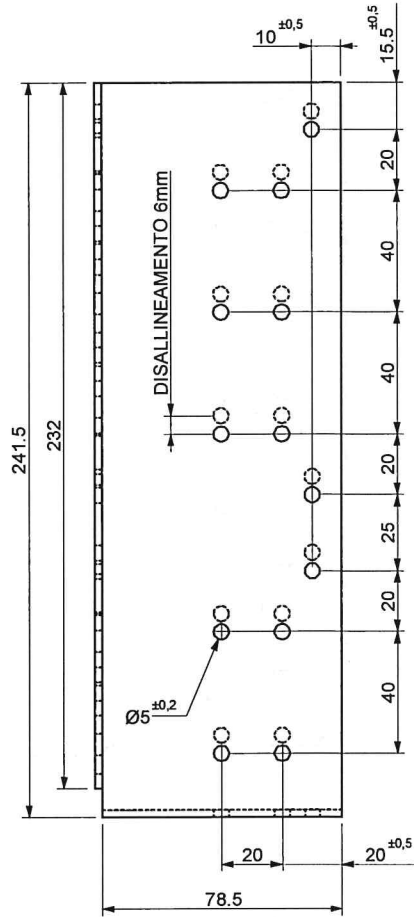
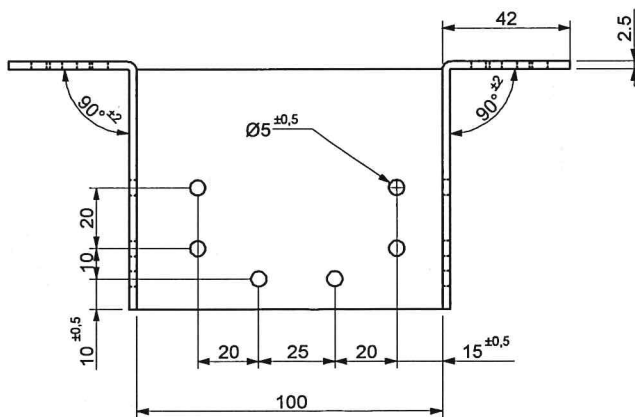
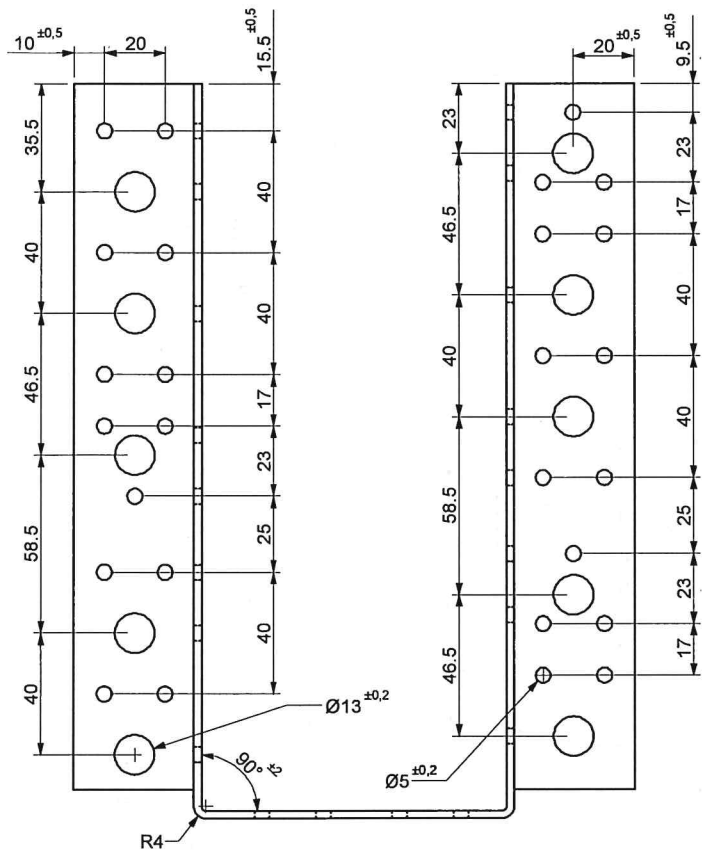


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1101

Allegato A8
dell'ETA N° 19/0535

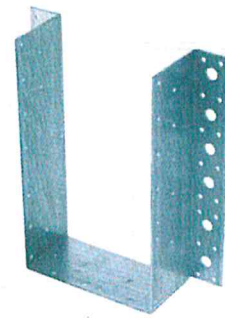
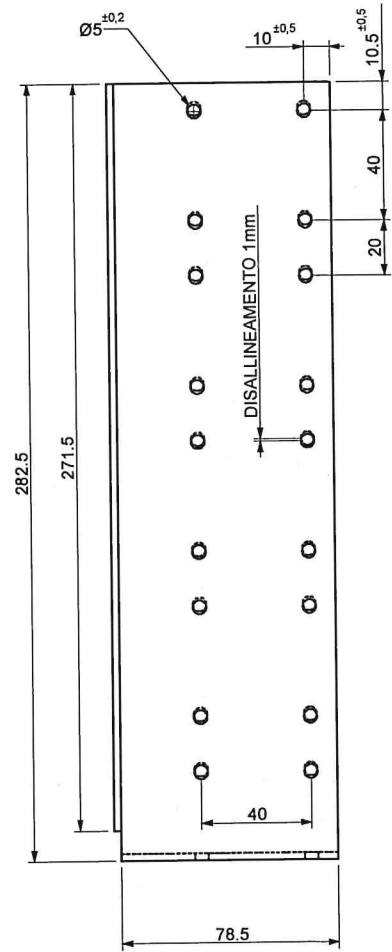
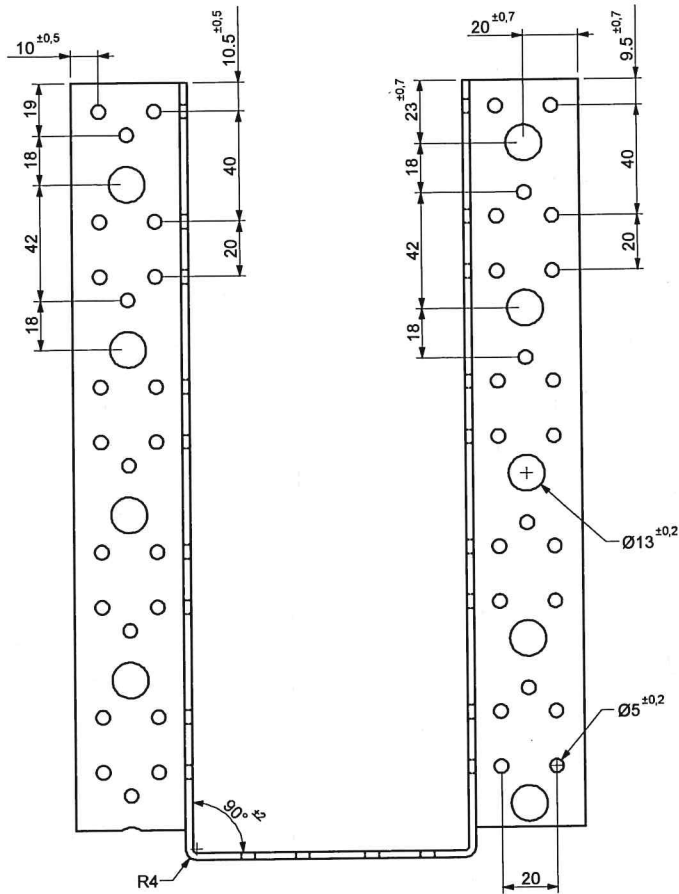


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1102

Allegato A9
dell'ETA N° 19/0535

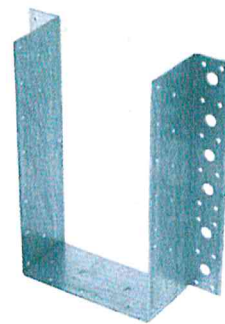
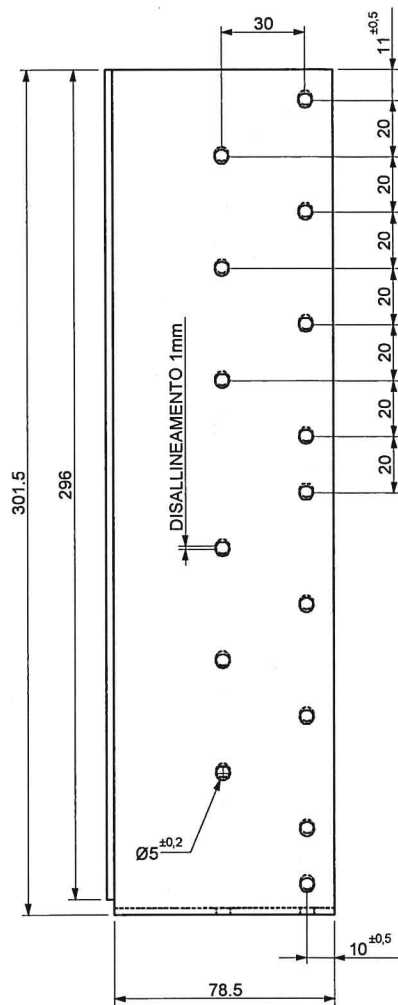
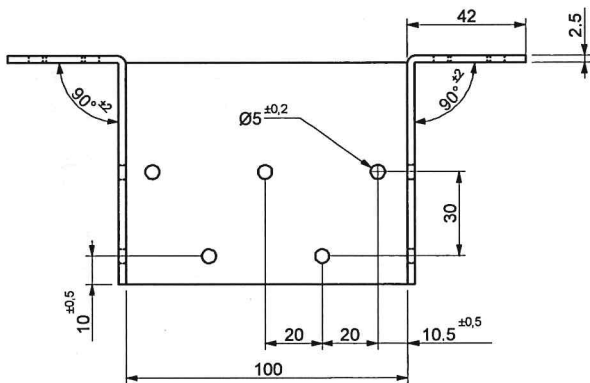
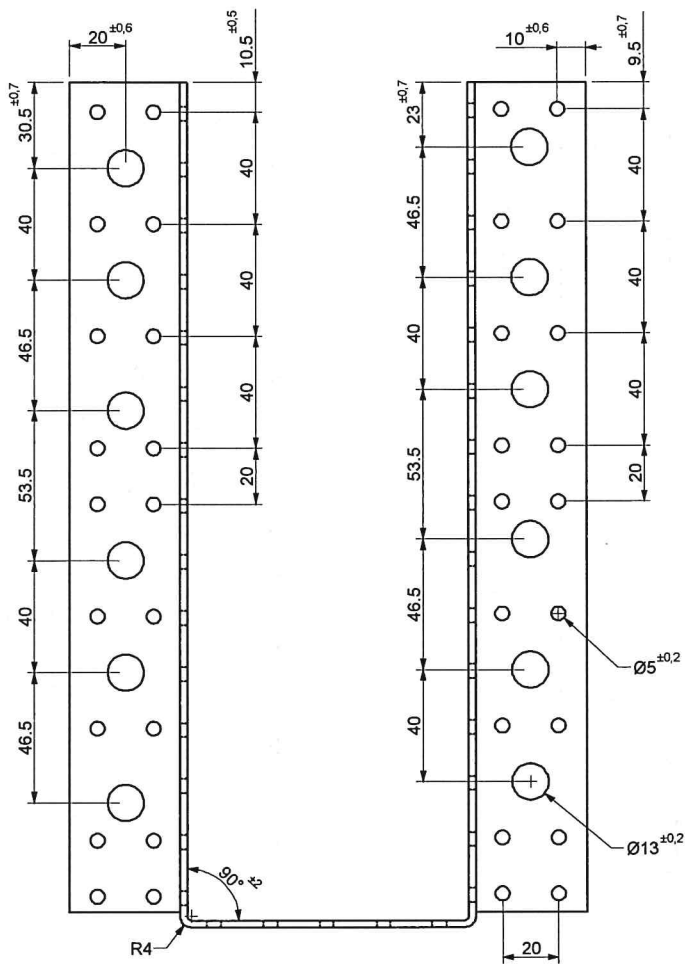


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1103

Allegato A10
dell'ETA N° 19/0535

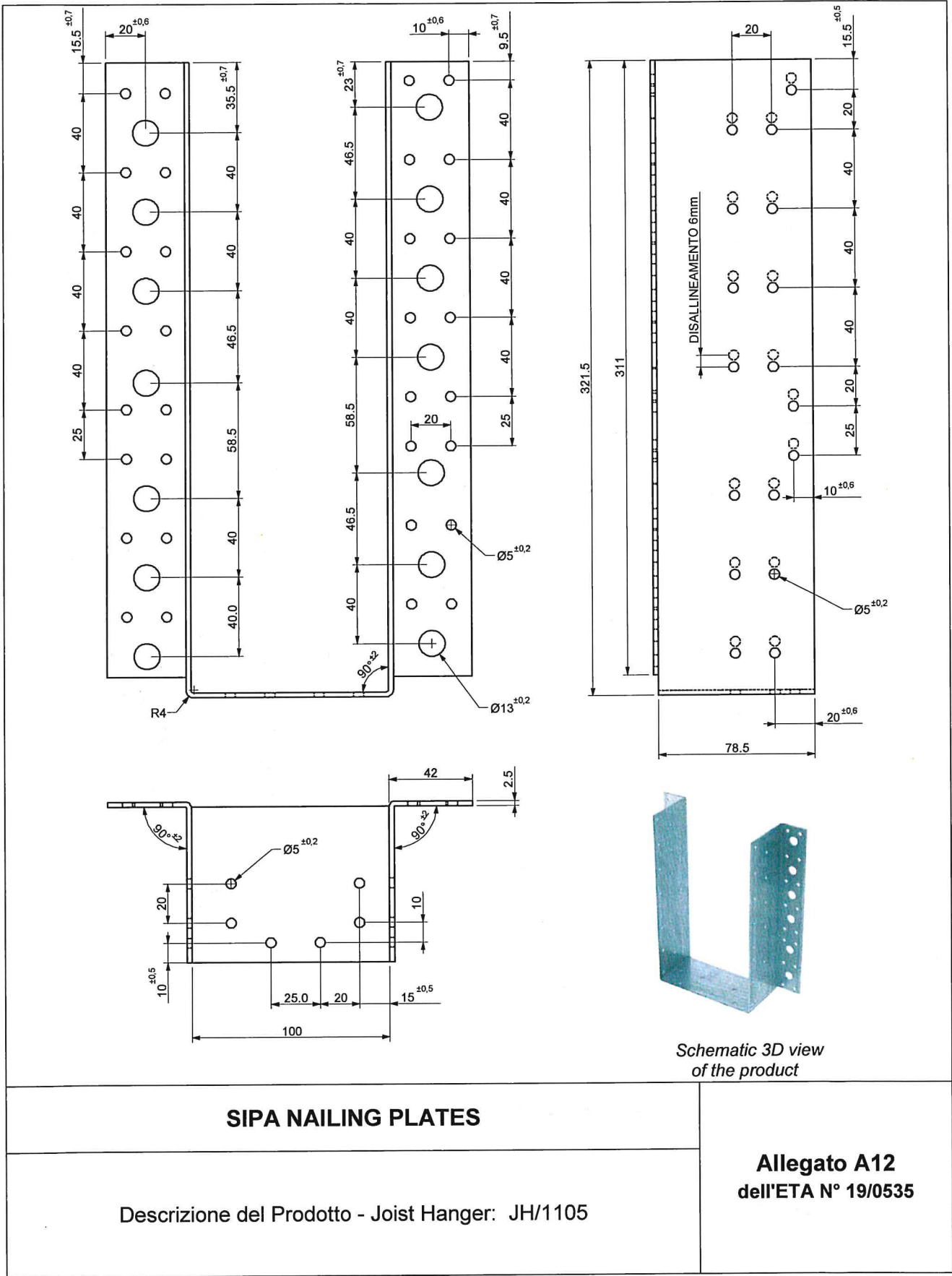


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1104

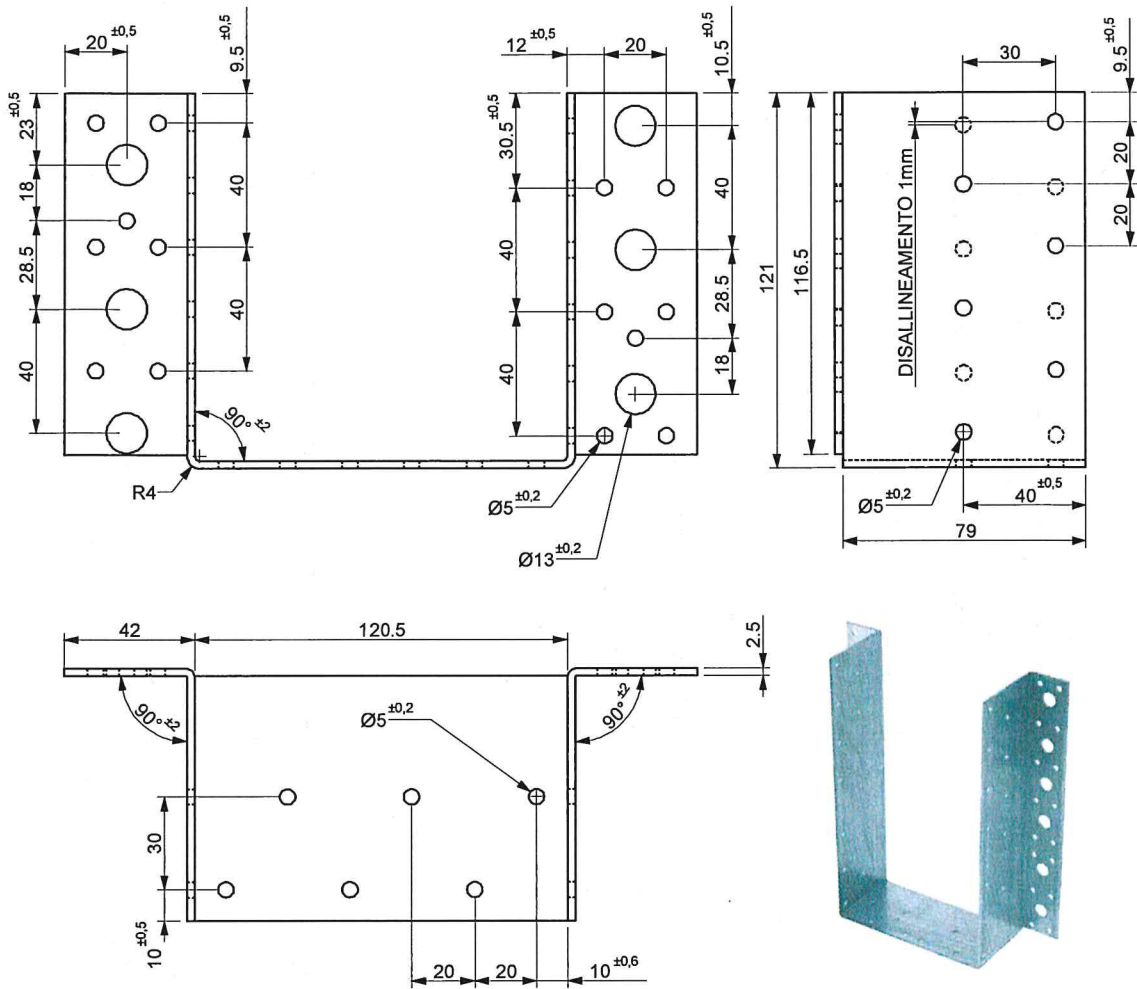
Allegato A11
dell'ETA N° 19/0535



SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1105

**Allegato A12
dell'ETA N° 19/0535**

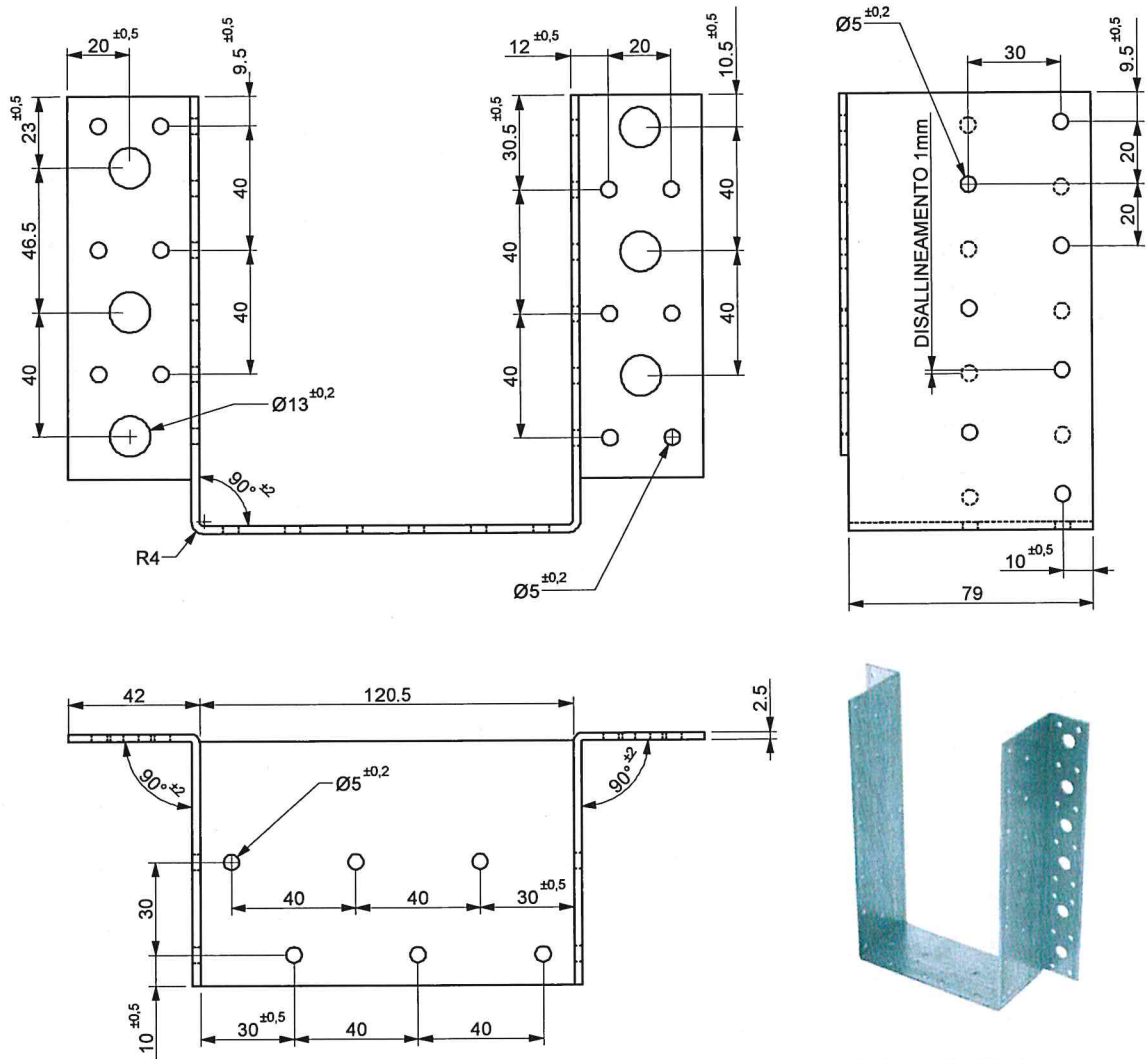


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1106

Allegato A13
dell'ETA N° 19/0535

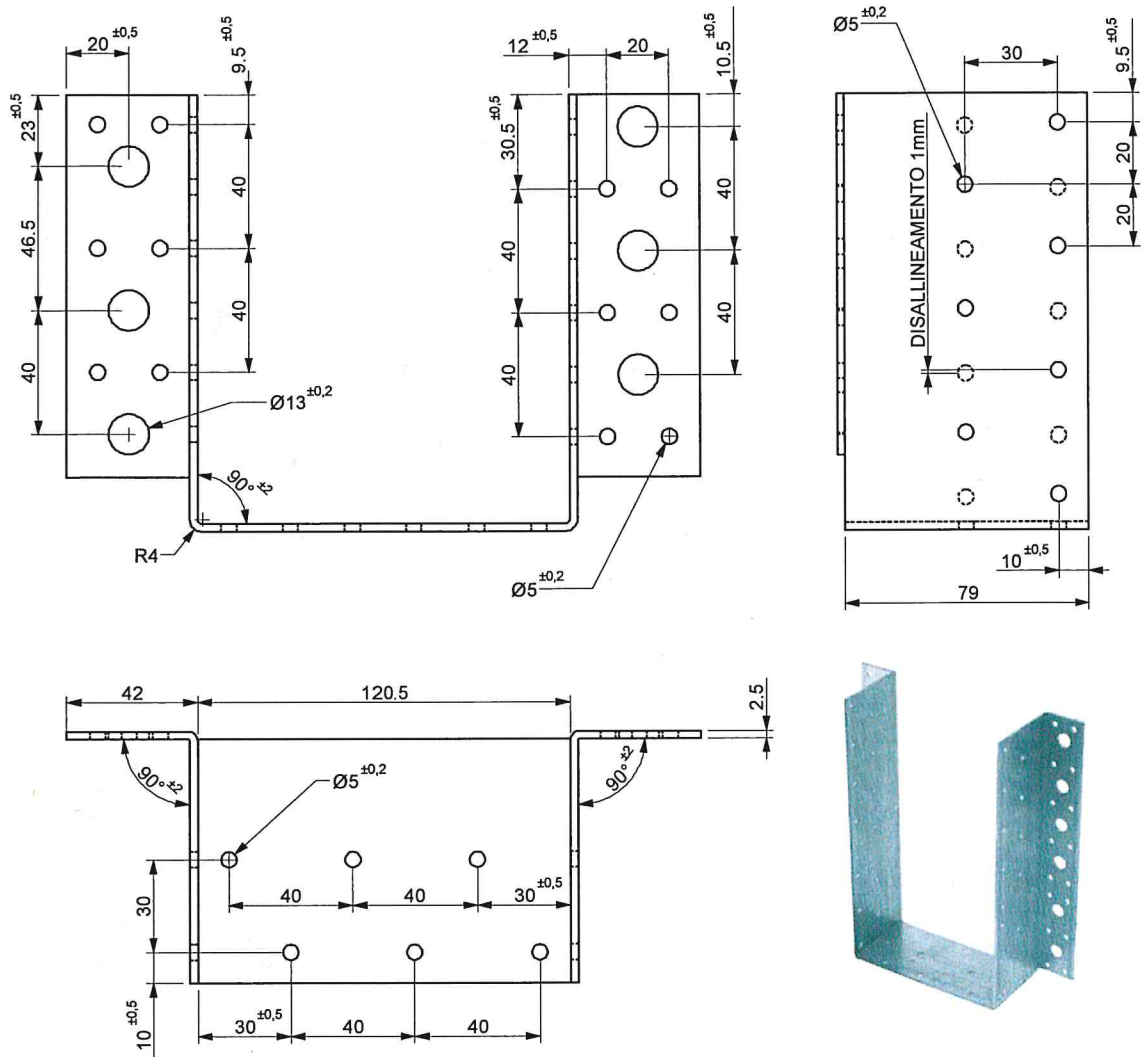


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1107

Allegato A14
dell'ETA N° 19/0535

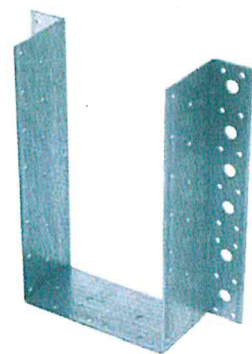
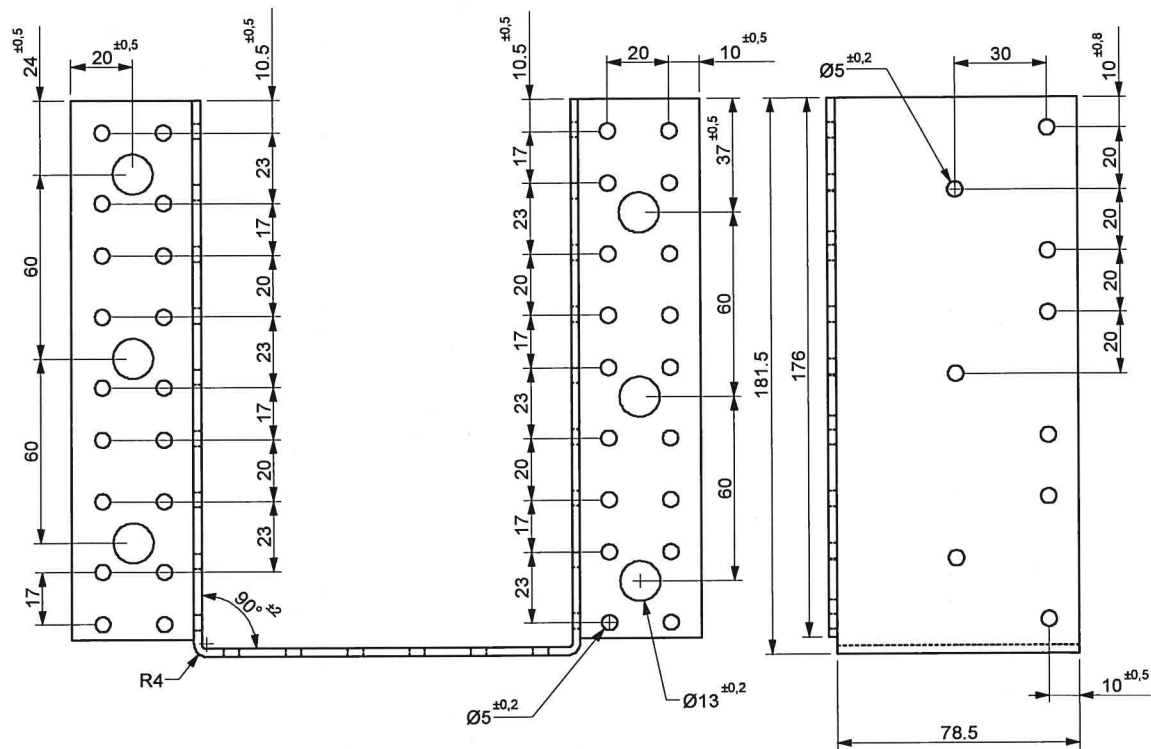


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1108

Allegato A15
dell'ETA N° 19/0535

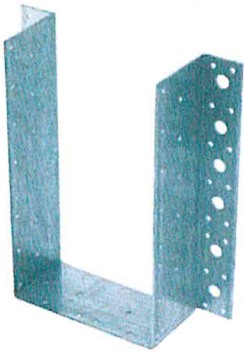
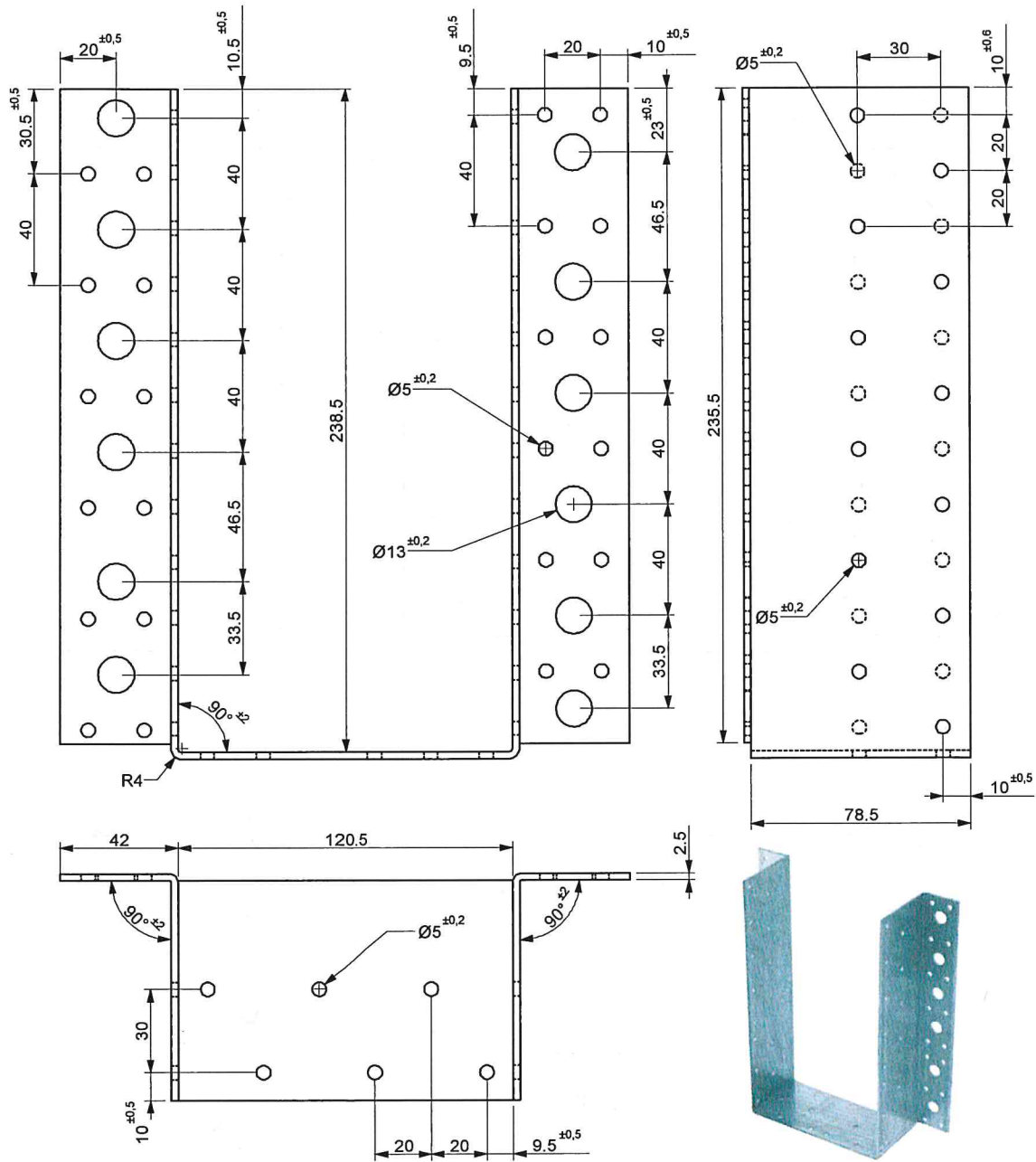


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1109

Allegato A16
dell'ETA N° 19/0535

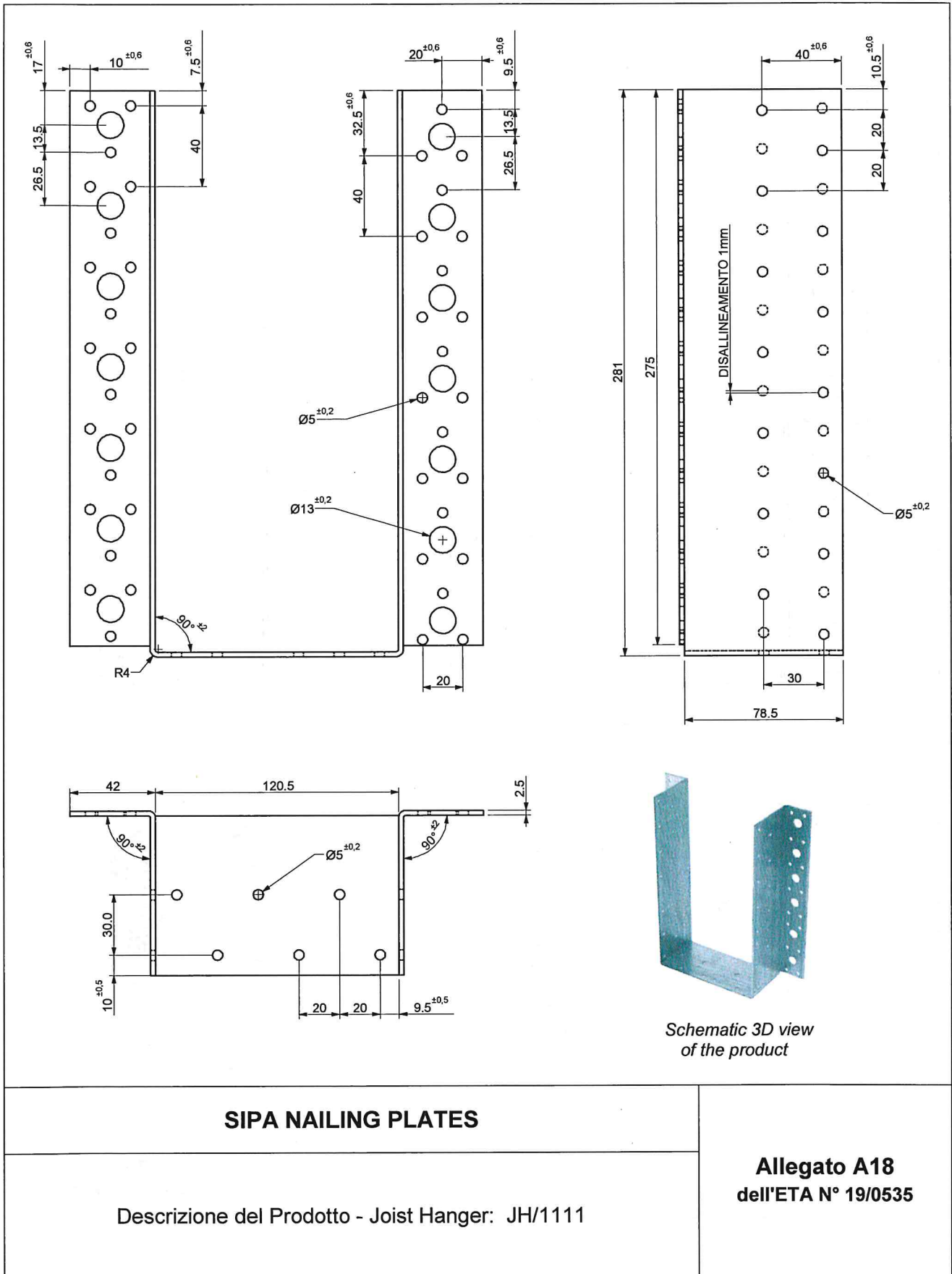


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1110

**Allegato A17
dell'ETA N° 19/0535**

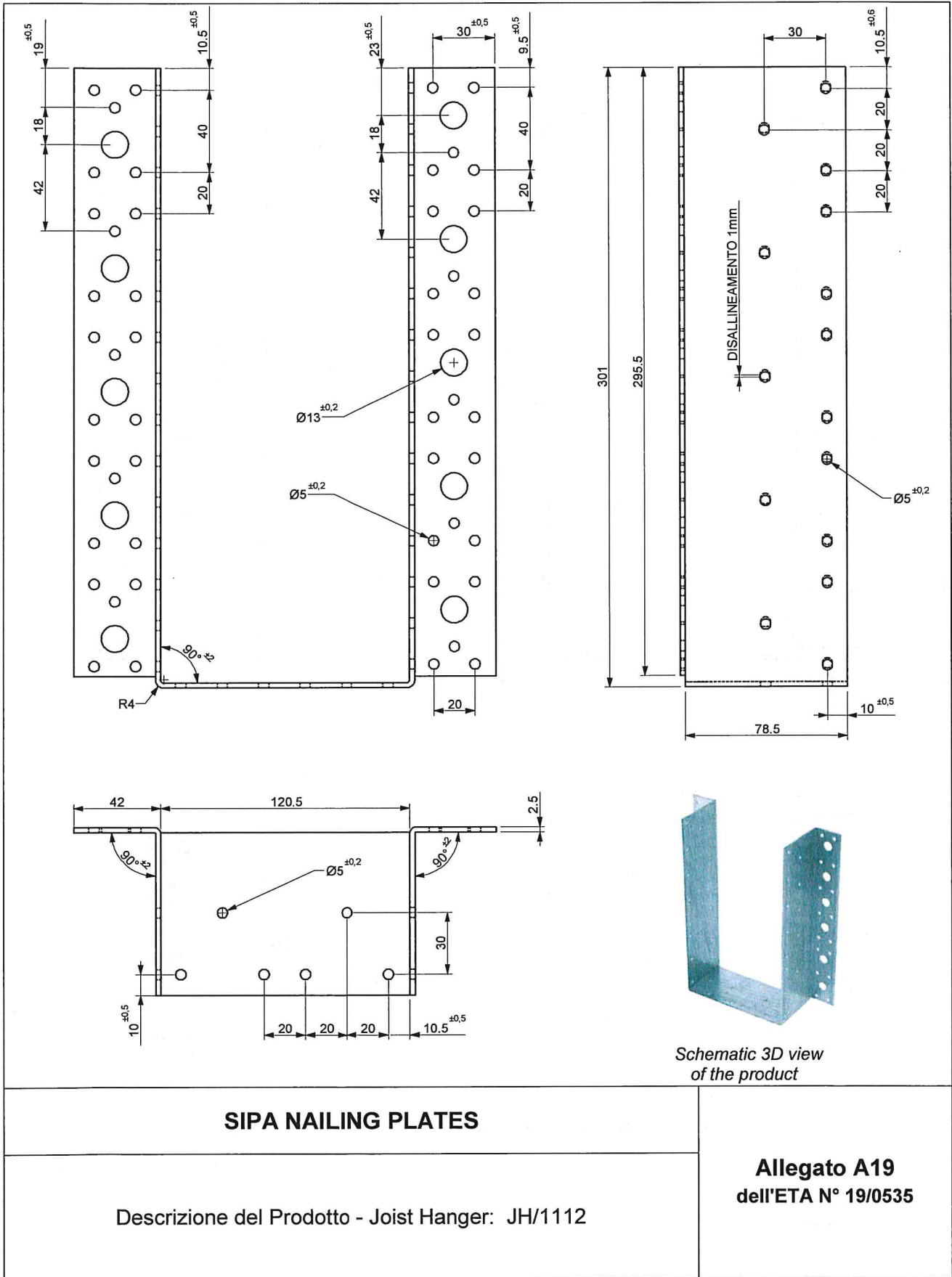


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1111

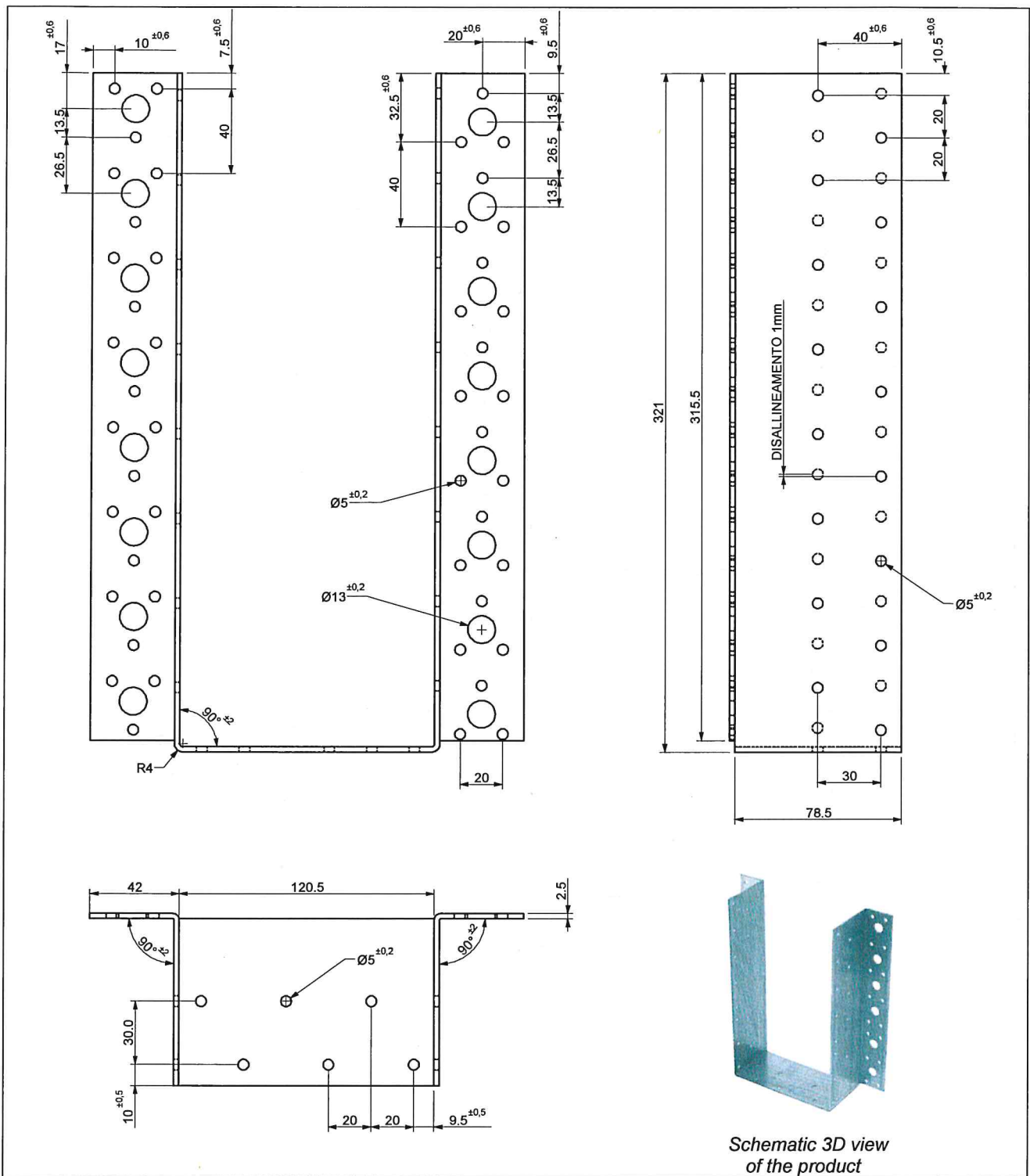
Allegato A18
dell'ETA N° 19/0535



SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1112

Allegato A19
dell'ETA N° 19/0535

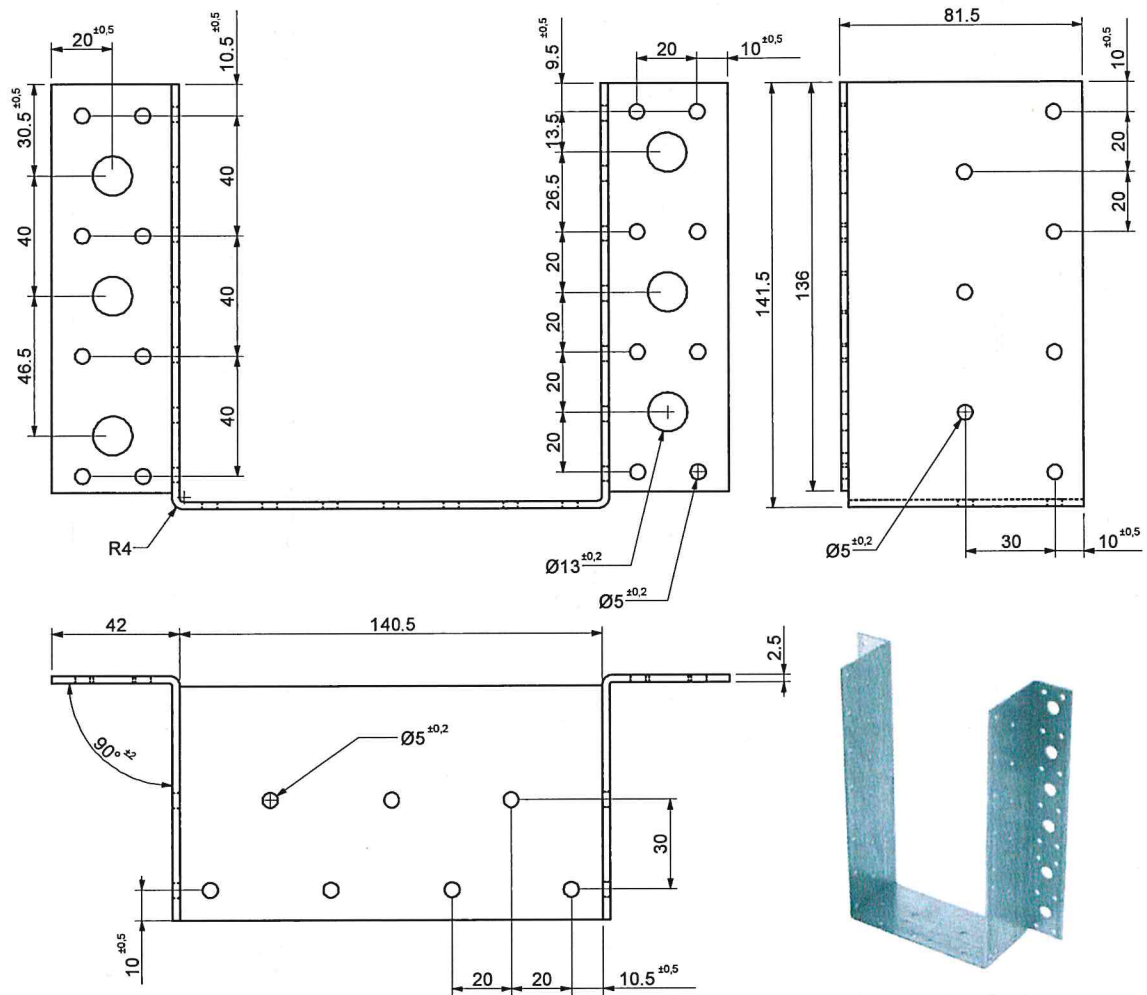


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1113

Allegato A20
dell'ETA N° 19/0535

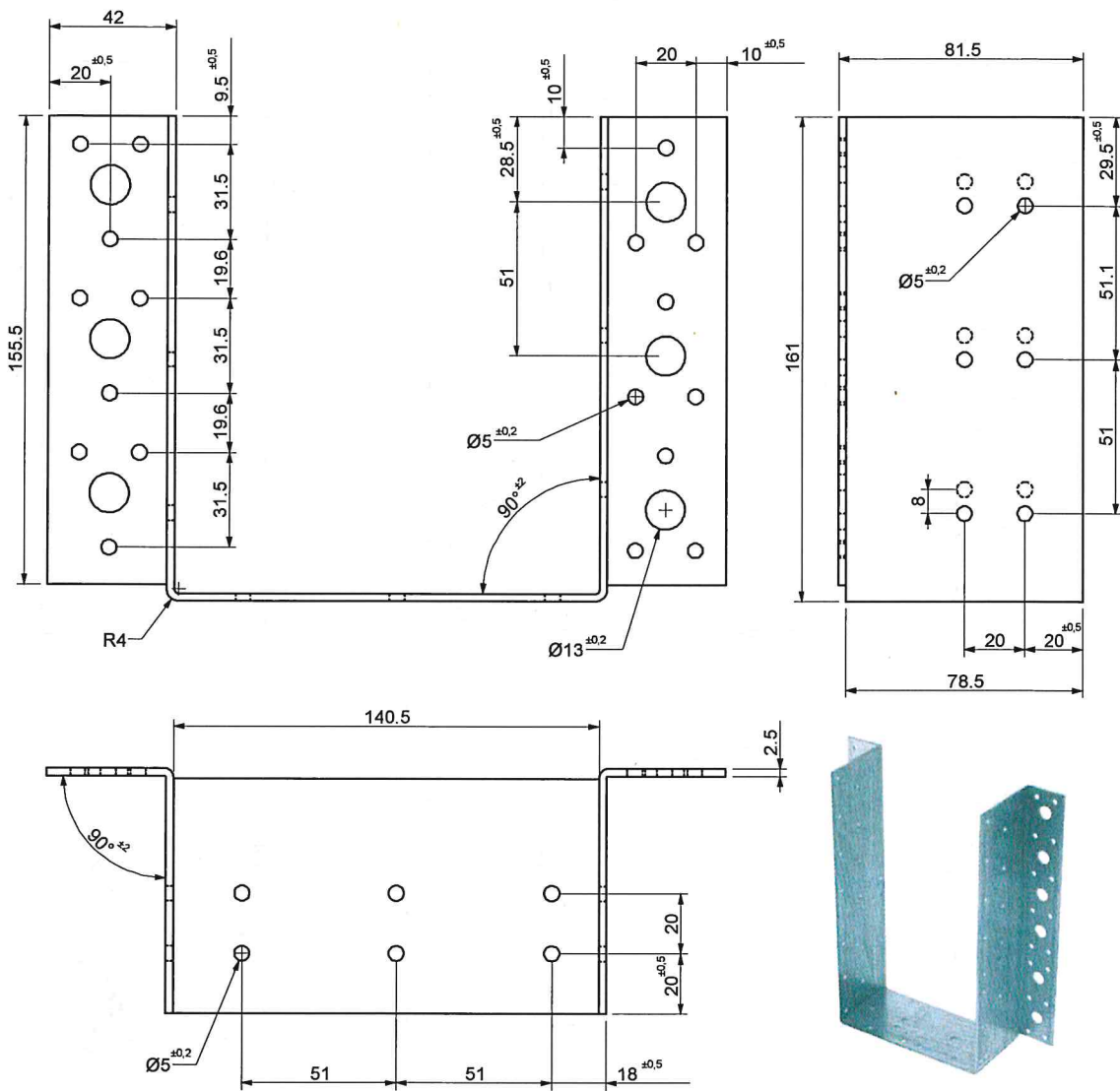


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1114

Allegato A21
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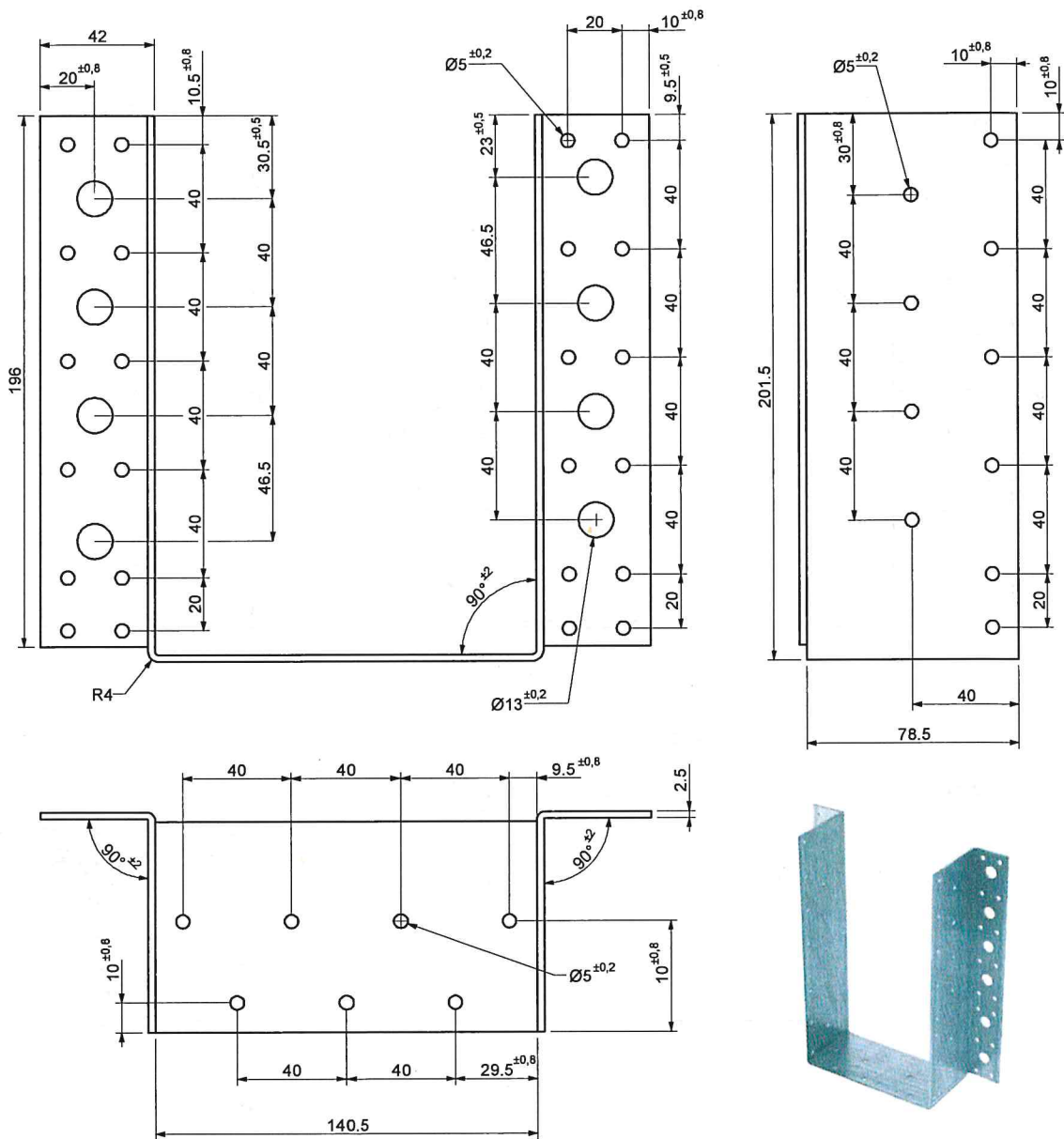


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1115

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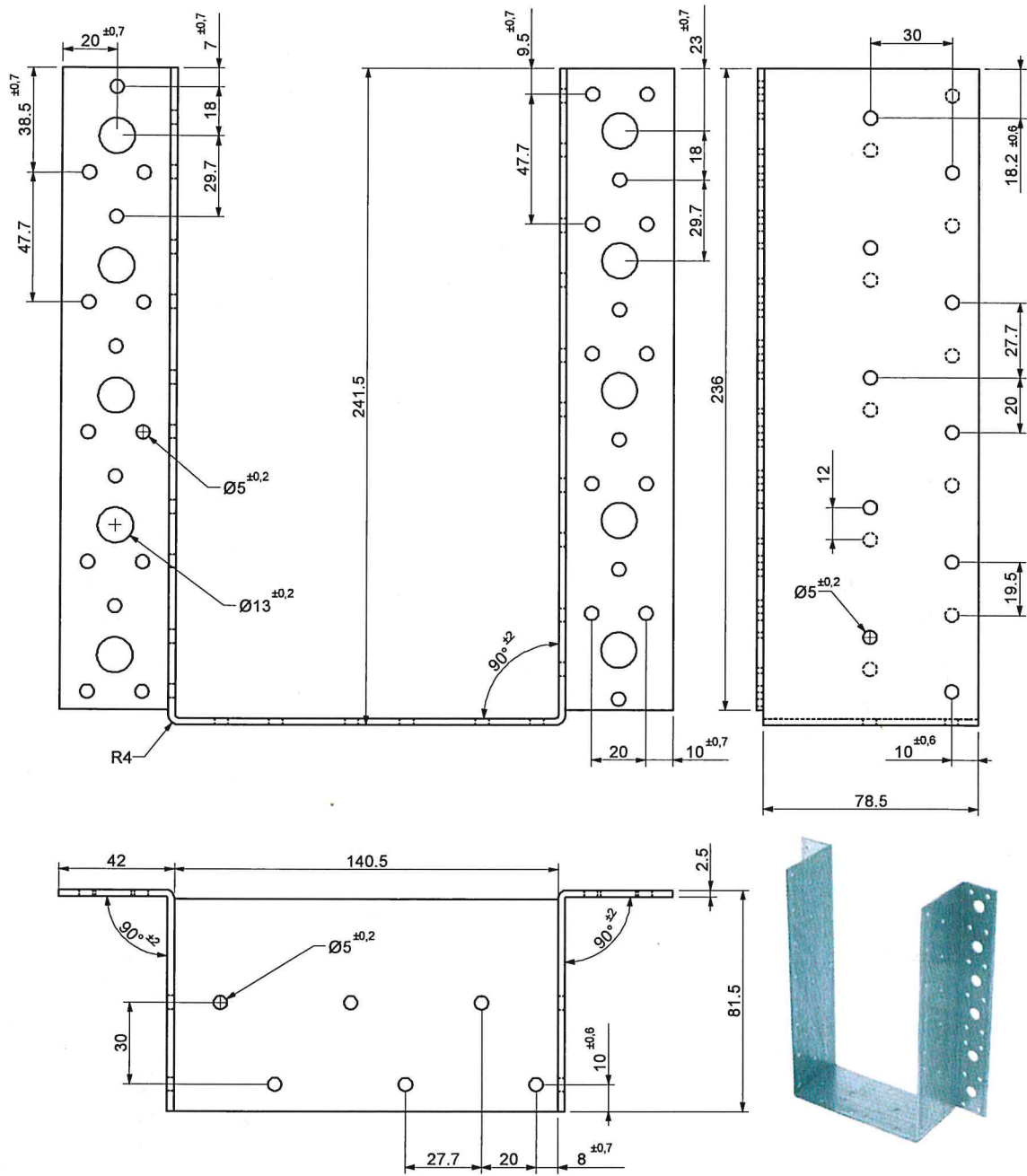


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1116

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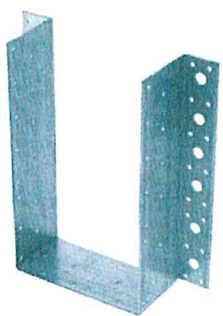
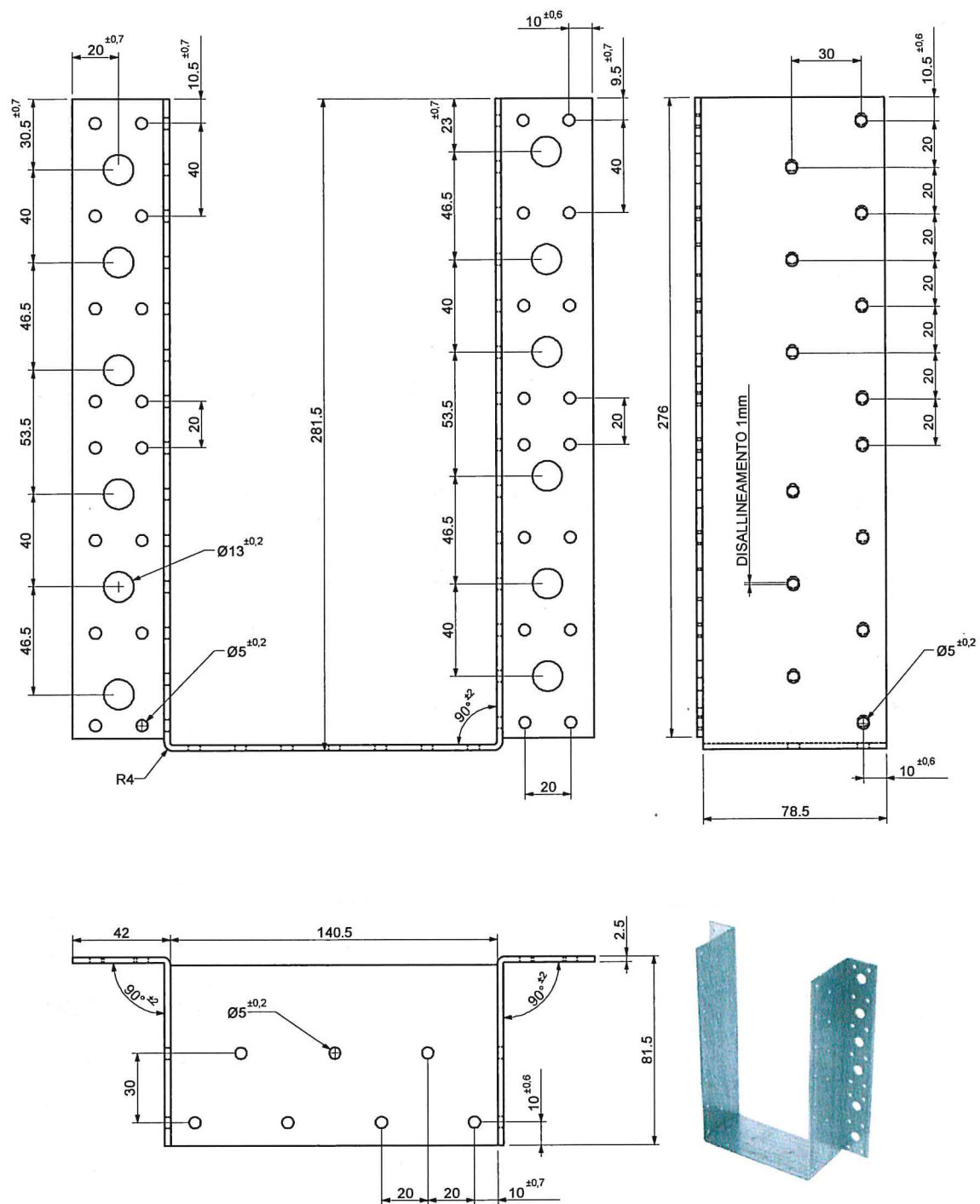


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1117

Allegato A24
dell'ETA N° 19/0535

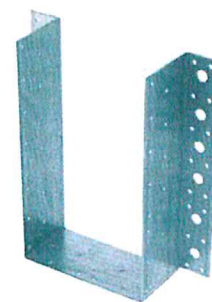
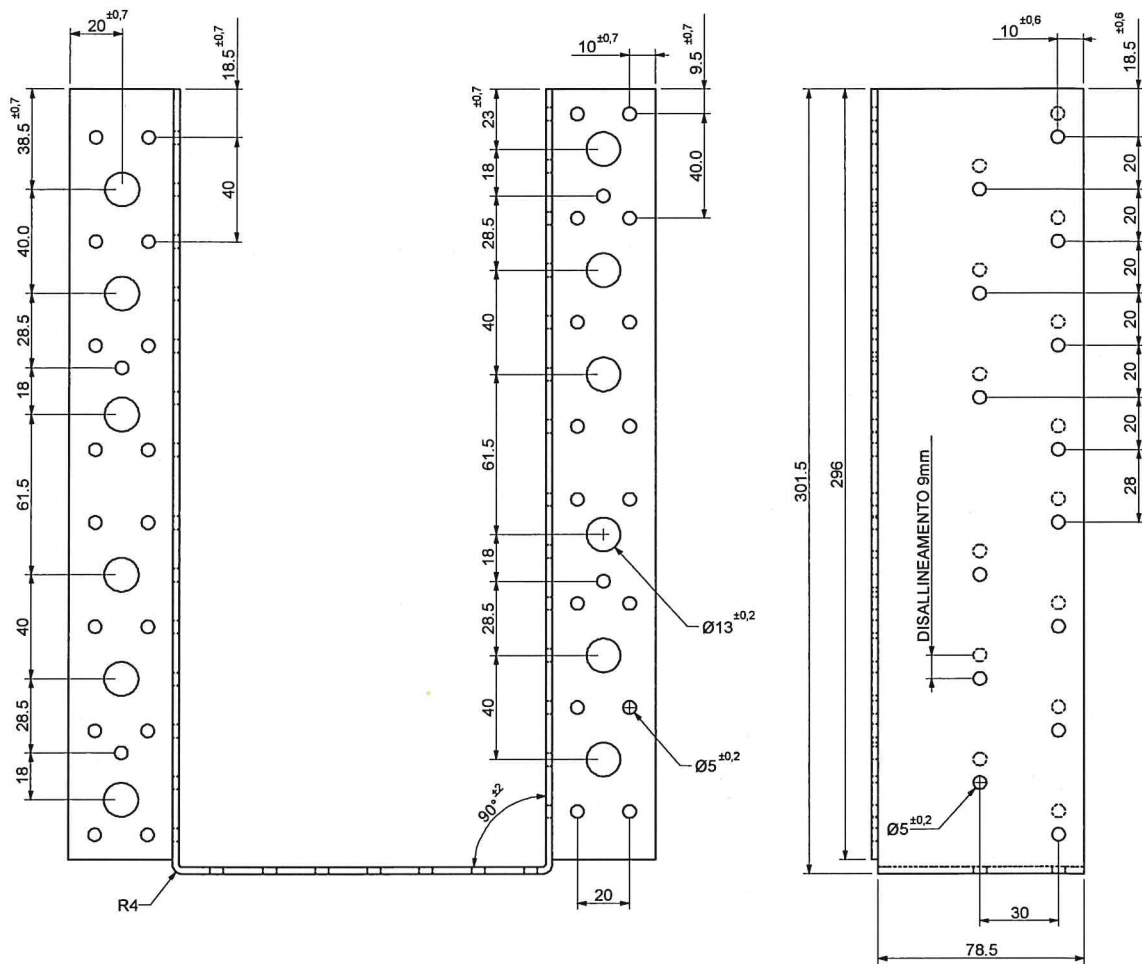


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1118

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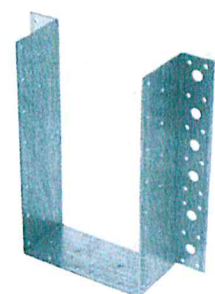
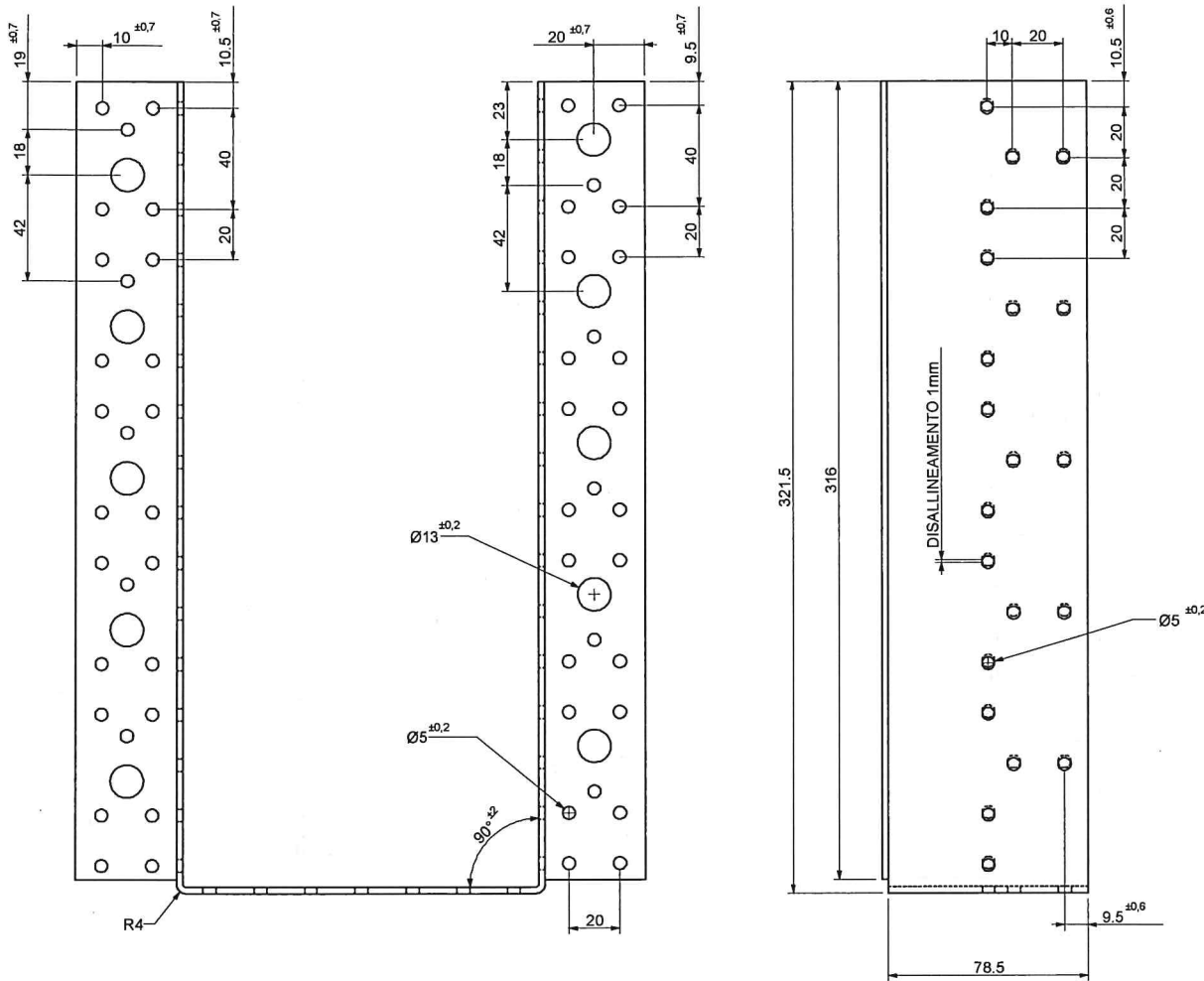


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1119

**Allegato A26
dell'ETA N° 19/0535**

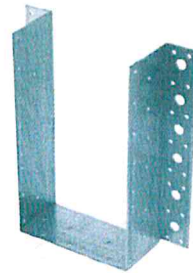
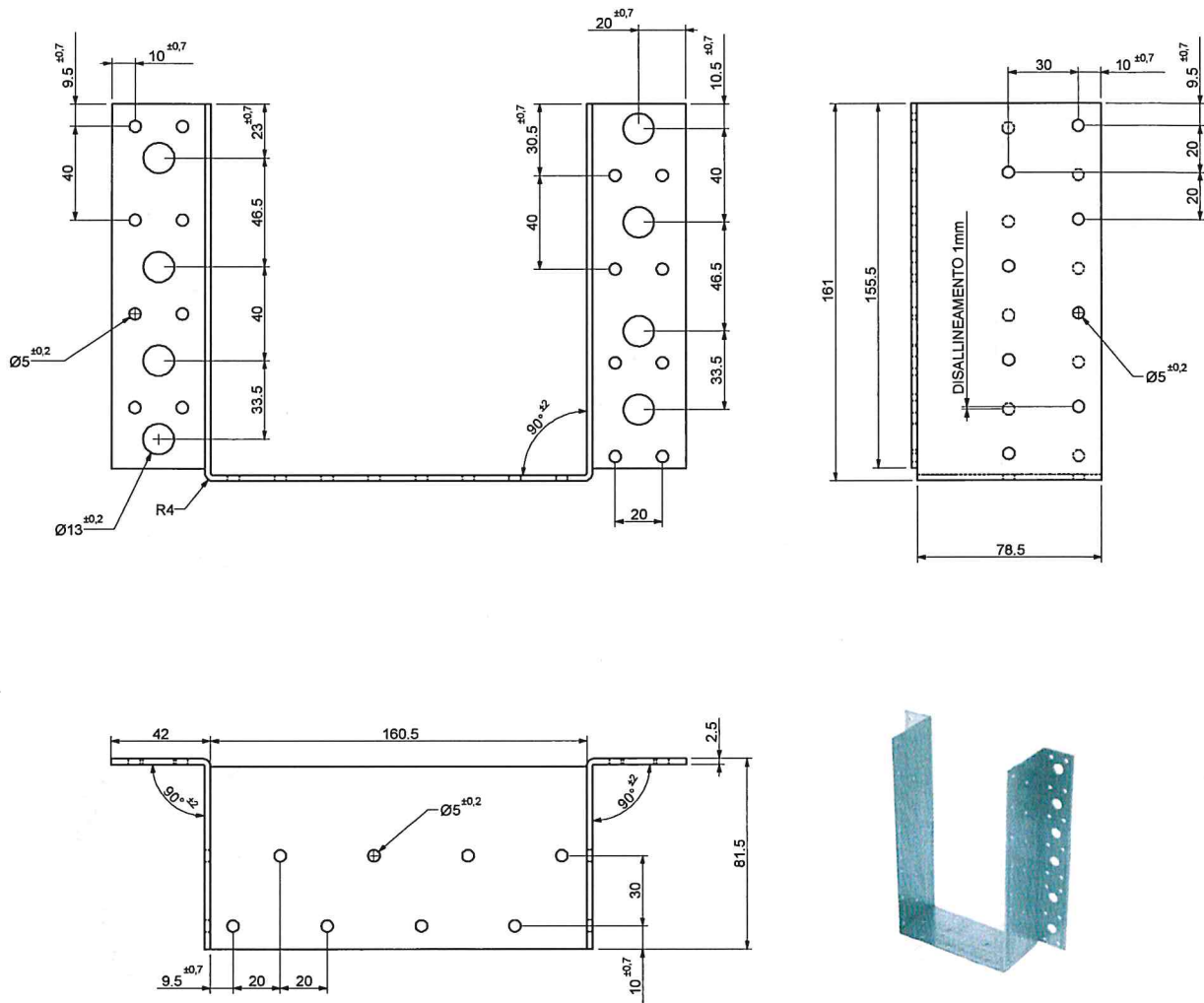


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1120

Allegato A27
dell'ETA N° 19/0535

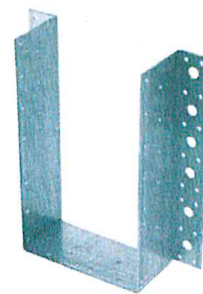
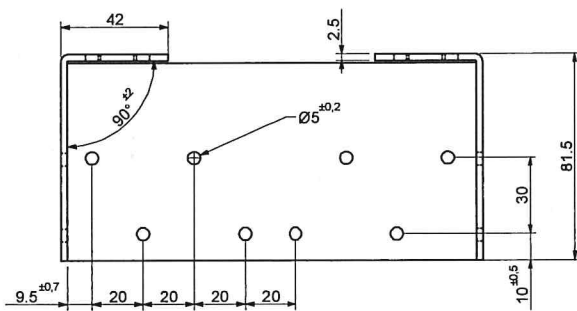
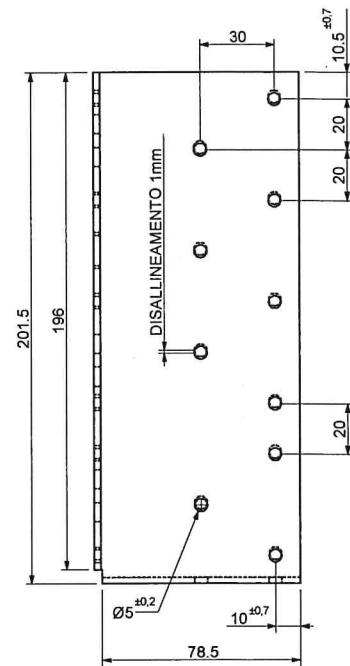
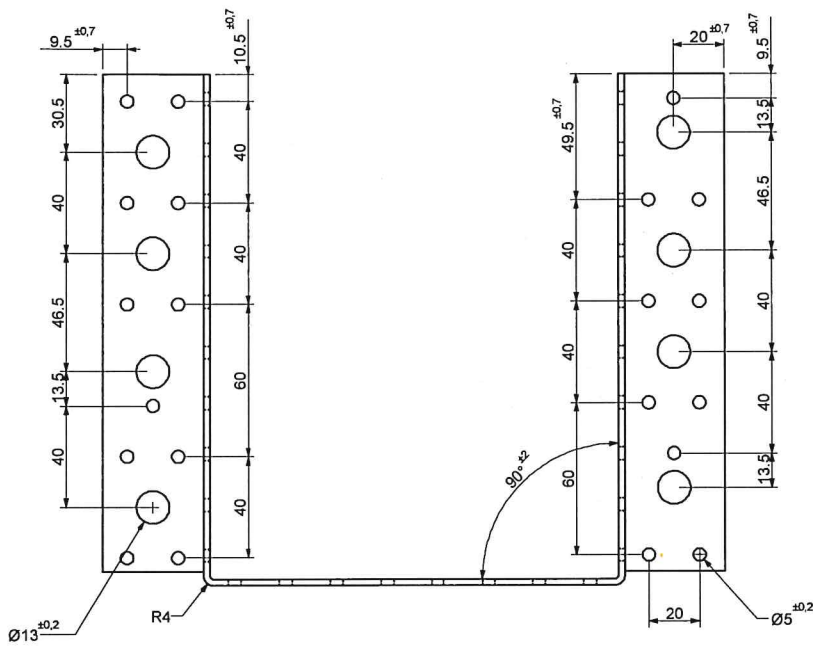


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1121

Allegato A28 dell'ETA N° 19/0535

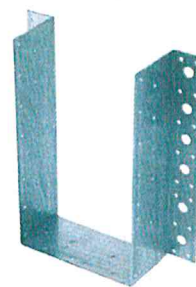
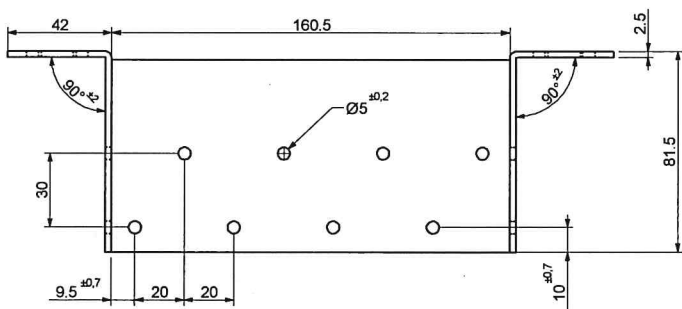
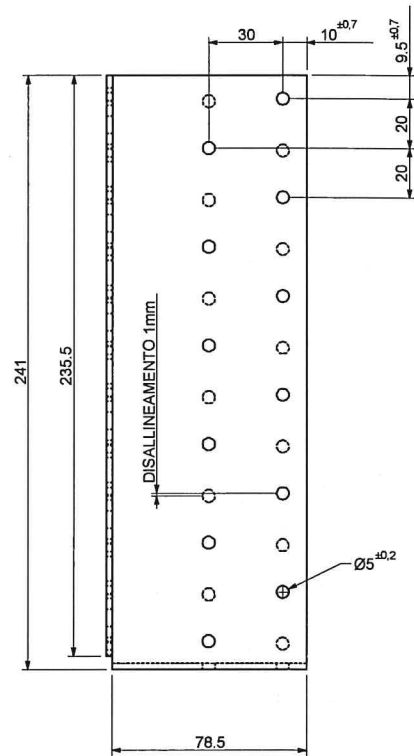
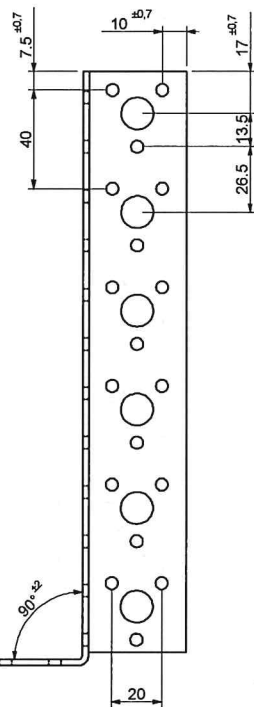
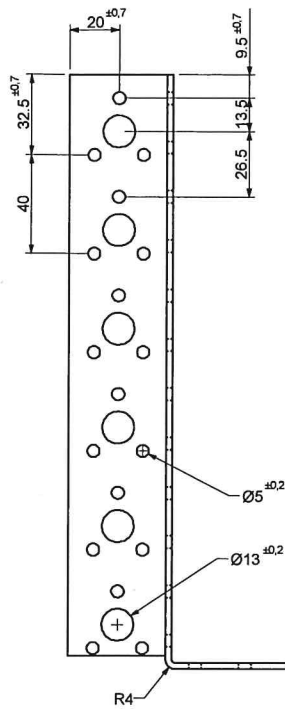


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1548

Allegato A29
dell'ETA N° 19/0535

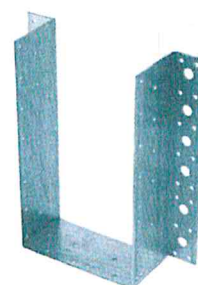
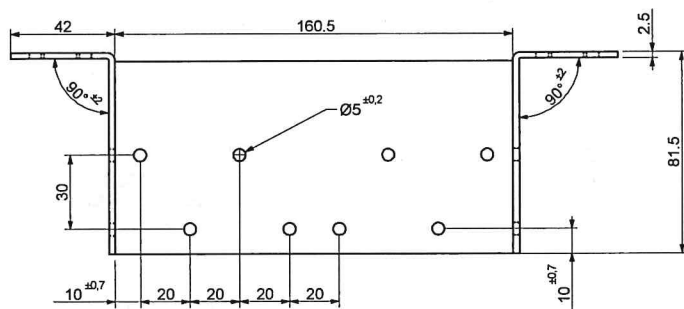
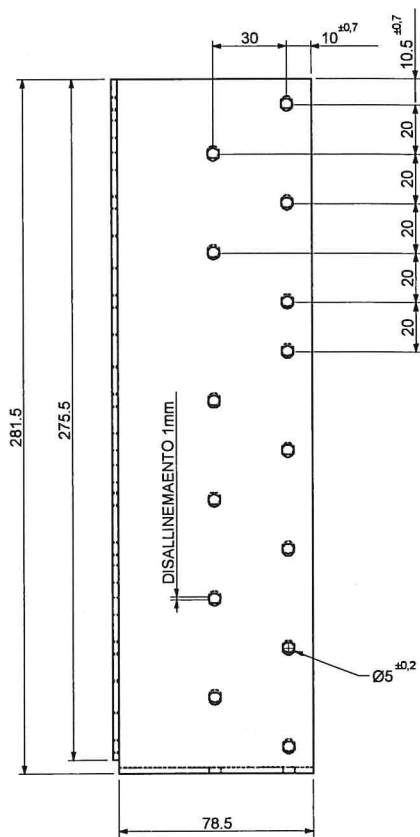
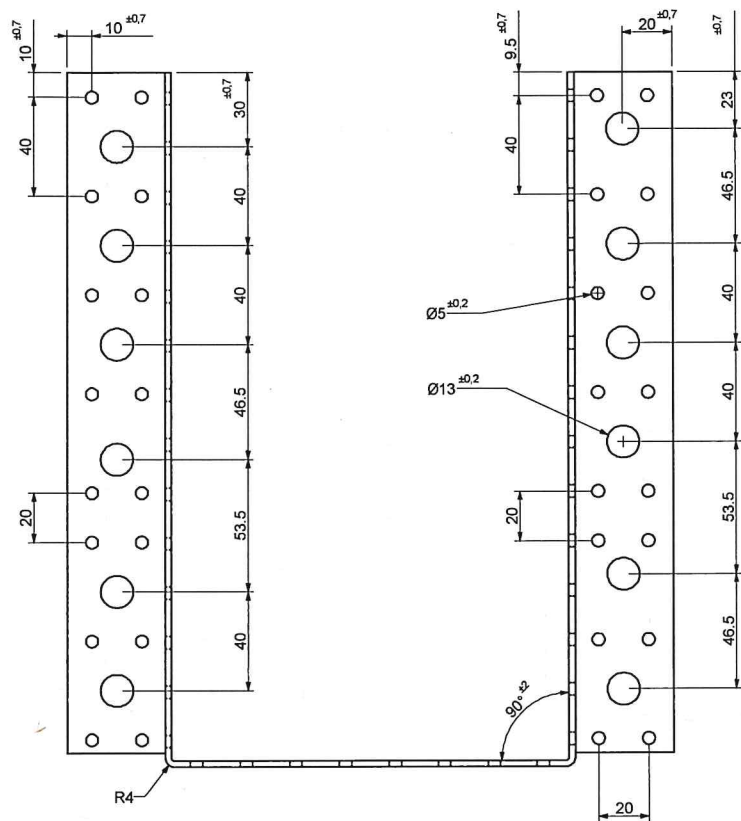


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1122

Allegato A30
dell'ETA N° 19/0535

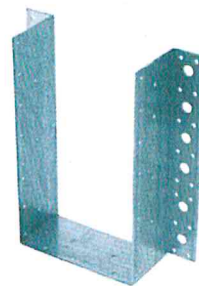
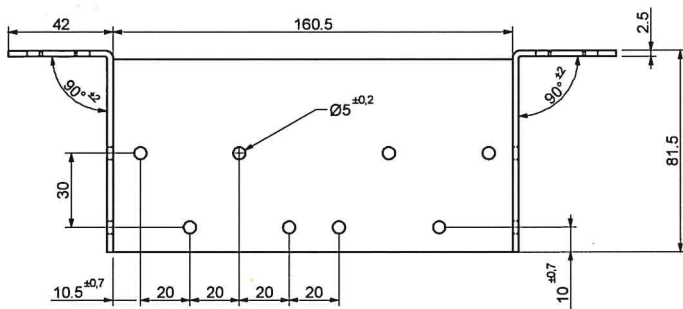
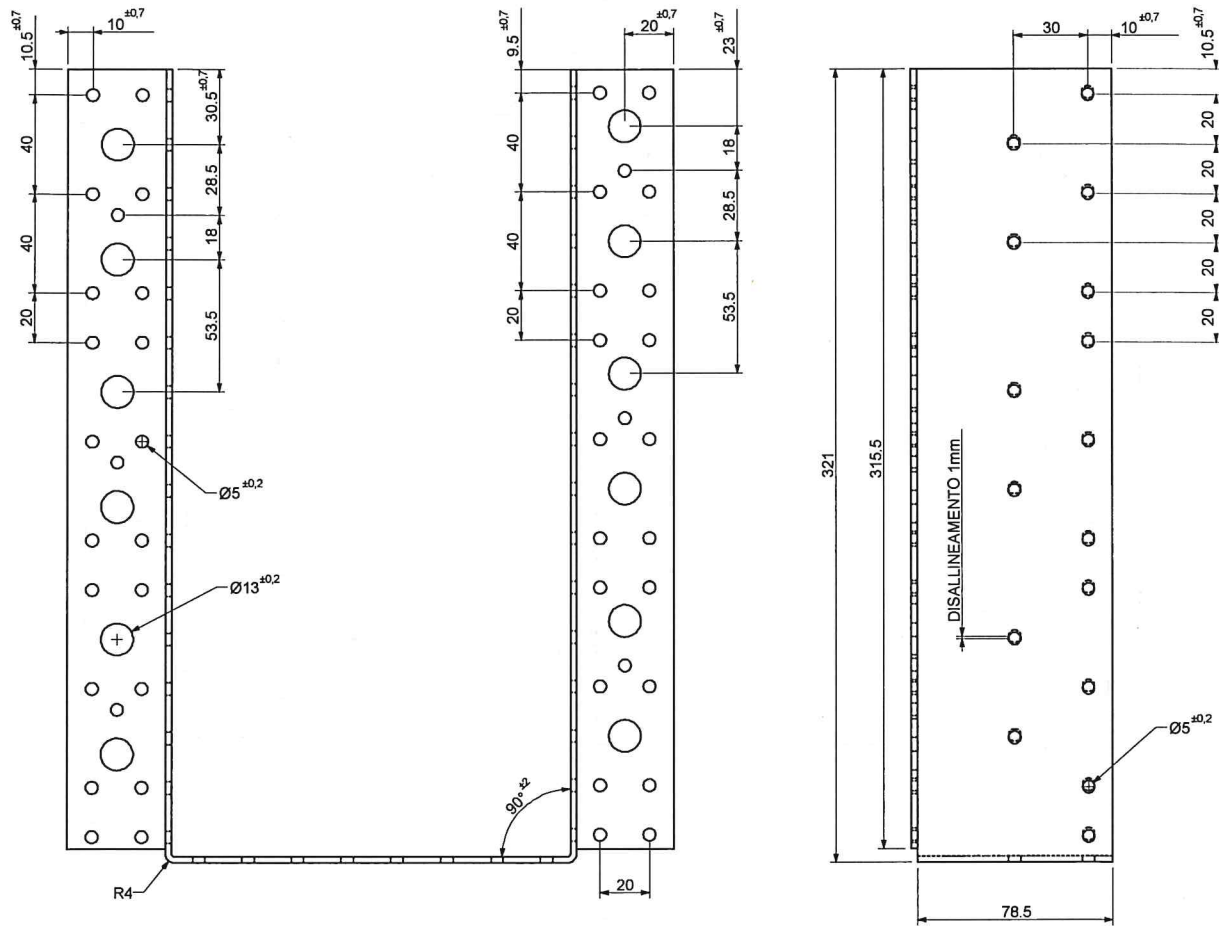


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1123

Allegato A31
dell'ETA N° 19/0535

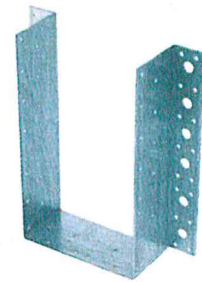
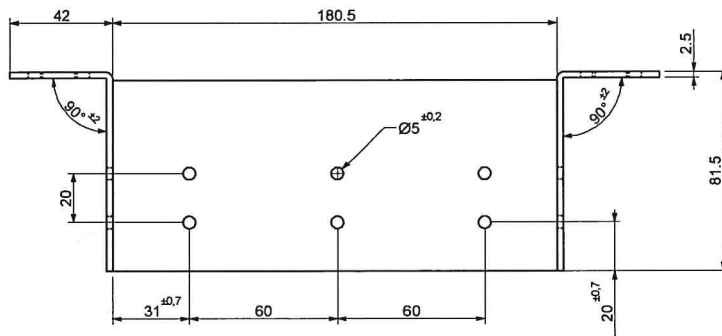
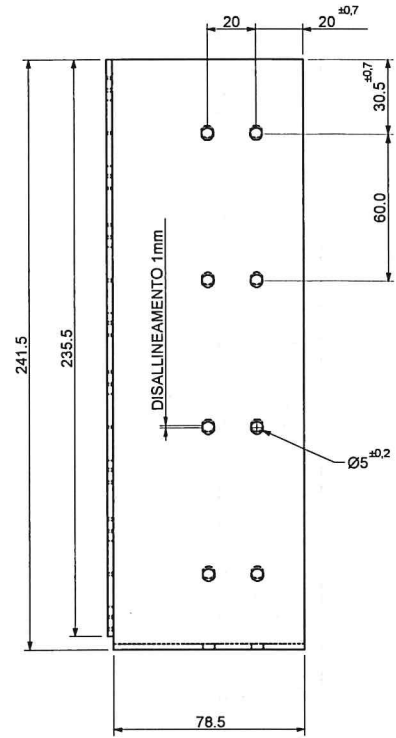
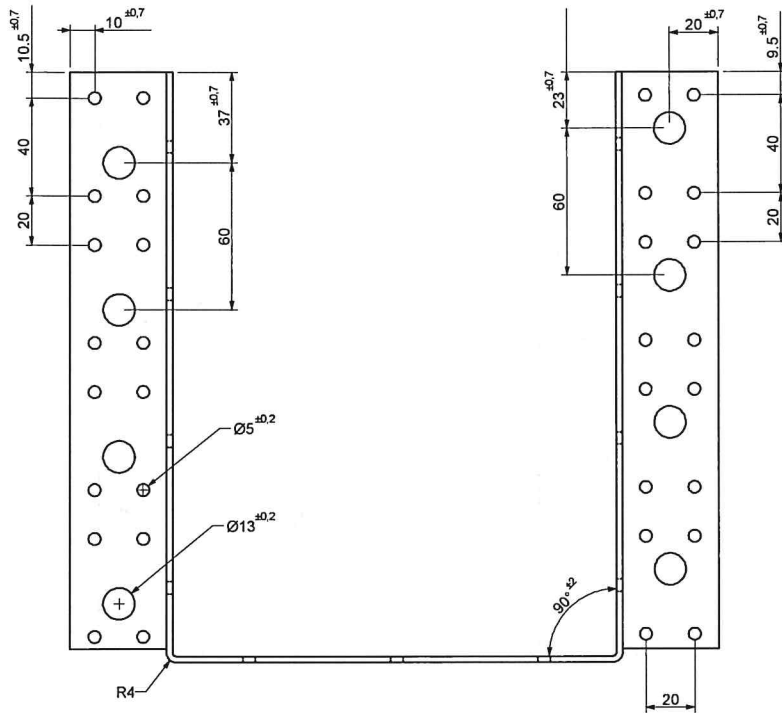


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1124

Allegato A32
dell'ETA N° 19/0535

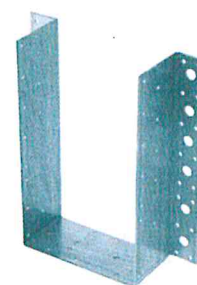
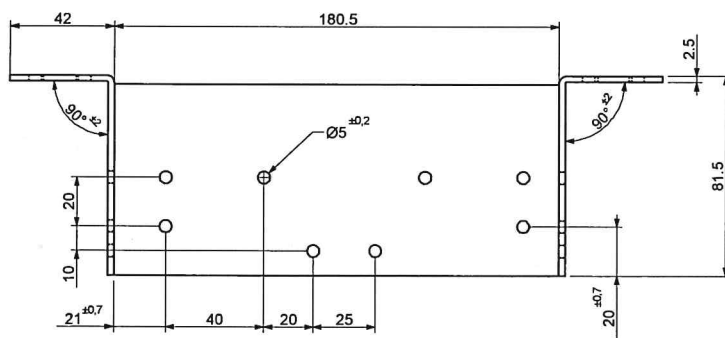
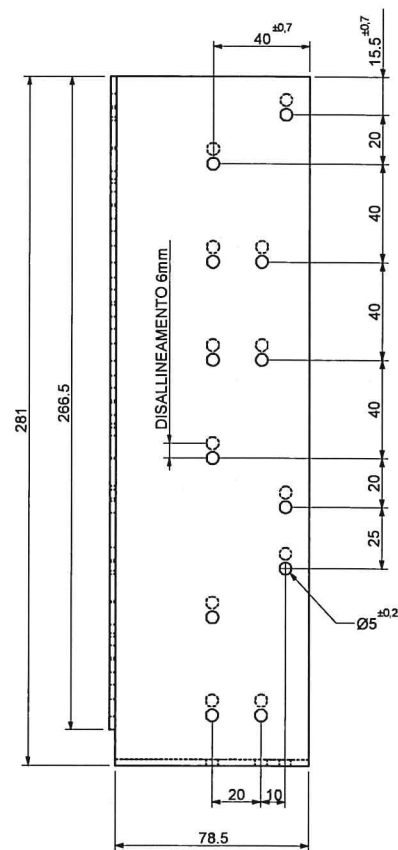
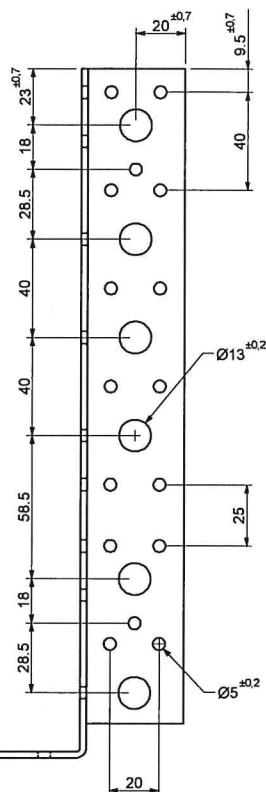
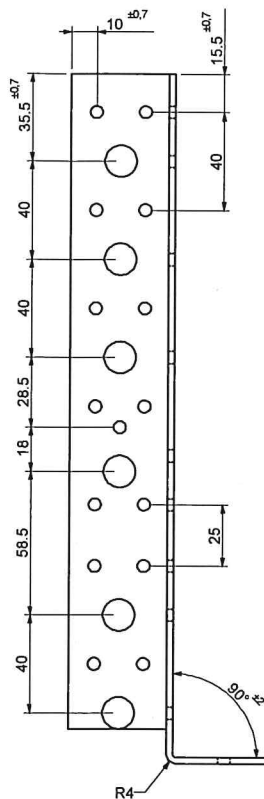


Schematic 3D view
of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1125

Allegato A33
dell'ETA N° 19/0535

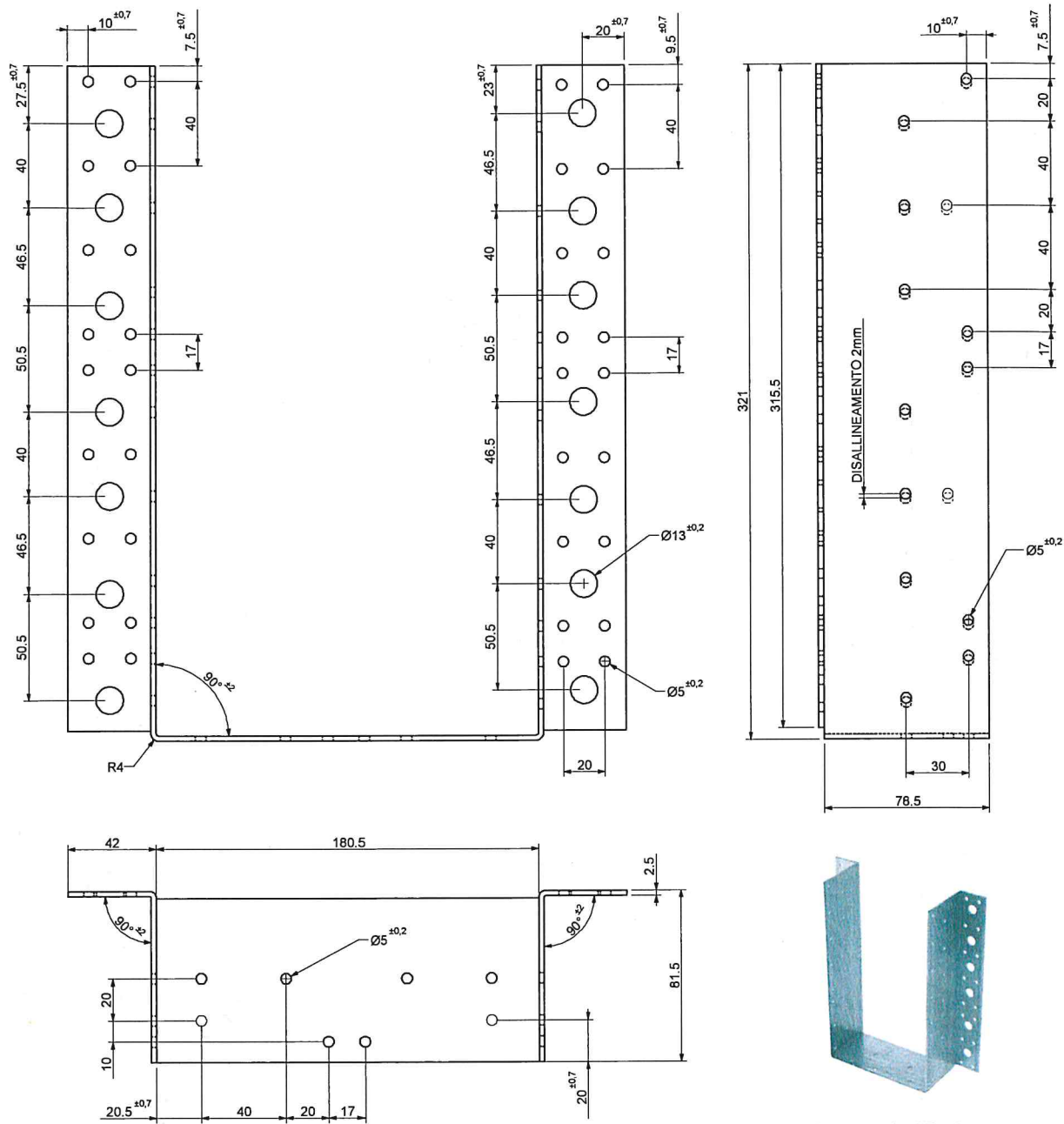


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1126

Allegato A34
dell'ETA N° 19/0535

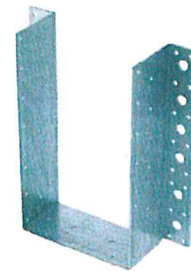
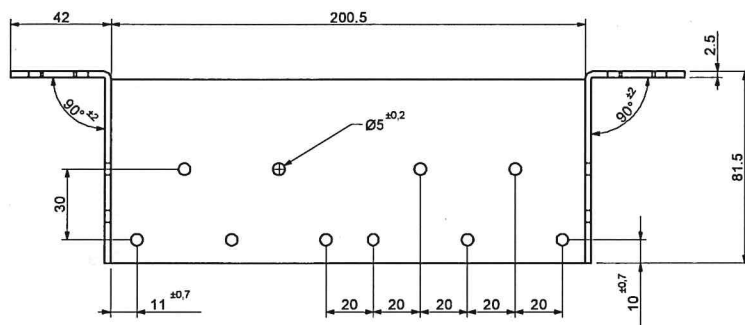
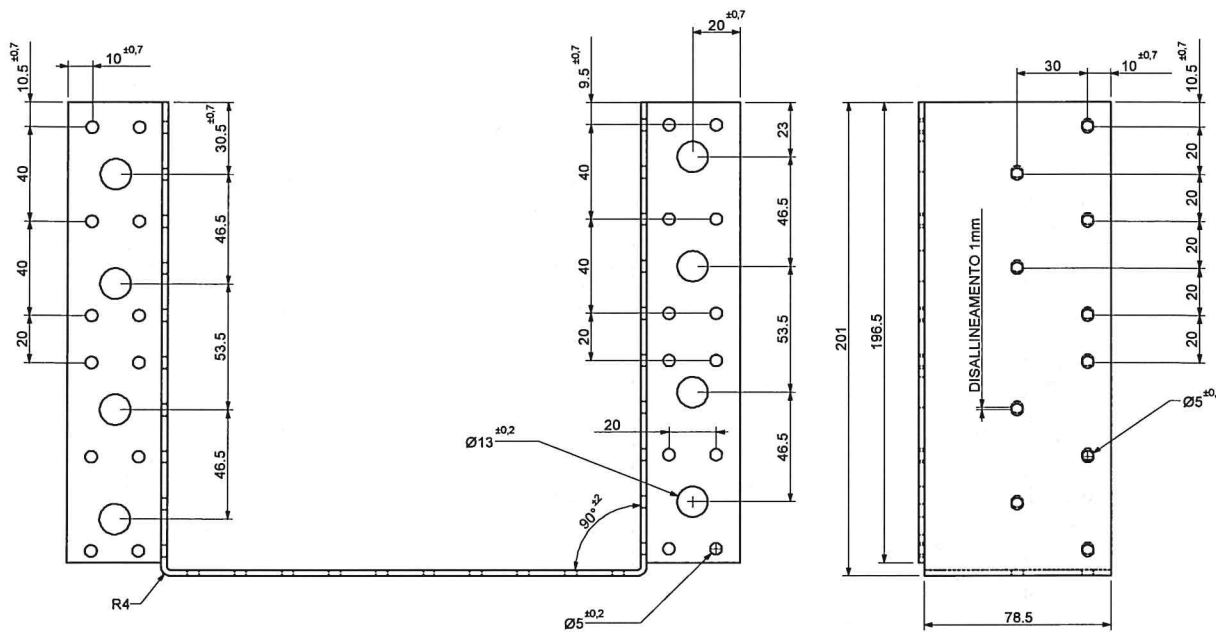


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1127

**Allegato A35
dell'ETA N° 19/0535**

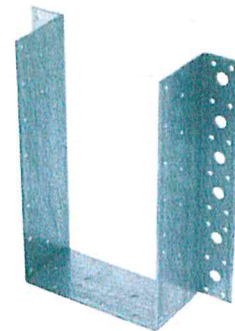
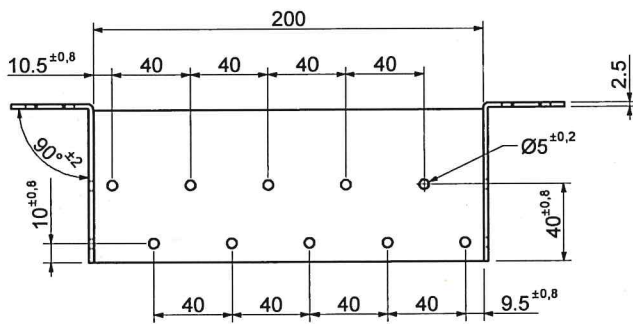
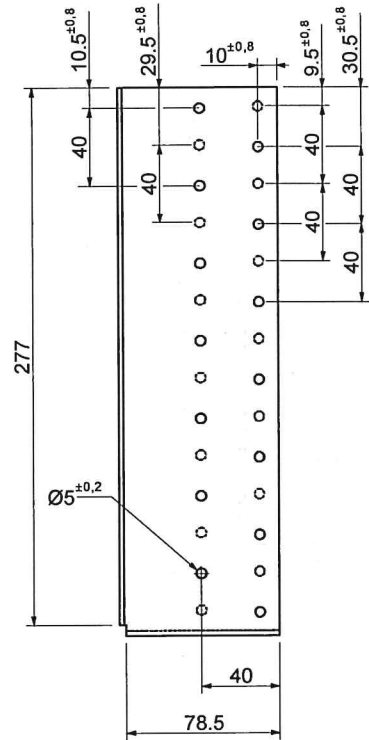
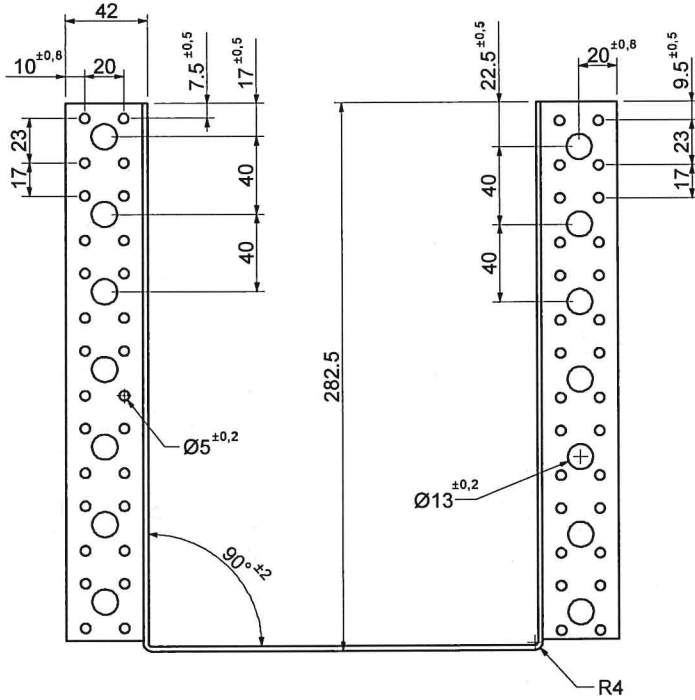


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1128

Allegato A36
dell'ETA N° 19/0535



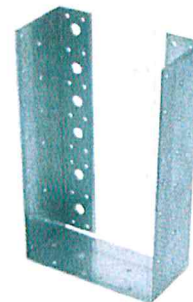
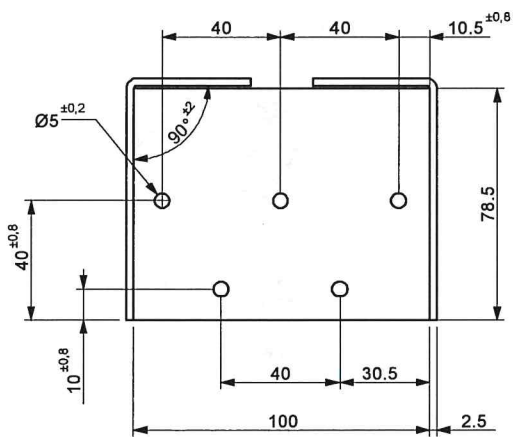
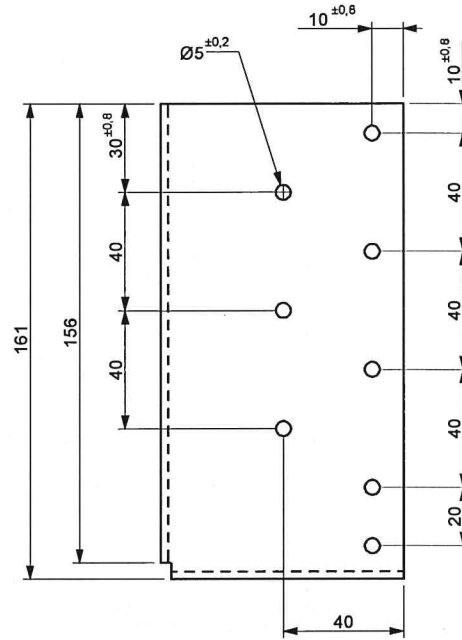
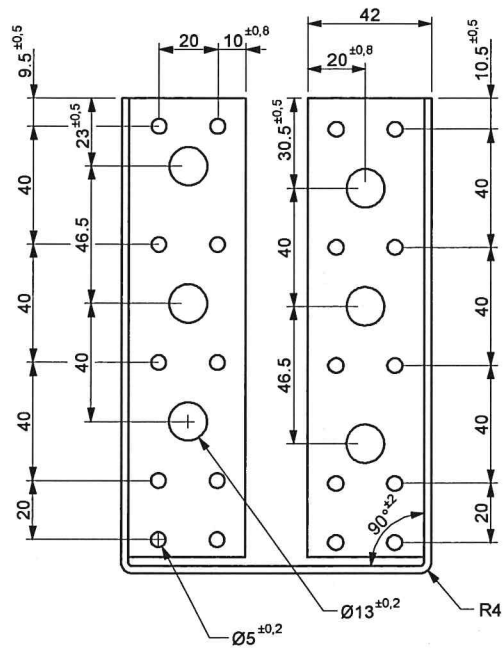
Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1129

Allegato A37
dell'ETA N° 19/0535

CFMH-JH

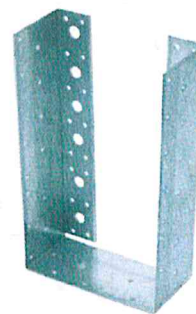
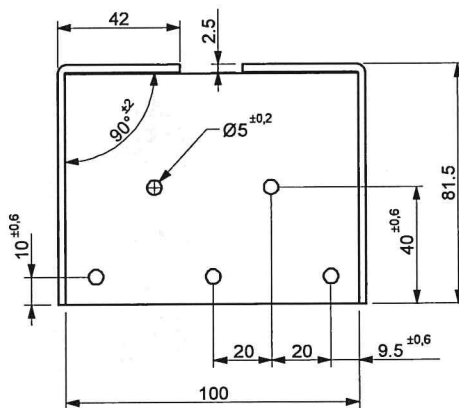
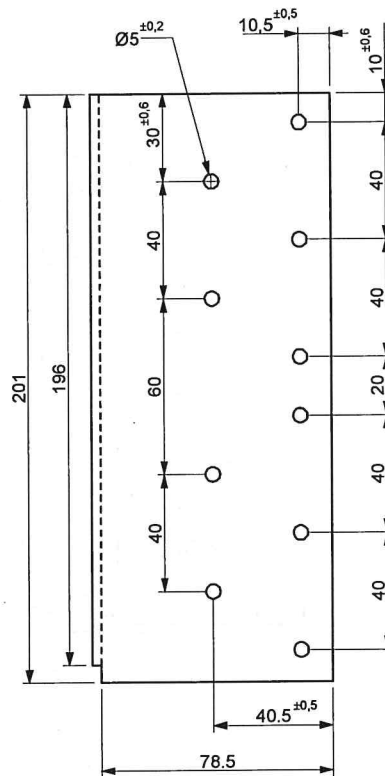
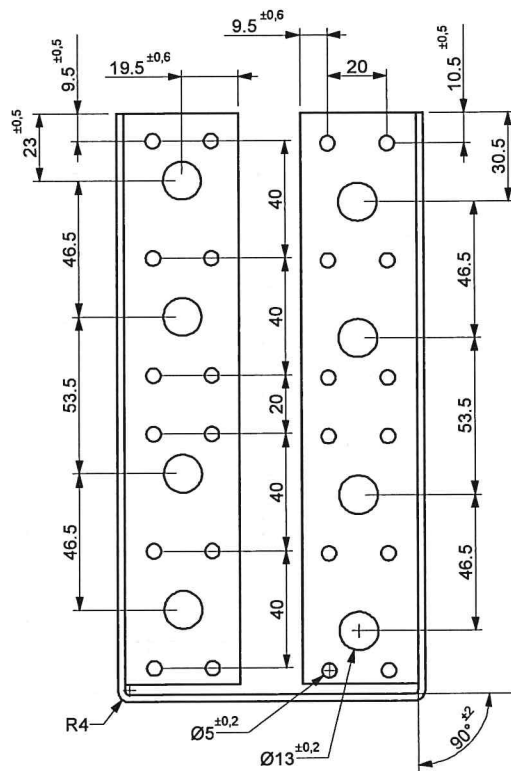


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1140

Allegato A38
dell'ETA N° 19/0535

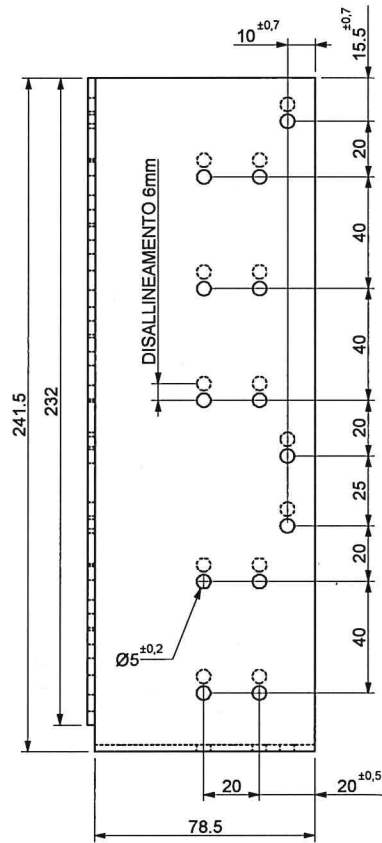
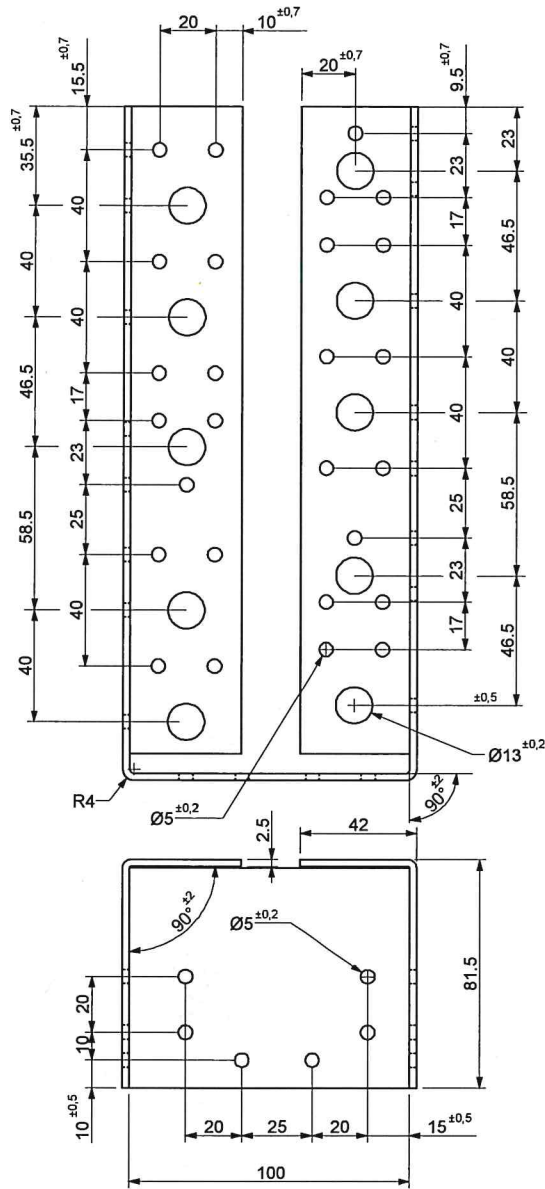


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1141

Allegato A39
dell'ETA N° 19/0535

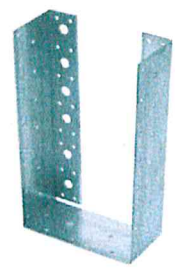
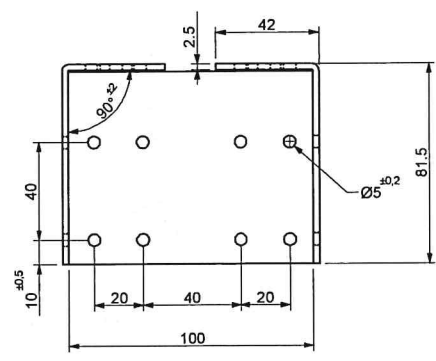
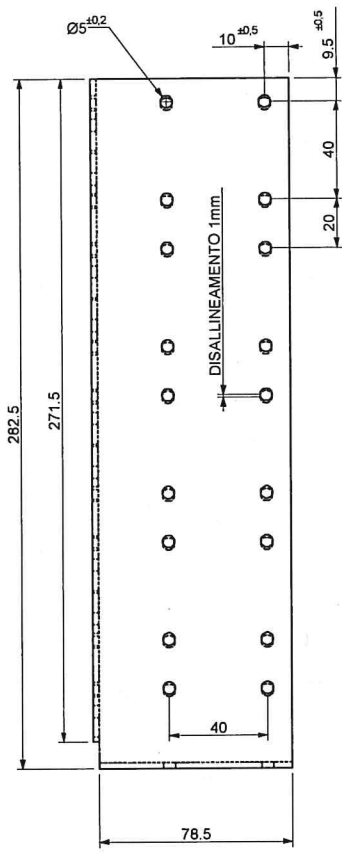
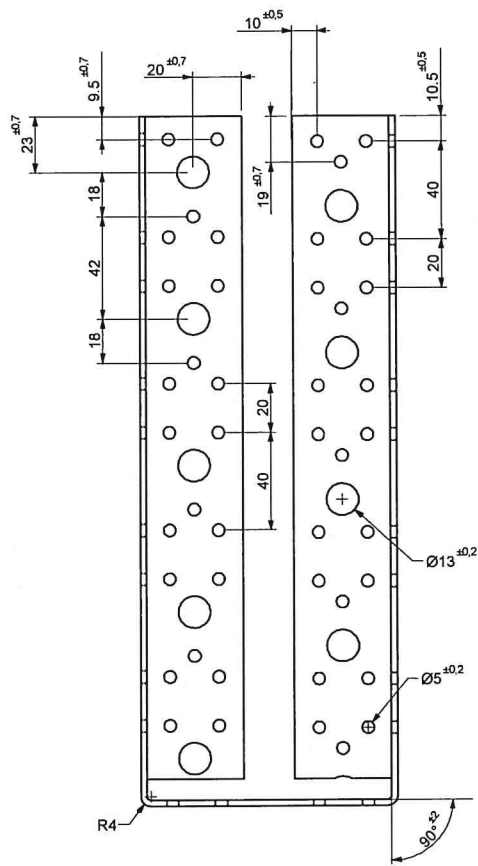


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1142

Allegato A40
dell'ETA N° 19/0535

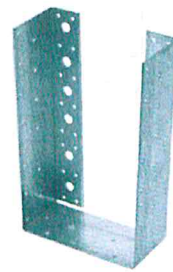
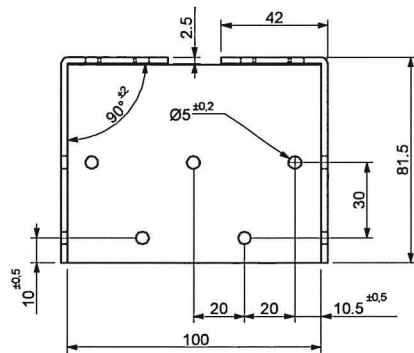
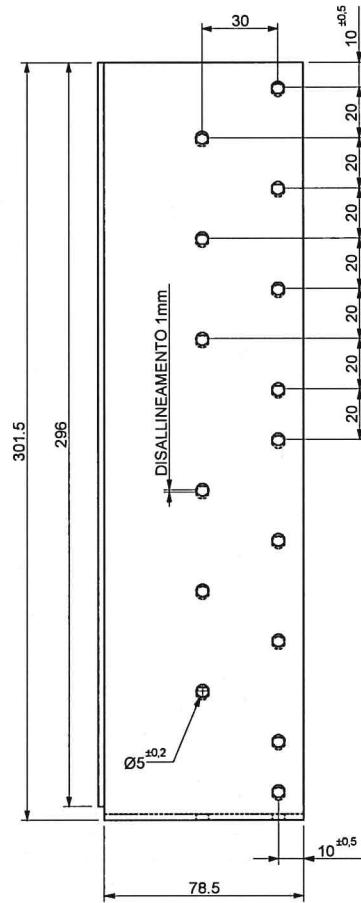
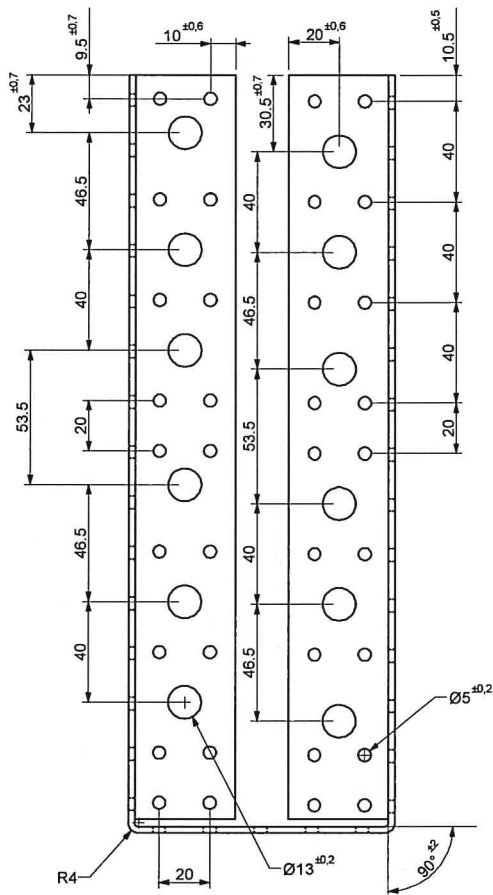


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1143

Allegato A41
dell'ETA N° 19/0535

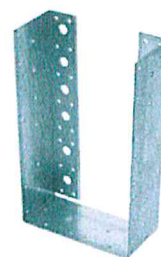
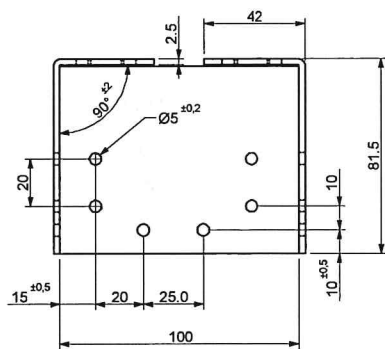
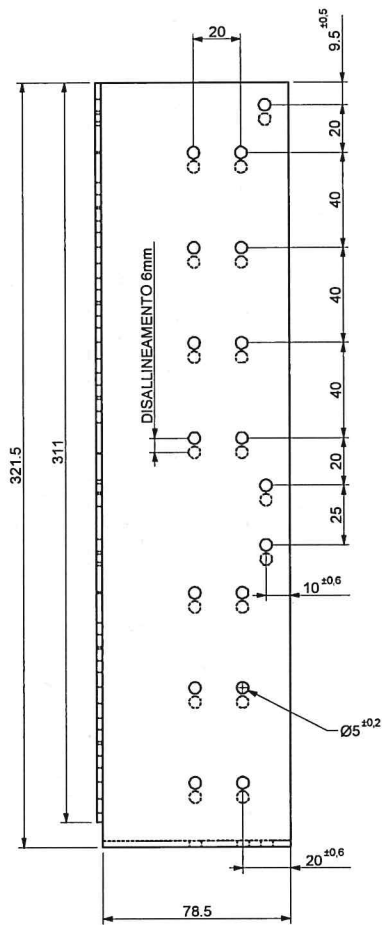
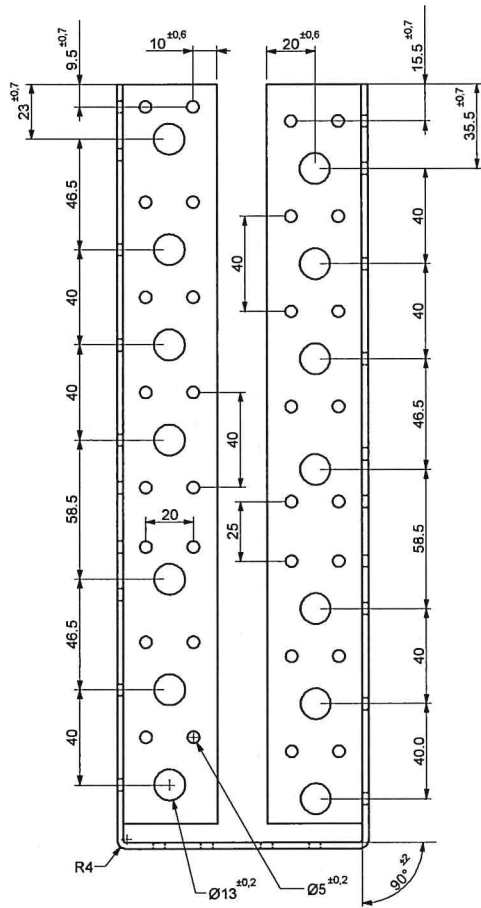


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1144

Allegato A42
dell'ETA N° 19/0535

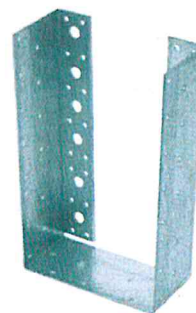
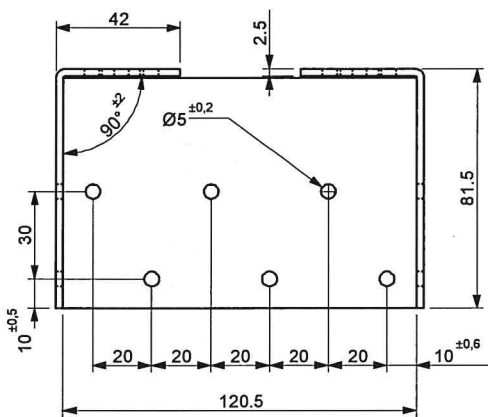
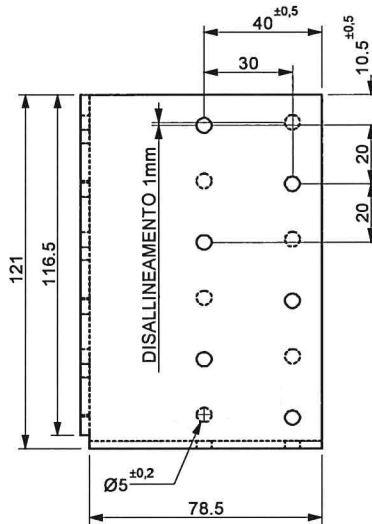
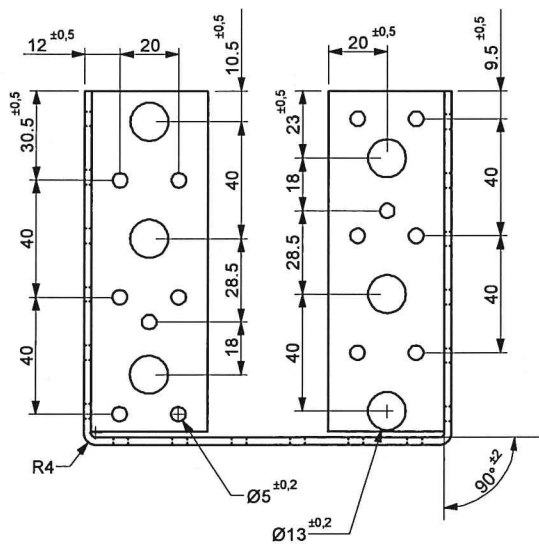


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1145

Allegato A43
dell'ETA N° 19/0535

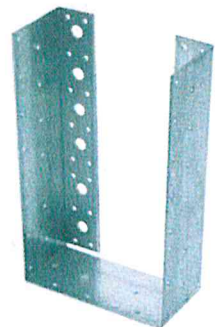
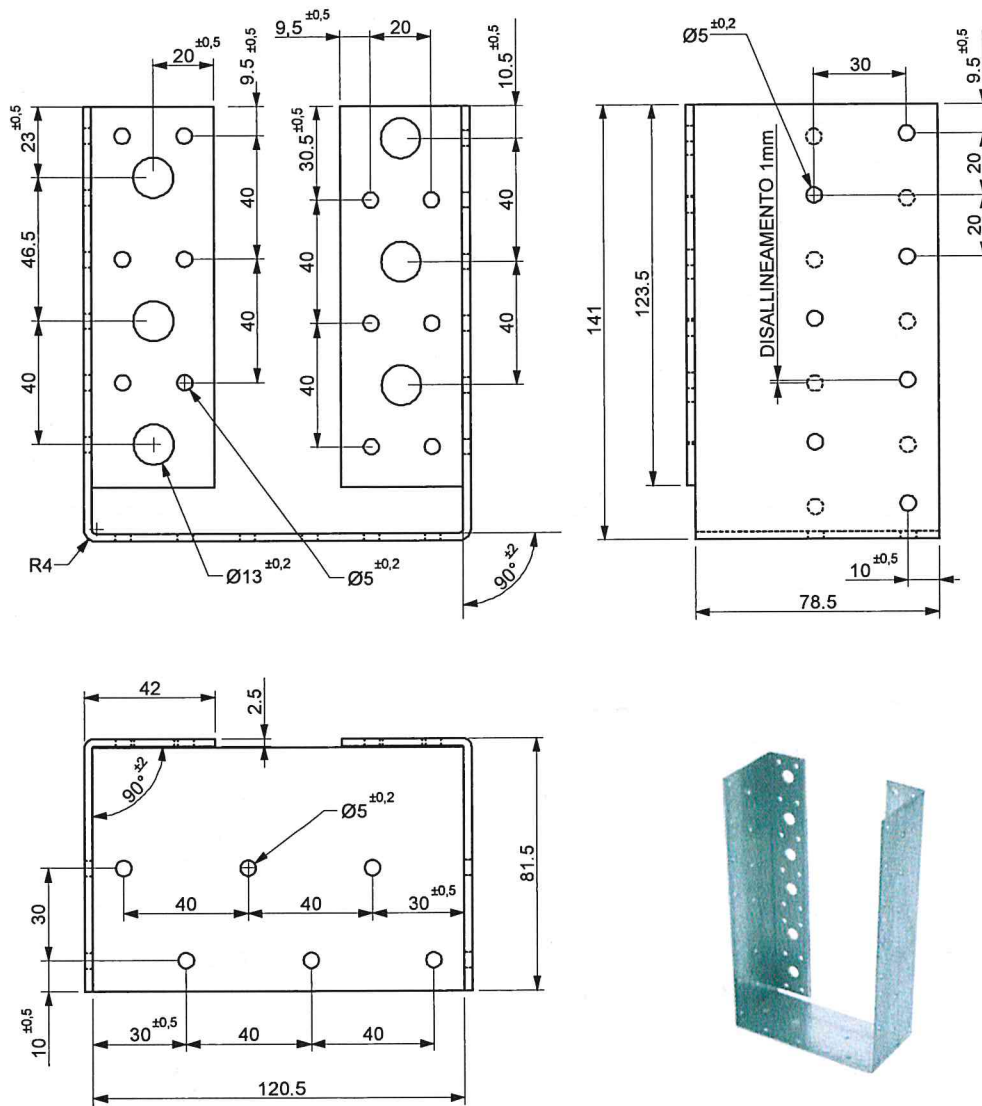


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1146

Allegato A44
dell'ETA N° 19/0535

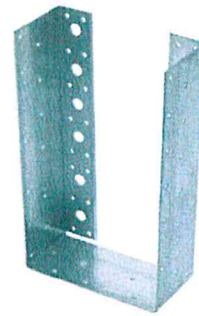
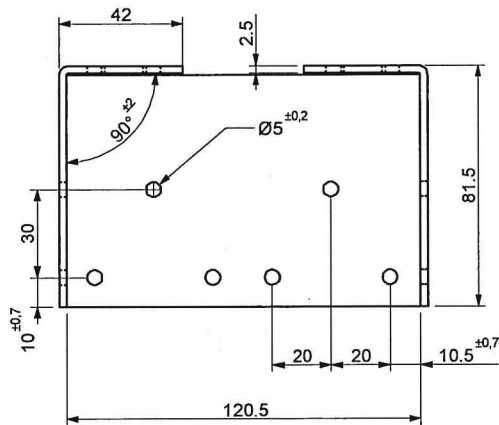
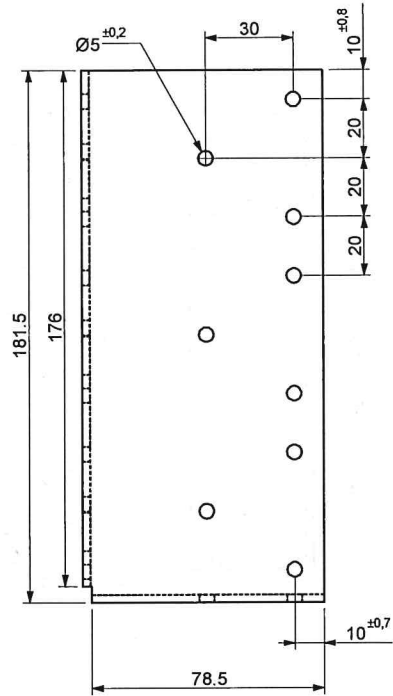
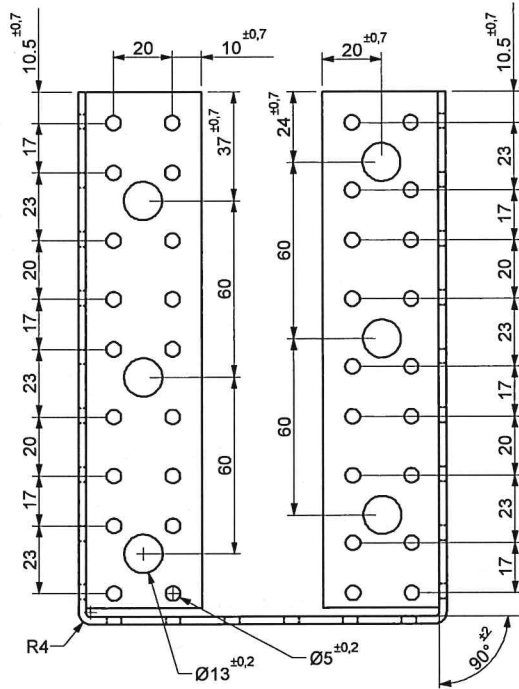


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1147

Allegato A45
dell'ETA N° 19/0535

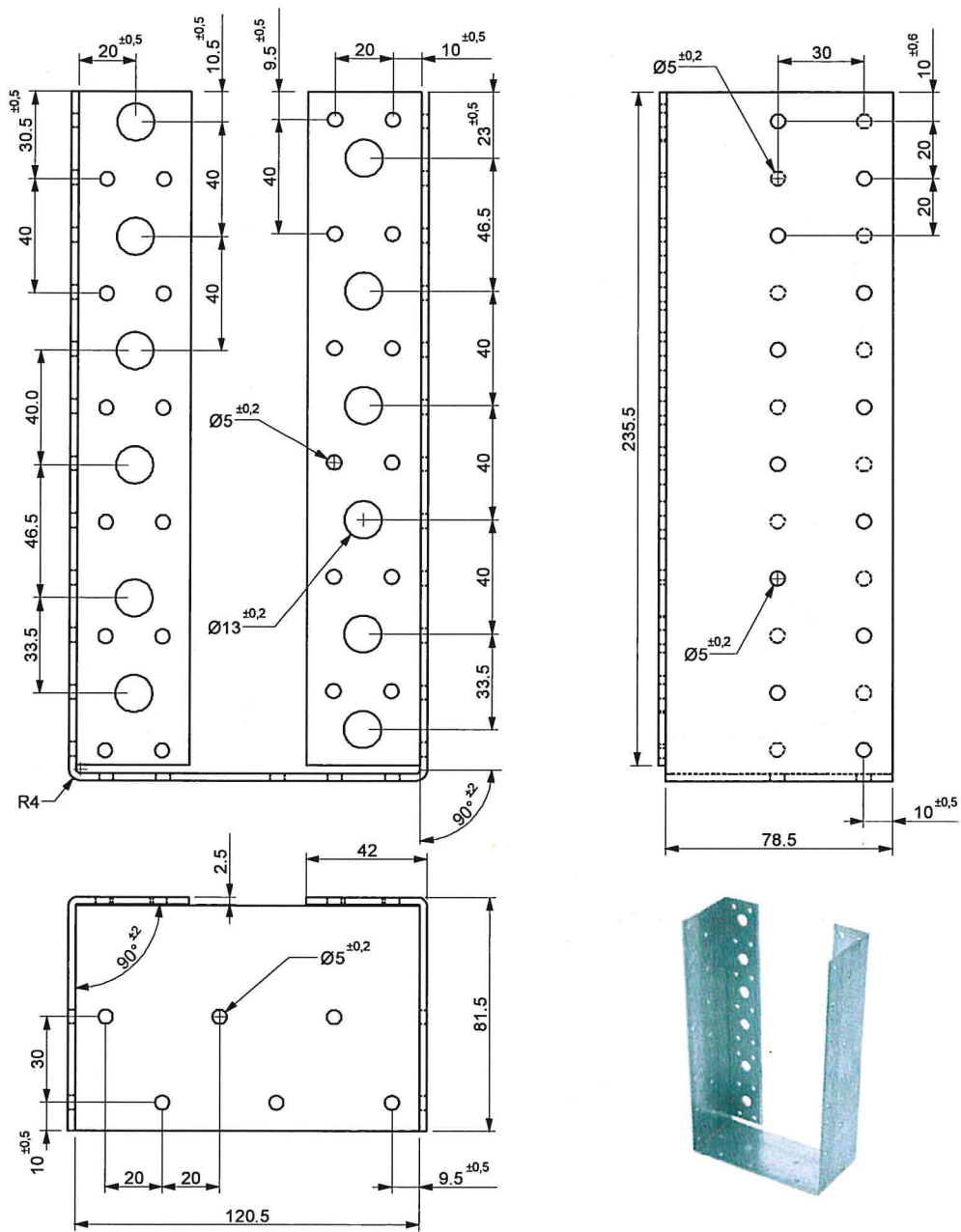


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1149

Allegato A47
dell'ETA N° 19/0535

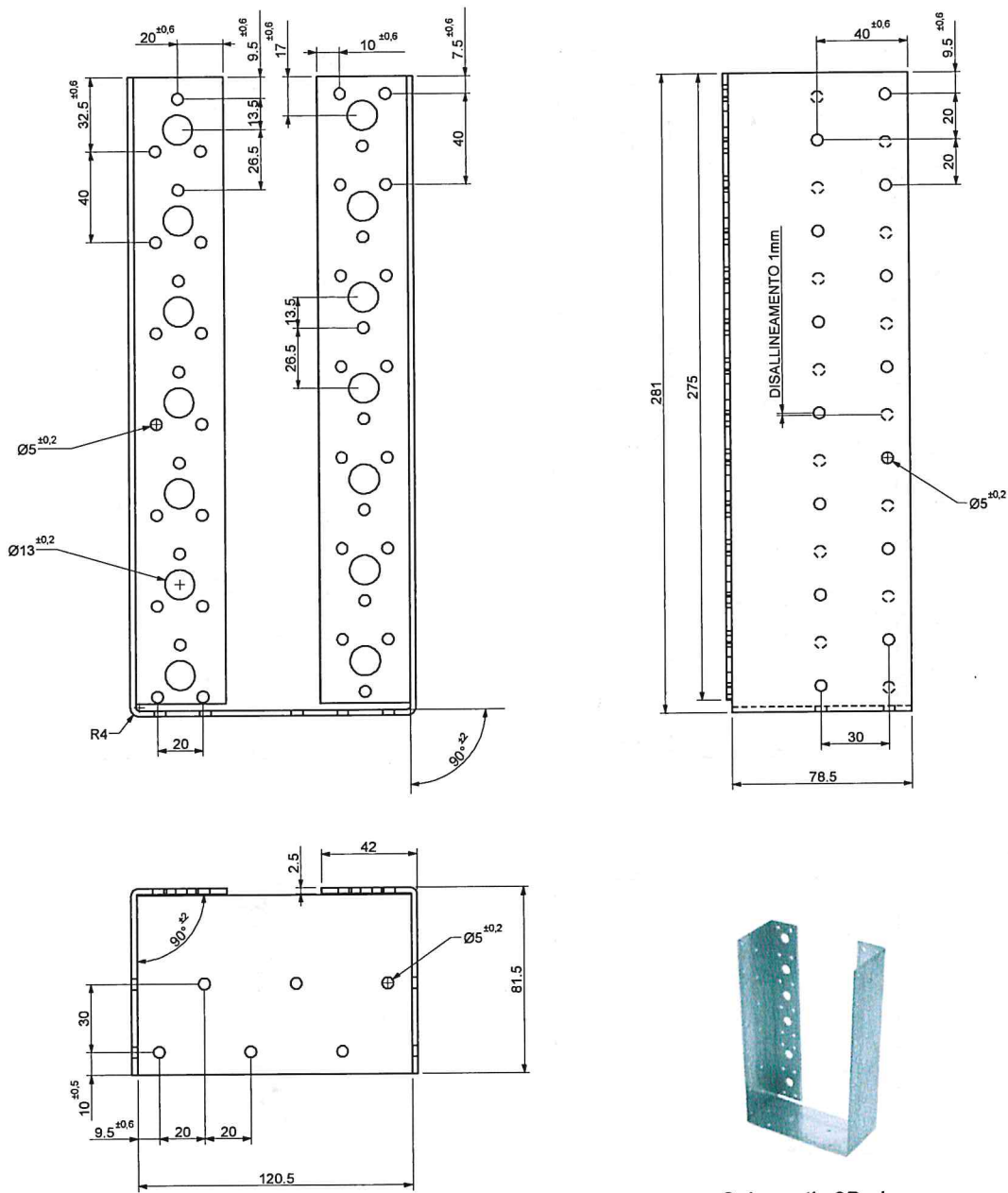


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1150

Allegato A48
dell'ETA N° 19/0535

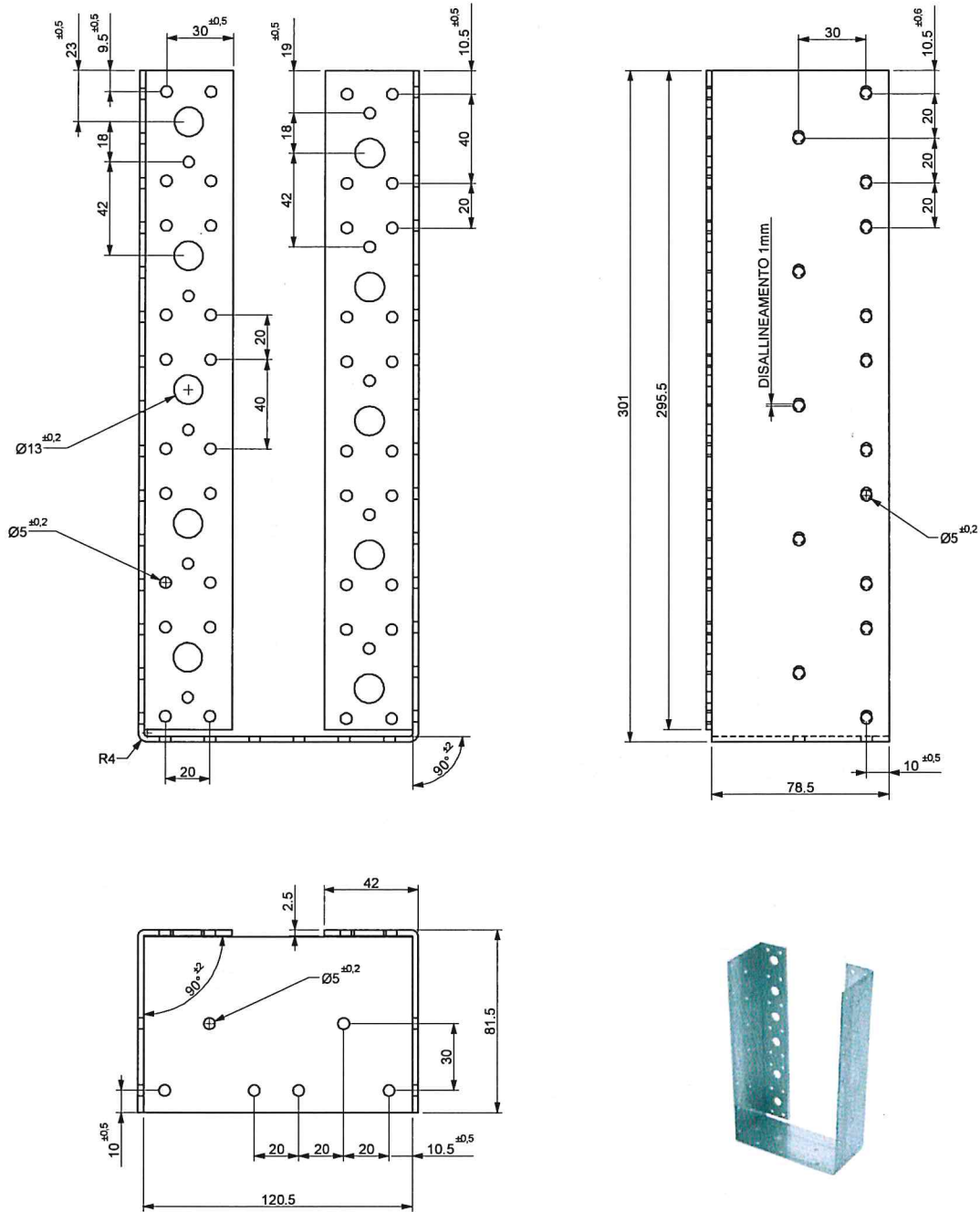


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1151

Allegato A49
dell'ETA N° 19/0535

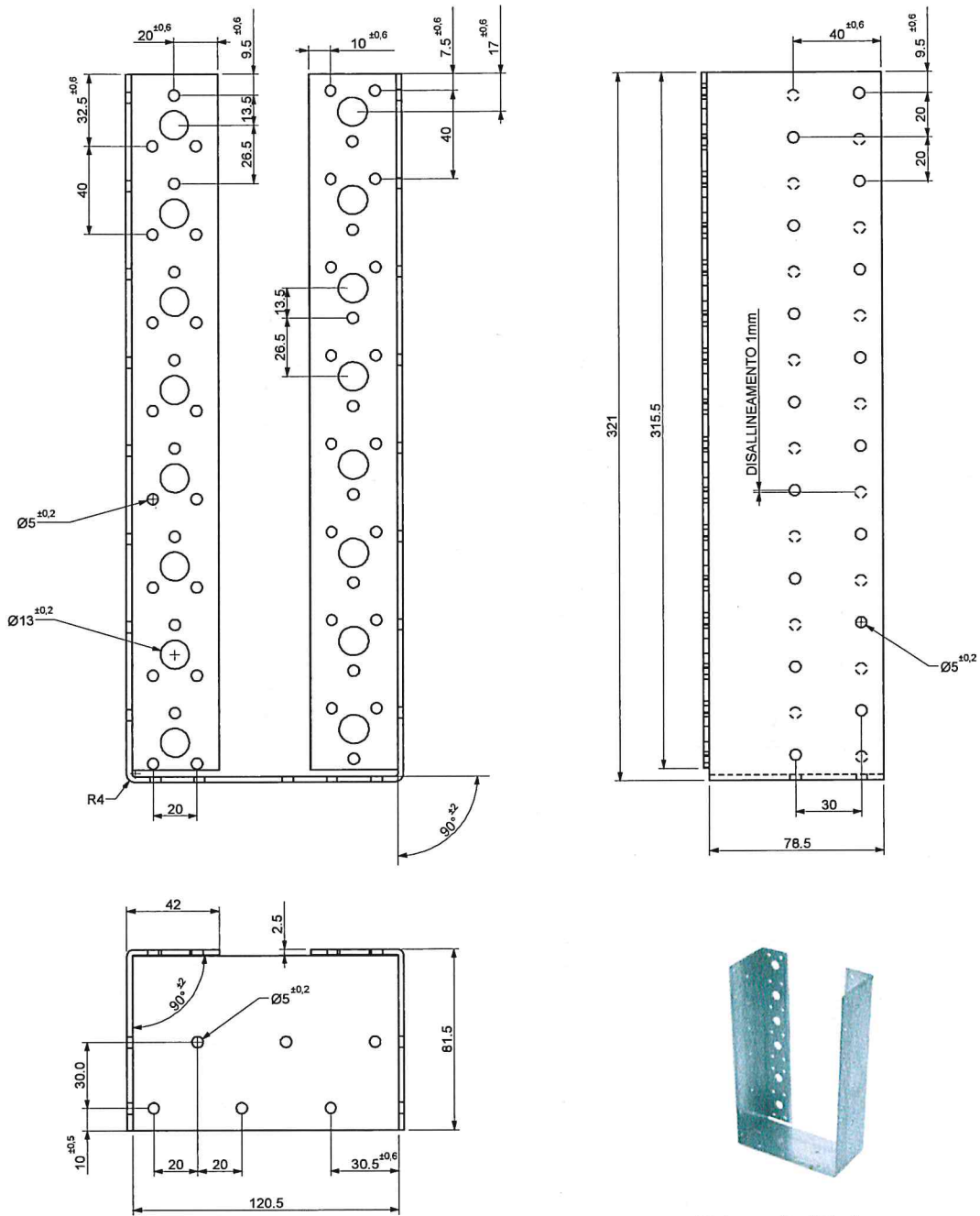


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1152

Allegato A50
dell'ETA N° 19/0535

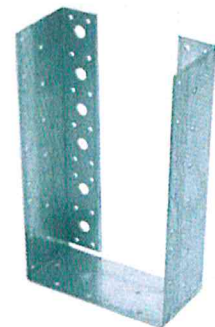
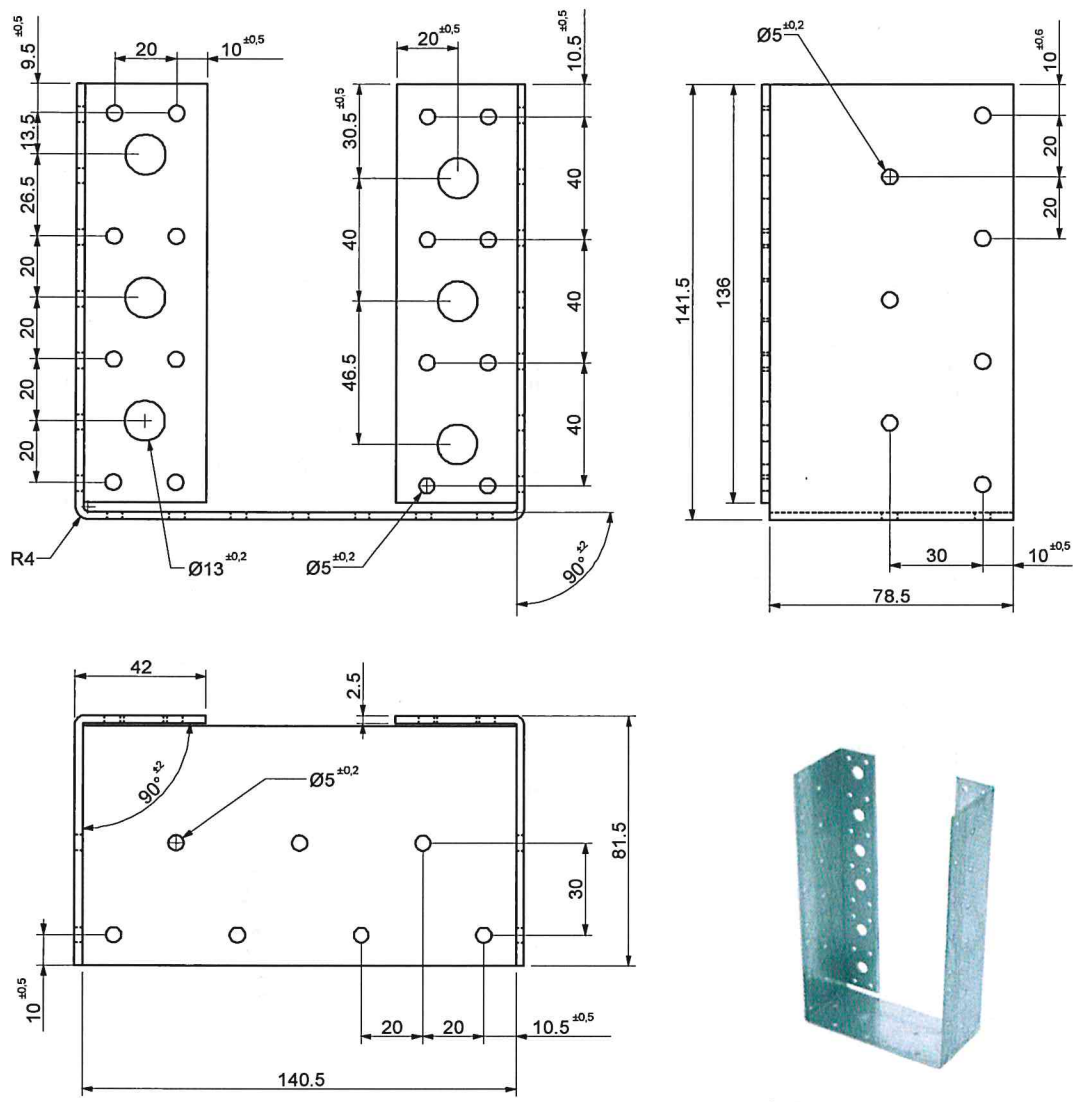


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1153

Allegato A51
dell'ETA N° 19/0535

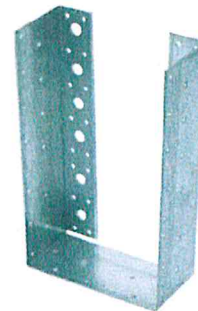
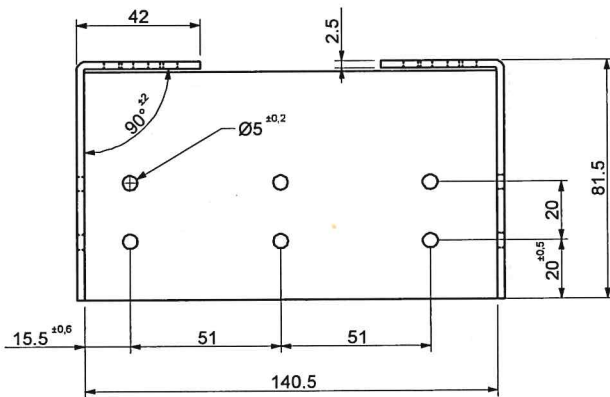
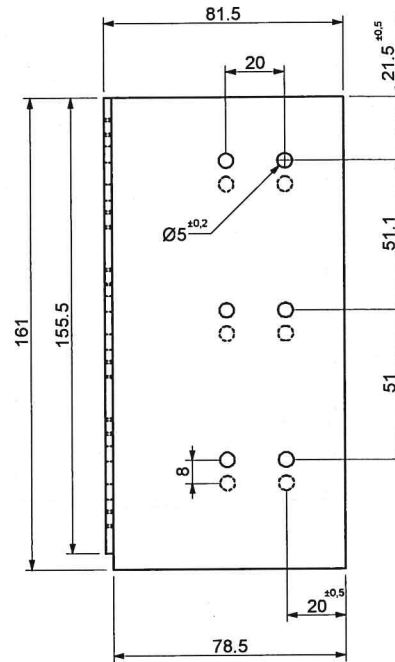
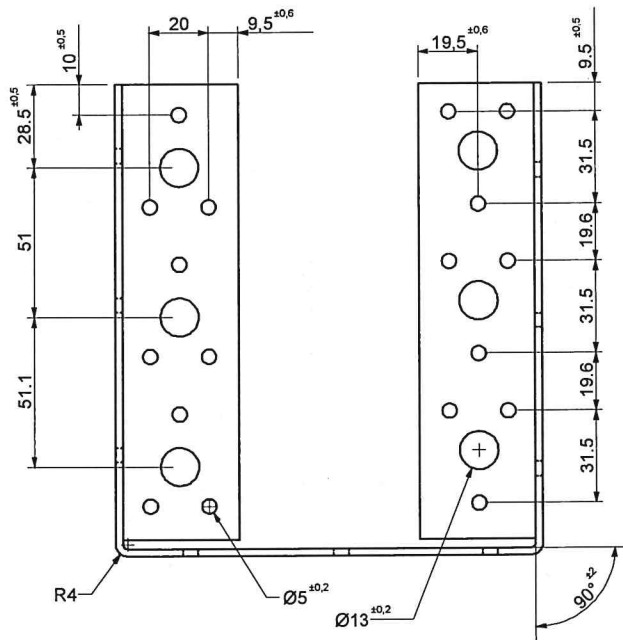


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1154

**Allegato A52
dell'ETA N° 19/0535**

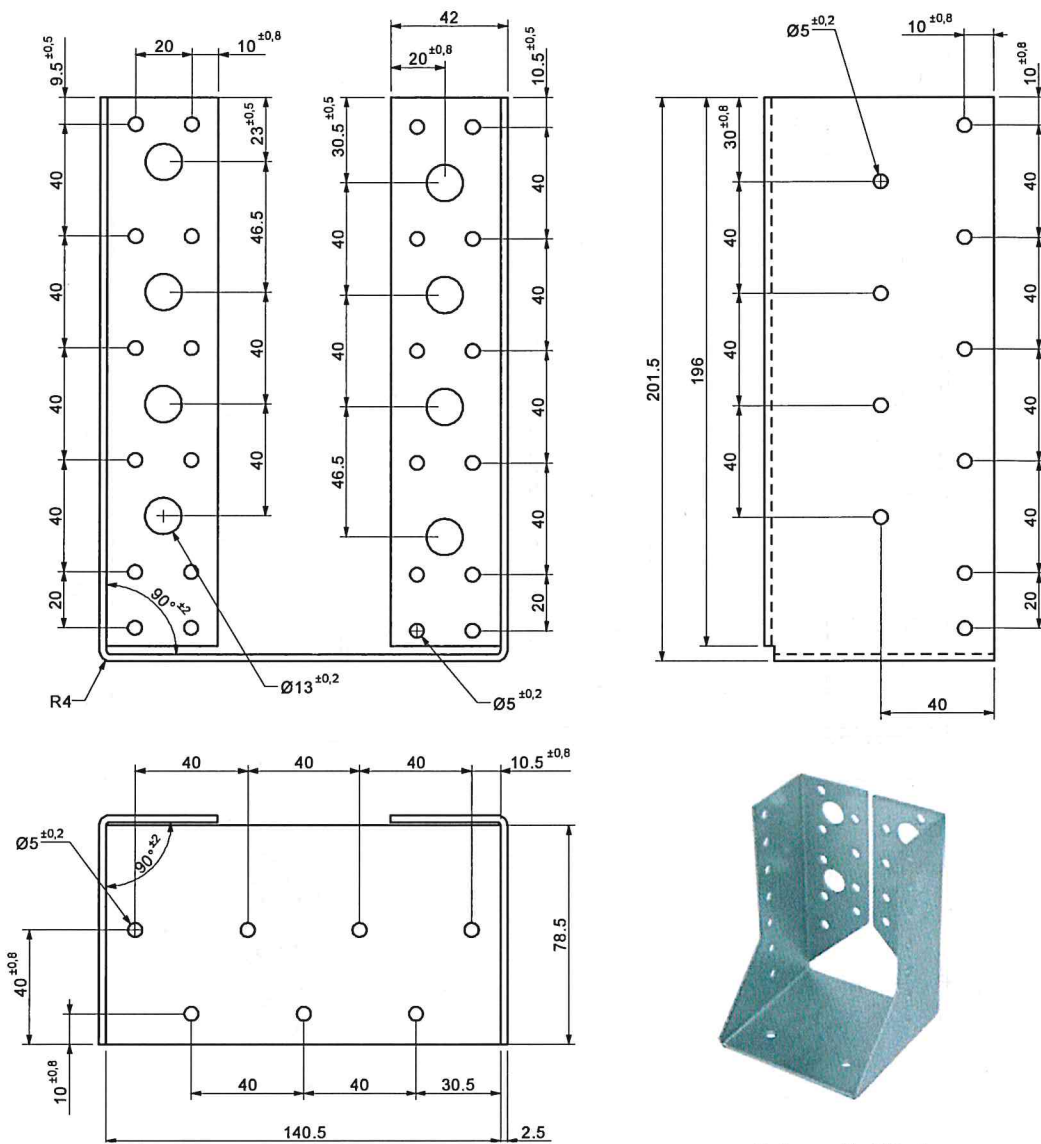


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1155

Allegato A53
dell'ETA N° 19/0535

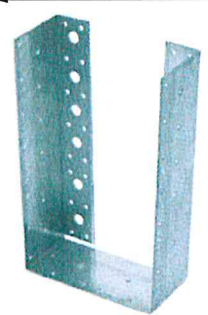
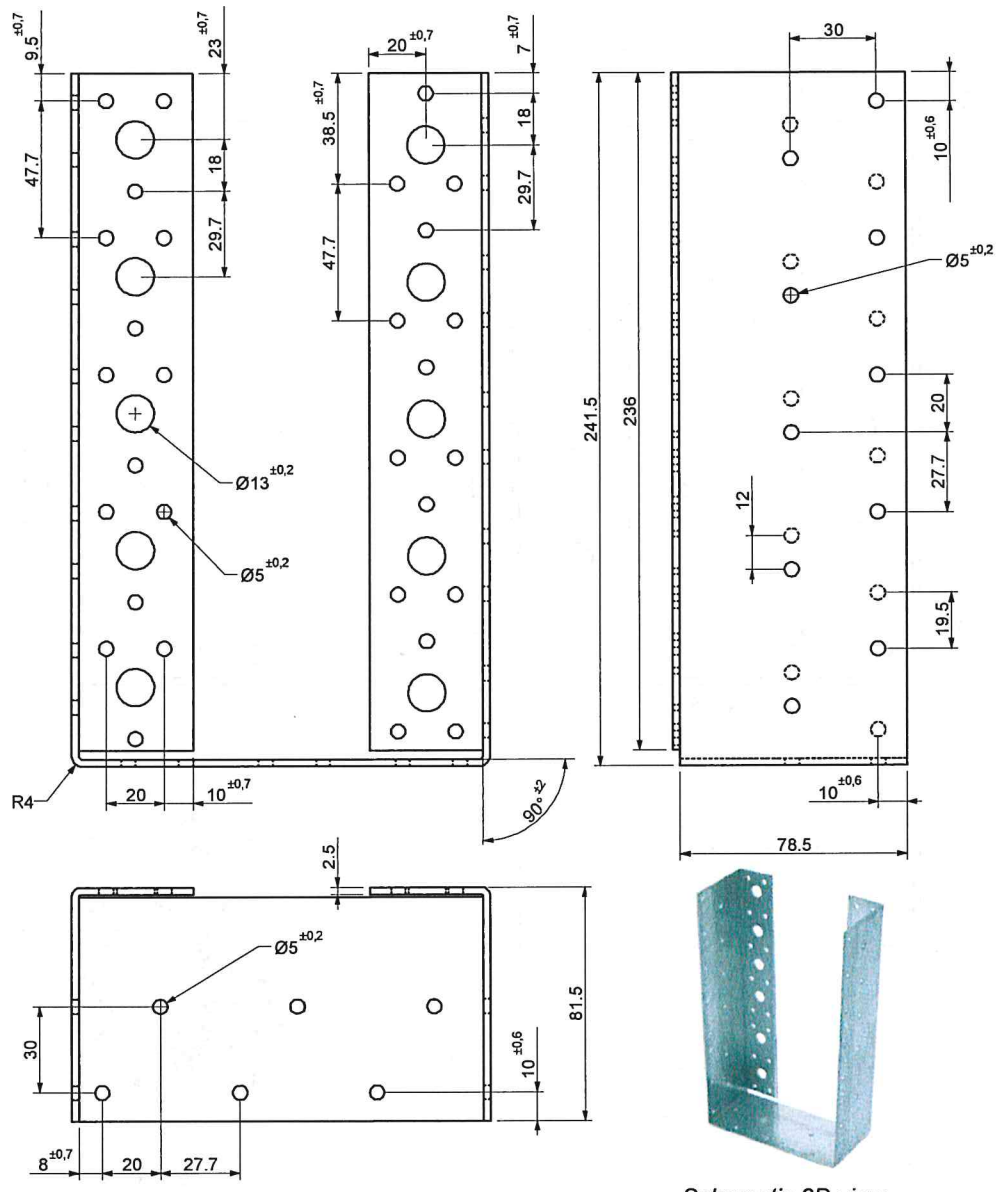


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1156

Allegato A54
dell'ETA N° 19/0535

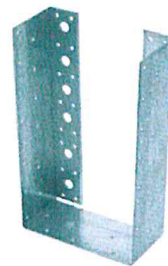
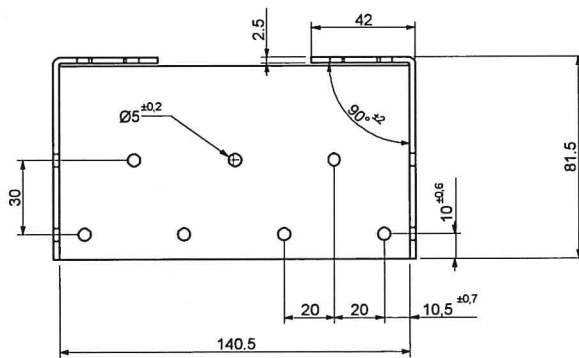
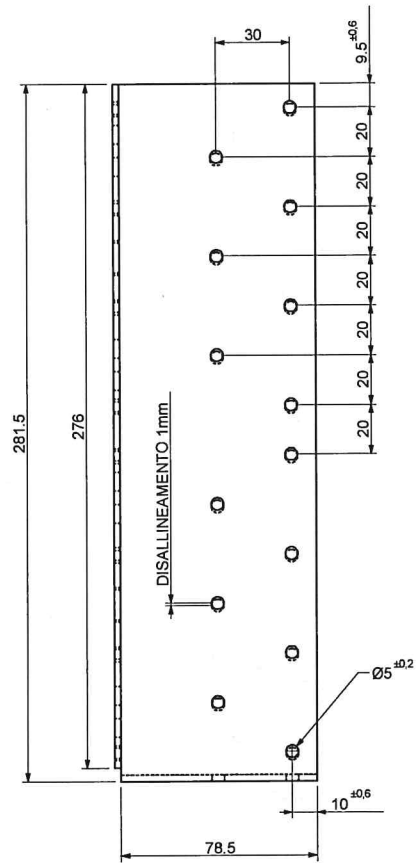
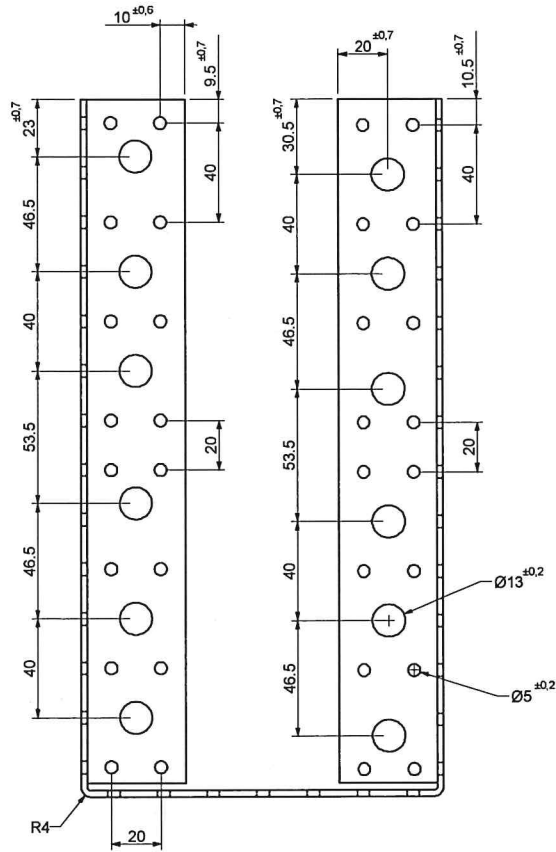


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1157

Allegato A55
dell'ETA N° 19/0535

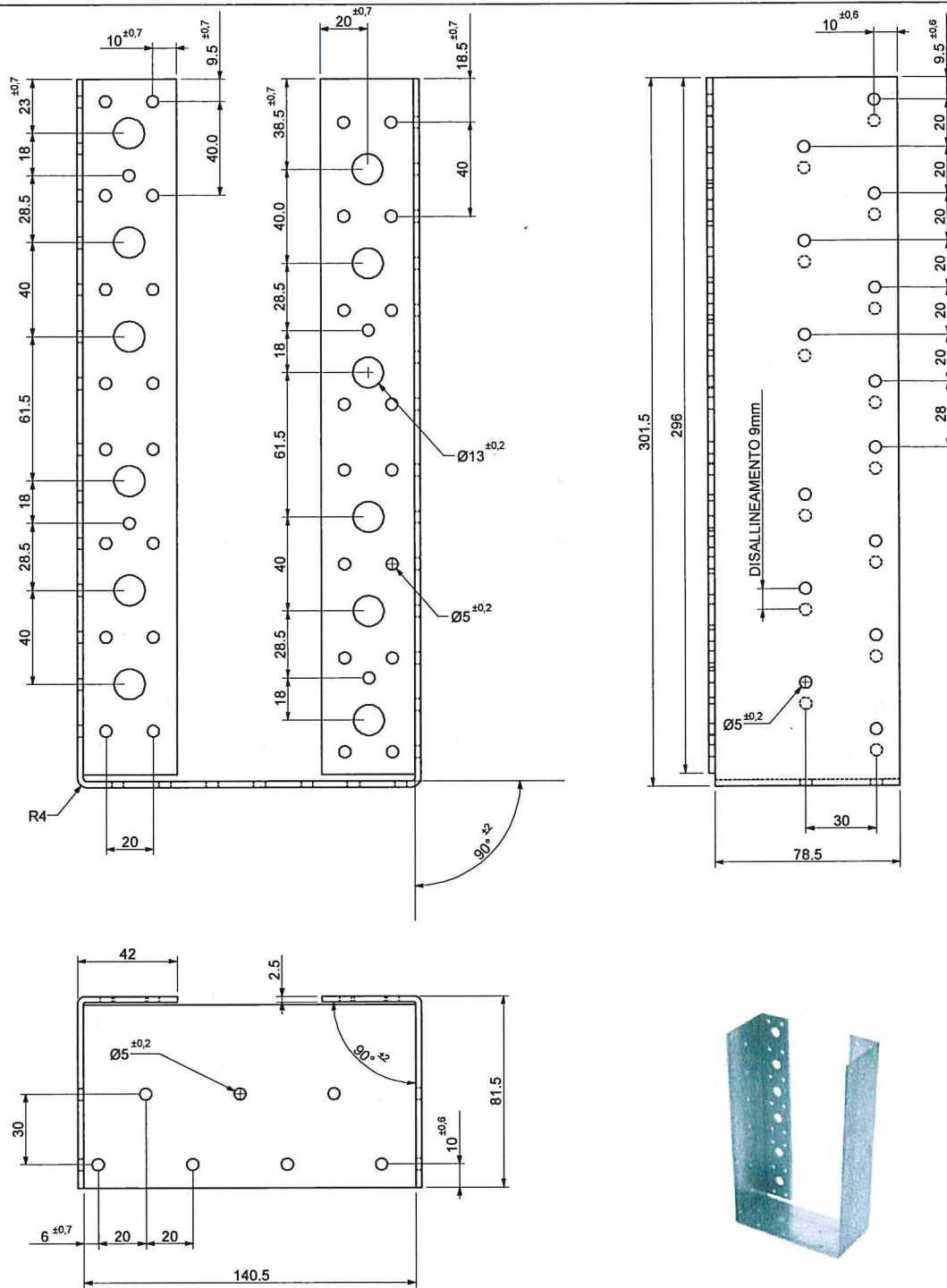


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1158

Allegato A56
dell'ETA N° 19/0535

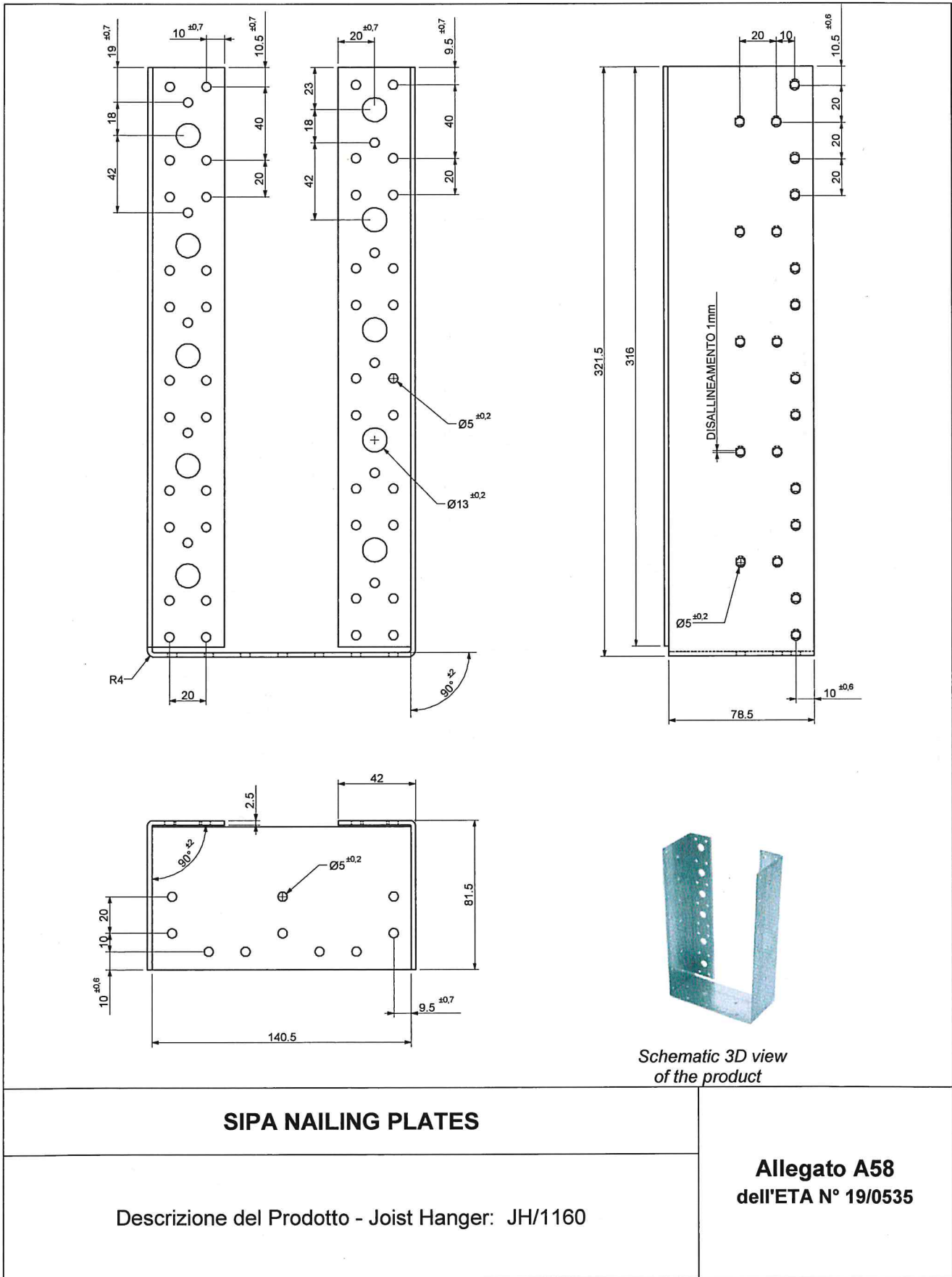


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1159

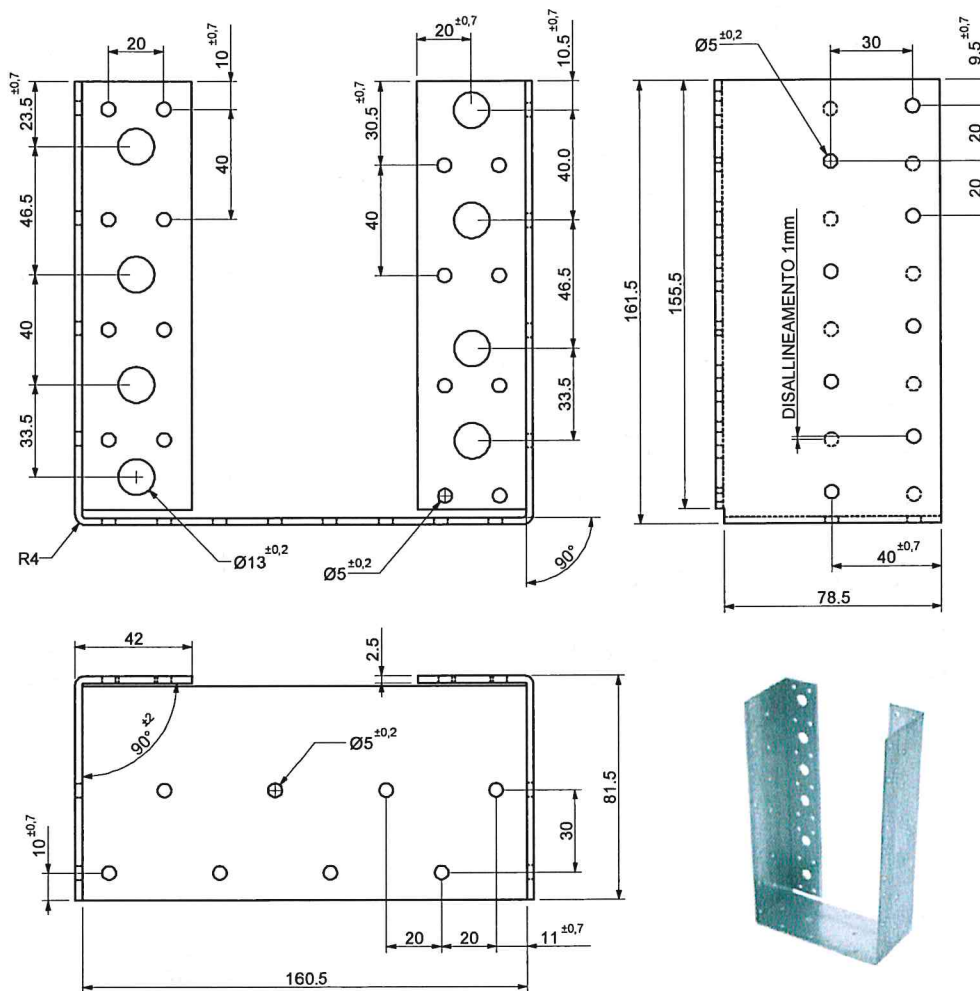
Allegato A57
dell'ETA N° 19/0535



SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1160

**Allegato A58
dell'ETA N° 19/0535**

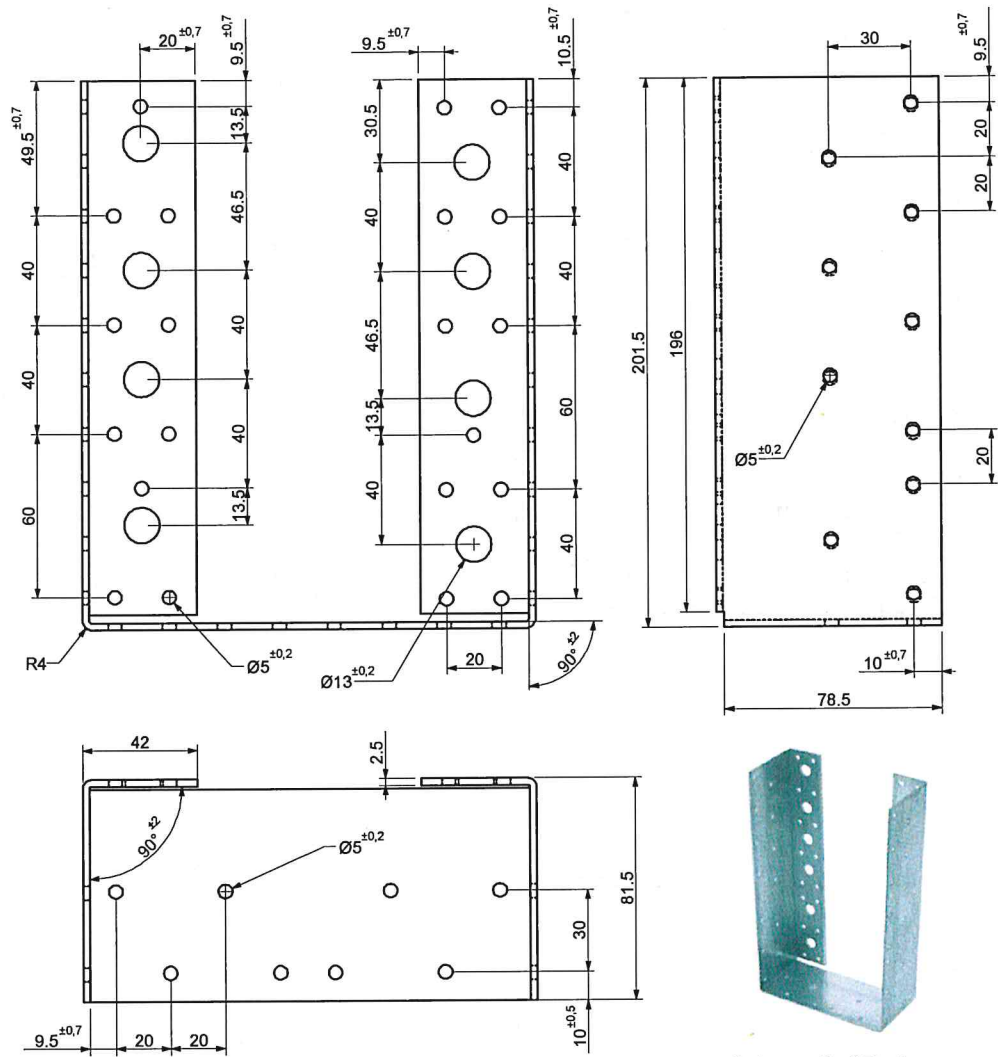


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1161

Allegato A59
dell'ETA N° 19/0535

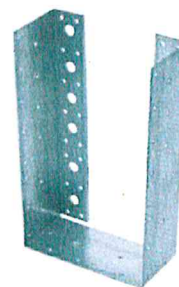
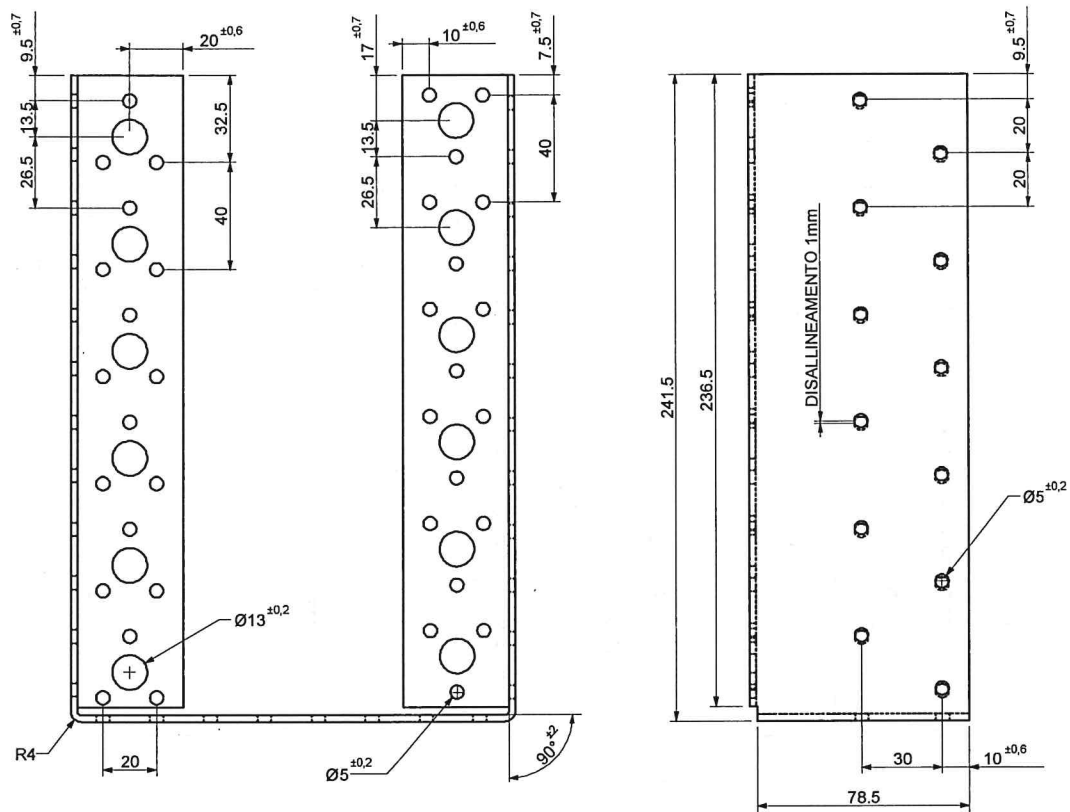


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1549

**Allegato A60
dell'ETA N° 19/0535**

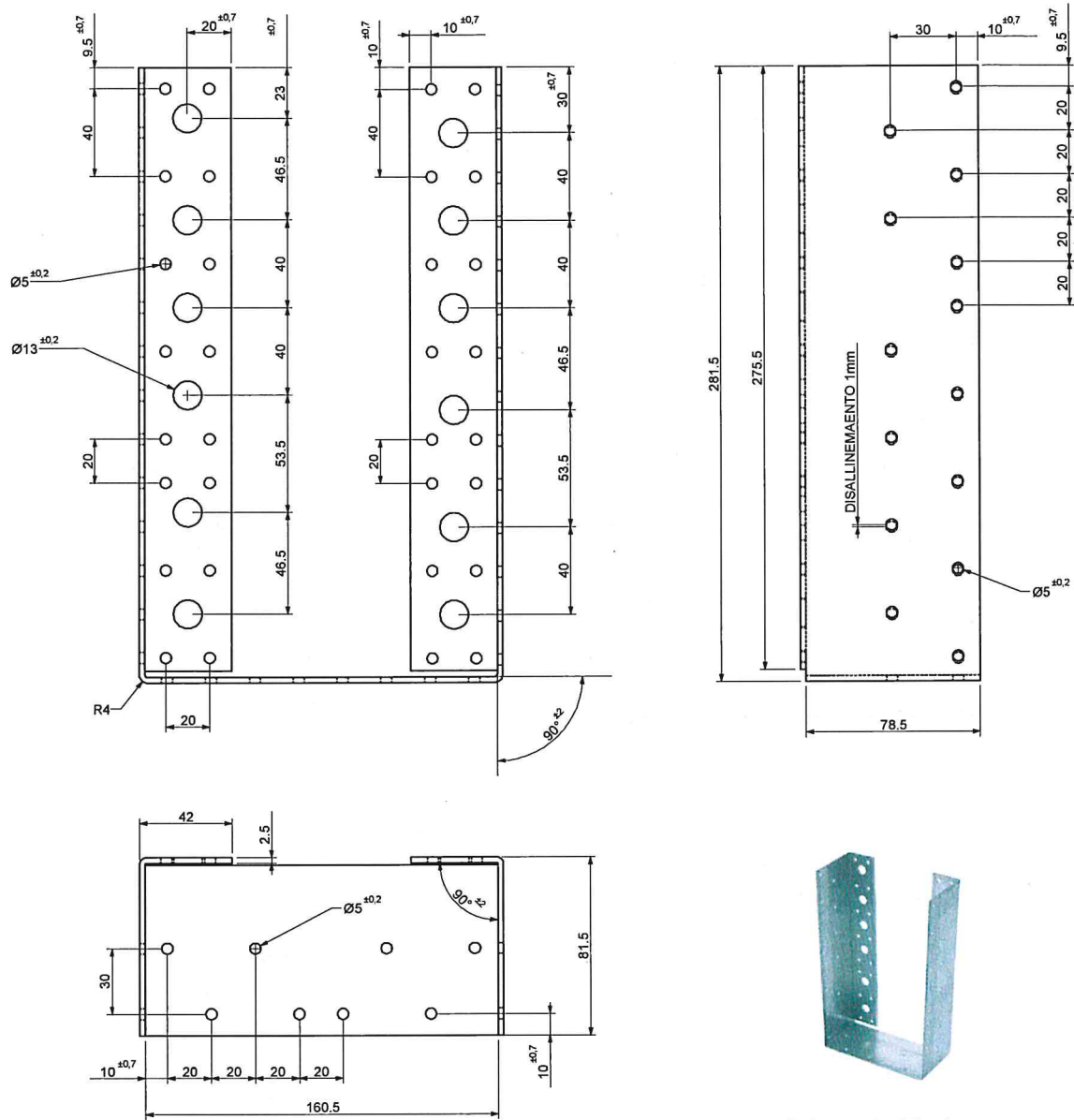


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1162

Allegato A61
dell'ETA N° 19/0535

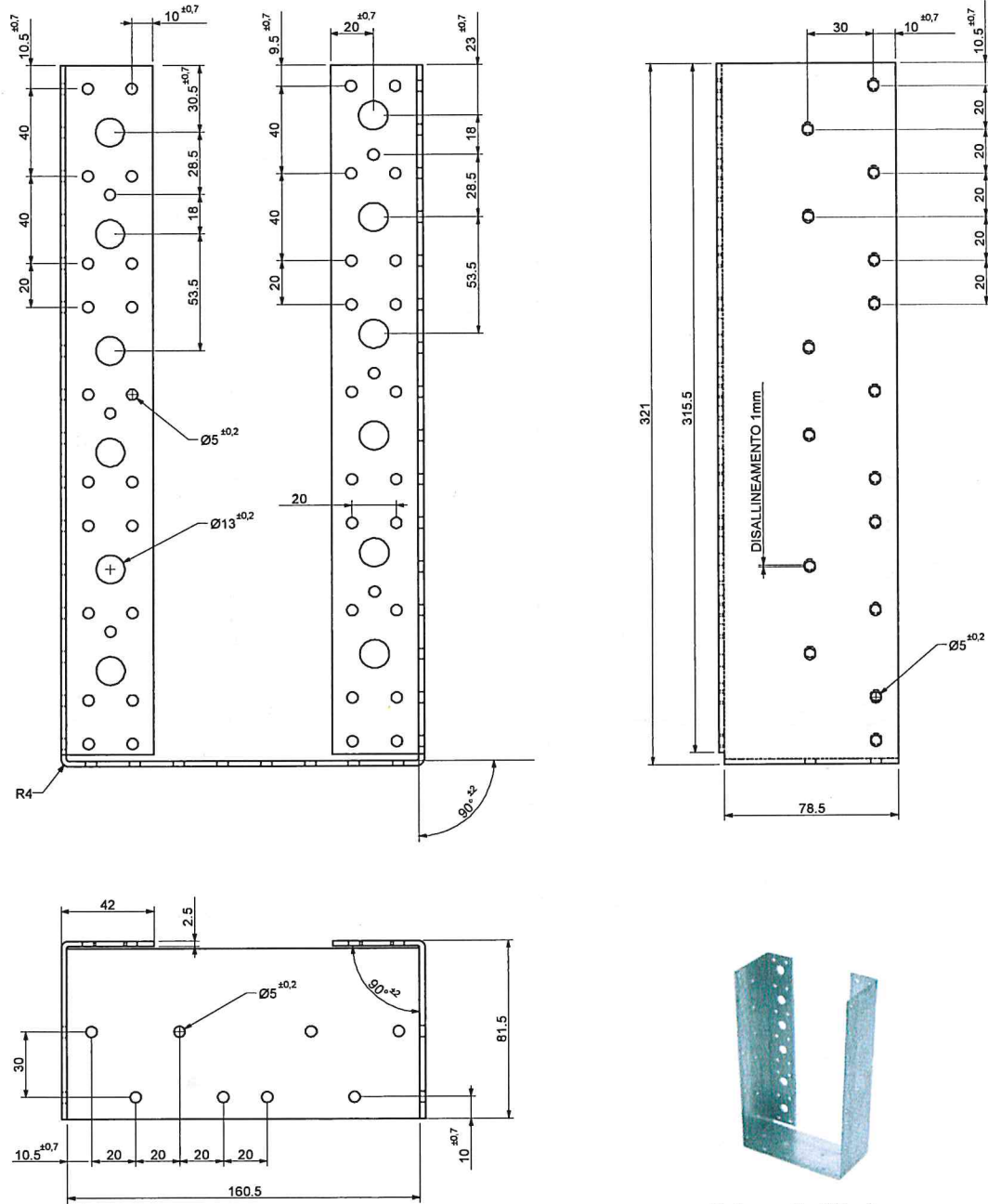


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1163

**Allegato A62
dell'ETA N° 19/0535**

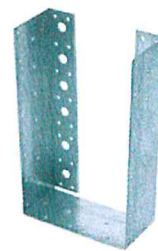
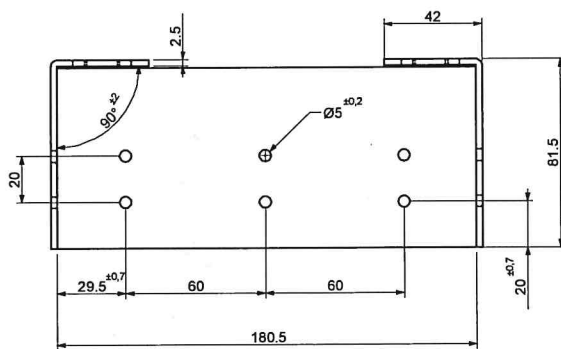
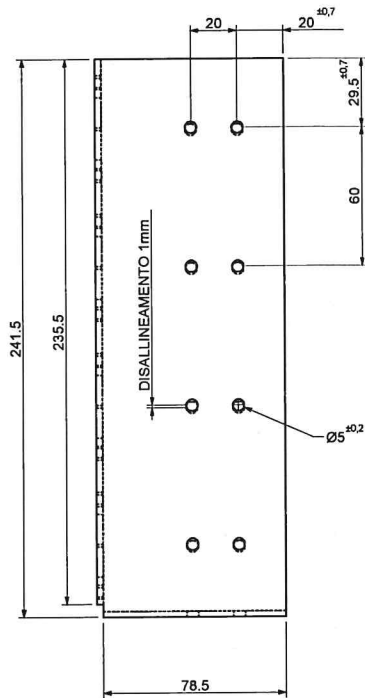
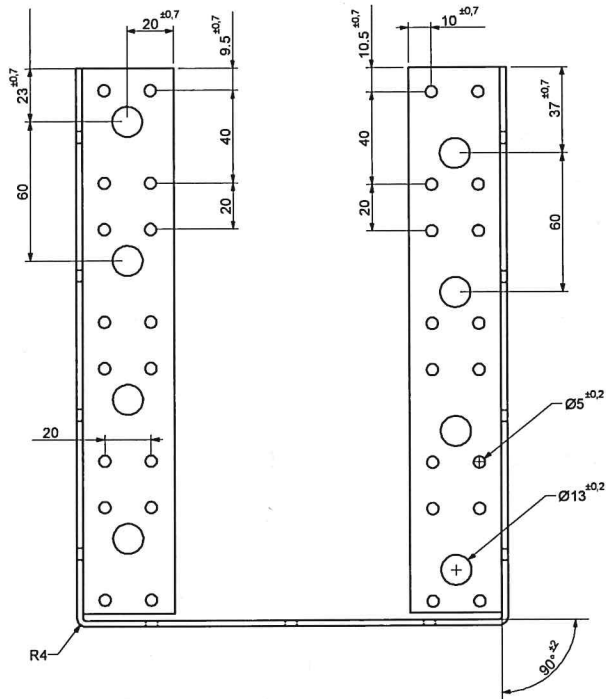


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1164

**Allegato A63
dell'ETA N° 19/0535**

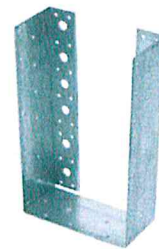
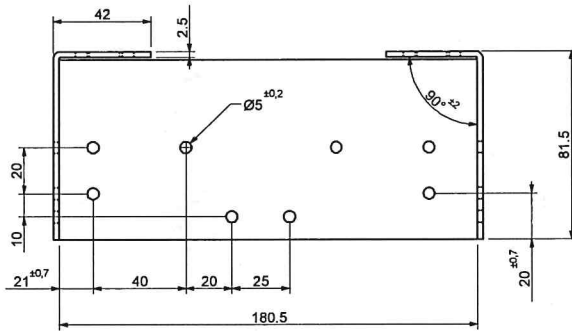
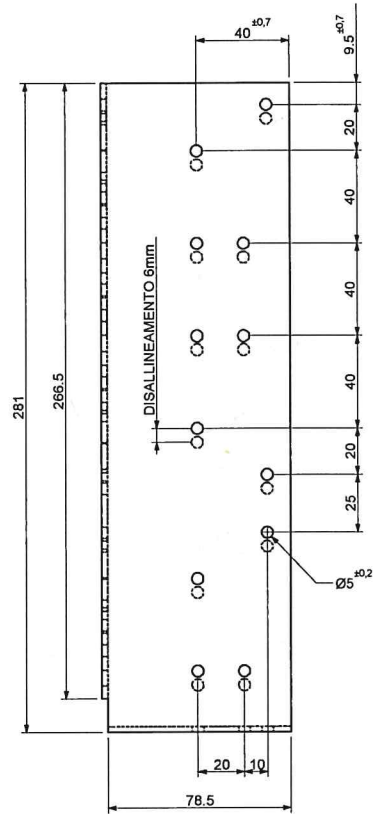
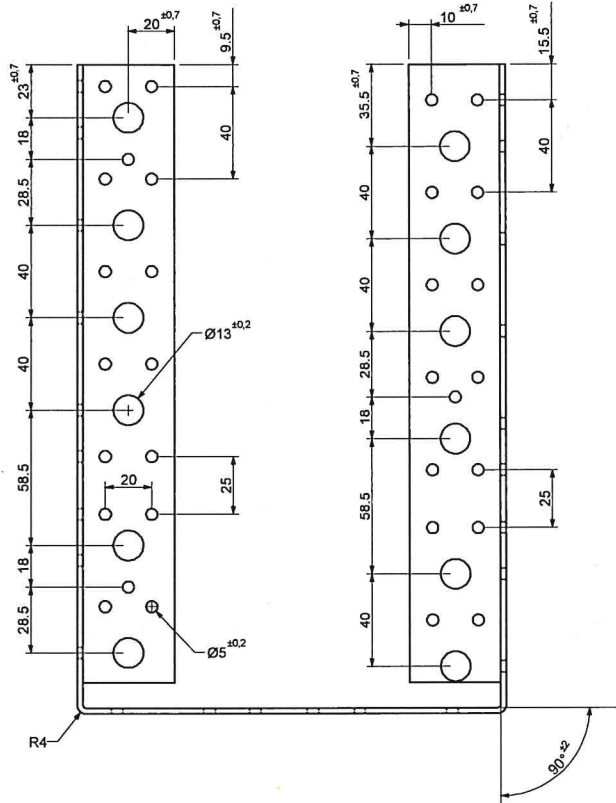


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1165

Allegato A64
dell'ETA N° 19/0535

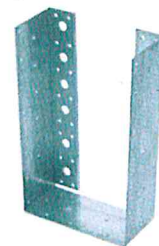
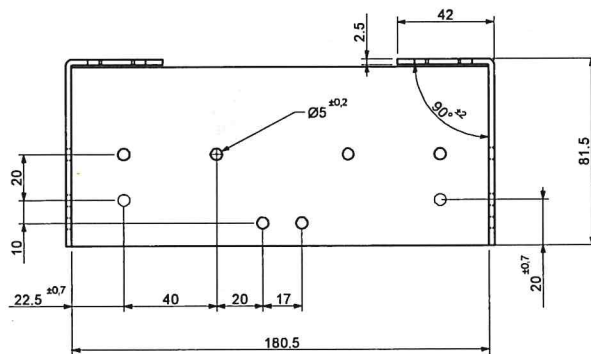
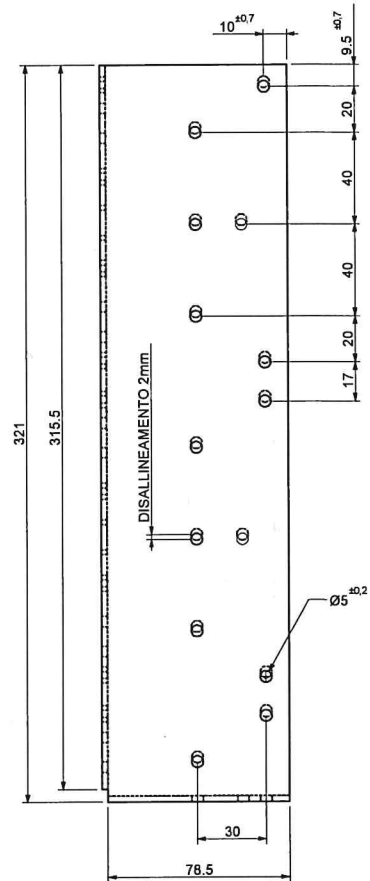
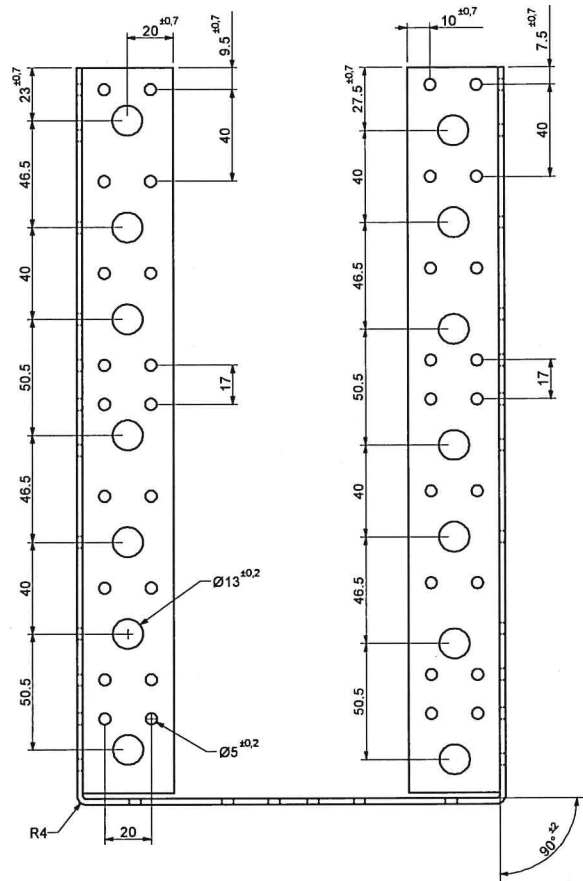


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1166

Allegato A65
dell'ETA N° 19/0535

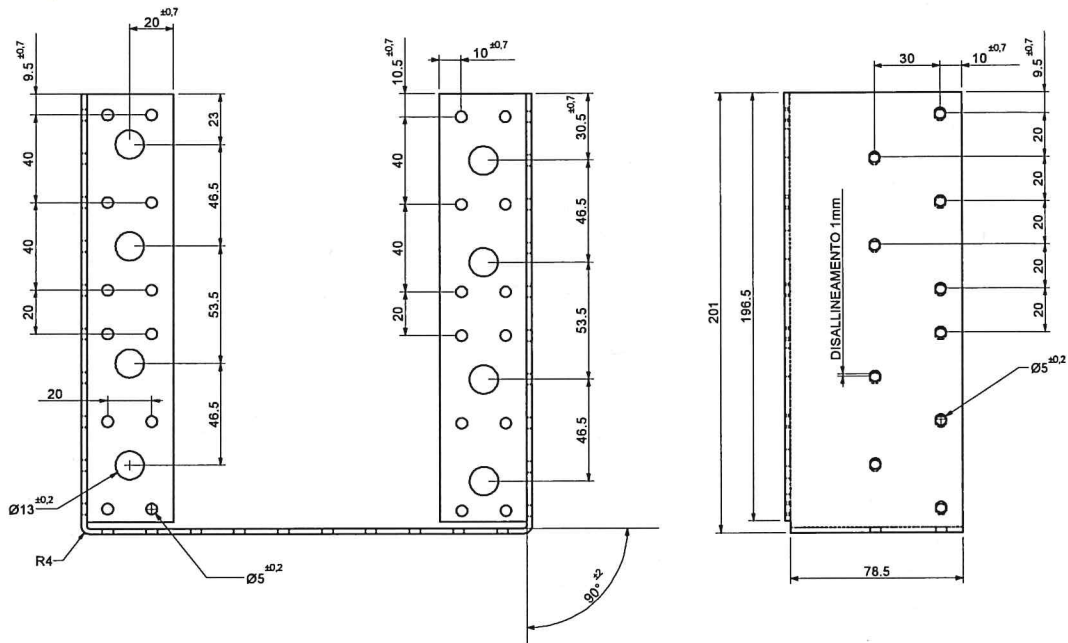


Schematic 3D view
of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1167

Allegato A66
dell'ETA N° 19/0535

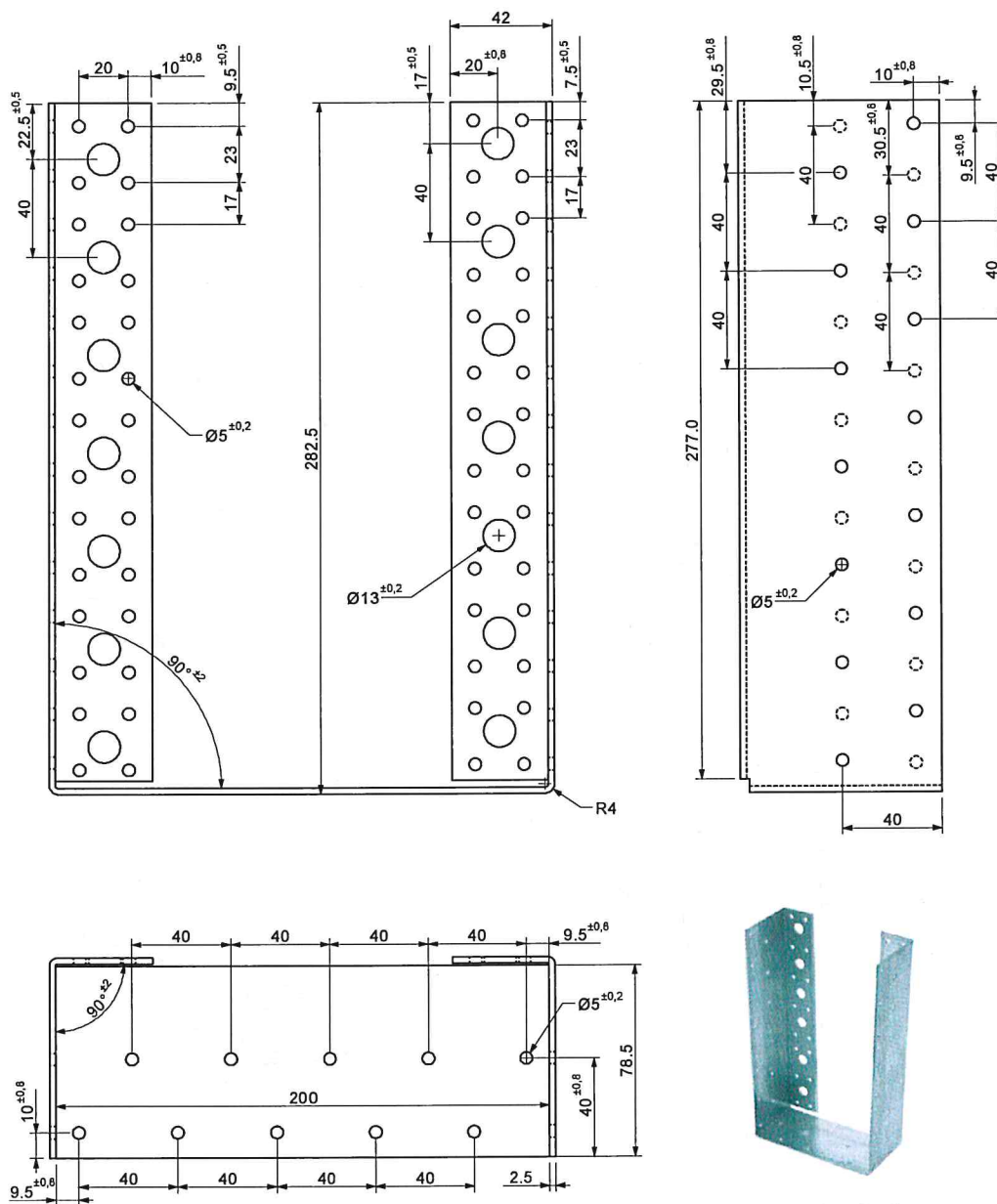


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1168

Allegato A67
dell'ETA N° 19/0535

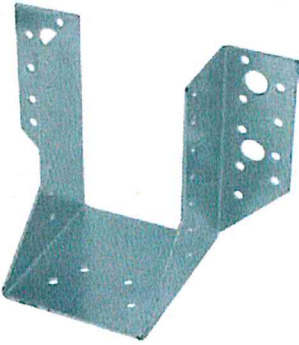
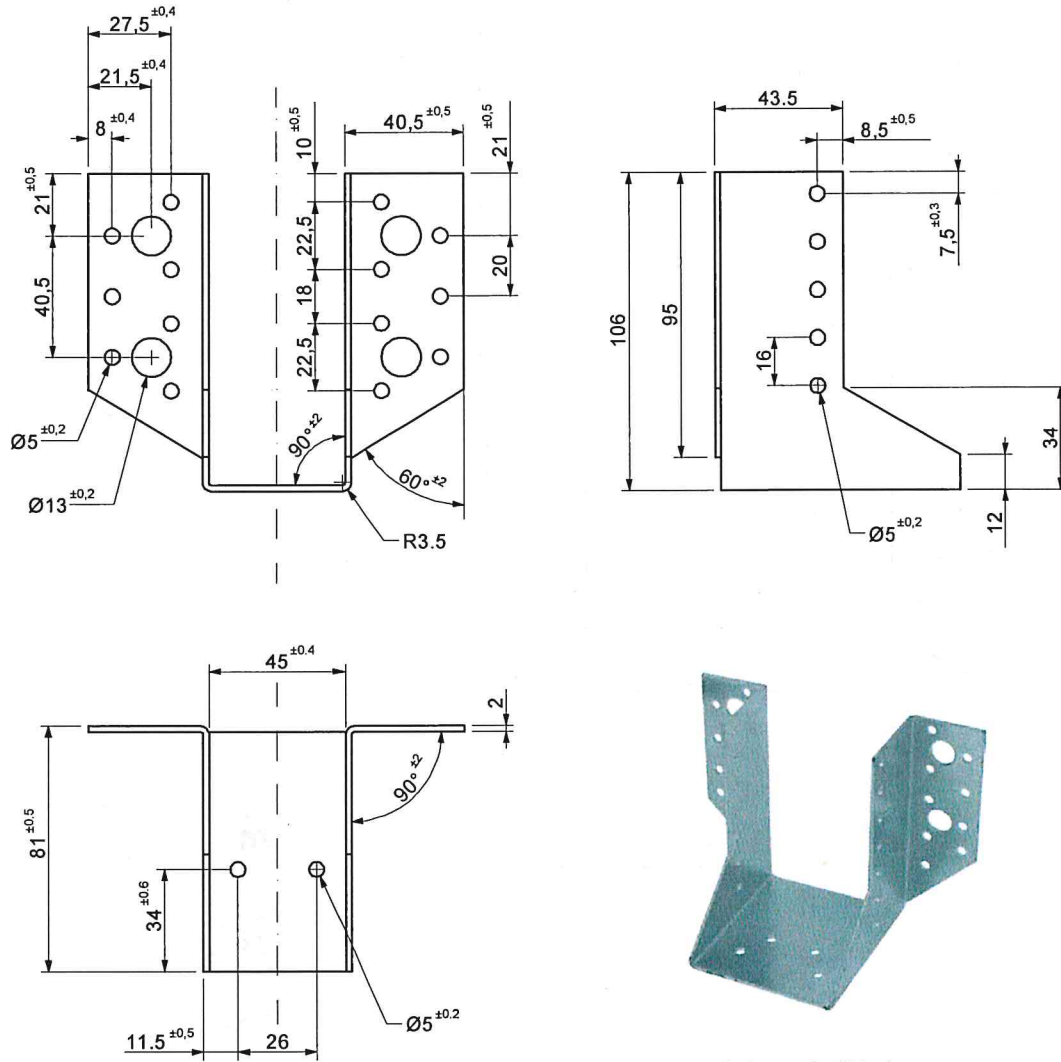


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1169

**Allegato A68
dell'ETA N° 19/0535**

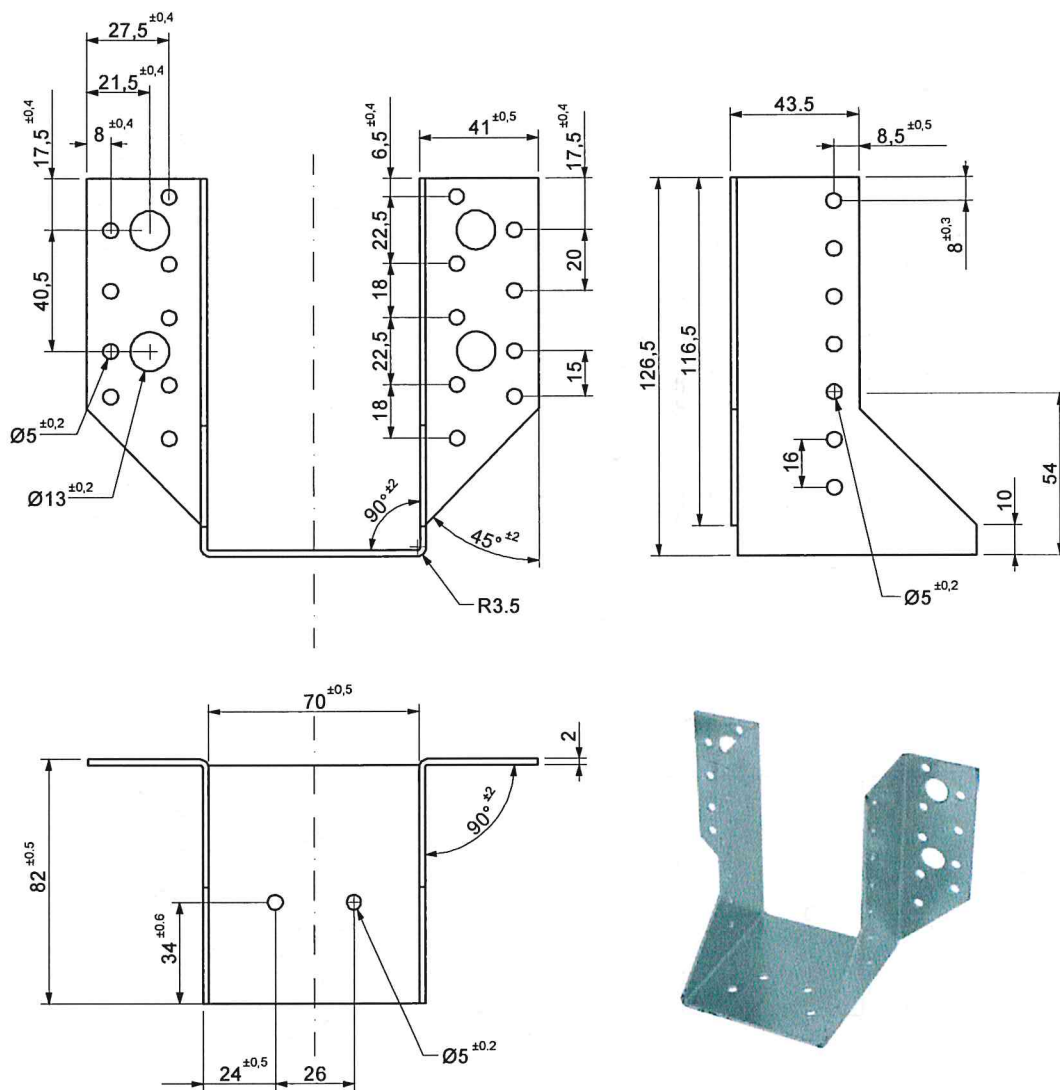


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/373

**Allegato A69
dell'ETA N° 19/0535**

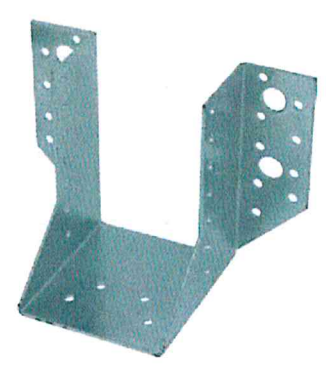
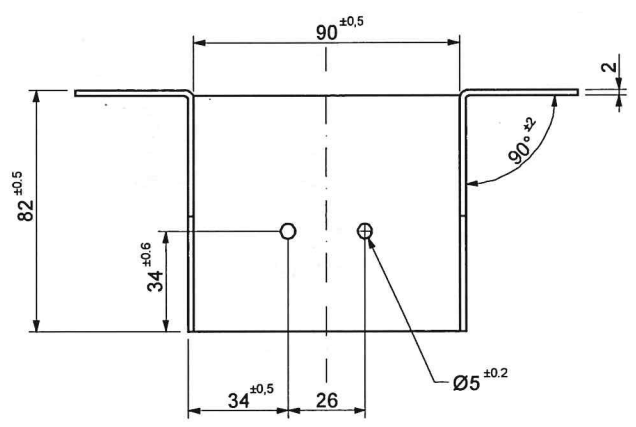
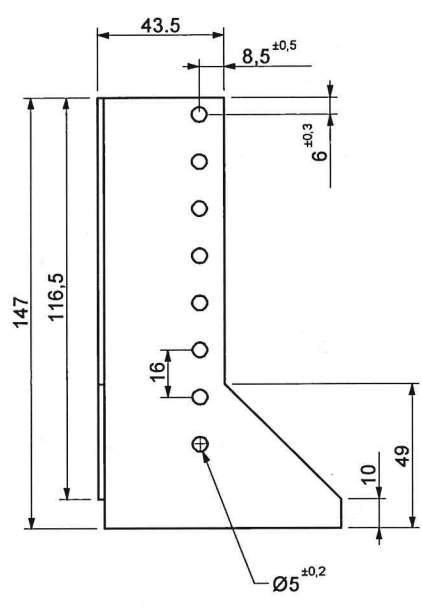
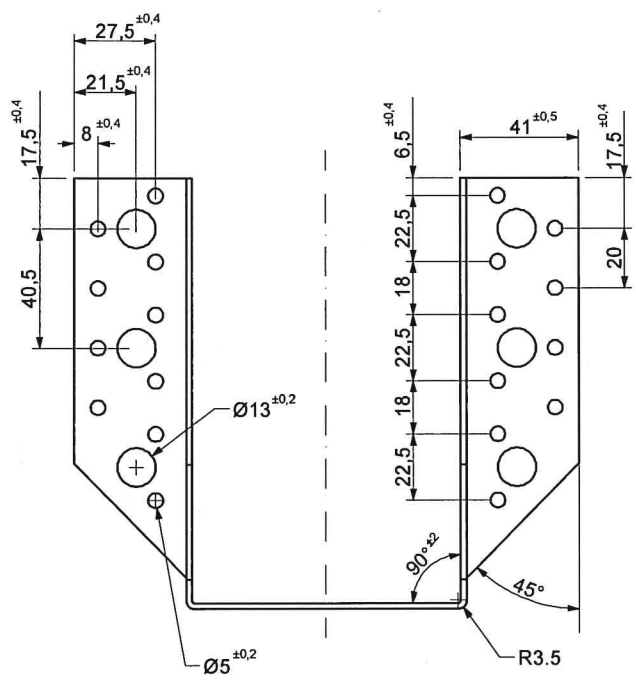


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/377

Allegato A71
dell'ETA N° 19/0535

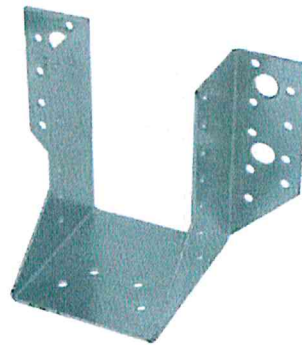
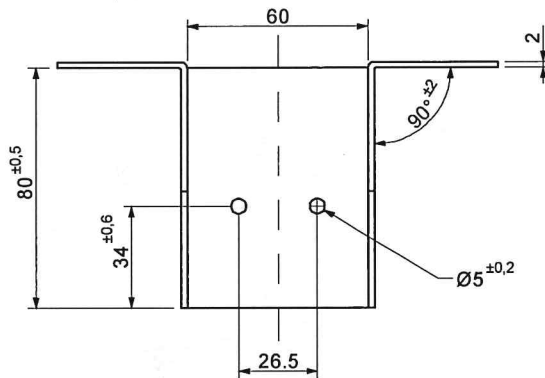
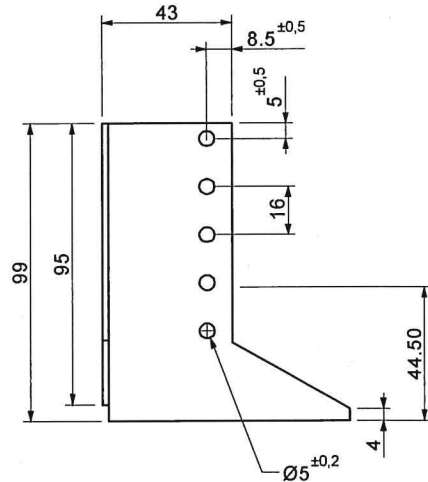
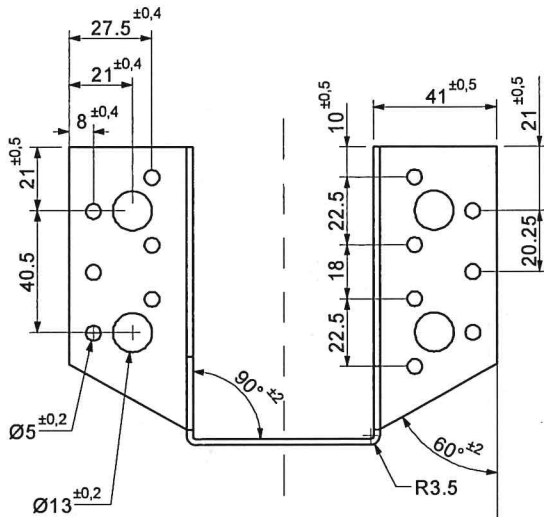


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/379

**Allegato A72
dell'ETA N° 19/0535**

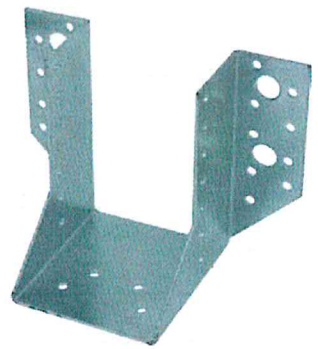
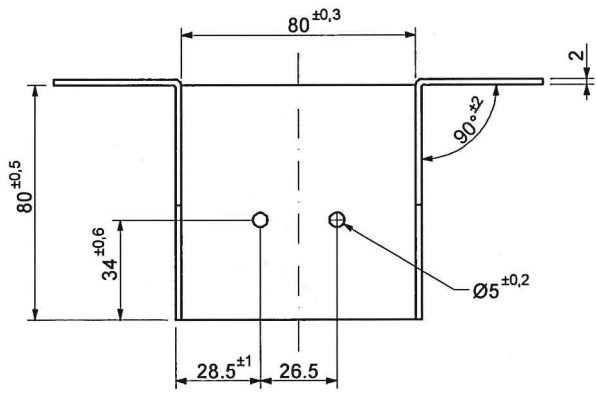
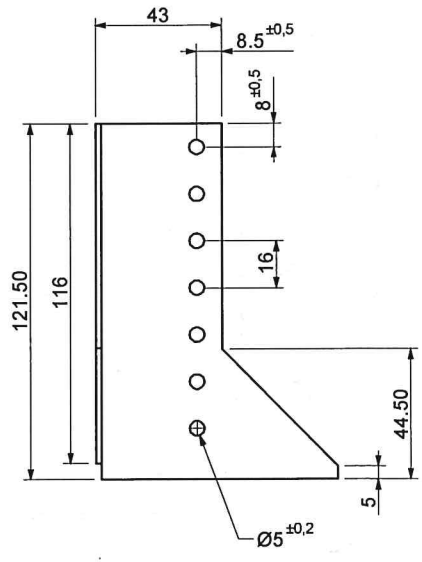
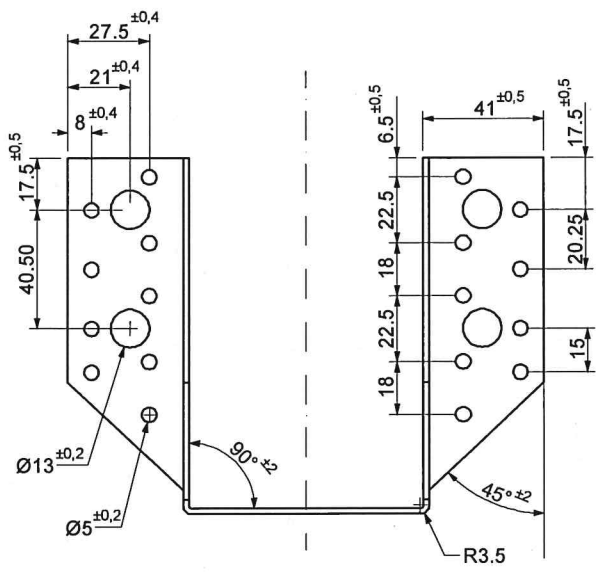


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/381

**Allegato A73
dell'ETA N° 19/0535**

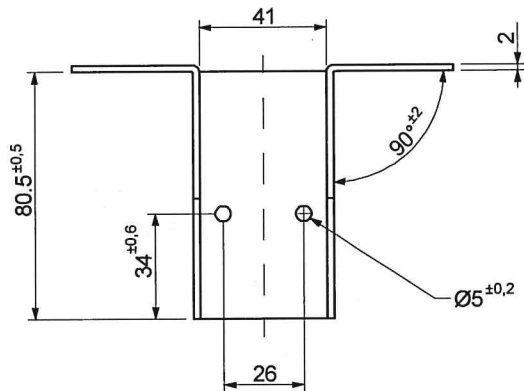
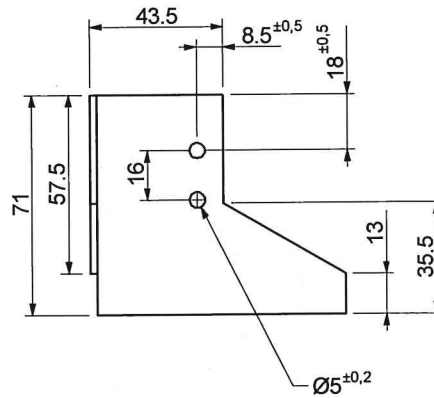
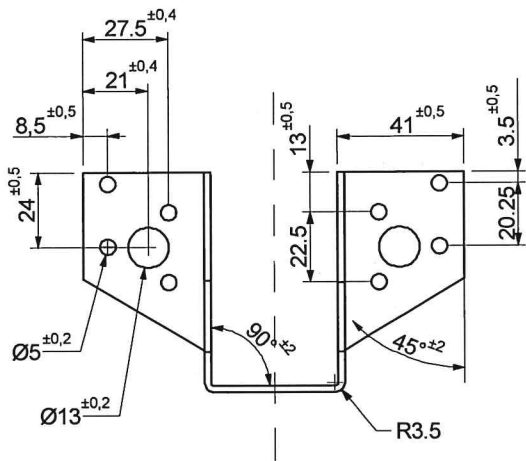


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/382

**Allegato A74
dell'ETA N° 19/0535**

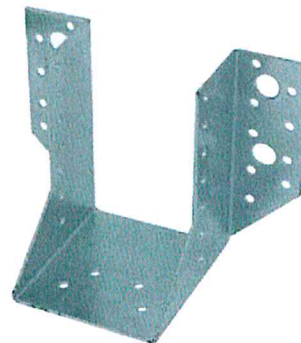
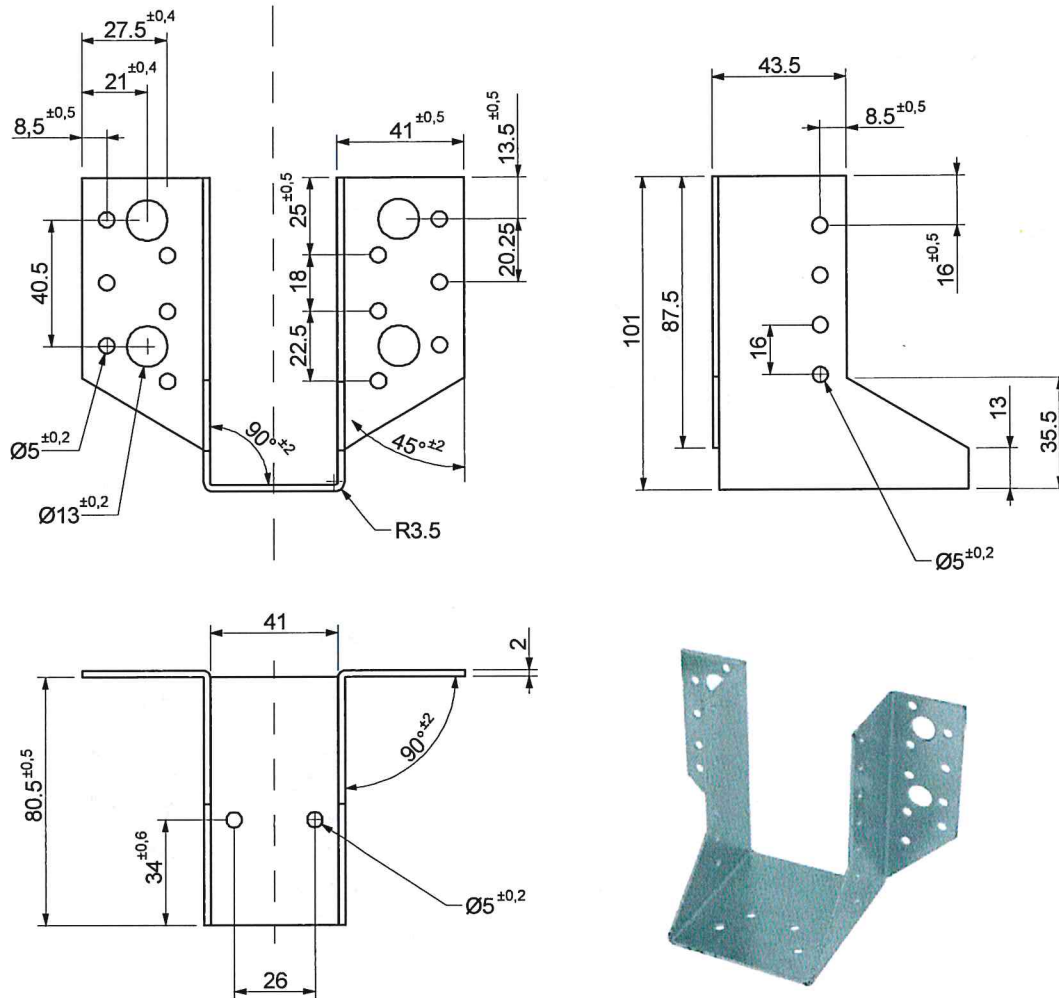


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1050

**Allegato A76
dell'ETA N° 19/0535**

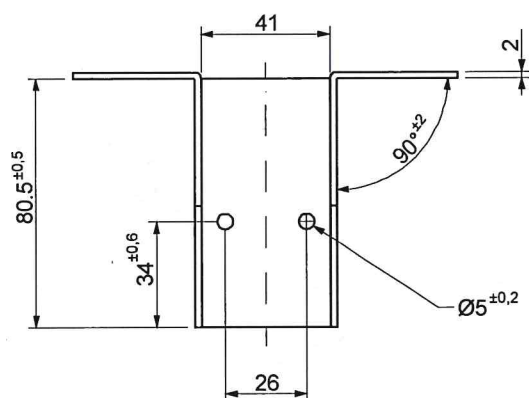
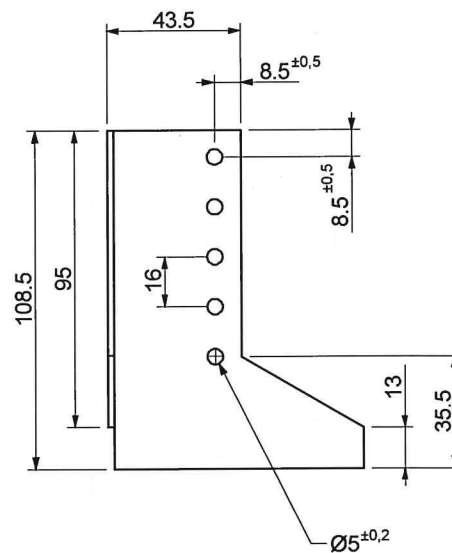
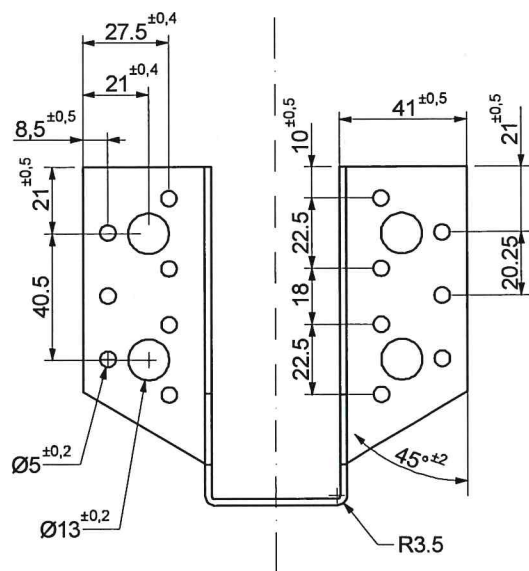


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1051

**Allegato A77
dell'ETA N° 19/0535**

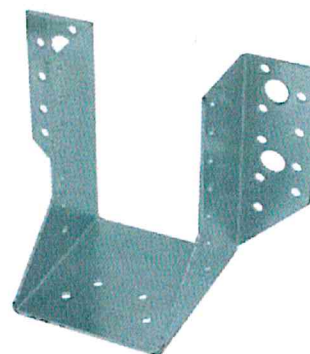
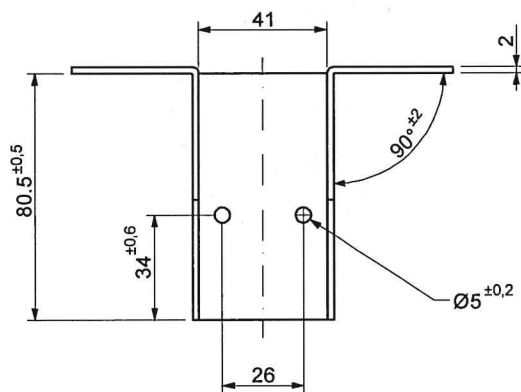
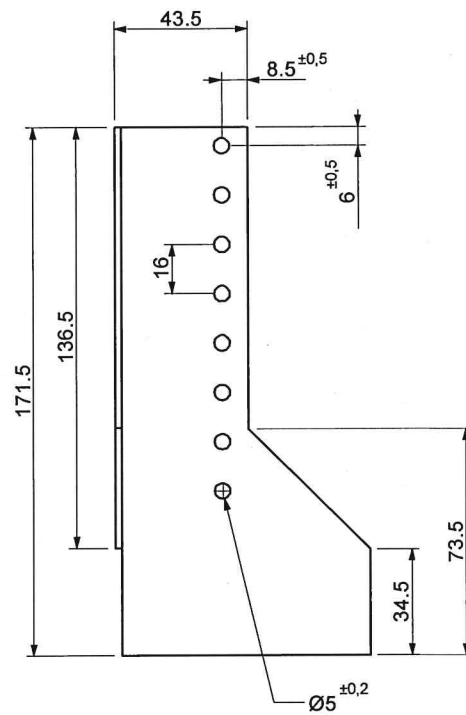
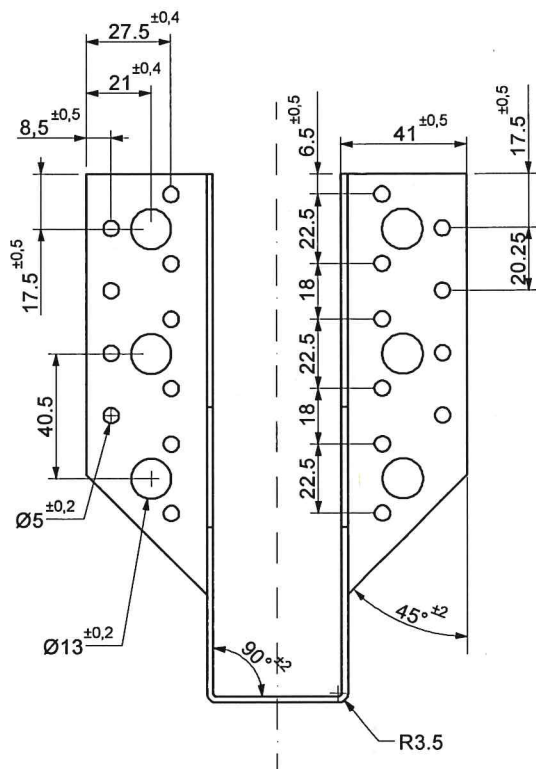


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1052

Allegato A78
dell'ETA N° 19/0535

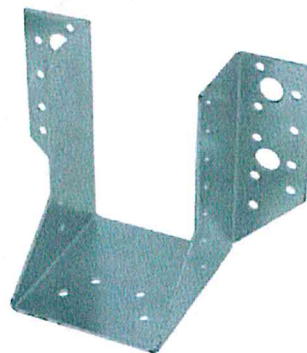
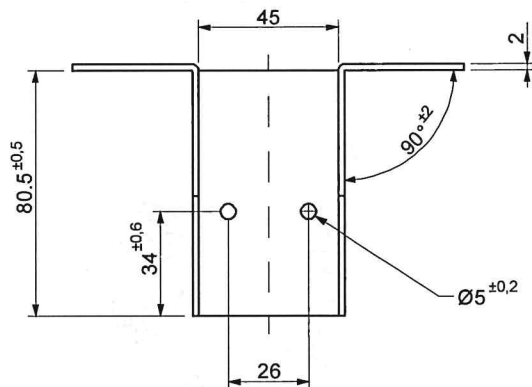
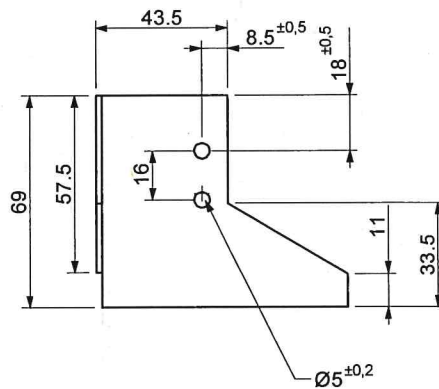
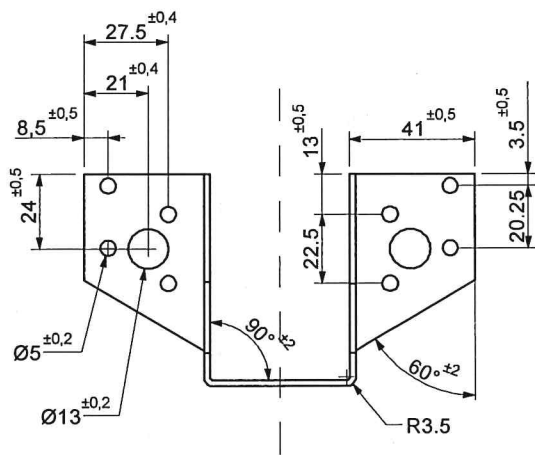


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1054

Allegato A80
dell'ETA N° 19/0535

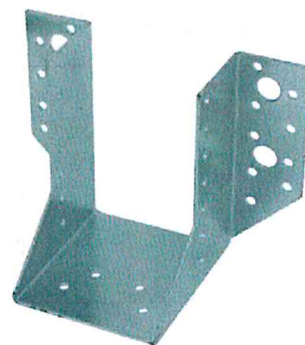
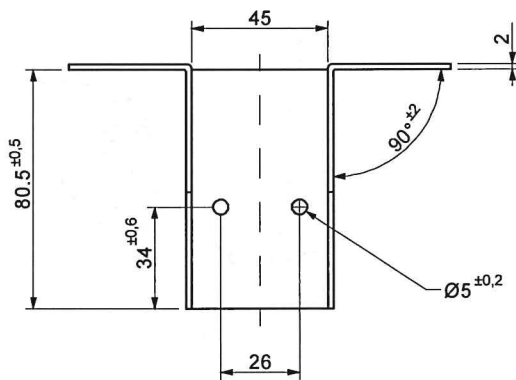
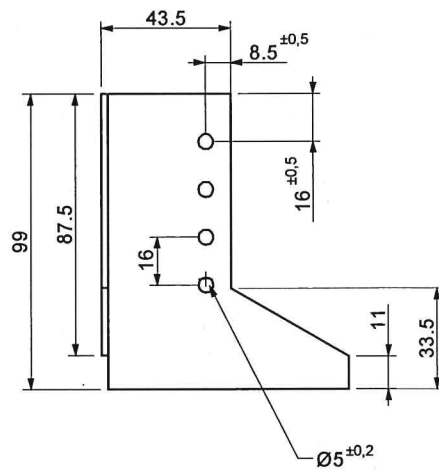
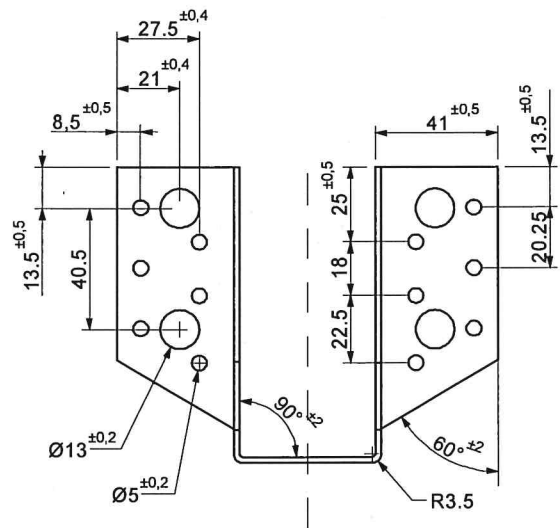


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1055

**Allegato A81
dell'ETA N° 19/0535**

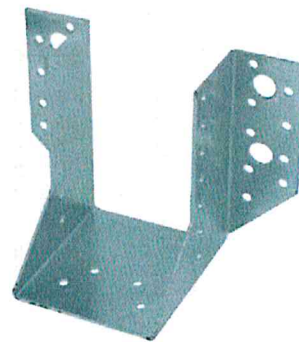
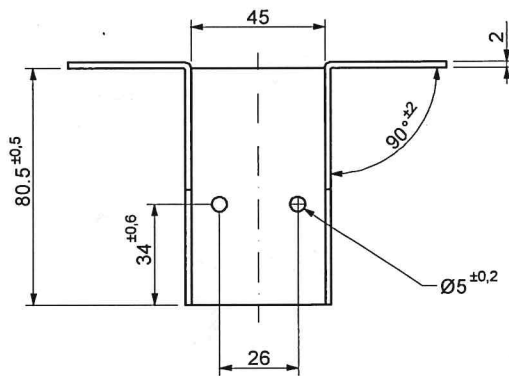
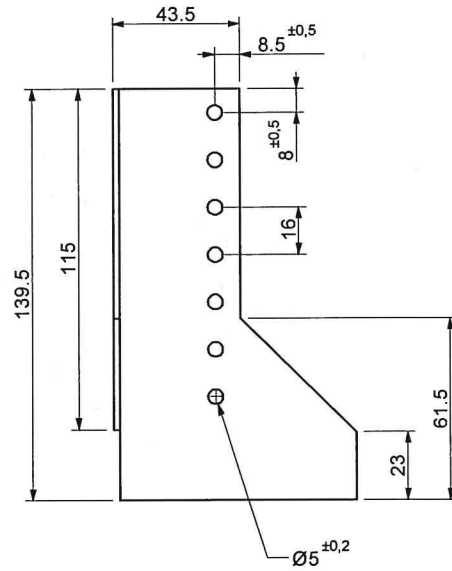
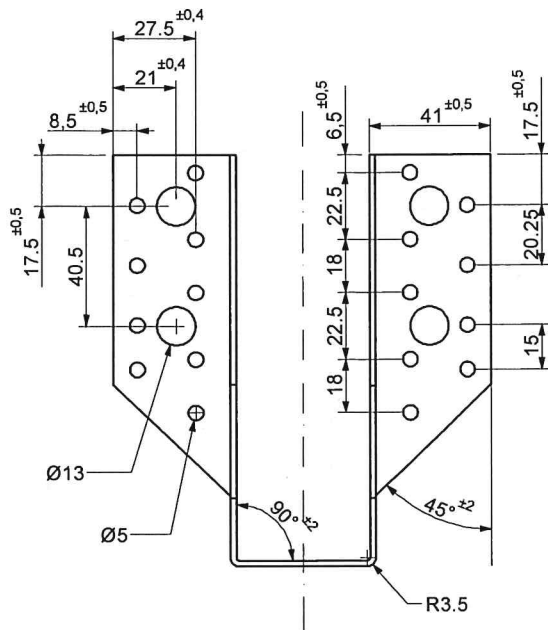


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1056

Allegato A82
dell'ETA N° 19/0535

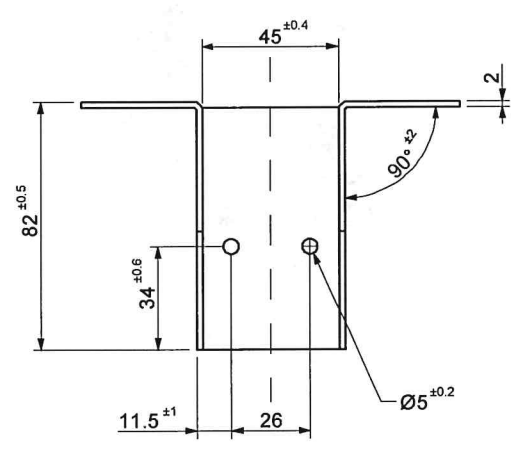
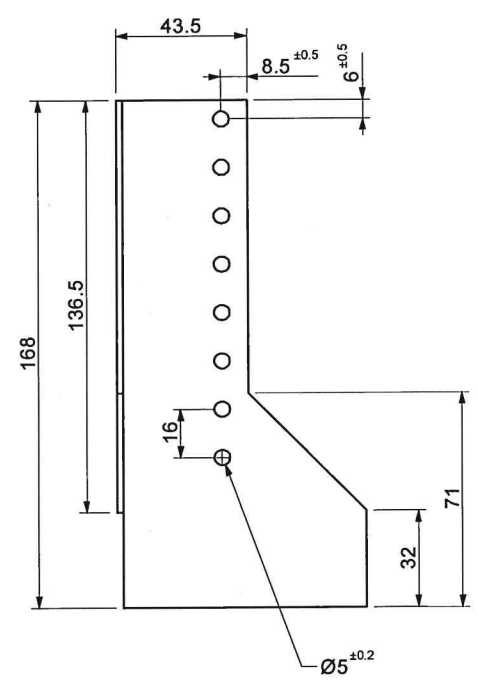
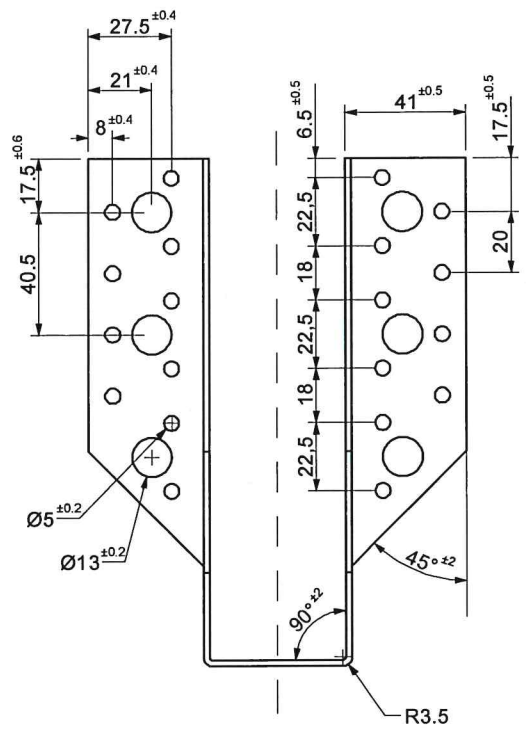


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1057

Allegato A83
dell'ETA N° 19/0535

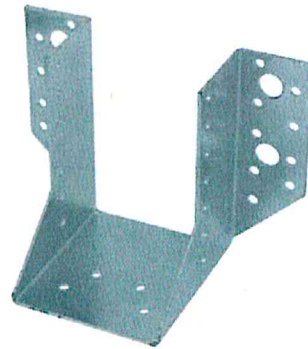
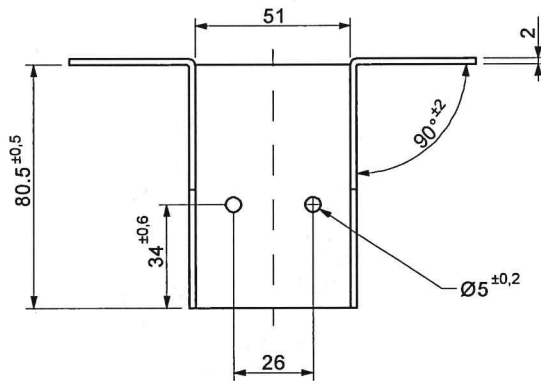
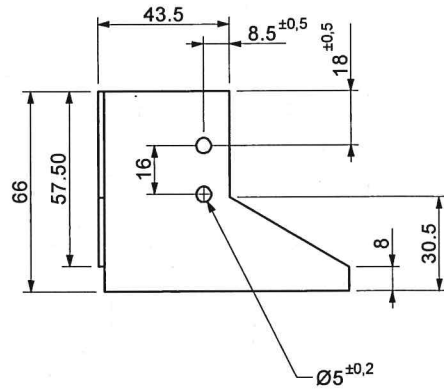
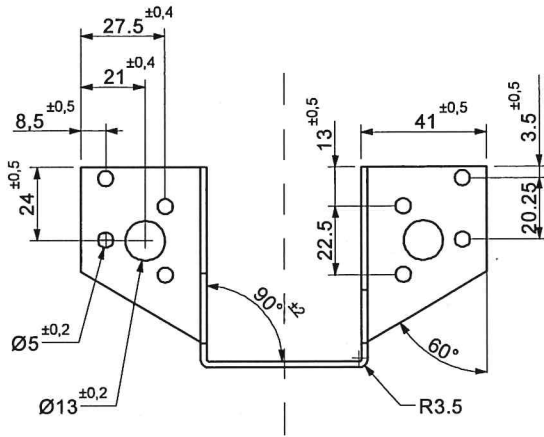


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1058

Allegato A84
dell'ETA N° 19/0535

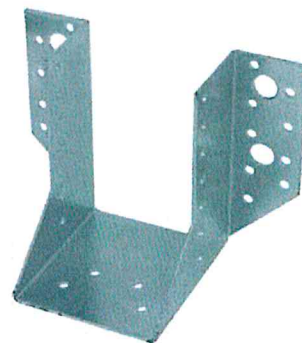
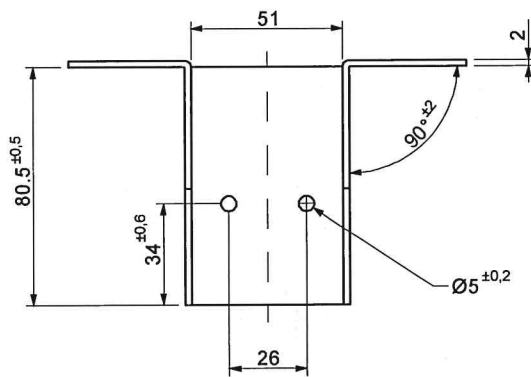
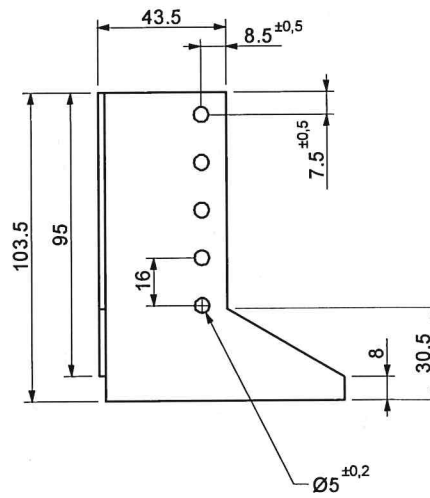
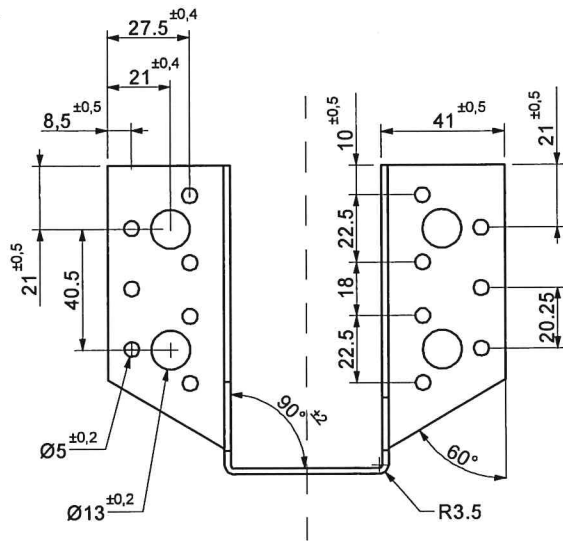


Schematic 3D view
of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1060

Allegato A85
dell'ETA N° 19/0535

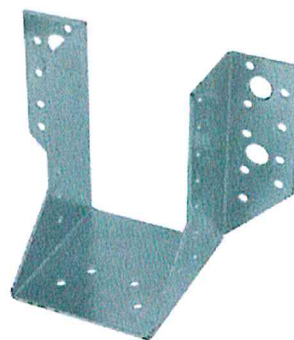
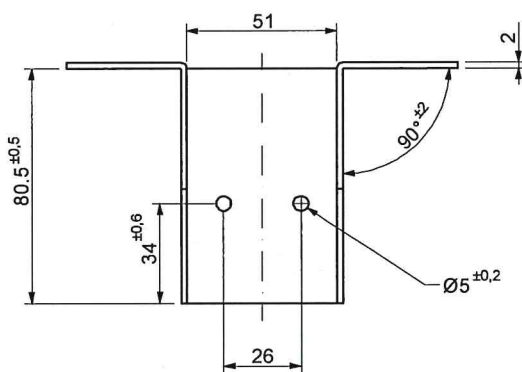
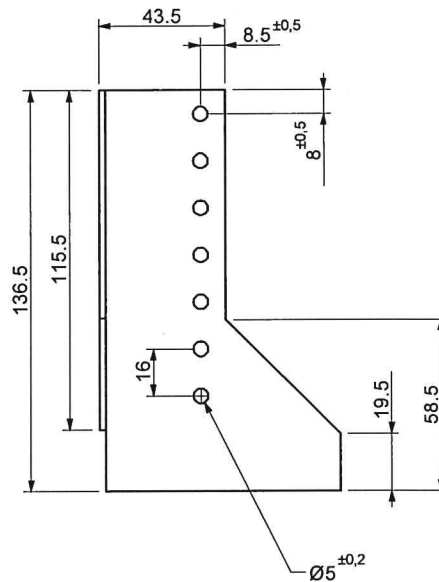
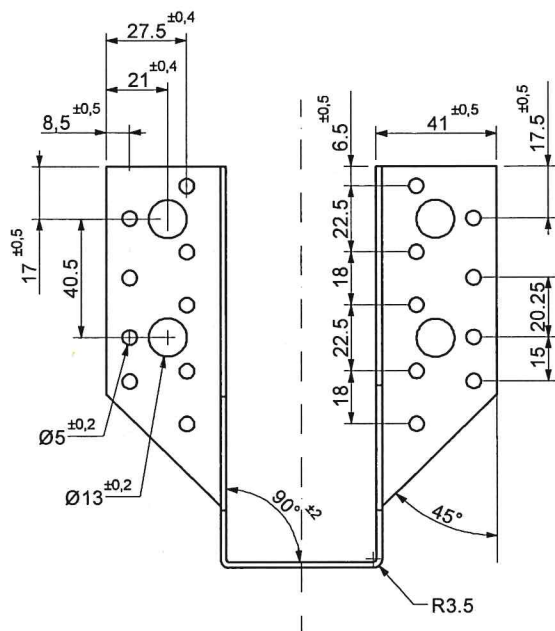


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1061

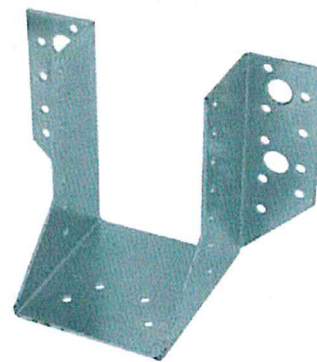
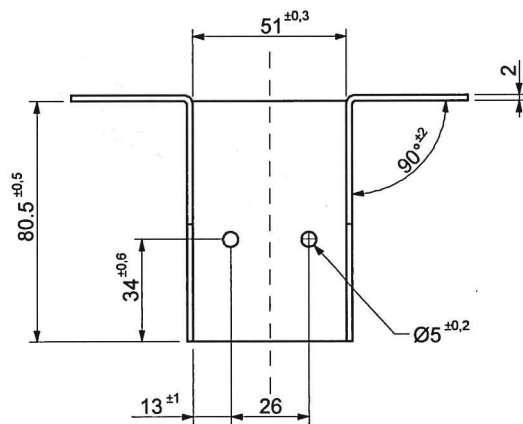
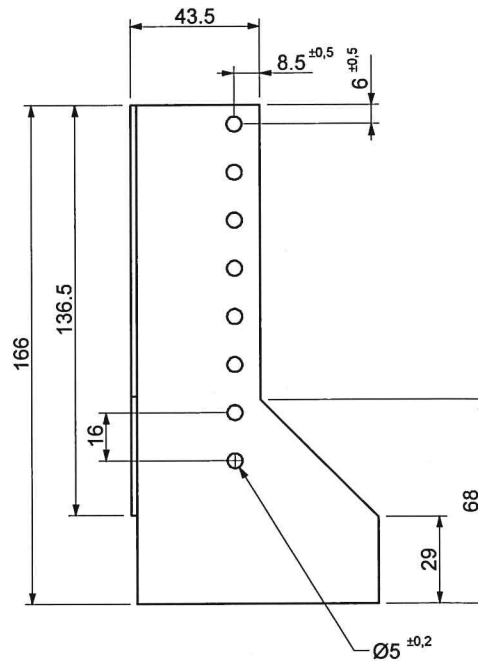
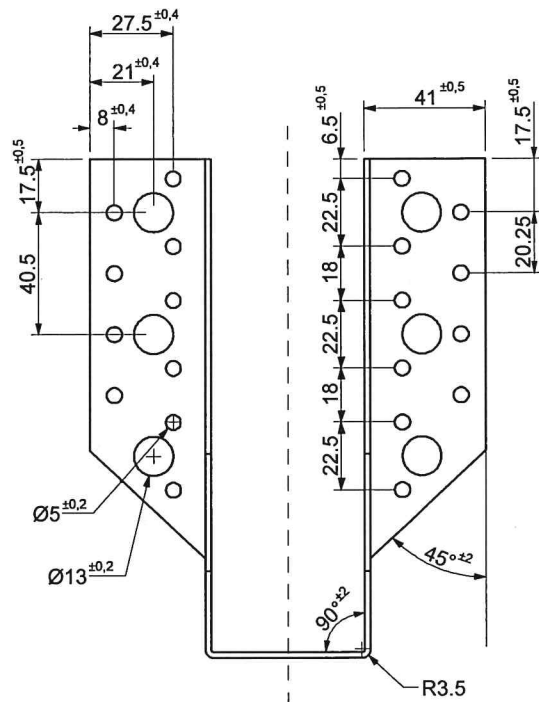
**Allegato A86
dell'ETA N° 19/0535**



SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1062

**Allegato A87
dell'ETA N° 19/0535**

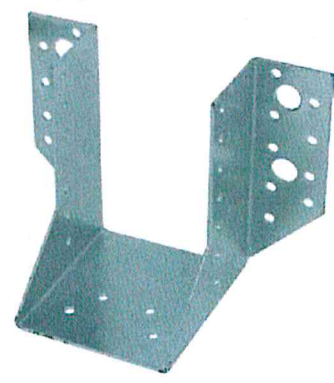
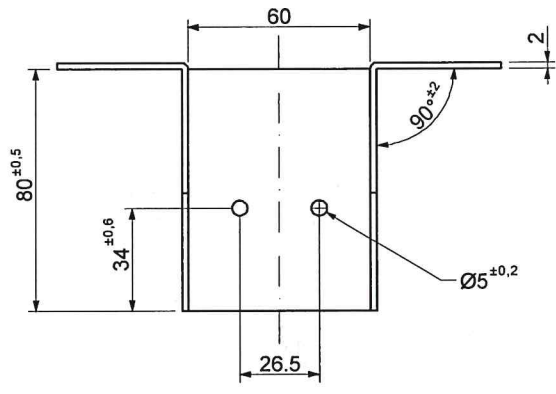
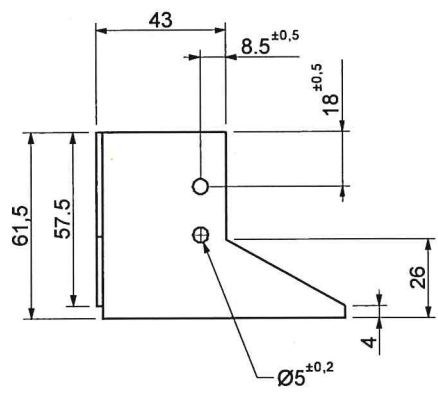
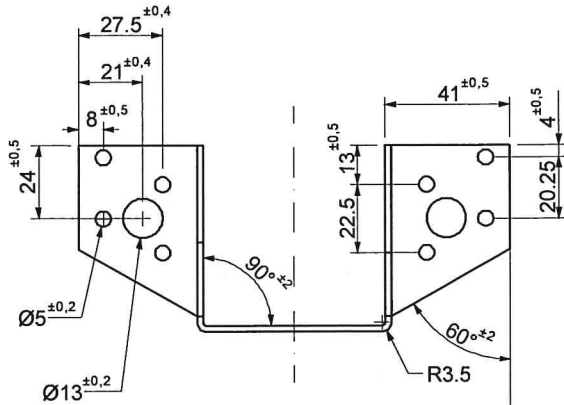


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1063

Allegato A88
dell'ETA N° 19/0535

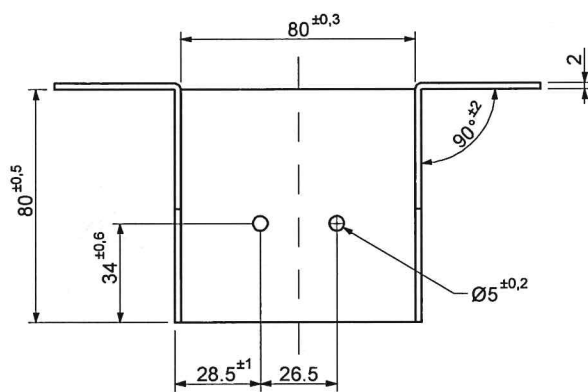
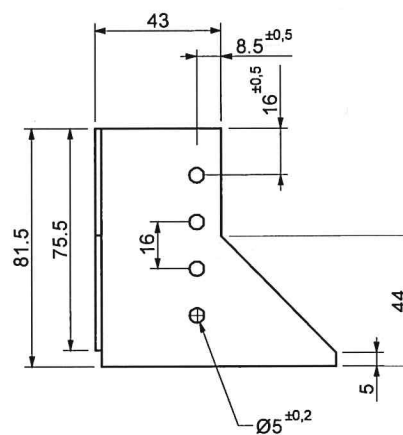
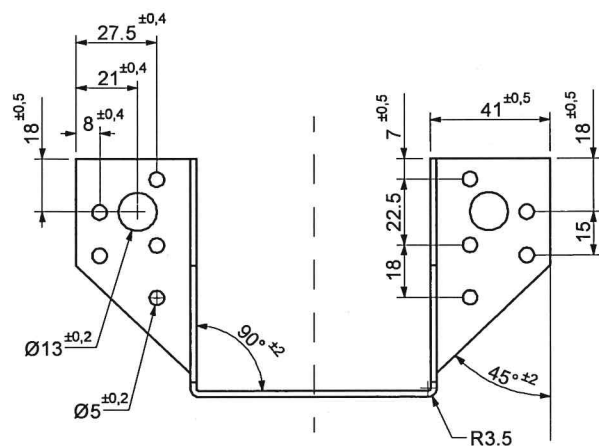


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1064

**Allegato A89
dell'ETA N° 19/0535**

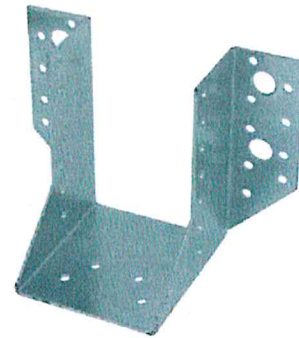
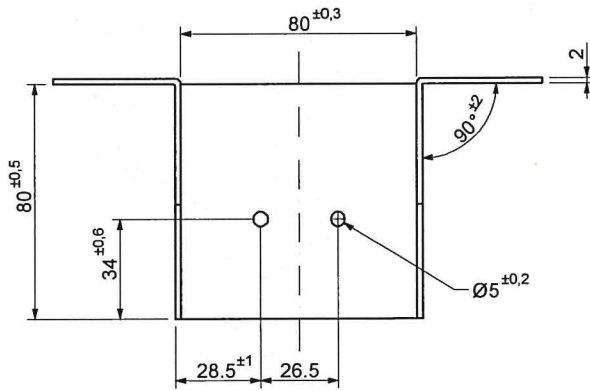
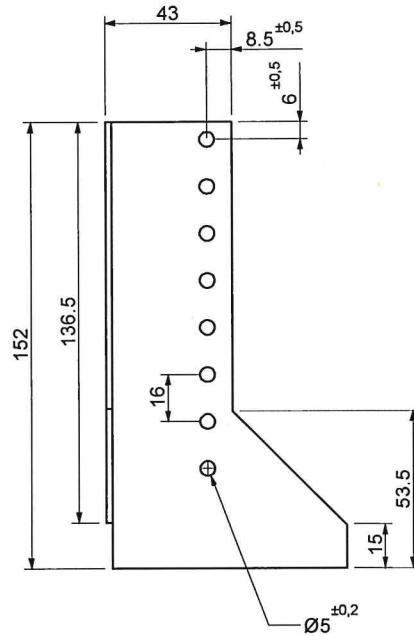
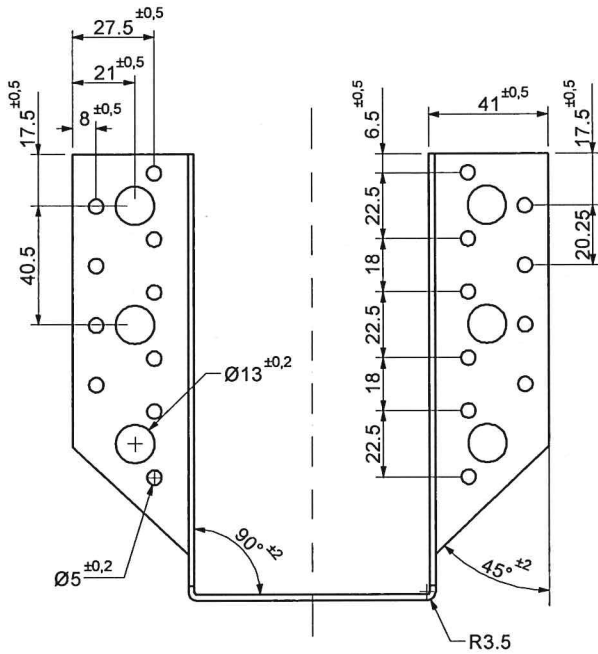


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1067

Allegato A92
dell'ETA N° 19/0535

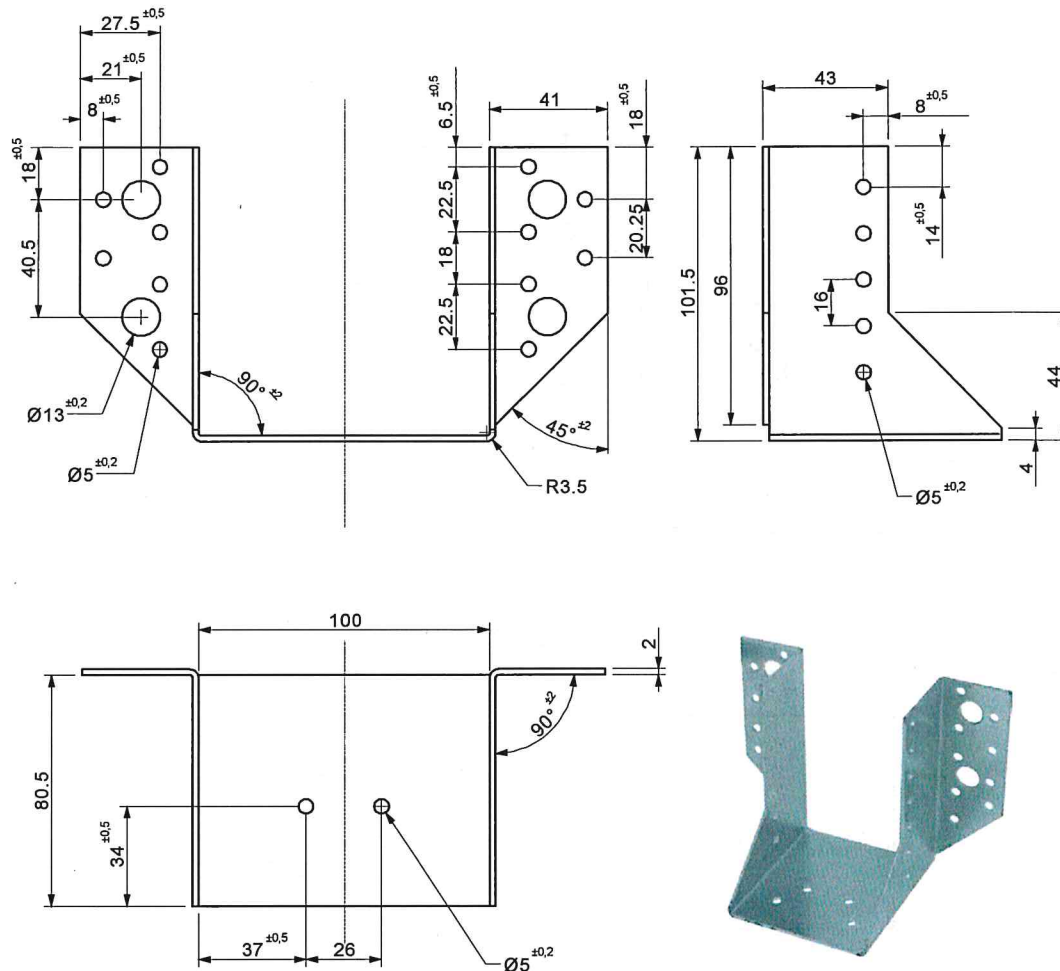


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1068

Allegato A93
dell'ETA N° 19/0535

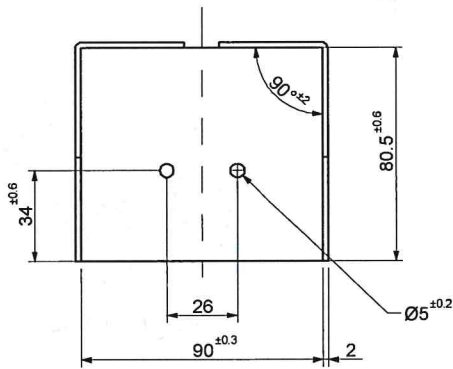
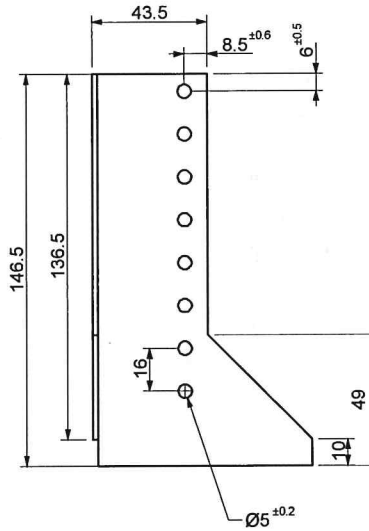
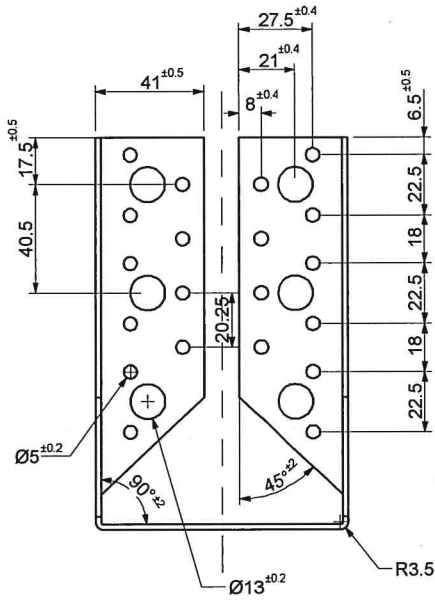


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1069

**Allegato A94
dell'ETA N° 19/0535**

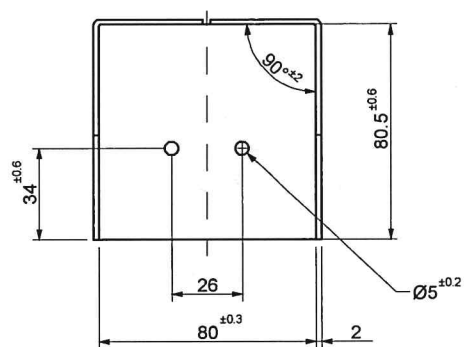
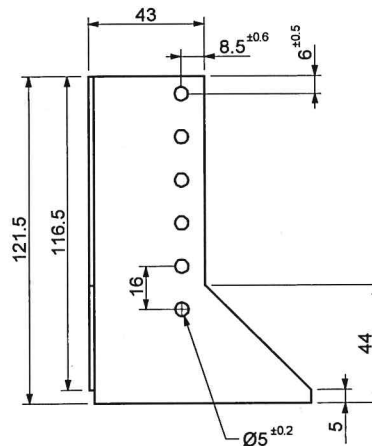
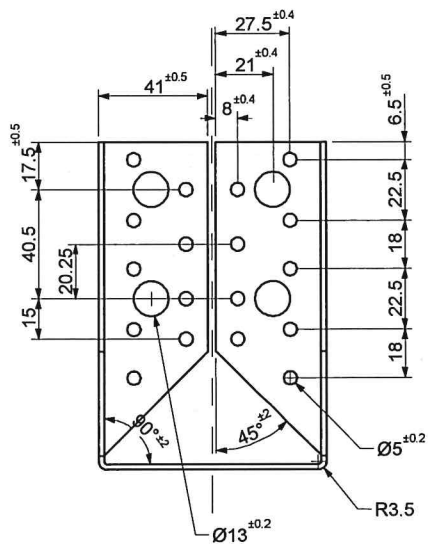


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/655

Allegato A95
del'ETA N° 19/0535

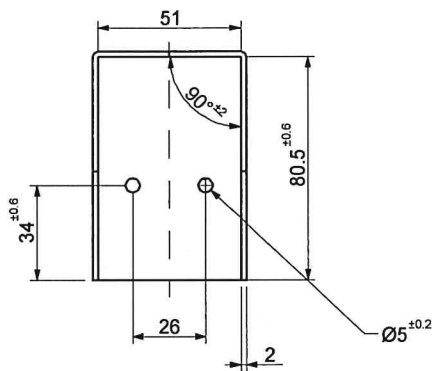
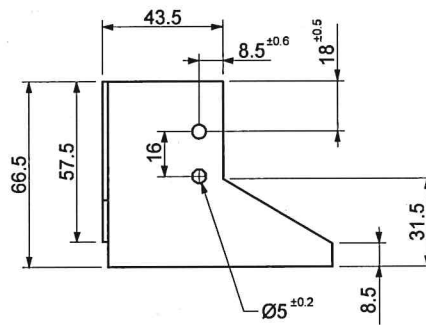
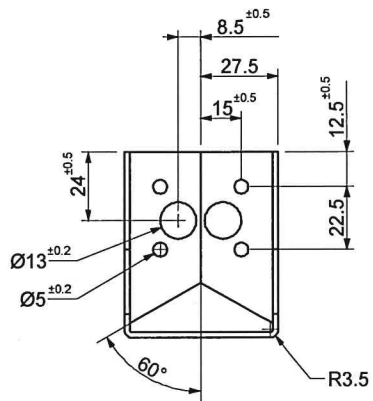


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/656

**Allegato A96
dell'ETA N° 19/0535**

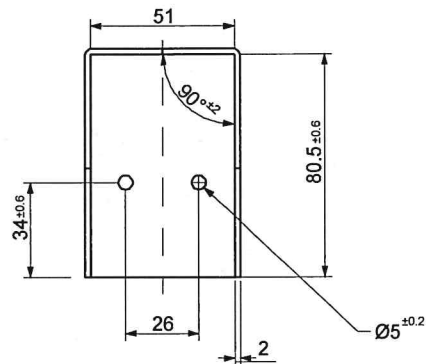
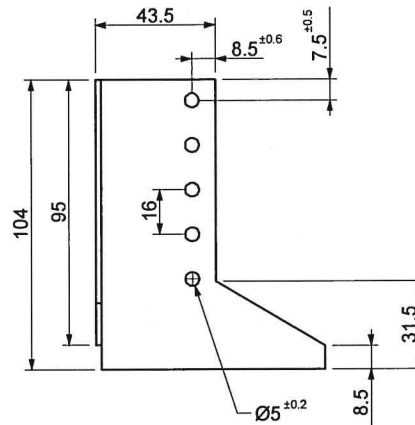
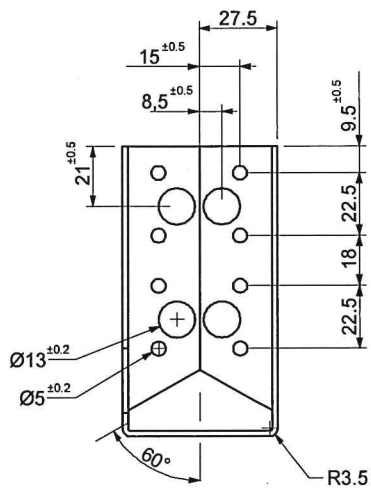


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1081

Allegato A98
dell'ETA N° 19/0535

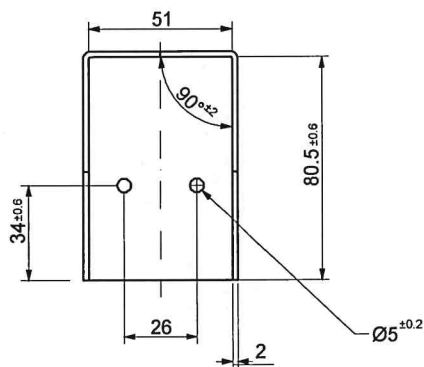
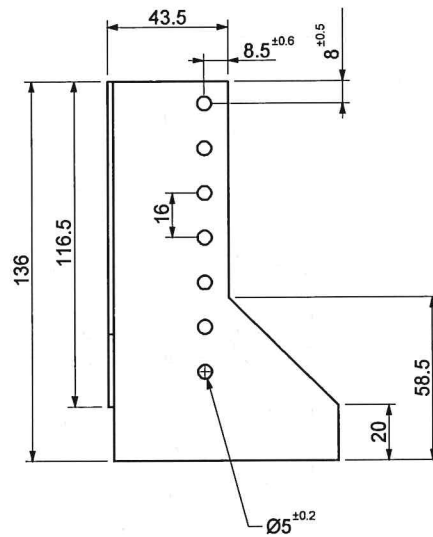
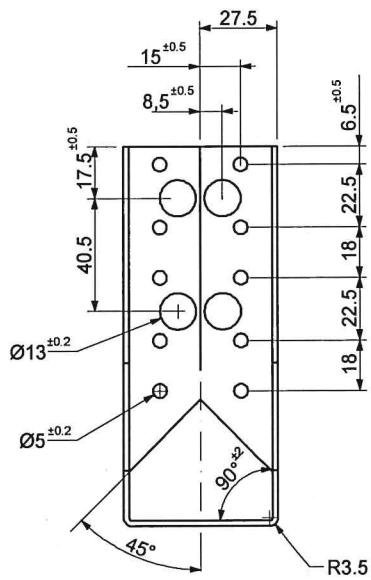


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1082

Allegato A99
dell'ETA N° 19/0535

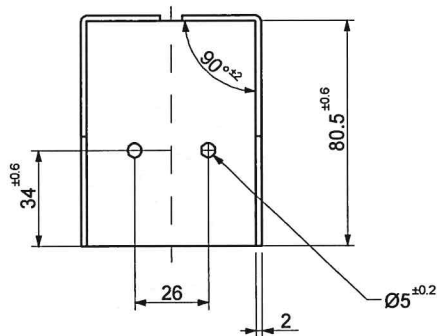
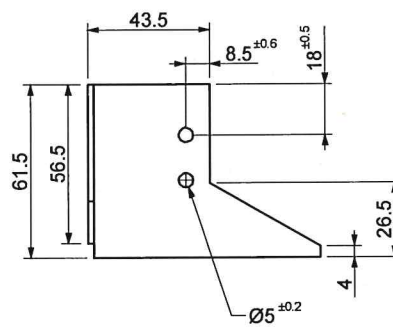
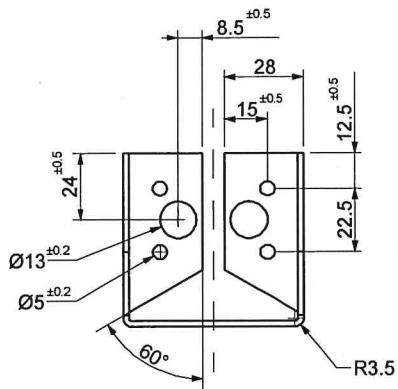


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1083

Allegato A100
dell'ETA N° 19/0535

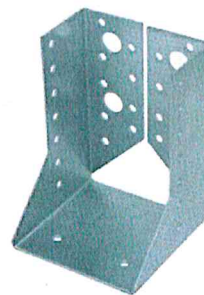
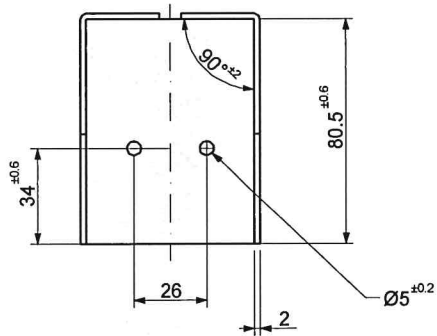
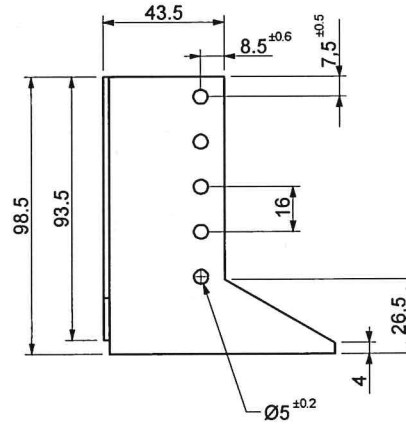
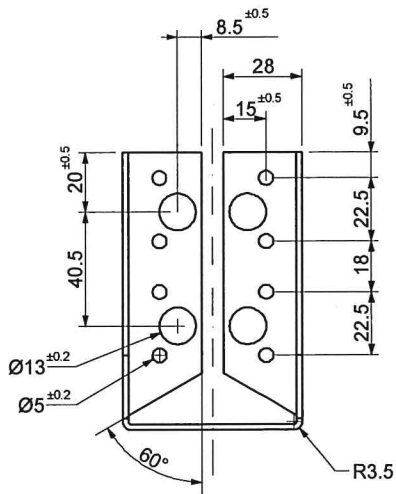


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1085

**Allegato A102
dell'ETA N° 19/0535**

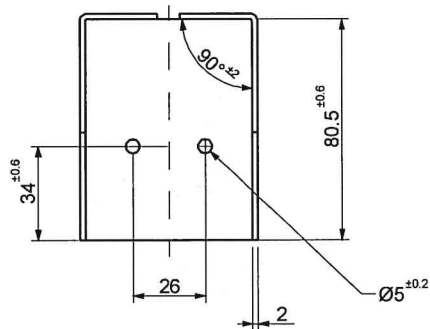
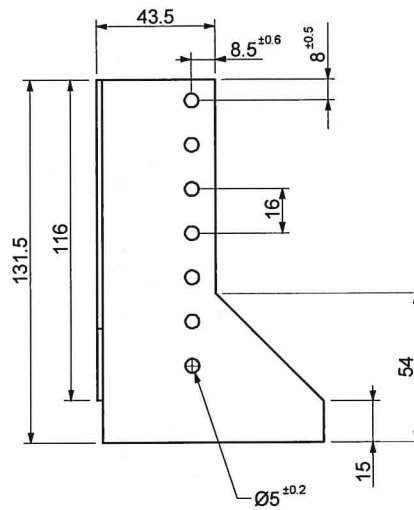
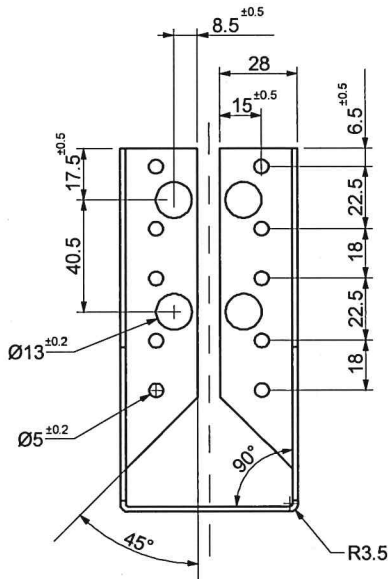


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1086

**Allegato A103
dell'ETA N° 19/0535**

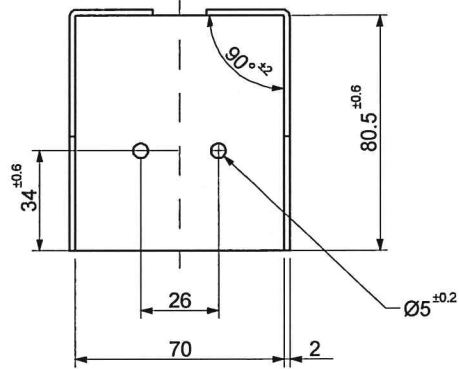
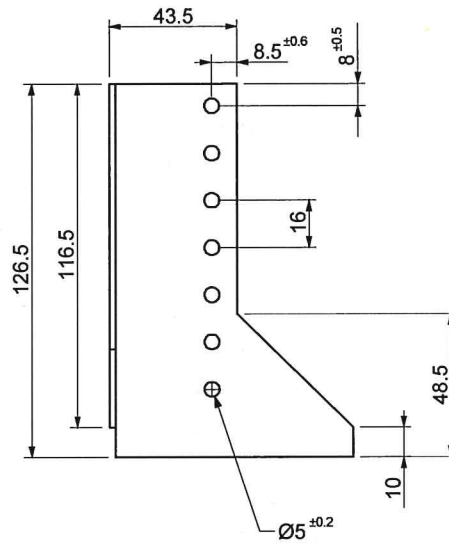
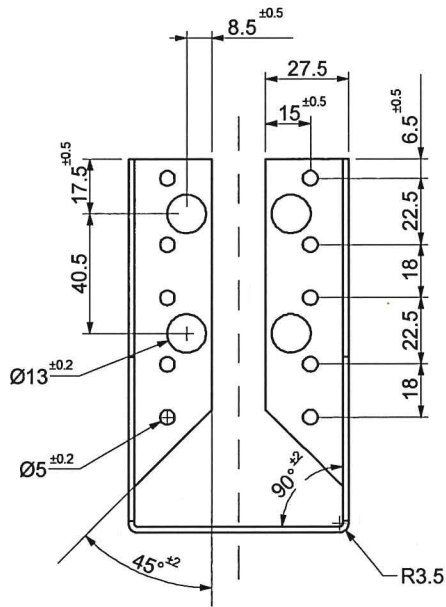


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1087

**Allegato A104
dell'ETA N° 19/0535**

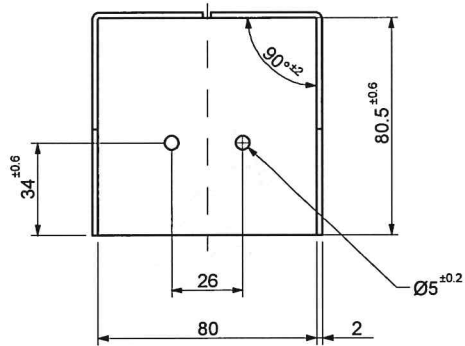
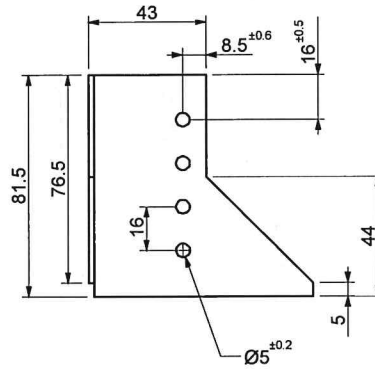
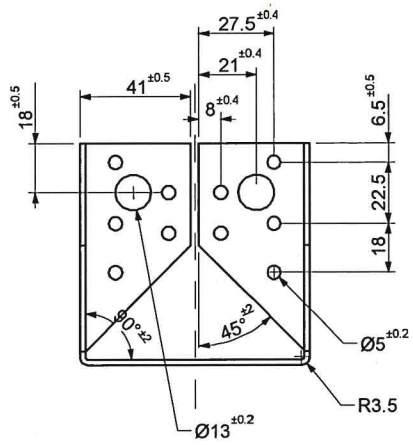


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1089

Allegato A106
dell'ETA N° 19/0535

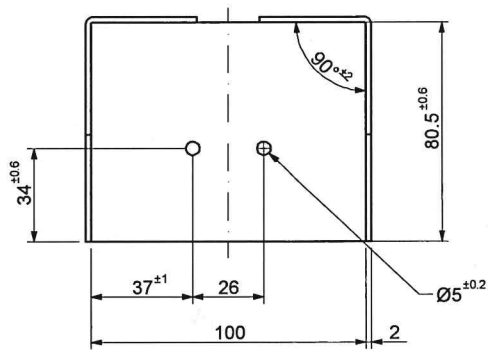
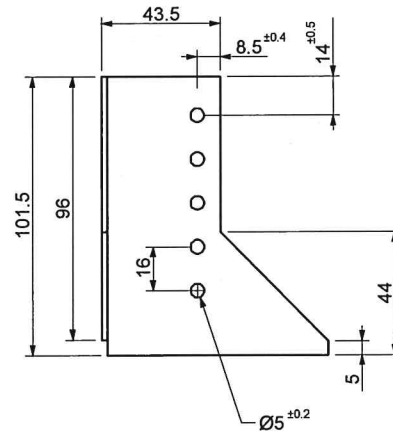
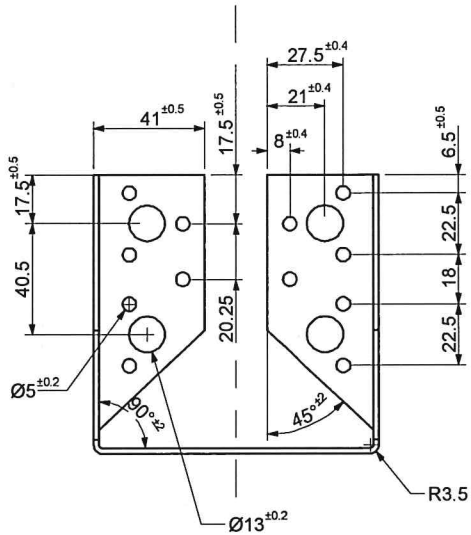


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1091

Allegato A108
dell'ETA N° 19/0535



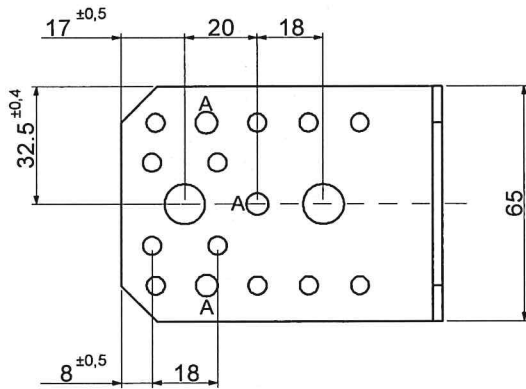
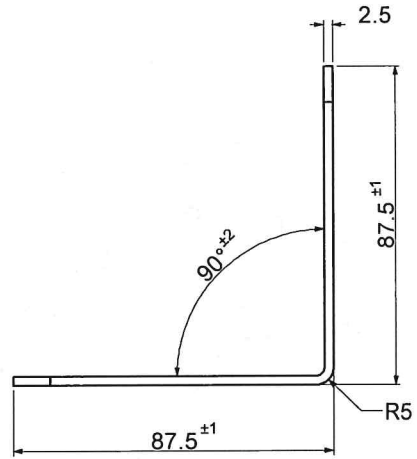
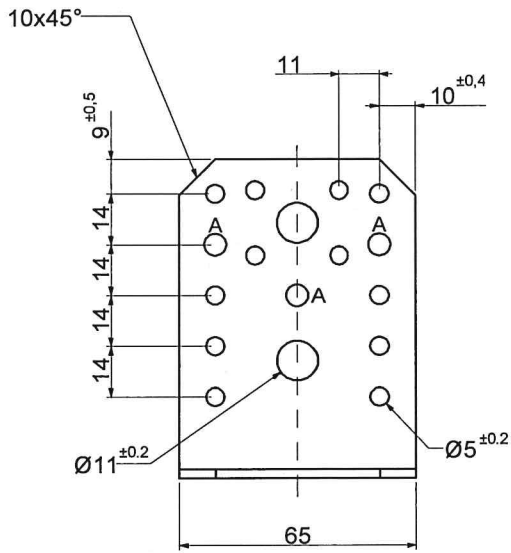
Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Joist Hanger: JH/1093

Allegato A110
dell'ETA N° 19/0535

AB

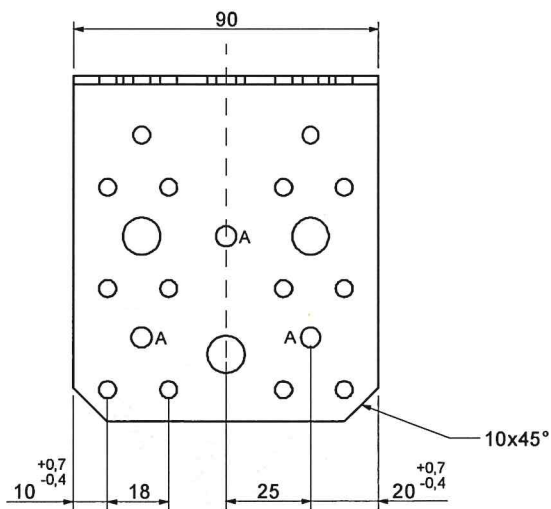
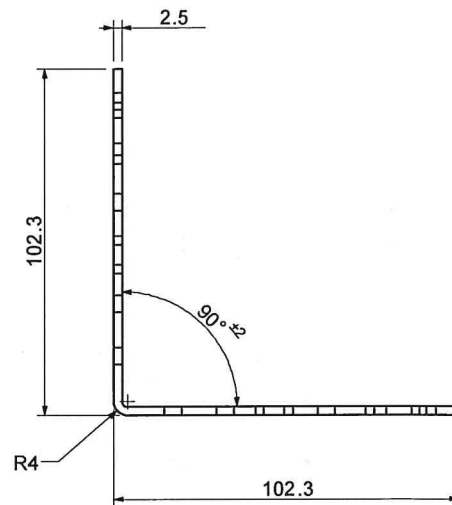
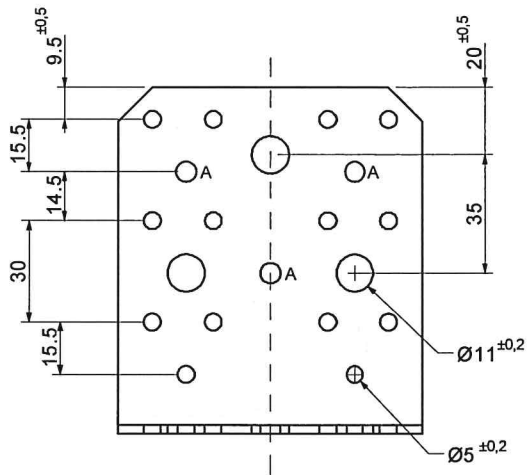


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Angle Bracket: AB/756

Allegato A111
dell'ETA N° 19/0535

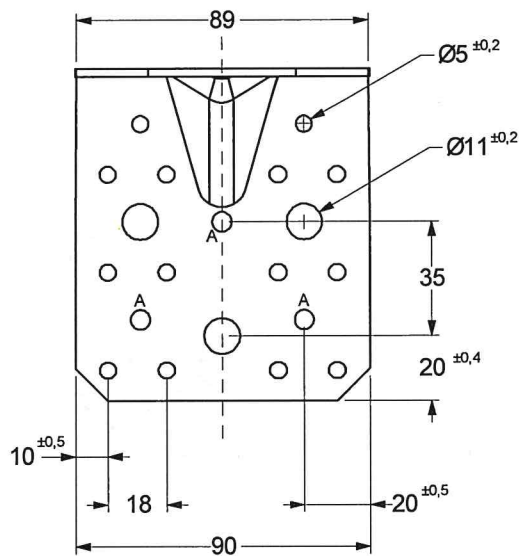
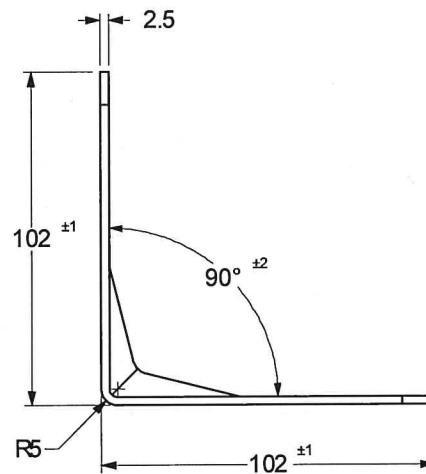
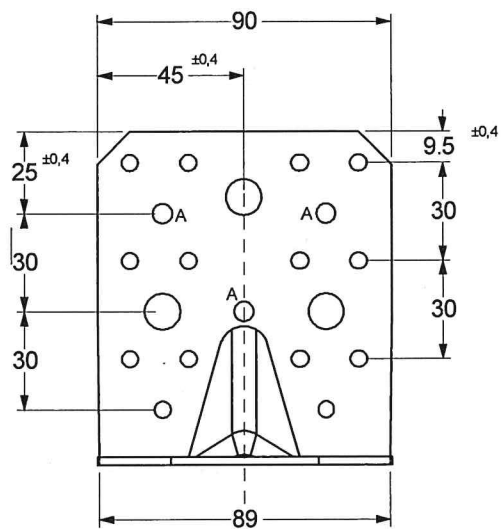


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Angle Bracket: AB/757

Allegato A112
dell'ETA N° 19/0535

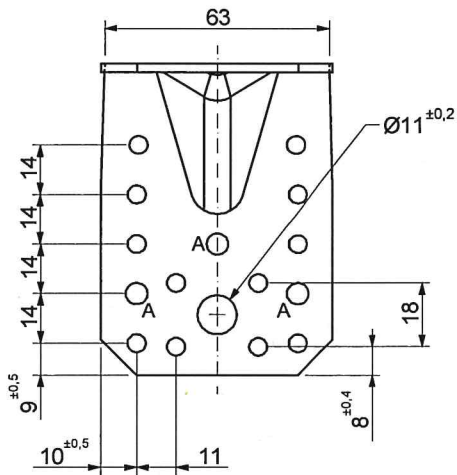
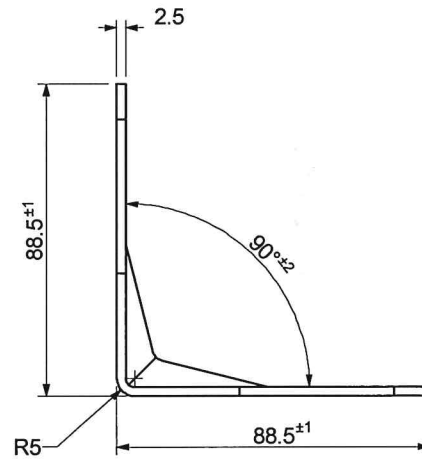
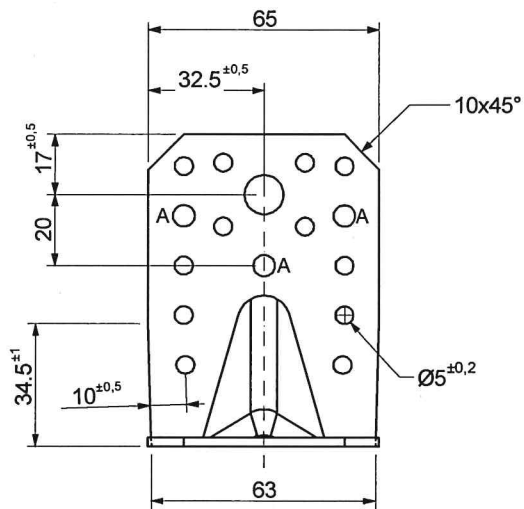


Schematic 3D view
of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Angle Bracket: AB/397

Allegato A113
dell'ETA N° 19/0535

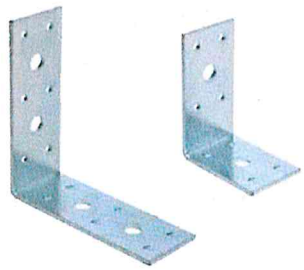
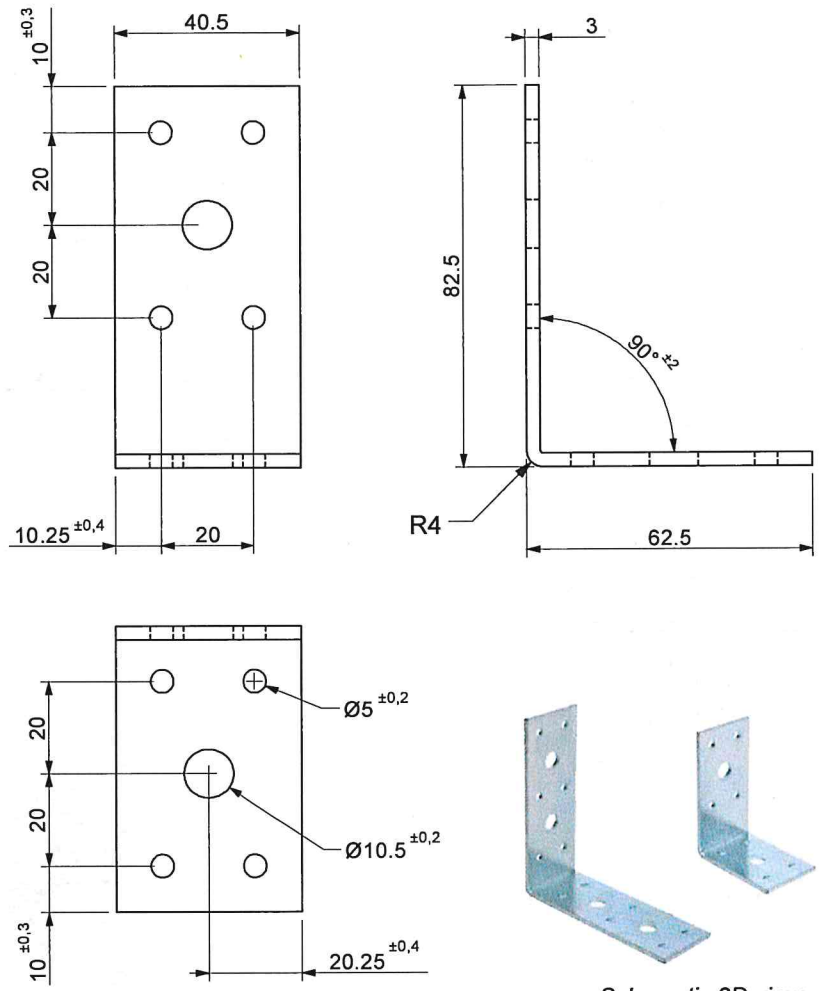


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Angle Bracket: AB/395

Allegato A114
dell'ETA N° 19/0535

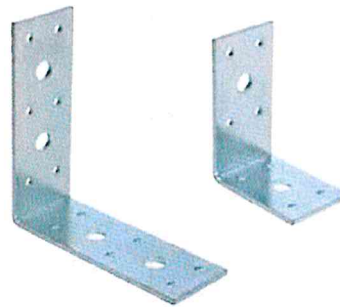
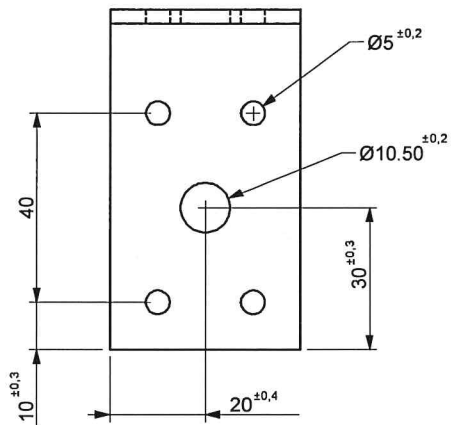
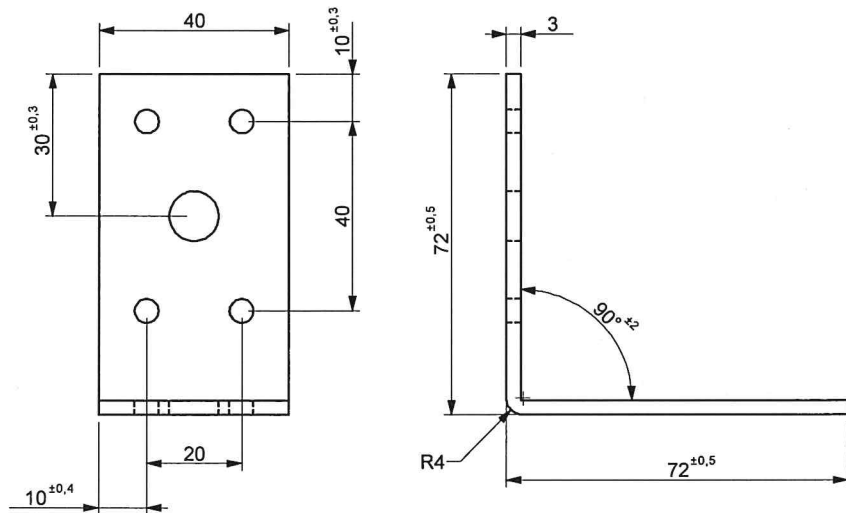


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Angle Bracket: AB/1616

**Allegato A115
del'ETA N° 19/0535**

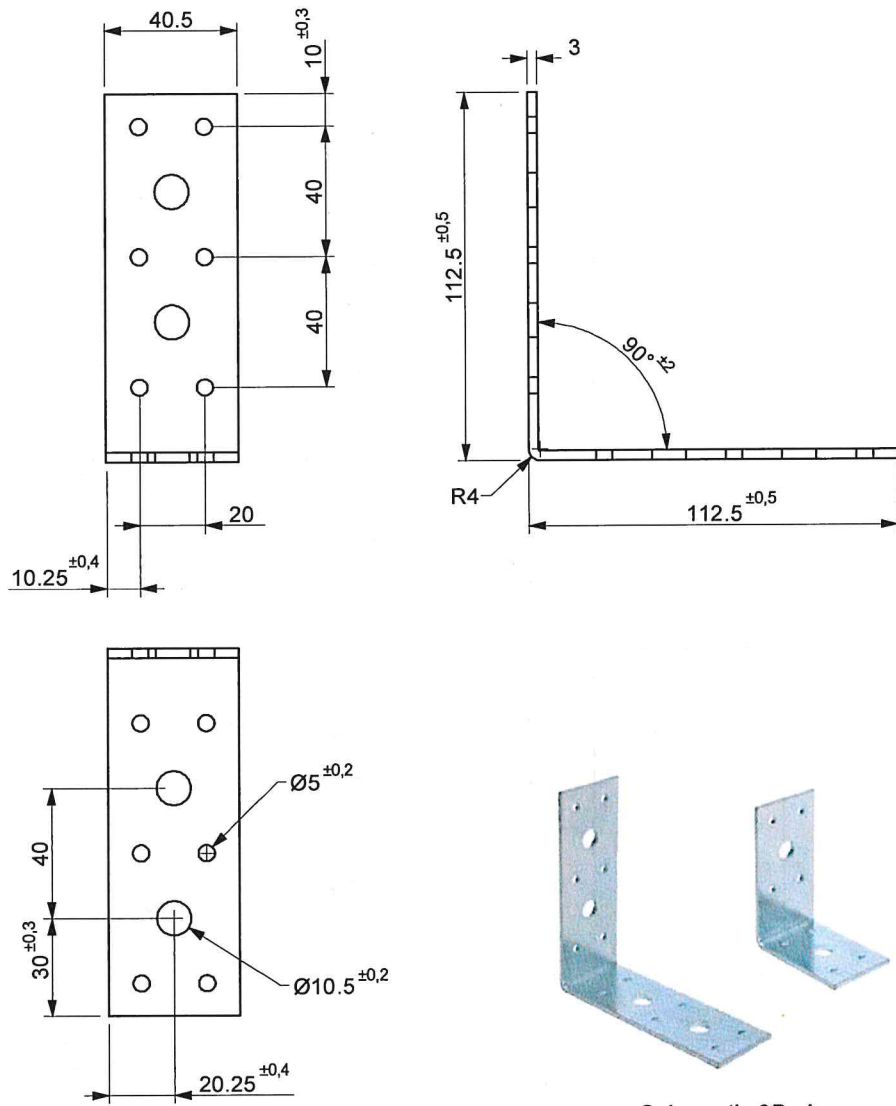


Schematic 3D view
of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Angle Bracket: AB/1617

Allegato A116
dell'ETA N° 19/0535

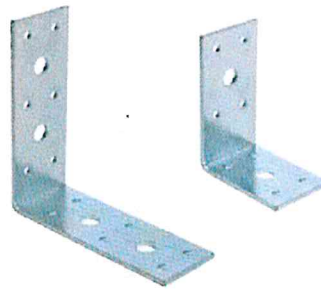
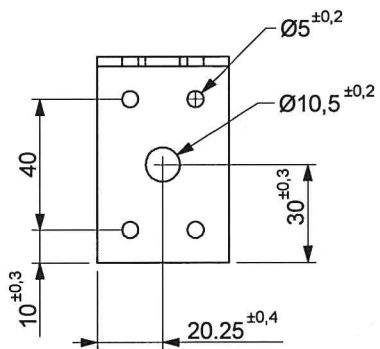
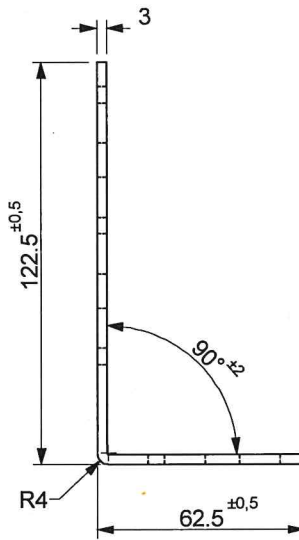
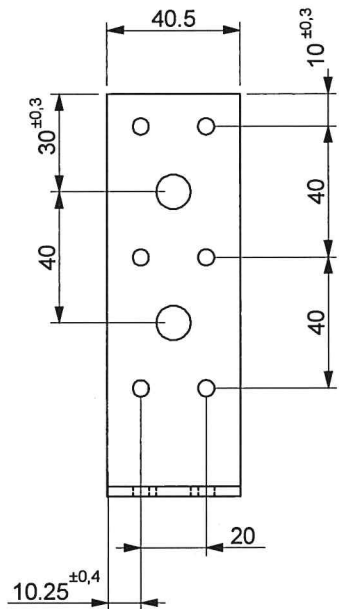


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Angle Bracket: AB/1618

**Allegato A117
dell'ETA N° 19/0535**



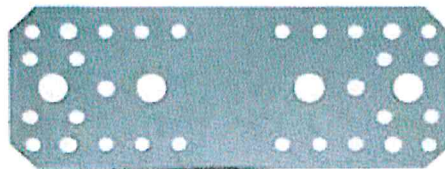
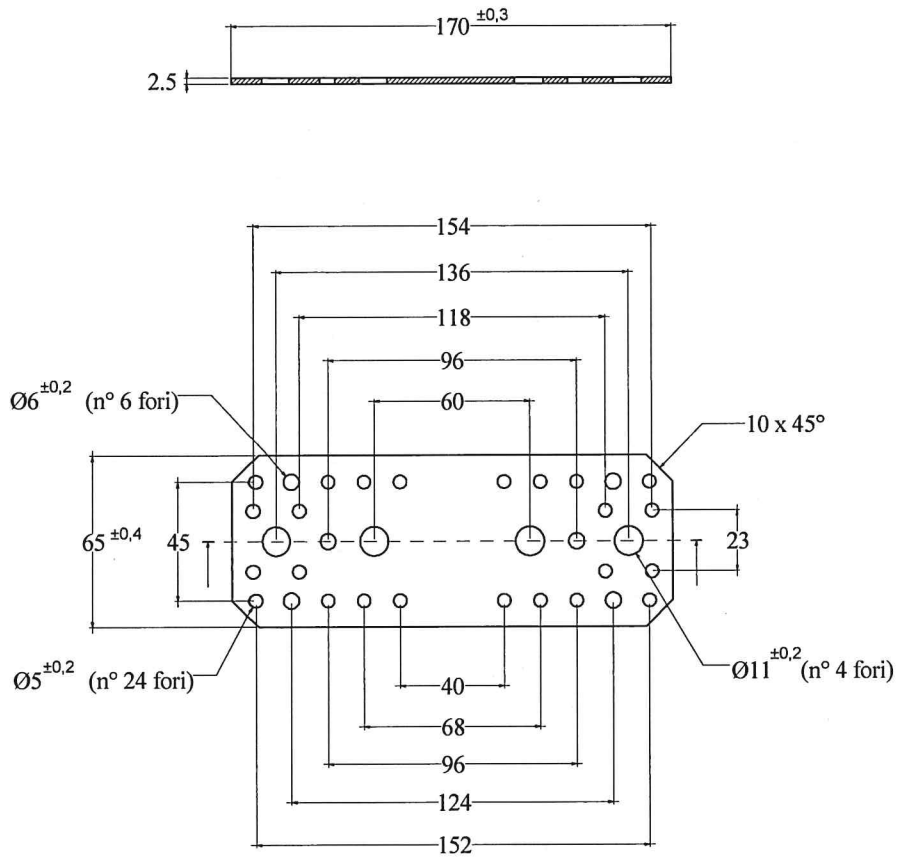
Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto - Angle Bracket: AB/1619

**Allegato A118
dell'ETA N° 19/0535**

RP

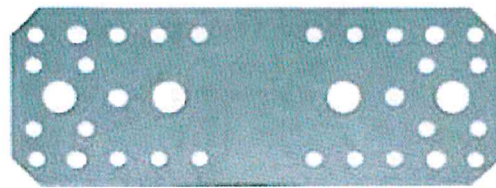
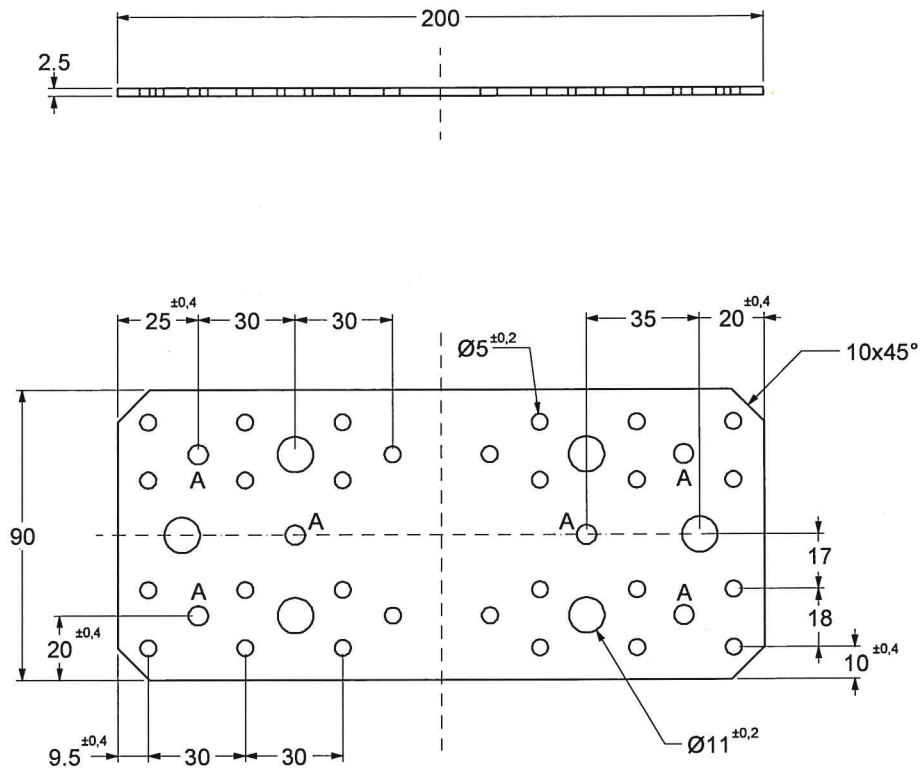


Schematic 3D view
of the product

SIPA NAILING PLATES

Descrizione del Prodotto – Restraint Plate: RP/394

**Allegato A119
dell'ETA N° 19/0535**

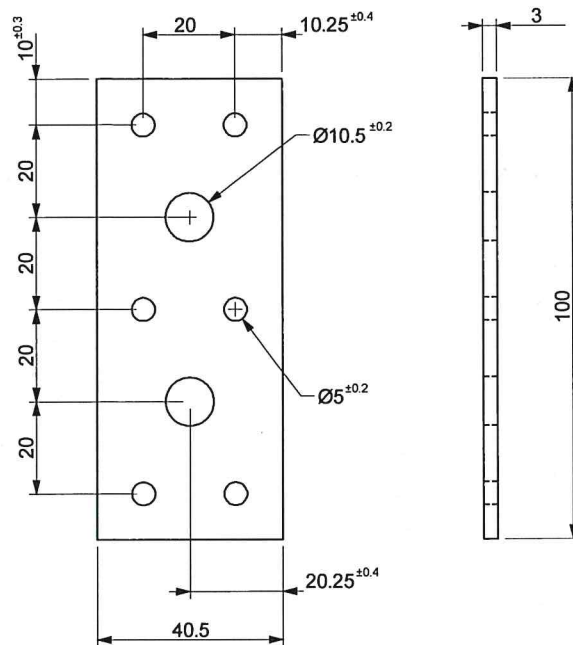


Schematic 3D view
of the product

SIPA NAILING PLATES

Descrizione del Prodotto – Restraint Plate: RP/396

Allegato A120
dell'ETA N° 19/0535

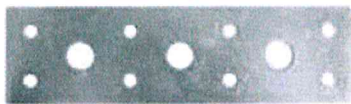
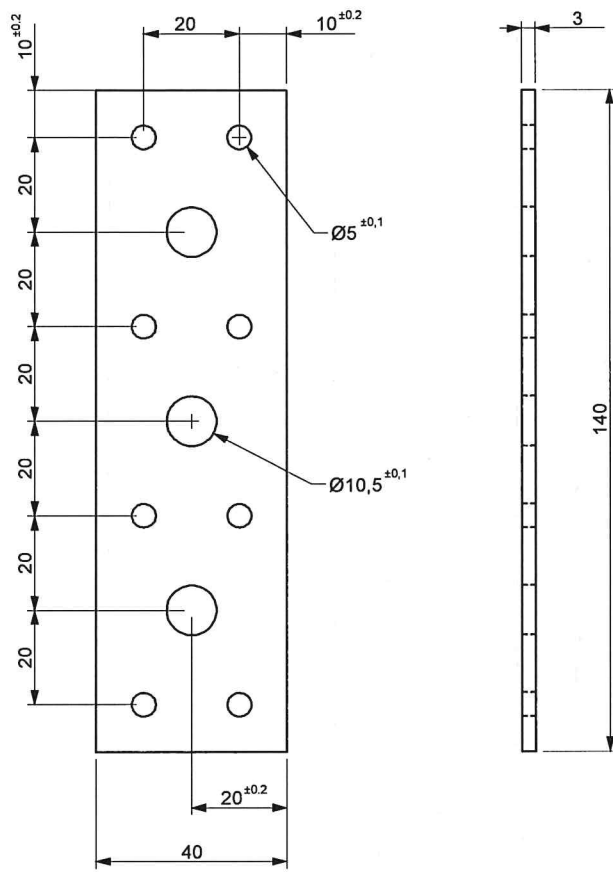


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto – Restraint Plate: RP/1676

**Allegato A121
dell'ETA N° 19/0535**

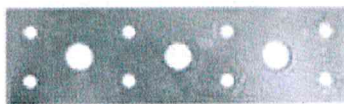
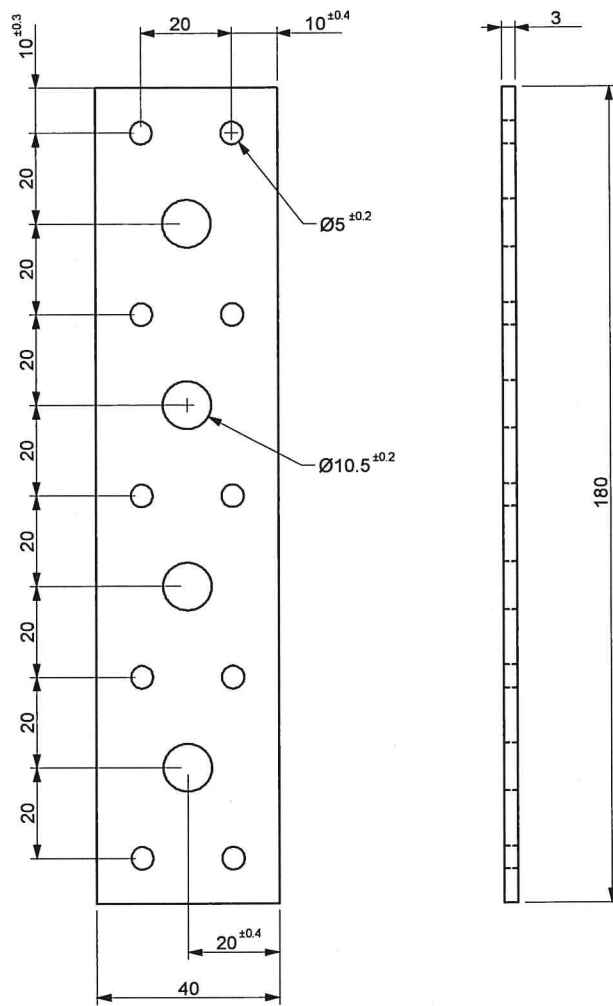


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto – Restraint Plate: RP/1677

**Allegato A122
dell'ETA N° 19/0535**

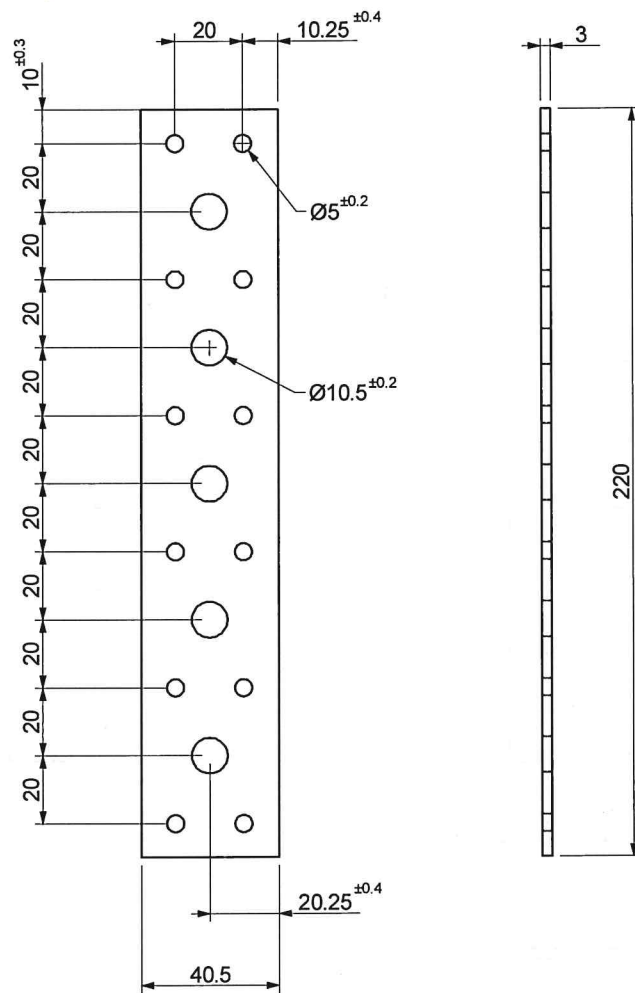


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto – Restraint Plate: RP/1678

Allegato A123
dell'ETA N° 19/0535



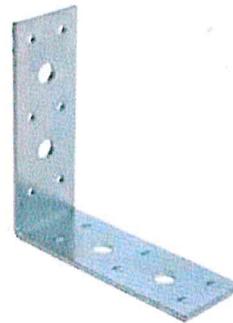
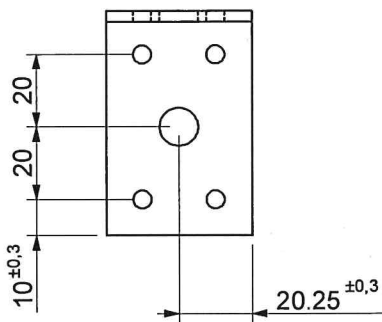
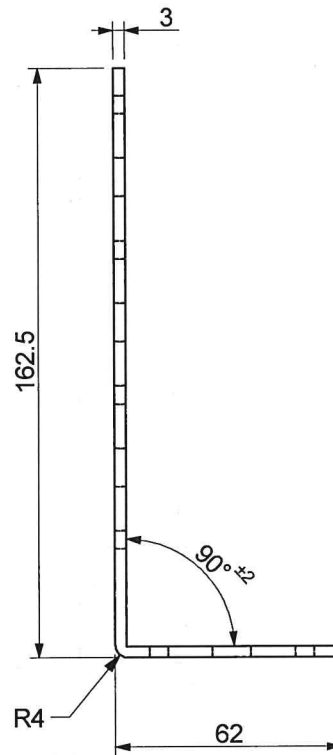
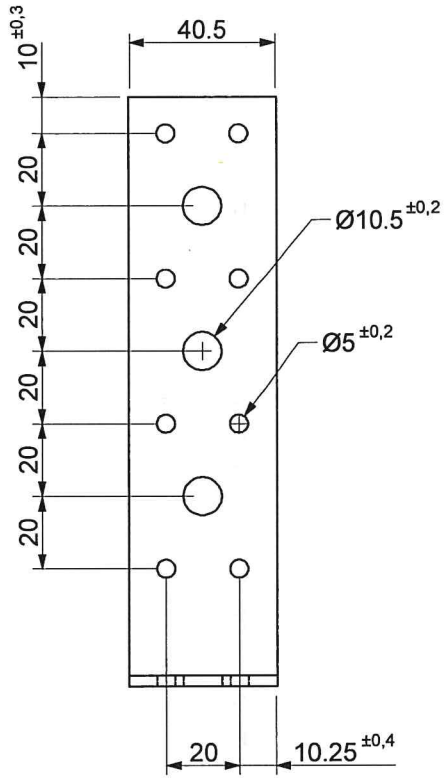
Schematic 3D view
of the product

SIPA NAILING PLATES

Descrizione del Prodotto – Restraint Plate: RP/1679

Allegato A124
dell'ETA N° 19/0535

HD

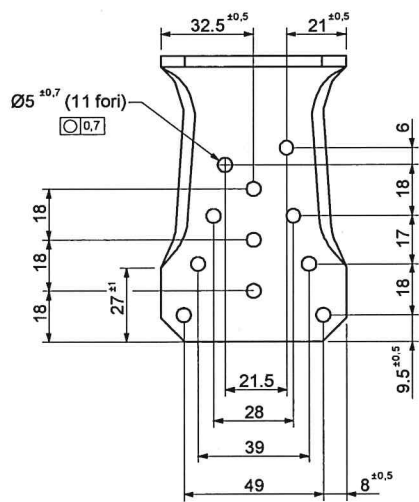
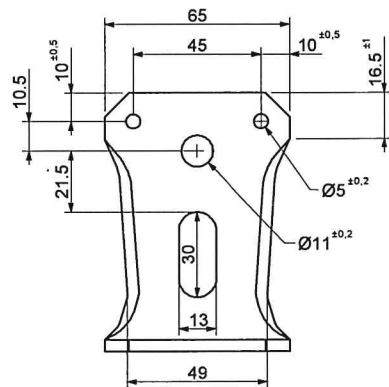


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto – Hold Down: HD/1645

Allegato A125
dell'ETA N° 19/0535

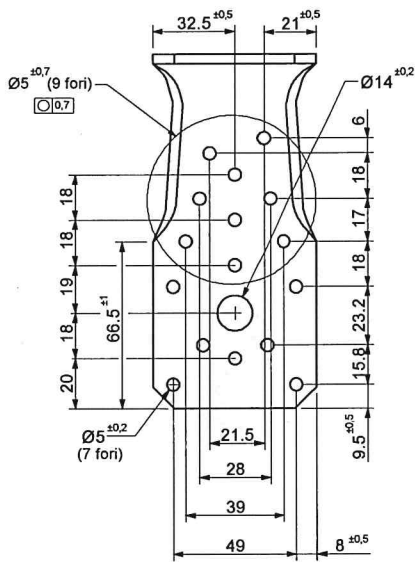
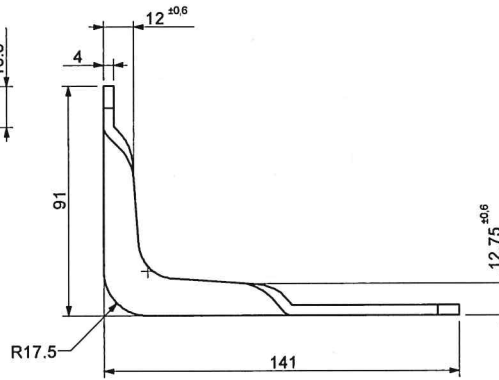
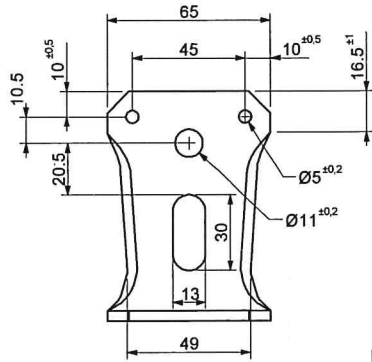


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto – Hold Down: HD/746

Allegato A126
dell'ETA N° 19/0535

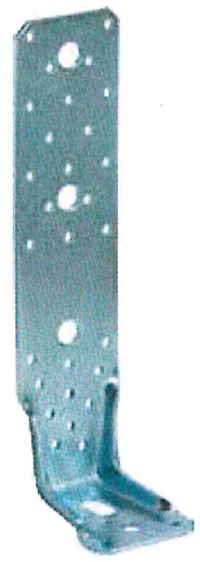
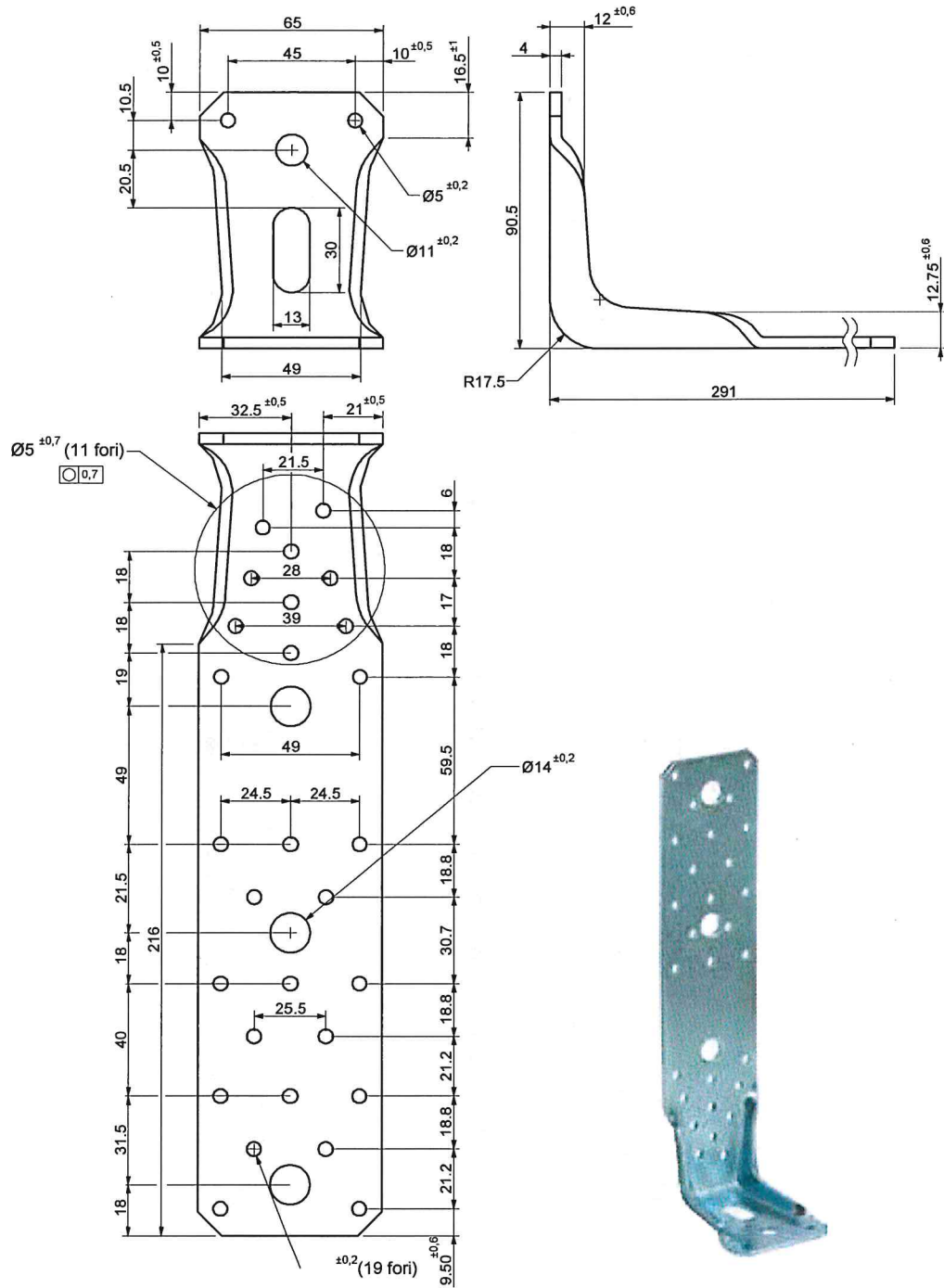


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto – Hold Down: HD/747

Allegato A127
dell'ETA N° 19/0535

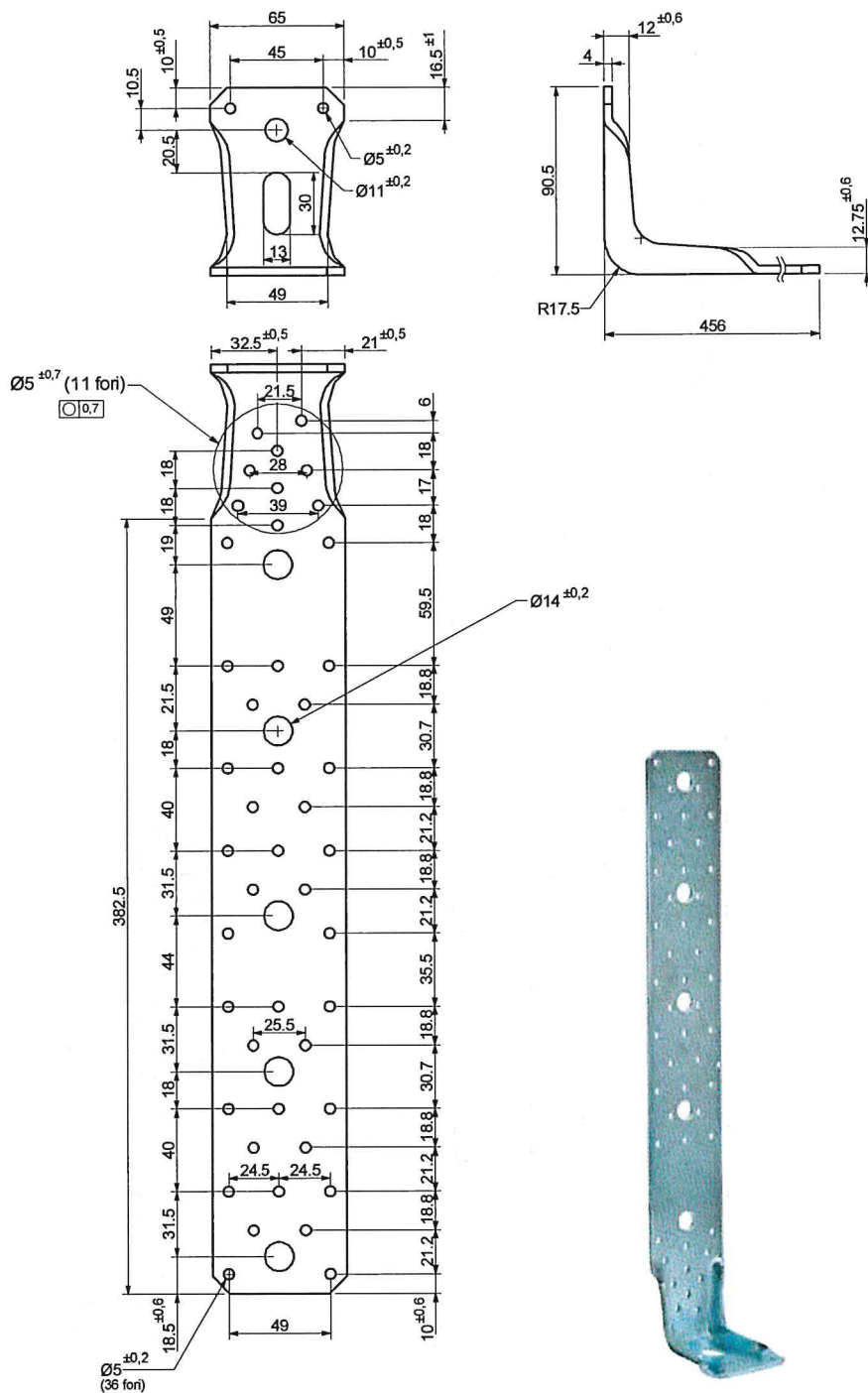


Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto – Hold Down: HD/748

Allegato A128
dell'ETA N° 19/0535



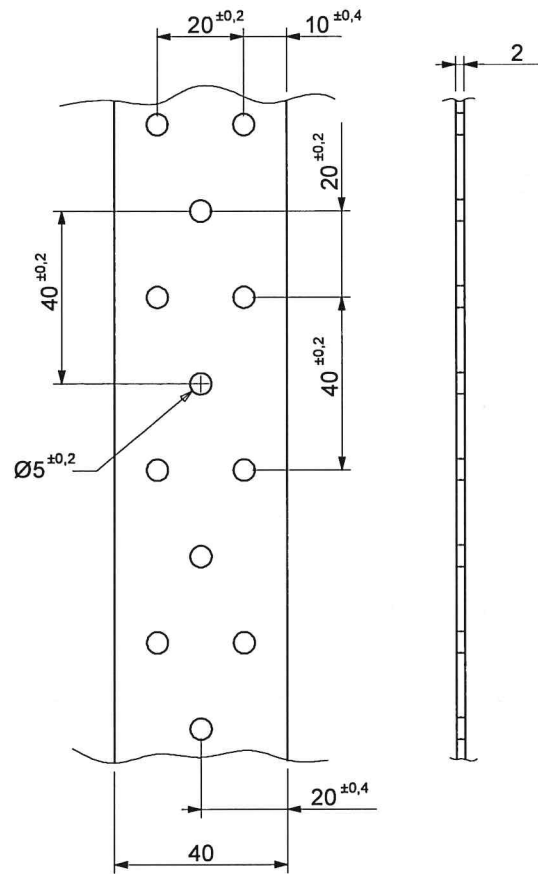
Schematic 3D view of the product

SIPA NAILING PLATES

Descrizione del Prodotto – Hold Down: HD/749

**Allegato A129
dell'ETA N° 19/0535**

RS

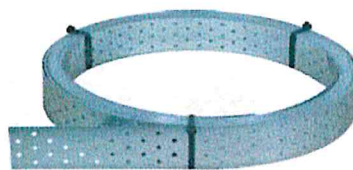
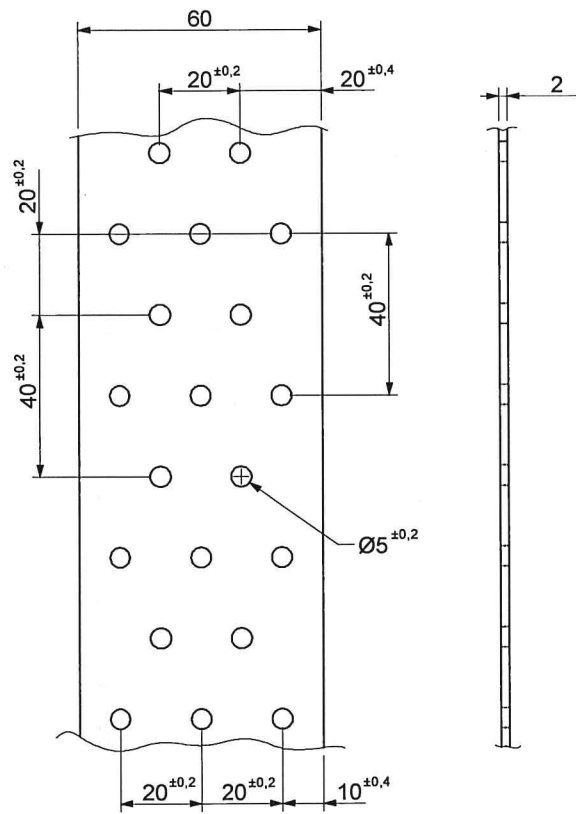


Schematic 3D view
of the product

SIPA NAILING PLATES

Descrizione del Prodotto – Restraint Strap: RS/758

Allegato A130
dell'ETA N° 19/0535



Schematic 3D view
of the product

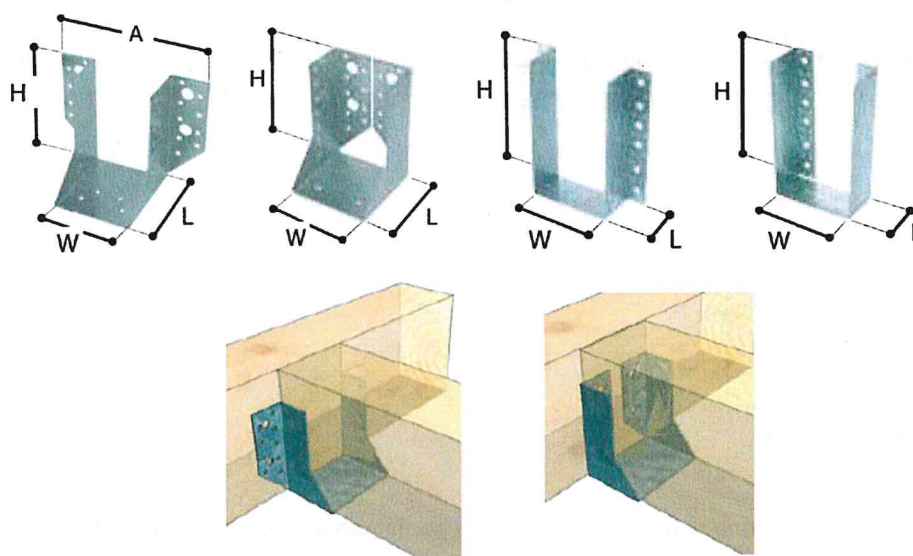
SIPA NAILING PLATES

Descrizione del Prodotto – Restraint Strap: RS/758

**Allegato A131
dell'ETA N° 19/0535**

SPECIFICHE DELL'USO PREVISTO E ISTRUZIONI DI INSTALLAZIONE

JOST HANGERS



Visione 3D schematica delle varie tipologie di piastre SIPA (Joist Hangers) e installazione tipica

Operazioni di installazione

- L'elemento secondario in legno viene connesso al piatto orizzontale in acciaio (non sono ammessi difetti dell'elemento in legno nella regione di connessione).
- La piastra di collegamento dell'elemento secondario viene connessa all'elemento principale mediante connettori inseriti nei fori previsti in accordo all'Allegato C.
- La larghezza della trave secondaria deve essere uguale a quella della piastra, con una massima differenza ammessa non superiore a 3 mm.
- Il valore minimo dell'altezza (H) della trave secondaria deve essere selezionato in modo che la distanza del connettore dalla superficie esterna deve essere maggiore di $5 \cdot d \geq 20$ mm.
- Non è consentita pre-foratura degli elementi in legno.
- La larghezza della trave principale deve essere maggiore di quella della trave secondaria.
- Se due travi secondarie sono connesse ad una trave principale lungo una stessa direzione perpendicolare, lo spessore dell'elemento principale deve essere maggiore di:
 - $t_f + 4$ mm (t_f è la profondità di penetrazione del connettore)
 - $2 \cdot l_f$ (l_f è la lunghezza totale del connettore)
- La distanza tra i baricentri di due piastre Joist Hanger consecutive deve essere maggiore di $A + 100$ mm.

SIPA NAILING PLATES

Usò previsto – Istruzione di installazione

Allegato B1
dell'ETA N° 19/0535

I valori caratteristici di resistenza e rigidità dei collegamenti legno-legno sono stati valutati mediante test sperimentali per Angle Bracket, Hold Down, Restraint Plate and Strap. Nel caso delle piastre tipo Joist Hanger la resistenza è stata valutata mediante calcolo assistito da sperimentazione, mentre la rigidità è stata valutata mediante test sperimentali per i prodotti sottoposti a sperimentazione.

Figure C1 e Figure C2 riportano la definizione delle direzioni di forza considerate nella valutazione, rispettivamente per "end-grain to side-grain" e "side-grain to side-grain connections".

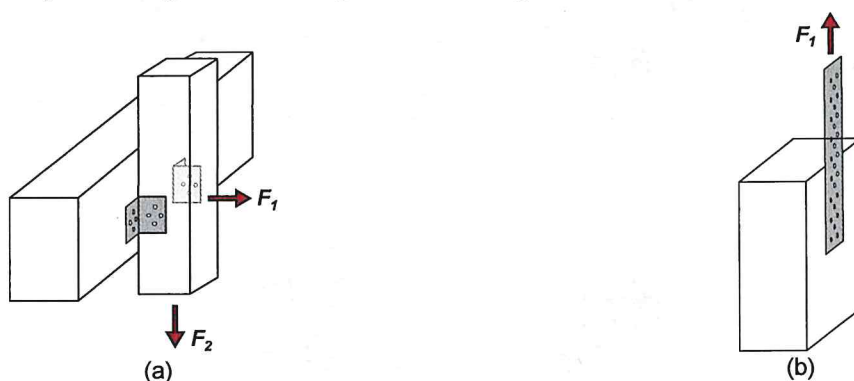


Figure C1: Definizione delle direzioni di forza per le connessioni side-grain to side-grain.

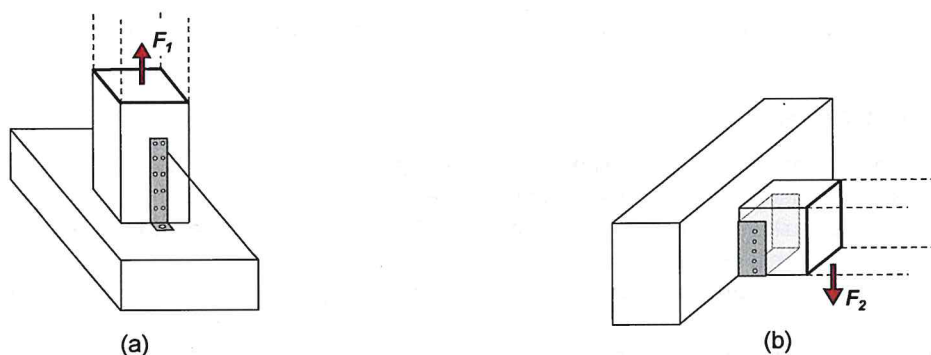


Figure C2: Definizione delle direzioni di forza per le connessioni end-grain to side-grain.

I valori di resistenza e rigidità, come riportati nelle seguenti tabelle, sono validi a condizione che:

- siano usati i connettori specificati nell'Allegato A e le configurazioni riportate in Allegato C;
- non siano presenti difetti che riducono la capacità del collegamento nella zona di connessione.

Per la valutazione delle prestazioni sono stati considerati i seguenti materiali:

- Legno massiccio C24 secondo la EN 338:2016 e EN 14081:2016 con densità comprese tra 301 e 448 kg/m³.
- Legno lamellare incollato GL24h secondo la EN 14080:2013 con densità compresa tra 399 e 428 kg/m³.
- Legno laminare incrociato (XLAM) secondo la EN16351:2015 con densità compresa tra 409 e 504 kg/m³.

I valori di progetto devono essere determinati in accordo all'EN 1995-1-1 (Eurocode 5) o simili riferimenti nazionali.

| | |
|--|---|
| SIPA NAILING PLATES | Allegato C1 dell'ETA N° 19/0535 |
| Valutazione delle Prestazioni – Direzione delle forze nodali | |

Table C1: Angle Brackets: configurazione dei connettori, resistenza e rigidezza per la forza F_2

| Product ID (-) | Nailing Pattern (-) | F_2^* (kN) | k_{s2}^* (kN/mm) |
|-------------------|------------------------|-----------------|-----------------------|
| AB/756 | | 13.77 | 2.30 |
| AB/757 | | 23.14 | 3.43 |
| AB/397 | | 24.04 | 3.95 |
| AB/395 | | 15.09 | 2.06 |
| AB/1616 | | 5.05 | 0.86 |
| AB/1617 | | 4.45 | 0.82 |
| AB/1618 | | 6.85 | 0.97 |
| AB/1619 | | 7.45 | 1.01 |

● Würth Comb Nail mod. 0681 940040 (4mm x 40mm)

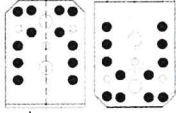
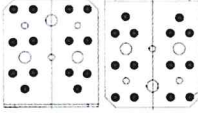
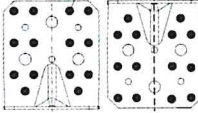
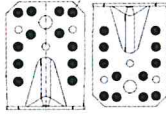
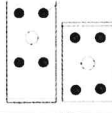
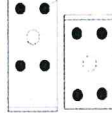
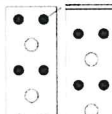
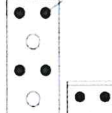
* I valori di forza e rigidezza riportati in tabella sono riferiti al collegamento costituito da due piastre Angle Brackets installate sui lati opposti dell'elemento collegato (Figure C1)

SIPA NAILING PLATES

Valutazione delle Prestazioni :
Resistenza e rigidezza per connessioni Angle Brackets

Allegato C2
dell'ETA N° 19/0535

Table C2: Angle Brackets: configurazione dei connettori, resistenza e rigidezza per la forza F_1

| Product ID (-) | Nailing Pattern (-) | F_1^* (kN) | k_{s1}^* (kN/mm) |
|-------------------|---|-----------------|-----------------------|
| AB/756 |  | 7.22 | 4.19 |
| AB/757 |  | 10.03 | 5.70 |
| AB/397 |  | 16.14 | 6.01 |
| AB/395 |  | 10.11 | 6.17 |
| AB/1616 |  | 4.91 | 3.73 |
| AB/1617 |  | 4.82 | 3.77 |
| AB/1618 |  | 4.44 | 3.91 |
| AB/1619 |  | 4.91 | 3.73 |

● Würth Comb Nail mod. 0681 940040 (4mm x 40mm)






* I valori di forza e rigidezza riportati in tabella sono riferiti al collegamento costituito da due piastre Angle Brackets installate sui lati opposti dell'elemento collegato (Figure C1)

SIPA NAILING PLATES

Valutazione delle Prestazioni :
Resistenza e rigidezza per connessioni Angle Brackets

Allegato C3
dell'ETA N° 19/0535

Table C3: Hold Downs: configurazione dei connettori, resistenza e rigidezza per la forza F_1

| Product ID (-) | Nailing Pattern (-) | F_1 (kN) | k_{s1} (kN/mm) |
|-------------------|---|---------------|---------------------|
| HD/1645 |  | 9.20 | 1.99 |
| HD/746 |  | 16.18 | 2.73 |
| HD/747 |  | 29.29 | 5.12 |
| HD/748 |  | 29.53 | 6.71 |
| HD/749 |  | 30.60 | 6.72 |

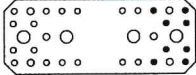
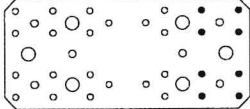
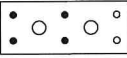
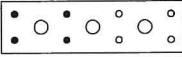
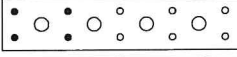
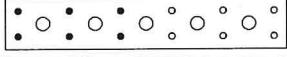
● Würth Comb Nail mod. 0681 940040 (4mm x 75mm)

SIPA NAILING PLATES

Valutazione delle Prestazioni :
Resistenza e rigidezza per connessioni Hold Downs

Allegato C4
dell'ETA N° 19/0535

Table C4: Restraint Plates : configurazione dei connettori, resistenza e rigidità per la forza F_1

| Product ID (-) | Nailing Pattern (-) | F_1 (kN) | k_{s1} (kN/mm) |
|-------------------|---|---------------|---------------------|
| RP/394 |  | 15.26 | 3.74 |
| RP/396 |  | 17.10 | 4.40 |
| RP/1676 |  | 4.15 | 2.48 |
| RP/1677 |  | 5.99 | 2.05 |
| RP/1678 |  | 7.83 | 1.61 |
| RP/1679 |  | 8.07 | 1.82 |

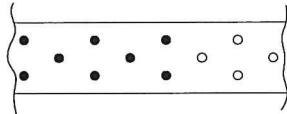
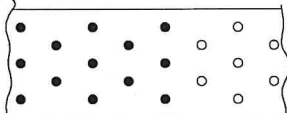
● Würth Comb Nail mod. 0681 940040 (4mm x 40mm)

SIPA NAILING PLATES

Valutazione delle Prestazioni :
Resistenza e rigidità per connessioni Restraint Plates

Allegato C5
dell'ETA N° 19/0535

Table C5: Restraint Straps : configurazione dei connettori, resistenza e rigidezza per la forza F_1

| Product ID (-) | Nailing Pattern (-) | F_1 (kN) | k_{s1} (kN/mm) |
|-------------------|---|---------------|---------------------|
| RS/758 |  | 15.37 | 4.32 |
| RS/759 |  | 24.47 | 6.21 |

● Würth Comb Nail mod. 0681 940040 (4mm x 40mm)

SIPA NAILING PLATES

Valutazione delle Prestazioni :
Resistenza e rigidezza per connessioni Restraint Straps

Allegato C6
dell'ETA N° 19/0535

Table C6: configurazione dei connettori, resistenza e rigidezza per le piastre Joist Hangers

| Product typology (-) | Product family (-) | Nailing Pattern* (-) |
|--|-------------------------------|-------------------------|
| Joist Hanger (JH) | Face-Mount Heavy JH | |
| | Concealed Face-Mount Heavy JH | |
| | Face-Mount Light JH | |
| | Concealed Face-Mount Light JH | |
| <p>● Würth Comb Nail mod. 0681 940040 (4mm x 75mm)</p> | | |

*Configurazione dei connettori assunta per tutti i prodotti della famiglia Joist Hanger per il calcolo delle prestazioni (in sequenza: vista frontale, laterale, dall'alto).

SIPA NAILING PLATES

Valutazione delle Prestazioni :
Configurazioni dei connettori per Joist Hanger

Allegato C7
dell'ETA N° 19/0535

Table C7: Face-Mount Light Joist Hangers: resistenza e rigidezza per la forza F_2

| Product ID (-) | F_2 (kN) | k_{s2} (kN/mm) |
|-------------------|---------------|---------------------|
| JH/373 | 19.12 | |
| JH/375 | 24.58 | |
| JH/377 | 24.58 | |
| JH/379 | 27.31 | |
| JH/381 | 19.12 | |
| JH/382 | 24.58 | |
| JH/383 | 30.96 | 5.97 |
| JH/1050 | 10.92 | |
| JH/1051 | 16.39 | |
| JH/1052 | 19.12 | |
| JH/1053 | 24.58 | |
| JH/1054 | 27.31 | |
| JH/1055 | 10.92 | |
| JH/1056 | 16.39 | |
| JH/1057 | 24.58 | |
| JH/1058 | 27.31 | |
| JH/1060 | 10.92 | |
| JH/1061 | 19.12 | |
| JH/1062 | 24.58 | |
| JH/1063 | 27.47 | 4.54 |
| JH/1064 | 10.92 | |
| JH/1065 | 27.31 | |
| JH/1066 | 30.74 | 5.05 |
| JH/1067 | 13.65 | |
| JH/1068 | 27.31 | |
| JH/1069 | 16.39 | |

SIPA NAILING PLATES

Valutazione delle Prestazioni :
Resistenza e rigidezza per connessioni Joist Hangers

**Allegato C8
dell'ETA N° 19/0535**

Table C8: Concealed Face-Mount Light Joist Hanger: resistenza e rigidezza per la forza F_2

| Product ID (-) | F_2 (kN) | k_{s2} (kN/mm) |
|-------------------|---------------|---------------------|
| JH/655 | 27.31 | |
| JH/656 | 24.58 | |
| JH/657 | 32.51 | 5.74 |
| JH/1081 | 5.46 | |
| JH/1082 | 10.92 | |
| JH/1083 | 13.65 | |
| JH/1084 | 29.04 | 3.68 |
| JH/1085 | 5.46 | |
| JH/1086 | 10.92 | |
| JH/1087 | 13.65 | |
| JH/1088 | 16.39 | |
| JH/1089 | 13.65 | |
| JH/1090 | 22.61 | 2.74 |
| JH/1091 | 13.65 | |
| JH/1092 | 27.31 | |
| JH/1093 | 16.39 | |

SIPA NAILING PLATES

Valutazione delle Prestazioni :
Resistenza e rigidezza per connessioni Joist Hangers

Allegato C9
dell'ETA N° 19/0535

Table C9: Face-Mount Heavy Joist Hanger: resistenza e rigidezza per la forza F_2

| Product ID (-) | F_2 (kN) | k_{s2} (kN/mm) |
|-------------------|---------------|---------------------|
| JH/1100 | 35.21 | 6.04 |
| JH/1101 | 32.77 | |
| JH/1102 | 32.77 | |
| JH/1103 | 49.16 | |
| JH/1104 | 49.16 | |
| JH/1105 | 43.70 | |
| JH/1106 | 16.39 | |
| JH/1107 | 16.39 | |
| JH/1108 | 16.39 | |
| JH/1109 | 49.16 | |
| JH/1110 | 32.77 | |
| JH/1111 | 57.35 | |
| JH/1112 | 54.62 | |
| JH/1113 | 65.54 | |
| JH/1114 | 21.85 | |
| JH/1115 | 24.58 | |
| JH/1116 | 46.49 | 9.24 |
| JH/1117 | 49.16 | |
| JH/1118 | 43.70 | |
| JH/1119 | 43.70 | |
| JH/1120 | 60.08 | |
| JH/1121 | 21.85 | |
| JH/1548 | 27.31 | |
| JH/1122 | 49.16 | |
| JH/1123 | 43.70 | |
| JH/1124 | 54.62 | |
| JH/1125 | 43.70 | |
| JH/1126 | 38.23 | |
| JH/1127 | 49.16 | |
| JH/1128 | 32.77 | |
| JH/1129 | 79.08 | 13.68 |

SIPA NAILING PLATES

Valutazione delle Prestazioni :
Resistenza e rigidezza per connessioni Joist Hangers

Allegato C10
dell'ETA N° 19/0535

Table C10: Concealed Face-Mount Heavy Joist Hanger: resistenza e rigidezza per la forza F₂

| Product ID (-) | F ₂ (kN) | k _{s2} (kN/mm) |
|-------------------|------------------------|----------------------------|
| JH/1140 | 28.51 | 4.37 |
| JH/1141 | 32.77 | |
| JH/1142 | 36.87 | |
| JH/1143 | 49.16 | |
| JH/1144 | 49.16 | |
| JH/1145 | 43.70 | |
| JH/1146 | 16.39 | |
| JH/1147 | 16.39 | |
| JH/1148 | 32.77 | |
| JH/1149 | 54.62 | |
| JH/1150 | 32.77 | |
| JH/1151 | 65.54 | |
| JH/1152 | 54.62 | |
| JH/1153 | 65.54 | |
| JH/1154 | 21.85 | |
| JH/1155 | 24.58 | |
| JH/1156 | 39.41 | 5.93 |
| JH/1157 | 40.96 | |
| JH/1158 | 43.70 | |
| JH/1159 | 43.70 | |
| JH/1160 | 60.08 | |
| JH/1161 | 21.85 | |
| JH/1549 | 27.31 | |
| JH/1162 | 49.16 | |
| JH/1163 | 43.70 | |
| JH/1164 | 54.62 | |
| JH/1165 | 43.70 | |
| JH/1166 | 38.23 | |
| JH/1167 | 49.16 | |
| JH/1168 | 32.77 | |
| JH/1169 | 77.63 | 12.53 |

SIPA NAILING PLATES

Valutazione delle Prestazioni :
Resistenza e rigidezza per connessioni Joist Hangers

Allegato C11
dell'ETA N° 19/0535



**CONSIGLIO SUPERIORE DEI
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European Organisation for
Technical Assessment
Organisation Européenne
pour l'évaluation technique

European Technical Assessment **ETA 19/0535 of 21/10/2019**

GENERAL PART

Trade name of the construction product

Product family to which the construction product belongs

Manufacturer

Manufacturing plant

This European Technical Assessment contains:

This European Technical Assessment is issued in accordance with Regulation (EU) n° 305/2011, on the basis of

SIPA NAILING PLATES

- Joist Hangers (104 products)
- Hold Downs (5 products)
- Angle Brackets (8 products)
- Restraint Plates (6 products)
- Restraint Straps (2 products)

PAC 13: STRUCTURAL TIMBER PRODUCT/ELEMENTS AND ANCILLARIES Three-dimensional nailing plates

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36027 San Pietro di Rosà (VI) - Italy

Sipa s.r.l.
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148 pages, including 144 annexes which form an integral part of this assessment

ETAG 015 Edition November 2012 – Three-dimensional nailing plates

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SPECIFIC PARTS

1. TECHNICAL DESCRIPTION OF THE PRODUCT

SIPA NAILING PLATES consist of Joist Hangers (JH), Hold-Downs (HD), Angle Brackets (AB), Restraint Plates (RP) and Restraint Strips (RS). All these products are enumerated in the following through product identification codes (ID) and dimensions:

| <i>Face-Mount Heavy JH</i> | <i>Concealed Face-Mount Heavy JH</i> | <i>Face-Mount Light JH</i> | <i>Concealed Face-Mount Light JH</i> |
|----------------------------|--------------------------------------|----------------------------|--------------------------------------|
| JH/1100-100x160x80 | JH/1140-100x160x80 | JH/373-45x108x80 | JH/655-90x145x80 |
| JH/1101-100x200x80 | JH/1141-100x200x80 | JH/375-60x130x80 | JH/656-80x120x80 |
| JH/1102-100x240x80 | JH/1142-100x240x80 | JH/377-70x125x80 | JH/657-100x140x80 |
| JH/1103-100x280x80 | JH/1143-100x280x80 | JH/379-90x145x80 | JH/1081-51x65x80 |
| JH/1104-100x300x80 | JH/1144-100x300x80 | JH/381-60x100x80 | JH/1082-51x105x80 |
| JH/1105-100x320x80 | JH/1145-100x320x80 | JH/382-80x120x80 | JH/1083-51x135x80 |
| JH/1106-120x120x80 | JH/1146-120x120x80 | JH/383-100x140x80 | JH/1084-51x165x80 |
| JH/1107-120x140x80 | JH/1147-120x140x80 | JH/1050-41x70x80 | JH/1085-60x60x80 |
| JH/1108-120x160x80 | JH/1148-120x160x80 | JH/1051-41x100x80 | JH/1086-60x100x80 |
| JH/1109-120x180x80 | JH/1149-120x180x80 | JH/1052-41x110x80 | JH/1087-60x130x80 |
| JH/1110-120x240x80 | JH/1150-120x240x80 | JH/1053-41x140x80 | JH/1088-60x160x80 |
| JH/1111-120x280x80 | JH/1151-120x280x80 | JH/1054-41x170x80 | JH/1089-70x125x80 |
| JH/1112-120x300x80 | JH/1152-120x300x80 | JH/1055-45x68x80 | JH/1090-70x155x80 |
| JH/1113-120x320x80 | JH/1153-120x320x80 | JH/1056-45x98x80 | JH/1091-80x80x80 |
| JH/1114-140x140x80 | JH/1154-140x140x80 | JH/1057-45x138x80 | JH/1092-80x150x80 |
| JH/1115-140x160x80 | JH/1155-140x160x80 | JH/1058-45x167x80 | JH/1093-100x100x80 |
| JH/1116-140x200x80 | JH/1156-140x200x80 | JH/1060-51x65x80 | |
| JH/1117-140x240x80 | JH/1157-140x240x80 | JH/1061-51x105x80 | |
| JH/1118-140x280x80 | JH/1158-140x280x80 | JH/1062-51x135x80 | |
| JH/1119-140x300x80 | JH/1159-140x300x80 | JH/1063-51x165x80 | |
| JH/1120-140x320x80 | JH/1160-140x320x80 | JH/1064-60x60x80 | |
| JH/1121-160x160x80 | JH/1161-160x160x80 | JH/1065-60x160x80 | |
| JH/1548-160x200x80 | JH/1549-160x200x80 | JH/1066-70x155x80 | |
| JH/1122-160x240x80 | JH/1162-160x240x80 | JH/1067-80x80x80 | |
| JH/1123-160x280x80 | JH/1163-160x280x80 | JH/1068-80x150x80 | |
| JH/1124-160x320x80 | JH/1164-160x320x80 | JH/1069-100x100x80 | |
| JH/1125-180x240x80 | JH/1165-180x240x80 | | |
| JH/1126-180x280x80 | JH/1166-180x280x80 | | |
| JH/1127-180x320x80 | JH/1167-180x320x80 | | |
| JH/1128-200x200x80 | JH/1168-200x200x80 | | |
| JH/1129-200x280x80 | JH/1169-200x280x80 | | |

| <i>Angle Brackets (AB)</i> | <i>Restraint Plates (RP)</i> | <i>Hold Downs (HD)</i> | <i>Restraint Straps (RS)</i> |
|----------------------------|------------------------------|------------------------|------------------------------|
| AB/756-65x85x85 | RP/394-65x170 | HD/1645-40x160x60 | RS/758-40x20000 |
| AB/757-90x100x100 | RP/396-90x200 | HD/746-65x95x90 | RS/759-60x20000 |
| AB/397-90x100x100 | RP/1676-40x100 | HD/747-65x135x90 | |
| AB/395-65x85x85 | RP/1677-40x140 | HD/748-65x285x90 | |
| AB/1616-40x60x80 | RP/1678-40x180 | HD/749-65x450x90 | |
| AB/1617-40x70x70 | RP/1679-40x220 | | |
| AB/1618-40x110x110 | | | |
| AB/1619-40x60x120 | | | |
| AB/756-65x85x85 | | | |

SIPA NAILING PLATES are one-piece cold-formed non-welded face-fixed three-dimensional steel nailing plates to be used in timber-to-timber or timber-to-concrete or timber-to-steel connections, (excluded Restraint Plates and Straps to be used only in connections between timber members). They are connected to timber or wood-based members by means of threaded nails or screws

according to EN 14592:2012. The Joist Hangers present steel plate thickness of 2.0 mm (Light) or 2.5 mm (Heavy). The Hold Downs are characterized by steel plate thickness varying between 3.0 mm and 4.0 mm. Steel plate thickness of Angle Brackets, Restraint Plates and Straps is within the range 2.0 mm and 3.0 mm. All the products are made of steel grade:

- S250GD (hot-dip zinc-coated steel, according to EN 10346:2015) with $R_{p0,2}/R_{eH} \geq 250$ MPa and $R_m \geq 330$ MPa. Several zinc coating thicknesses are adopted (from Z100 to Z275, as stated in Annex A);
- S235JR (according to EN 10025-2:2005) with $R_{eH} \geq 235$ MPa and $R_m \geq 360$ MPa.

Holes and ribs are obtained by stamping of steel sheets.

Detailed product drawings and specifications are given in Annex A.

2. SPECIFICATION OF THE INTENDED USE IN ACCORDANCE WITH ETAG 015 USED AS EUROPEAN ASSESSMENT DOCUMENT (hereinafter EAD)

SIPA NAILING PLATES are intended to be used in load-bearing timber structures as timber-to-timber or timber-to-concrete or timber-to-steel connections, for which load-carrying capacity and stiffness is assessed with specified fasteners, subjected to static or quasi-static loading.

The wood members may be of solid timber, glued laminated timber and similar glued members, or wood-based structural members, with characteristic density between 290 and 490 kg/m³. In particular, the following materials can be used:

- Solid timber classified as C14 - C50 according to EN 338:2016 and EN 14081:2016
- Glued laminated timber classified as GL20 – GL32 according to EN 14080:2013
- Glued solid timber according to EN 14080:2013
- Cross laminated timber (XLAM) according to EN16351:2015
- Structural laminated veneer lumber (LVL) according to EN 14374:2005
- Plywood according to EN 636:2015
- Oriented Strand Board (OSB) according to EN 13986:2015

Concerning product packaging, transport and storage, it is the responsibility of the manufacturer to undertake the appropriate measures and to advise his clients on the transport and storage, as he considers necessary in order to reach the declared performances.

The information about installation is provided with the technical documentation from the Manufacturer and it is assumed that the product will be installed according to it or (in absence of such instructions) according to the usual practice of the building professionals.

The specifications and conditions given by the manufacturer are summarized in Annex B.

The performances assessed in this European Technical Assessment, according to the applicable EAD, are based on an assumed intended working life of at least 50 years, provided that the conditions for the installation, packaging, transport, storage, installation as well as appropriate use, maintenance and repair are met. The indications given on the working life cannot be interpreted as a guarantee given by the manufacturer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

3. PERFORMANCE OF THE PRODUCT AND REFERENCES TO THE METHODS USED FOR ITS ASSESSMENT

The assessment of the performances of SIPA NAILING PLATES were carried out in compliance with EAD, according to methods and criteria reported herein.

3.1 MECHANICAL RESISTANCE AND STABILITY (BWR 1)

| # | Essential characteristic | Performance |
|---|---|--|
| 1 | Joint strength | See Annex C |
| 2 | Joint stiffness | See Annex C |
| 3 | Resistance to seismic actions | No performance assessed |
| 4 | Resistance to corrosion and deterioration | Products made of hot-dip zinc coated-steel S250GD are characterized by coating mass of Z100, Z140, Z180, Z200, Z225, Z275. According to EAD, products made of hot-dip zinc coated-steel S250GD sheet with coating mass of Z275 and thickness less than or equal to 3.0 mm have satisfactory long-term service in service class 2. |

3.2 SAFETY IN CASE OF FIRE (BWR 2)

| # | Essential characteristic | Performance |
|---|--------------------------|---|
| 5 | Reaction to fire | The three dimensional nailing plates are considered to satisfy the requirements for performance Class A1 of the characteristic reaction to fire in accordance with the EC Decision 2000/605/EC without the need for testing on the basis of it fulfilling the conditions set out in that Decision and its intended use being covered by that Decision. |
| 6 | Resistance to fire | No performance assessed |

4. ASSESSMENT AND VERIFICATION OF CONSTANCY OF PERFORMANCE (AVCP) SYSTEM APPLIED, WITH REFERENCE TO ITS LEGAL BASE

In accordance with the EAD the applicable European legal act is: **Decision 1997/638/EC**.
The AVCP system to be applied is: **2+**, for all uses.

5. TECHNICAL DETAILS NECESSARY FOR THE IMPLEMENTATION OF THE AVCP SYSTEM, AS PROVIDED FOR IN EAD

Technical details necessary for the implementation of the AVCP system are laid down in the Control Plan deposited at STC.

Issued in Rome, Italy on 21/10/2019
by STC - CSLP



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The president of
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Eng. Donato Carlea



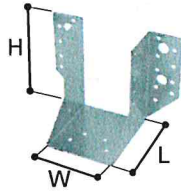


Table A1: Face-Mount Light Joist Hangers - Product details

| Product ID | Dimensions | | | Thickness | Steel and Coating specification | |
|------------|------------|------|------|-----------|---------------------------------|---------|
| | W | H | L | t | Type 1 | Type 2* |
| (-) | (mm) | (mm) | (mm) | (mm) | (-) | (-) |
| JH/373 | 45 | 108 | 80 | 2,0 | S235JR | S250GD |
| JH/375 | 60 | 130 | 80 | 2,0 | S235JR | S250GD |
| JH/377 | 70 | 125 | 80 | 2,0 | S235JR | S250GD |
| JH/379 | 90 | 145 | 80 | 2,0 | S235JR | S250GD |
| JH/381 | 60 | 100 | 80 | 2,0 | S235JR | S250GD |
| JH/382 | 80 | 120 | 80 | 2,0 | S235JR | S250GD |
| JH/383 | 100 | 140 | 80 | 2,0 | S235JR | S250GD |
| JH/1050 | 41 | 70 | 80 | 2,0 | S235JR | S250GD |
| JH/1051 | 41 | 100 | 80 | 2,0 | S235JR | S250GD |
| JH/1052 | 41 | 110 | 80 | 2,0 | S235JR | S250GD |
| JH/1053 | 41 | 140 | 80 | 2,0 | S235JR | S250GD |
| JH/1054 | 41 | 170 | 80 | 2,0 | S235JR | S250GD |
| JH/1055 | 45 | 68 | 80 | 2,0 | S235JR | S250GD |
| JH/1056 | 45 | 98 | 80 | 2,0 | S235JR | S250GD |
| JH/1057 | 45 | 138 | 80 | 2,0 | S235JR | S250GD |
| JH/1058 | 45 | 167 | 80 | 2,0 | S235JR | S250GD |
| JH/1060 | 51 | 65 | 80 | 2,0 | S235JR | S250GD |
| JH/1061 | 51 | 105 | 80 | 2,0 | S235JR | S250GD |
| JH/1062 | 51 | 135 | 80 | 2,0 | S235JR | S250GD |
| JH/1063 | 51 | 165 | 80 | 2,0 | S235JR | S250GD |
| JH/1064 | 60 | 60 | 80 | 2,0 | S235JR | S250GD |
| JH/1065 | 60 | 160 | 80 | 2,0 | S235JR | S250GD |
| JH/1066 | 70 | 155 | 80 | 2,0 | S235JR | S250GD |
| JH/1067 | 80 | 80 | 80 | 2,0 | S235JR | S250GD |
| JH/1068 | 80 | 150 | 80 | 2,0 | S235JR | S250GD |
| JH/1069 | 100 | 100 | 80 | 2,0 | S235JR | S250GD |

* For steel "Type 2" several zinc coating thicknesses are adopted: Z100, Z140, Z180, Z200, Z225, Z275.

SIPA NAILING PLATES

Product Description:
Face-Mount Light Joist Hangers

Annex A1
of ETA N° 19/0535

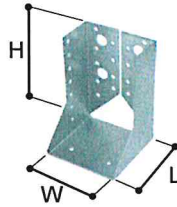


Table A2: Concealed Face-Mount Light Joist Hangers - Product details

| Product ID | Dimensions | | | Thickness | Steel and Coating specification | |
|------------|------------|------|------|-----------|---------------------------------|---------|
| | W | H | L | t | Type 1 | Type 2* |
| (-) | (mm) | (mm) | (mm) | (mm) | (-) | (-) |
| JH/655 | 90 | 145 | 80 | 2,0 | S235JR | S250GD |
| JH/656 | 80 | 120 | 80 | 2,0 | S235JR | S250GD |
| JH/657 | 100 | 140 | 80 | 2,0 | S235JR | S250GD |
| JH/1081 | 51 | 65 | 80 | 2,0 | S235JR | S250GD |
| JH/1082 | 51 | 105 | 80 | 2,0 | S235JR | S250GD |
| JH/1083 | 51 | 135 | 80 | 2,0 | S235JR | S250GD |
| JH/1084 | 51 | 165 | 80 | 2,0 | S235JR | S250GD |
| JH/1085 | 60 | 60 | 80 | 2,0 | S235JR | S250GD |
| JH/1086 | 60 | 100 | 80 | 2,0 | S235JR | S250GD |
| JH/1087 | 60 | 130 | 80 | 2,0 | S235JR | S250GD |
| JH/1088 | 60 | 160 | 80 | 2,0 | S235JR | S250GD |
| JH/1089 | 70 | 125 | 80 | 2,0 | S235JR | S250GD |
| JH/1090 | 70 | 155 | 80 | 2,0 | S235JR | S250GD |
| JH/1091 | 80 | 80 | 80 | 2,0 | S235JR | S250GD |
| JH/1092 | 80 | 150 | 80 | 2,0 | S235JR | S250GD |
| JH/1093 | 100 | 100 | 80 | 2,0 | S235JR | S250GD |

* For steel "Type 2" several zinc coating thicknesses are adopted: Z100, Z140, Z180, Z200, Z225, Z275.

SIPA NAILING PLATES

Product Description:
Concealed Face-Mount Light Joist Hangers

Annex A2
of ETA N° 19/0535

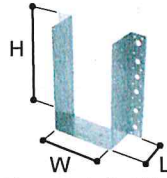


Table A3: Face-Mount Heavy Joist Hangers – Product details

| Product ID | Dimensions | | | Thickness | Steel and Coating specification | |
|------------|------------|------|------|-----------|---------------------------------|---------|
| | W | H | L | t | Type 1 | Type 2* |
| (-) | (mm) | (mm) | (mm) | (mm) | (-) | (-) |
| JH/1100 | 100 | 160 | 80 | 2,5 | S235JR | S250GD |
| JH/1101 | 100 | 200 | 80 | 2,5 | S235JR | S250GD |
| JH/1102 | 100 | 240 | 80 | 2,5 | S235JR | S250GD |
| JH/1103 | 100 | 280 | 80 | 2,5 | S235JR | S250GD |
| JH/1104 | 100 | 300 | 80 | 2,5 | S235JR | S250GD |
| JH/1105 | 100 | 320 | 80 | 2,5 | S235JR | S250GD |
| JH/1106 | 120 | 120 | 80 | 2,5 | S235JR | S250GD |
| JH/1107 | 120 | 140 | 80 | 2,5 | S235JR | S250GD |
| JH/1108 | 120 | 160 | 80 | 2,5 | S235JR | S250GD |
| JH/1109 | 120 | 180 | 80 | 2,5 | S235JR | S250GD |
| JH/1110 | 120 | 240 | 80 | 2,5 | S235JR | S250GD |
| JH/1111 | 120 | 280 | 80 | 2,5 | S235JR | S250GD |
| JH/1112 | 120 | 300 | 80 | 2,5 | S235JR | S250GD |
| JH/1113 | 120 | 320 | 80 | 2,5 | S235JR | S250GD |
| JH/1114 | 140 | 140 | 80 | 2,5 | S235JR | S250GD |
| JH/1115 | 140 | 160 | 80 | 2,5 | S235JR | S250GD |
| JH/1116 | 140 | 200 | 80 | 2,5 | S235JR | S250GD |
| JH/1117 | 140 | 240 | 80 | 2,5 | S235JR | S250GD |
| JH/1118 | 140 | 280 | 80 | 2,5 | S235JR | S250GD |
| JH/1119 | 140 | 300 | 80 | 2,5 | S235JR | S250GD |
| JH/1120 | 140 | 320 | 80 | 2,5 | S235JR | S250GD |
| JH/1121 | 160 | 160 | 80 | 2,5 | S235JR | S250GD |
| JH/1548 | 160 | 200 | 80 | 2,5 | S235JR | S250GD |
| JH/1122 | 160 | 240 | 80 | 2,5 | S235JR | S250GD |
| JH/1123 | 160 | 280 | 80 | 2,5 | S235JR | S250GD |
| JH/1124 | 160 | 320 | 80 | 2,5 | S235JR | S250GD |
| JH/1125 | 180 | 240 | 80 | 2,5 | S235JR | S250GD |
| JH/1126 | 180 | 280 | 80 | 2,5 | S235JR | S250GD |
| JH/1127 | 180 | 320 | 80 | 2,5 | S235JR | S250GD |
| JH/1128 | 200 | 200 | 80 | 2,5 | S235JR | S250GD |
| JH/1129 | 200 | 280 | 80 | 2,5 | S235JR | S250GD |

* For steel "Type 2" several zinc coating thicknesses are adopted: Z100, Z140, Z180, Z200, Z225, Z275.

SIPA NAILING PLATES

Product Description:
Face-Mount Heavy Joist Hangers

Annex A3
of ETA N° 19/0535

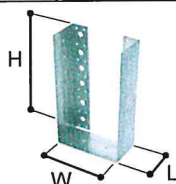


Table A4: Concealed Face-Mount Heavy Joist Hangers – Product details

| Product ID | Dimensions | | | Thickness | Steel and Coating specification | |
|------------|------------|------|------|-----------|---------------------------------|---------|
| | W | H | L | t | Type 1 | Type 2* |
| (-) | (mm) | (mm) | (mm) | (mm) | (-) | (-) |
| JH/1140 | 100 | 160 | 80 | 2,5 | S235JR | S250GD |
| JH/1141 | 100 | 200 | 80 | 2,5 | S235JR | S250GD |
| JH/1142 | 100 | 240 | 80 | 2,5 | S235JR | S250GD |
| JH/1143 | 100 | 280 | 80 | 2,5 | S235JR | S250GD |
| JH/1144 | 100 | 300 | 80 | 2,5 | S235JR | S250GD |
| JH/1145 | 100 | 320 | 80 | 2,5 | S235JR | S250GD |
| JH/1146 | 120 | 120 | 80 | 2,5 | S235JR | S250GD |
| JH/1147 | 120 | 140 | 80 | 2,5 | S235JR | S250GD |
| JH/1148 | 120 | 160 | 80 | 2,5 | S235JR | S250GD |
| JH/1149 | 120 | 180 | 80 | 2,5 | S235JR | S250GD |
| JH/1150 | 120 | 240 | 80 | 2,5 | S235JR | S250GD |
| JH/1151 | 120 | 280 | 80 | 2,5 | S235JR | S250GD |
| JH/1152 | 120 | 300 | 80 | 2,5 | S235JR | S250GD |
| JH/1153 | 120 | 320 | 80 | 2,5 | S235JR | S250GD |
| JH/1154 | 140 | 140 | 80 | 2,5 | S235JR | S250GD |
| JH/1155 | 140 | 160 | 80 | 2,5 | S235JR | S250GD |
| JH/1156 | 140 | 200 | 80 | 2,5 | S235JR | S250GD |
| JH/1157 | 140 | 240 | 80 | 2,5 | S235JR | S250GD |
| JH/1158 | 140 | 280 | 80 | 2,5 | S235JR | S250GD |
| JH/1159 | 140 | 300 | 80 | 2,5 | S235JR | S250GD |
| JH/1160 | 140 | 320 | 80 | 2,5 | S235JR | S250GD |
| JH/1161 | 160 | 160 | 80 | 2,5 | S235JR | S250GD |
| JH/1549 | 160 | 200 | 80 | 2,5 | S235JR | S250GD |
| JH/1162 | 160 | 240 | 80 | 2,5 | S235JR | S250GD |
| JH/1163 | 160 | 280 | 80 | 2,5 | S235JR | S250GD |
| JH/1164 | 160 | 320 | 80 | 2,5 | S235JR | S250GD |
| JH/1165 | 180 | 240 | 80 | 2,5 | S235JR | S250GD |
| JH/1166 | 180 | 280 | 80 | 2,5 | S235JR | S250GD |
| JH/1167 | 180 | 320 | 80 | 2,5 | S235JR | S250GD |
| JH/1168 | 200 | 200 | 80 | 2,5 | S235JR | S250GD |
| JH/1169 | 200 | 280 | 80 | 2,5 | S235JR | S250GD |

* For steel "Type 2" several zinc coating thicknesses are adopted: Z100, Z140, Z180, Z200, Z225, Z275.

SIPA NAILING PLATES

Product Description:
Concealed Face-Mount Heavy Joist Hangers

Annex A4
of ETA N° 19/0535

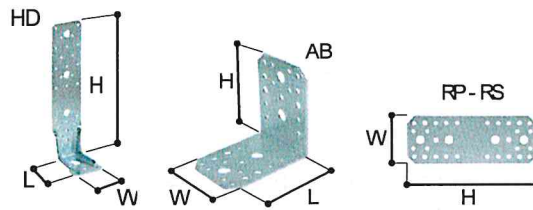


Table A5: Hold-Downs, Angle Brackets, Restraint Plates and Restraint Strips – Product details

| Product ID | Dimensions | | | Thickness | Steel and Coating specification | |
|------------|------------|-------|------|-----------|---------------------------------|---------|
| | W | H | L | t | Type 1 | Type 2* |
| (-) | (mm) | (mm) | (mm) | (mm) | (-) | (-) |
| HD/1645 | 40 | 160 | 60 | 3,0 | S235JR | S250GD |
| HD/746 | 65 | 95 | 90 | 4,0 | S235JR | S250GD |
| HD/747 | 65 | 135 | 90 | 4,0 | S235JR | S250GD |
| HD/748 | 65 | 285 | 90 | 4,0 | S235JR | S250GD |
| HD/749 | 65 | 450 | 90 | 4,0 | S235JR | S250GD |
| AB/756 | 65 | 85 | 85 | 2,5 | S235JR | S250GD |
| AB/757 | 90 | 100 | 100 | 2,5 | S235JR | S250GD |
| AB/397 | 90 | 100 | 100 | 2,5 | S235JR | S250GD |
| AB/395 | 65 | 85 | 85 | 2,5 | S235JR | S250GD |
| AB/1616 | 40 | 80 | 60 | 3,0 | S235JR | S250GD |
| AB/1617 | 40 | 70 | 70 | 3,0 | S235JR | S250GD |
| AB/1618 | 40 | 110 | 110 | 3,0 | S235JR | S250GD |
| AB/1619 | 40 | 120 | 60 | 3,0 | S235JR | S250GD |
| RP/394 | 65 | 170 | - | 2,5 | S235JR | S250GD |
| RP/396 | 90 | 200 | - | 2,5 | S235JR | S250GD |
| RP/1676 | 40 | 100 | - | 3,0 | S235JR | S250GD |
| RP/1677 | 40 | 140 | - | 3,0 | S235JR | S250GD |
| RP/1678 | 40 | 180 | - | 3,0 | S235JR | S250GD |
| RP/1679 | 40 | 220 | - | 3,0 | S235JR | S250GD |
| RS/758 | 40 | 20000 | - | 2,0 | S235JR | S250GD |
| RS/759 | 60 | 20000 | - | 2,0 | S235JR | S250GD |

* For steel "Type 2" several zinc coating thicknesses are adopted: Z100, Z140, Z180, Z200, Z225, Z275.

SIPA NAILING PLATES

Product Description:
Hold-Downs, Angle Brackets, Restraint Plates and Restraint Strips

Annex A5
of ETA N° 19/0535

Table A6: Maximum values of tolerances

| Tolerances (maximum and minimum values) | | | | | |
|---|-------------|-------------|------------|--------------------------------|--------------------|
| Product typology | Height (mm) | Length (mm) | Width (mm) | Hole position and spacing (mm) | Hole diameter (mm) |
| Joist Hangers | ±0.8 | ±0.8 | ±0.8 | ±0.8 | ±0.5 |
| Angle Brackets | ±1.0 | ±1.0 | - | ±0.7 | ±0.2 |
| Restraint Plates | ±0.3 | - | ±0.4 | ±0.4 | ±0.2 |
| Hold Downs | ±1.0 | ±0.6 | ±0.5 | ±0.5 | ±0.7 |
| Restraint Straps | - | - | - | ±0.4 | ±0.2 |

Characteristic load-carrying capacity and stiffness of the steel nailing plates, as stated in Annex C, have been assessed based on the use of connector nails Würth Comb Nail (mod. 0681 940040) and Würth Comb Nail (mod. 0681 940075). According to the EAD, for nails subjected to lateral load or to axial load, the assessment of the load-carrying capacity is based on the properties given in their Declaration of Performance. The following table reports the performances of the considered nails.

Table A7: Fasteners specification

| Fastener typology | Fastener dimensions | | | Material and Finish type |
|----------------------------|---------------------|-------------|----------------------|--------------------------|
| | Diameter (mm) | Length (mm) | Threaded length (mm) | |
| According to EN 14592:2012 | | | | |
| Threaded Nail | 4 | 40 | 32 | Zinc-coated steel |
| Threaded Nail | 4 | 75 | 66 | Zinc-coated steel |

Table A8: Extract of the DoP of the adopted fasteners

| Essential characteristic | Performance | Harmonized technical specification |
|--|-------------------------|------------------------------------|
| Characteristic pull-out parameter | 9.8 N/mm ² | EN 14592 |
| Characteristic head pull-through parameter | 19.0 N/mm ² | EN 14592 |
| Characteristic yield moment | 8461 Nmm | EN 14592 |
| Characteristic tensile strength | 667.0 N/mm ² | EN 14592 |

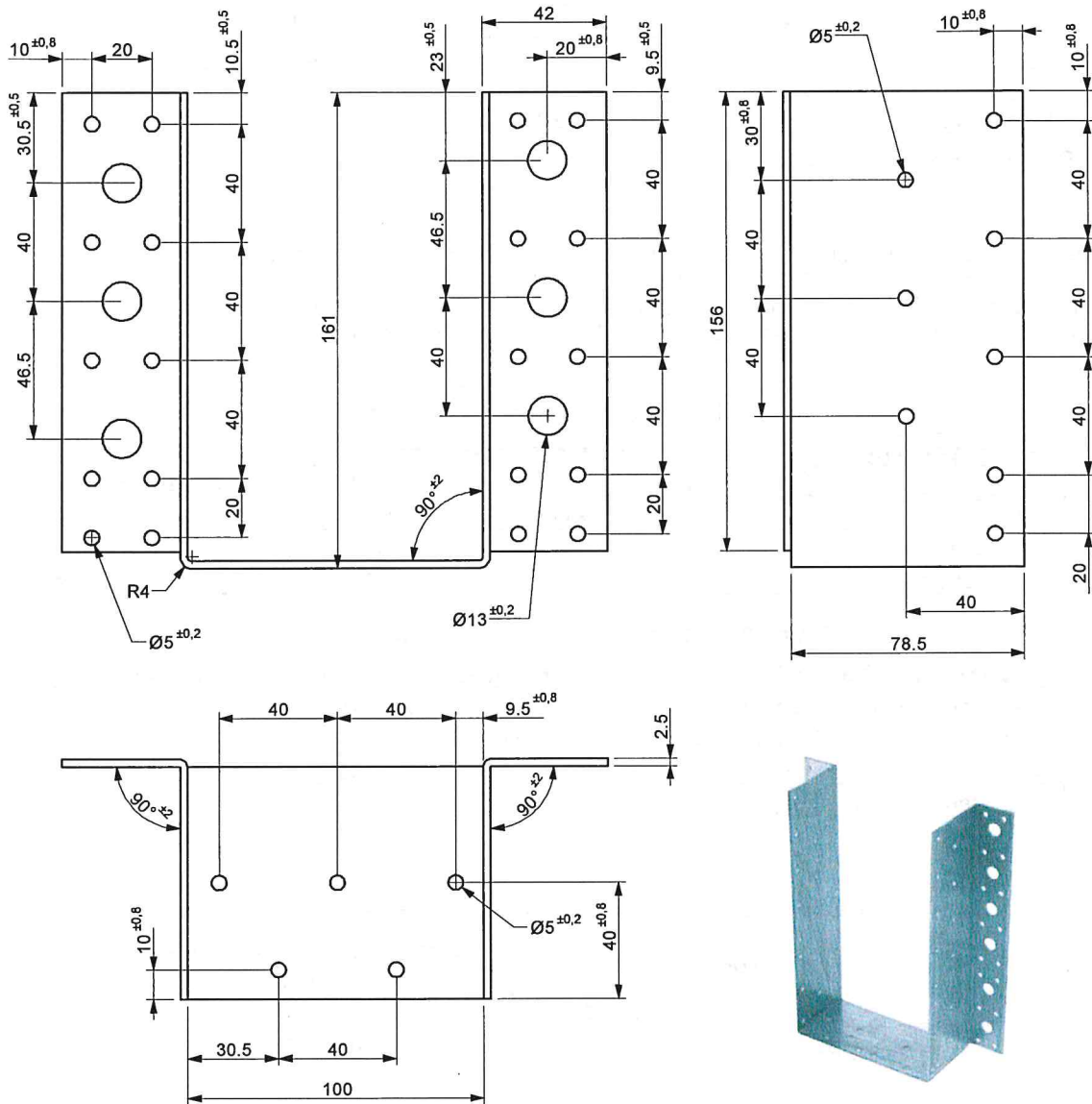
Table A9: Bolts and methal anchors specification for timber-to-steel or timber-to-concrete connections

| Typology | Corresponding hole diameters (mm) |
|---|-----------------------------------|
| Bolt according to EN 14952 | 10.5 – 13.0 |
| Anchor type specified by the Manufacturer | 10.5 – 13.0 |

SIPA NAILING PLATES

Product Description:
Tolerances and Fastener Specification

Annex A6
of ETA N° 19/0535

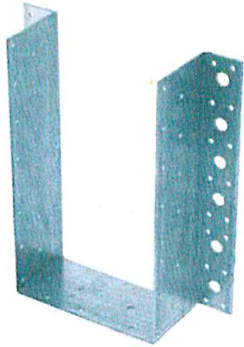
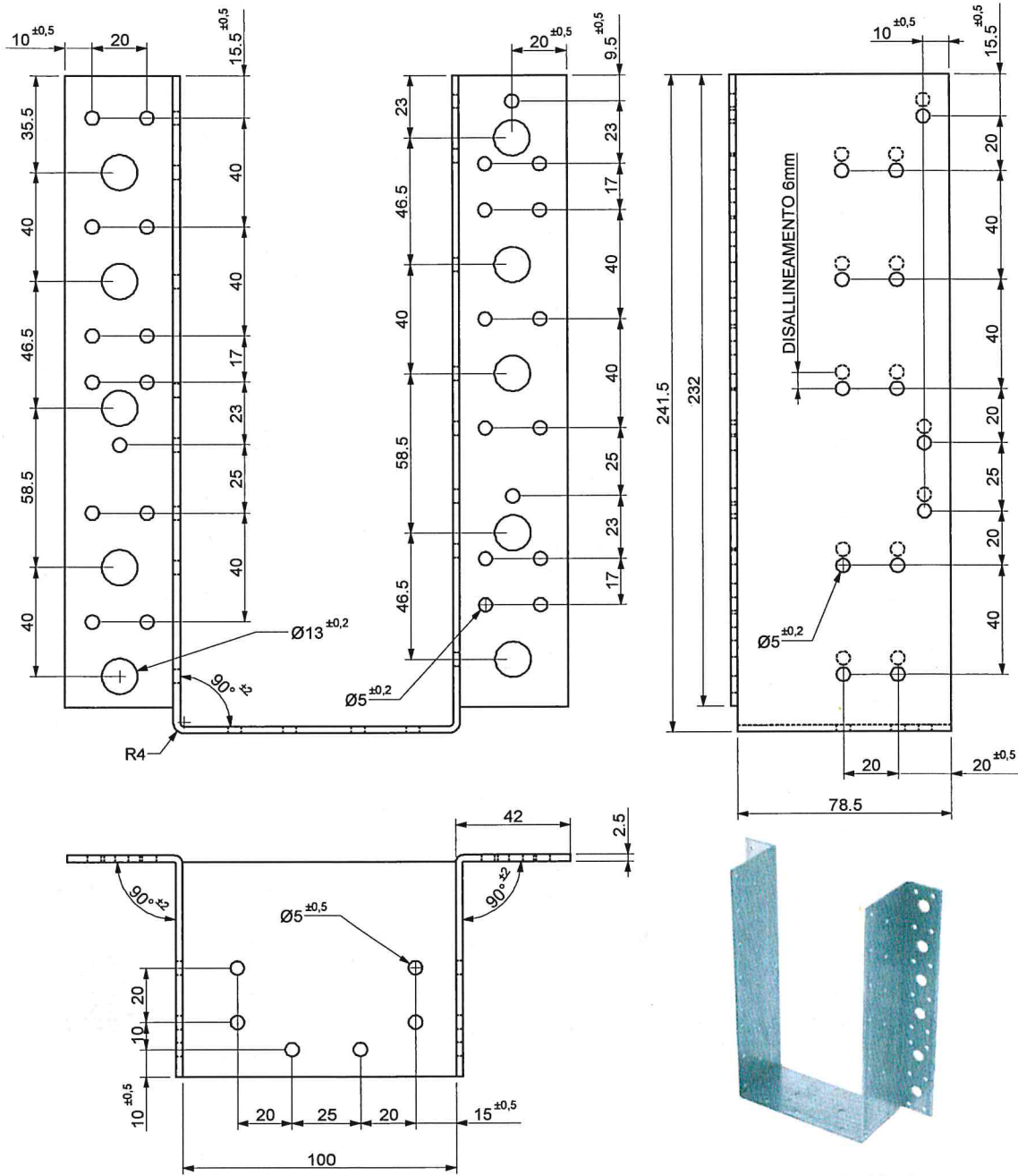


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1100

Annex A7
of ETA N° 19/0535

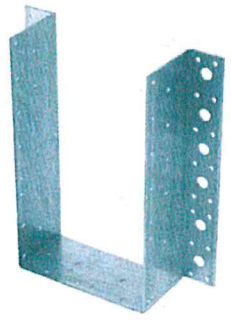
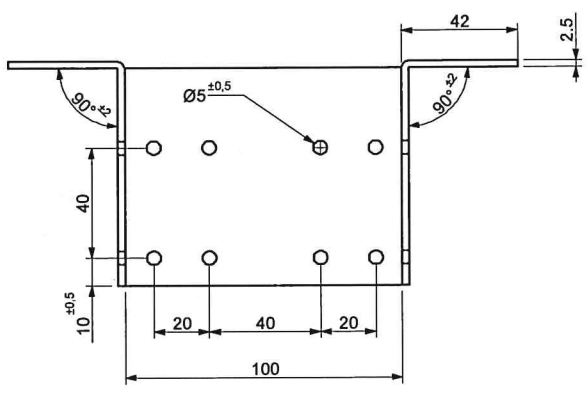
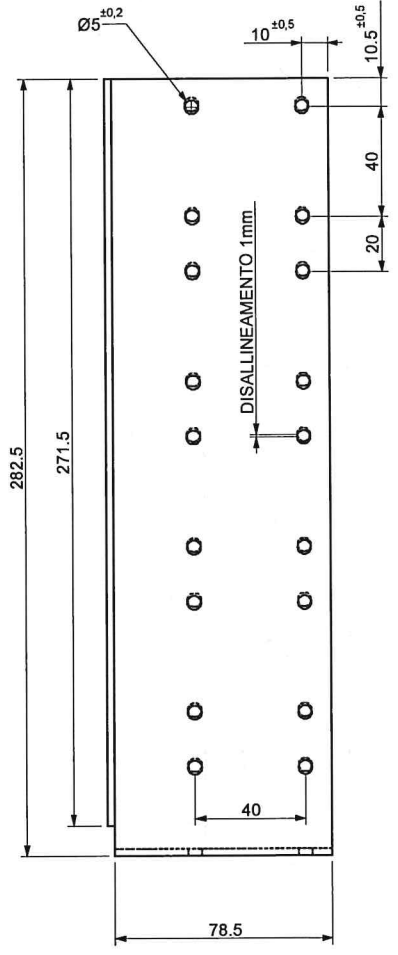
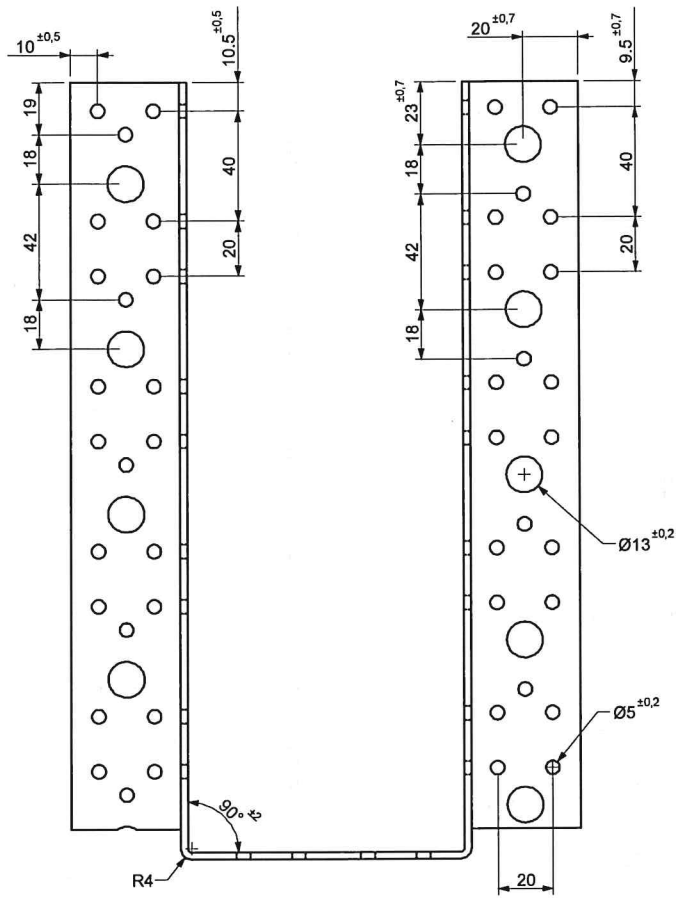


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1102

Annex A9
of ETA N° 19/0535

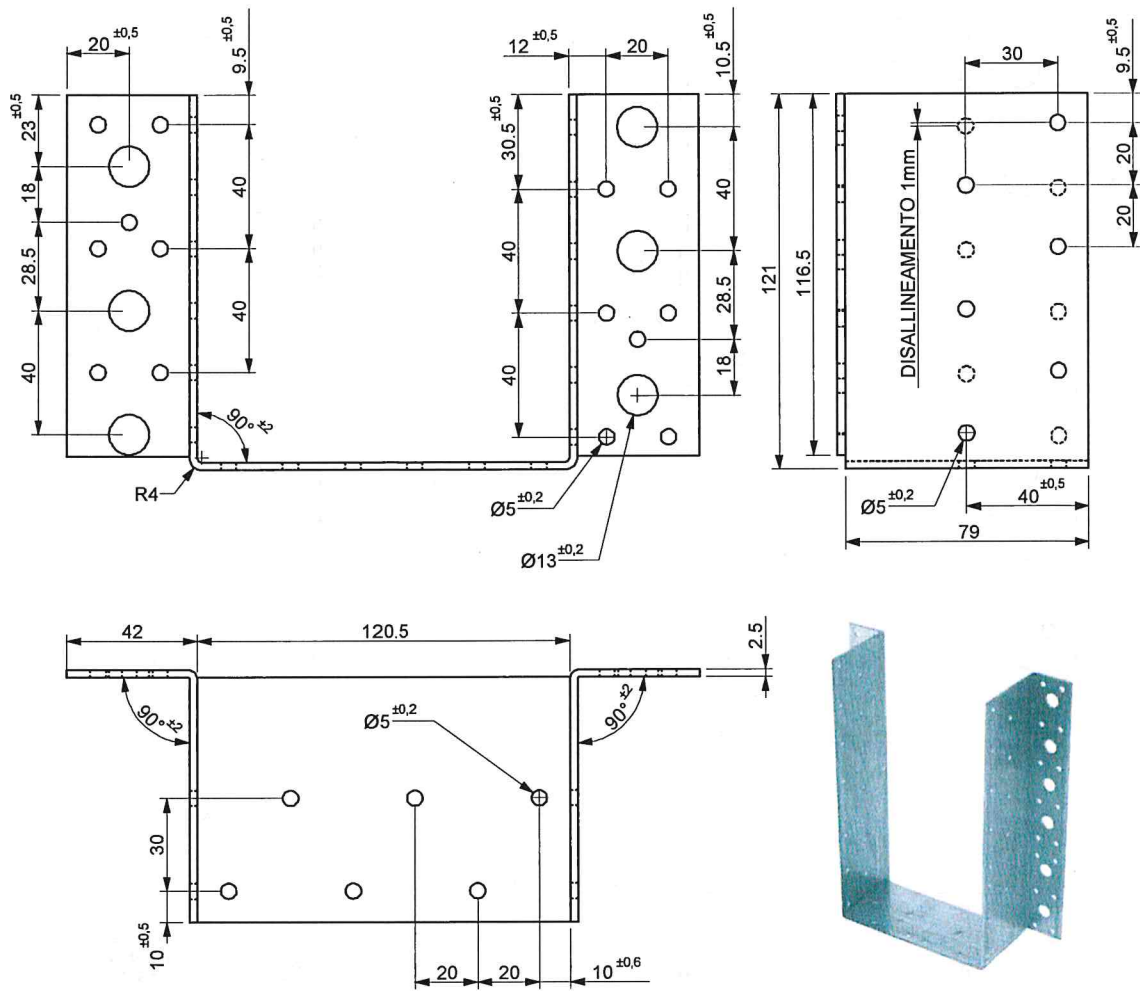


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1103

Annex A10
of ETA N° 19/0535

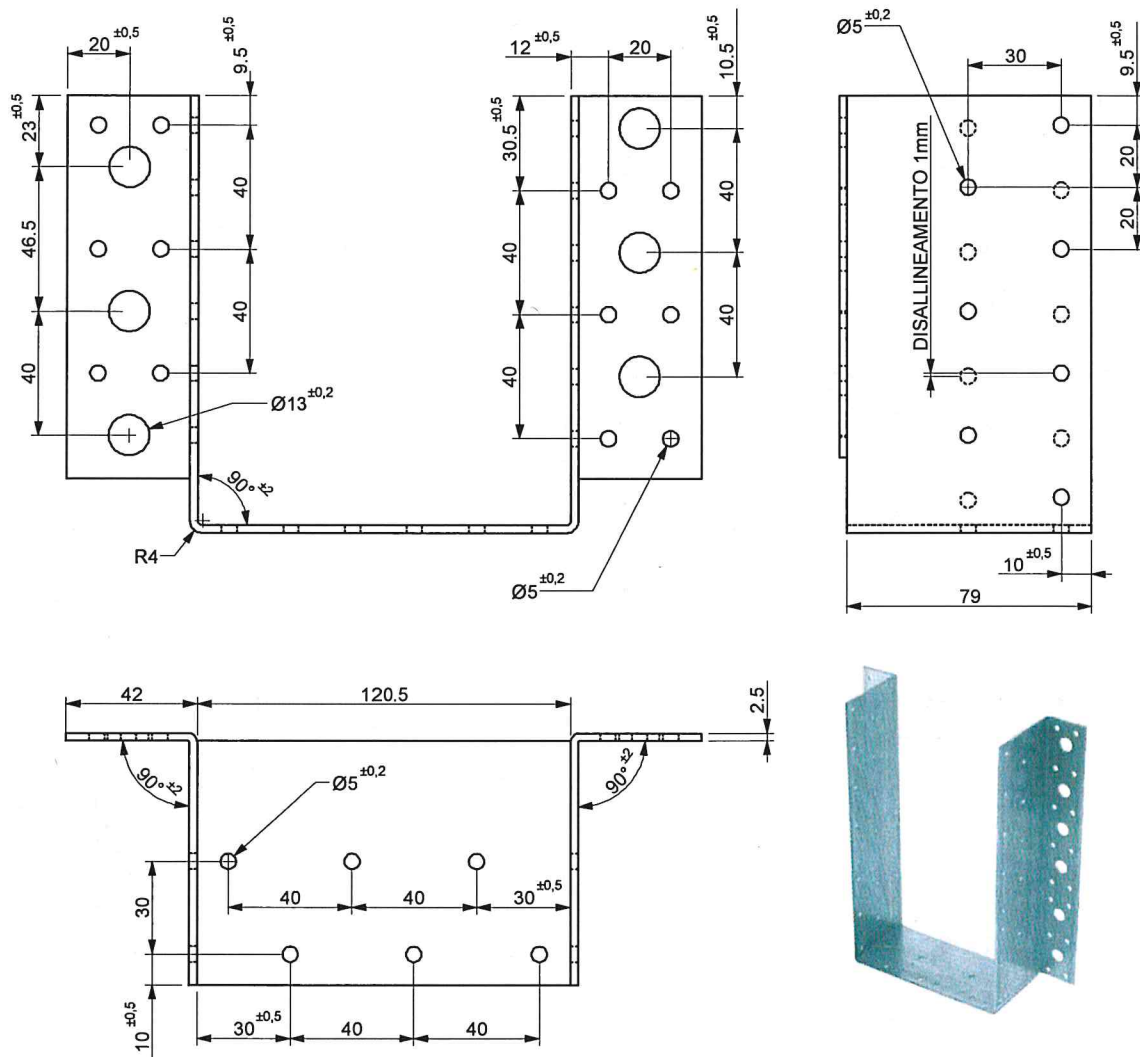


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1106

Annex A13
of ETA N° 19/0535

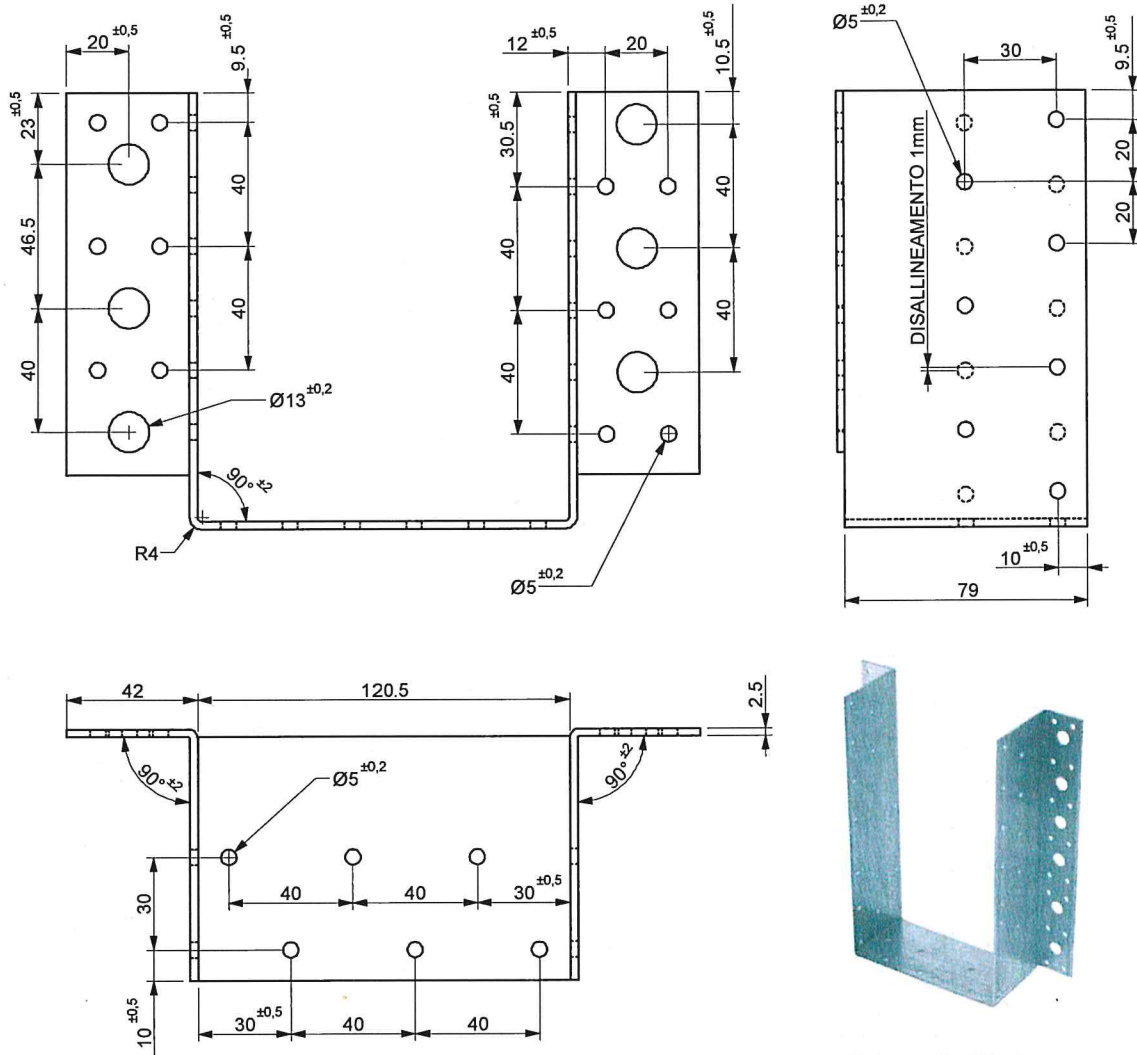


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1107

Annex A14
of ETA N° 19/0535

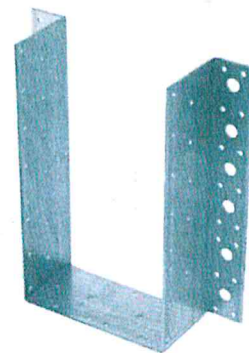
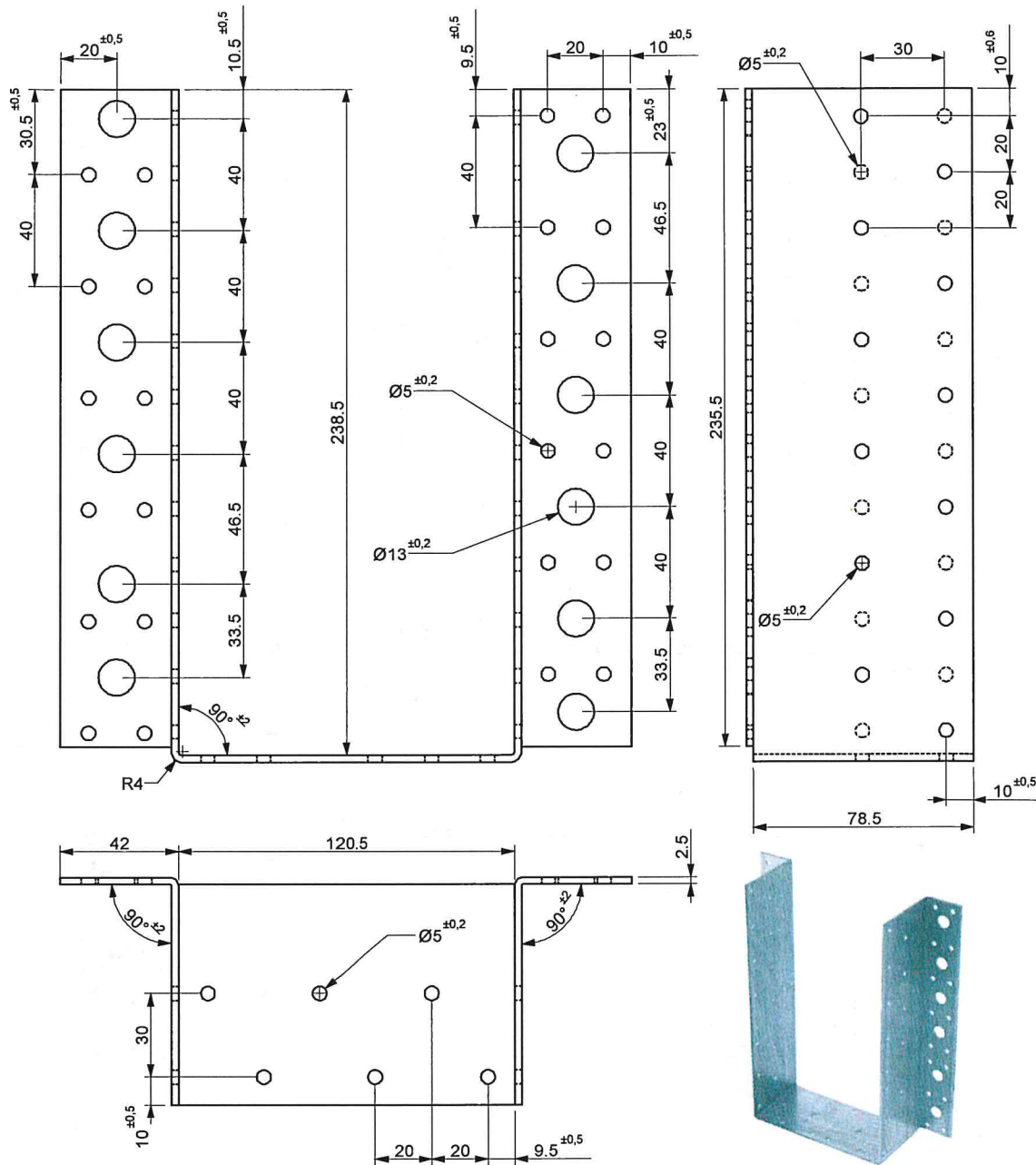


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1108

Annex A15
of ETA N° 19/0535

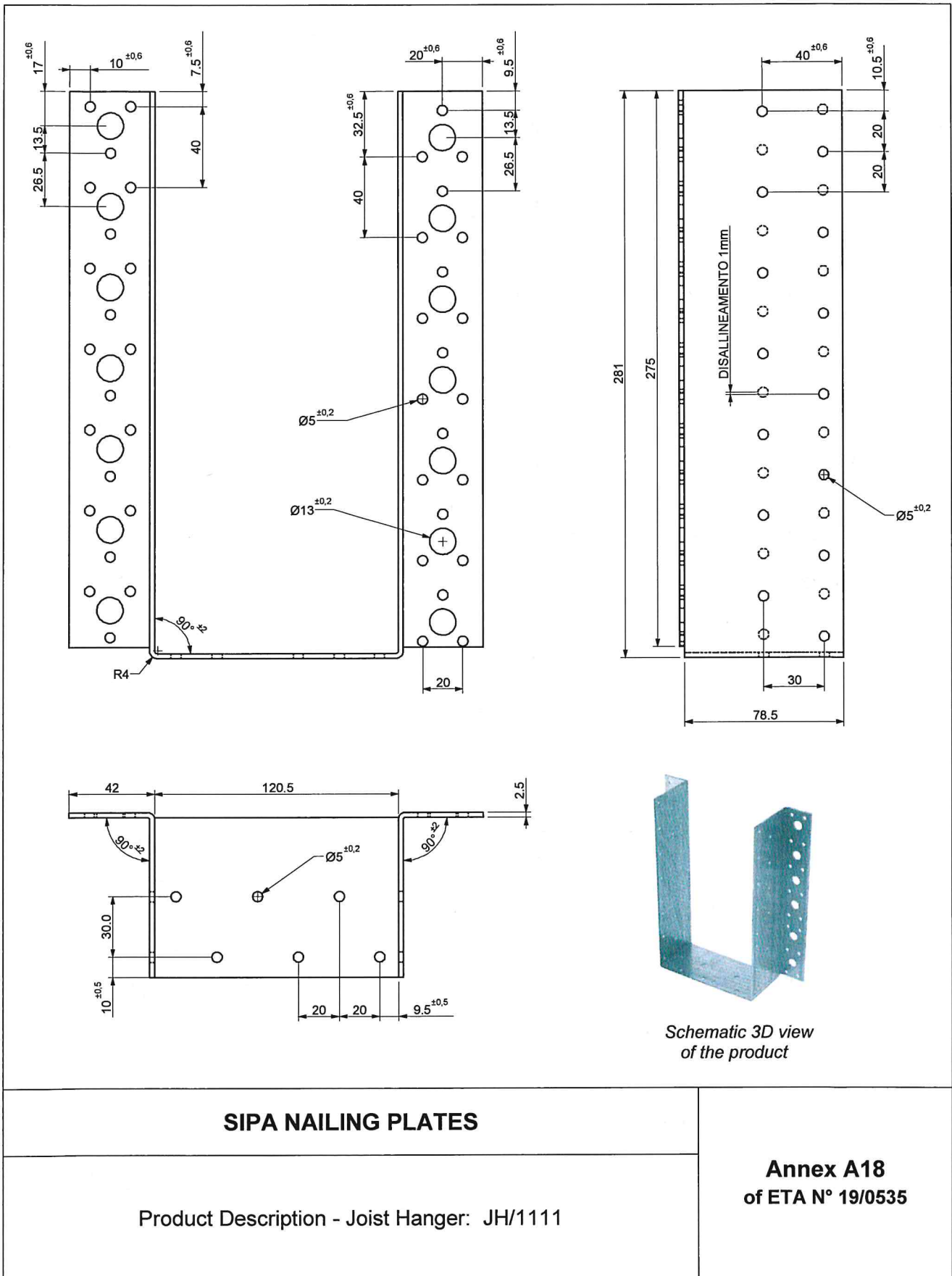


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1110

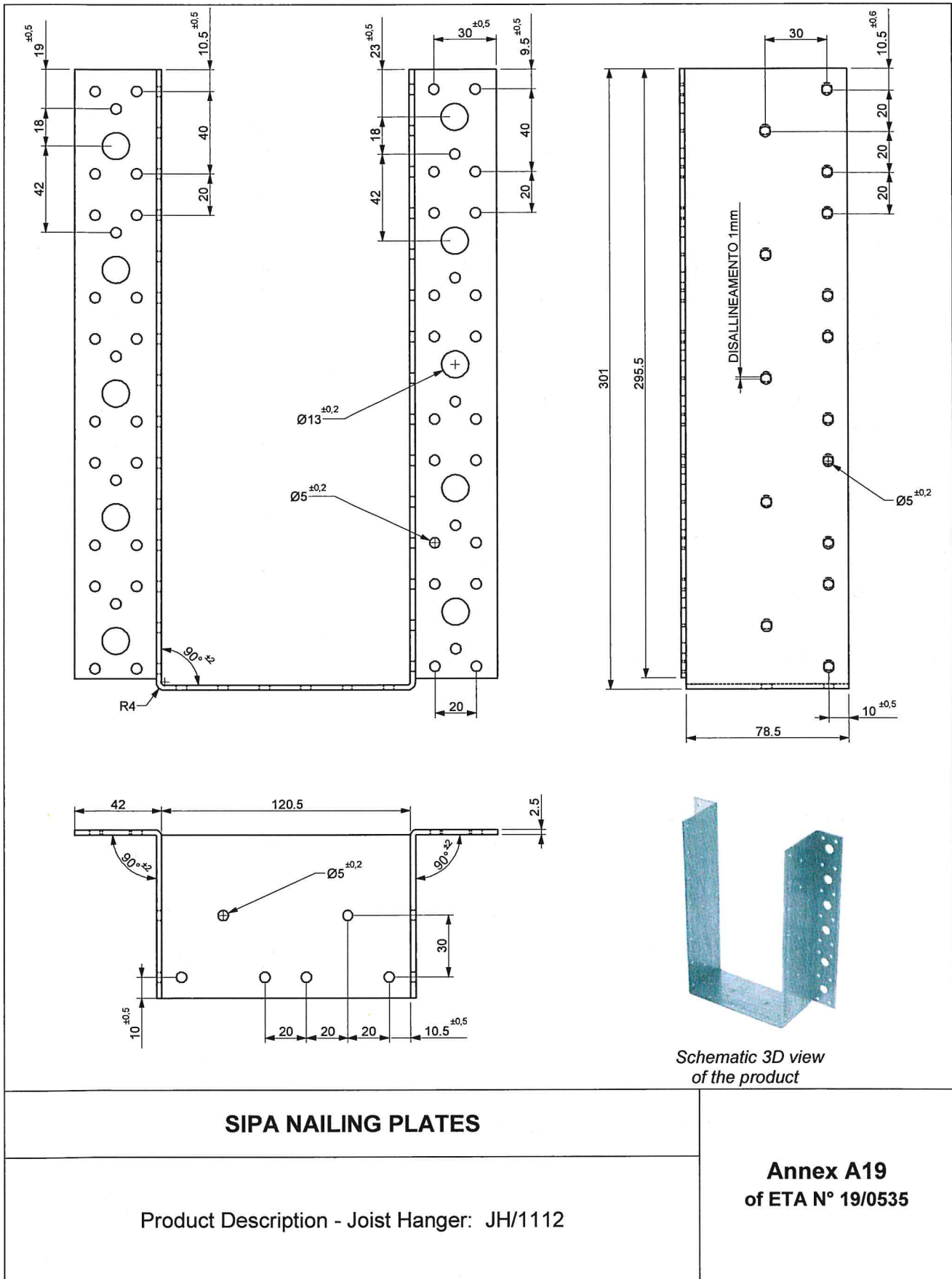
Annex A17
of ETA N° 19/0535



SIPA NAILING PLATES

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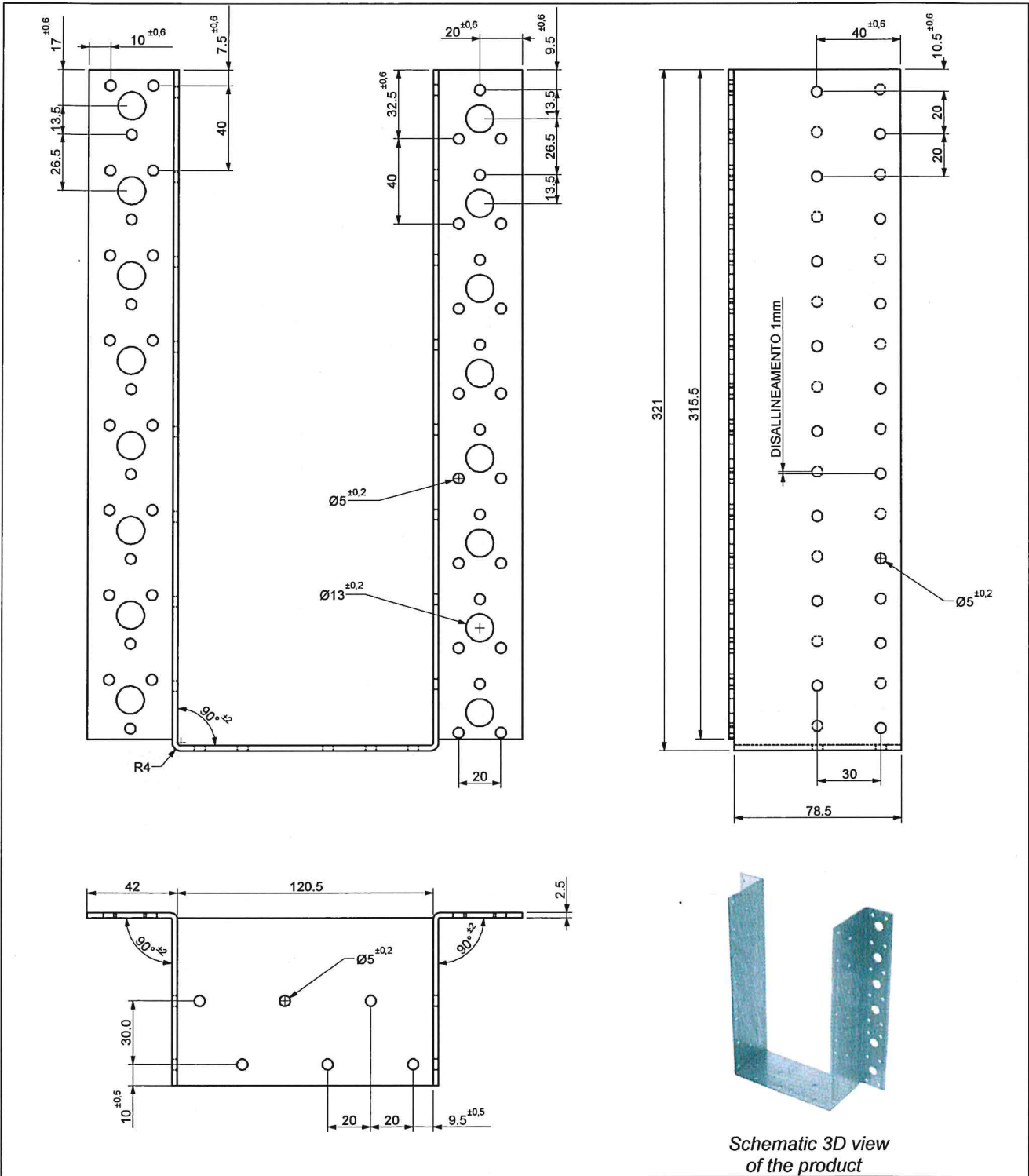
Annex A18
of ETA N° 19/0535



SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1112

Annex A19
of ETA N° 19/0535

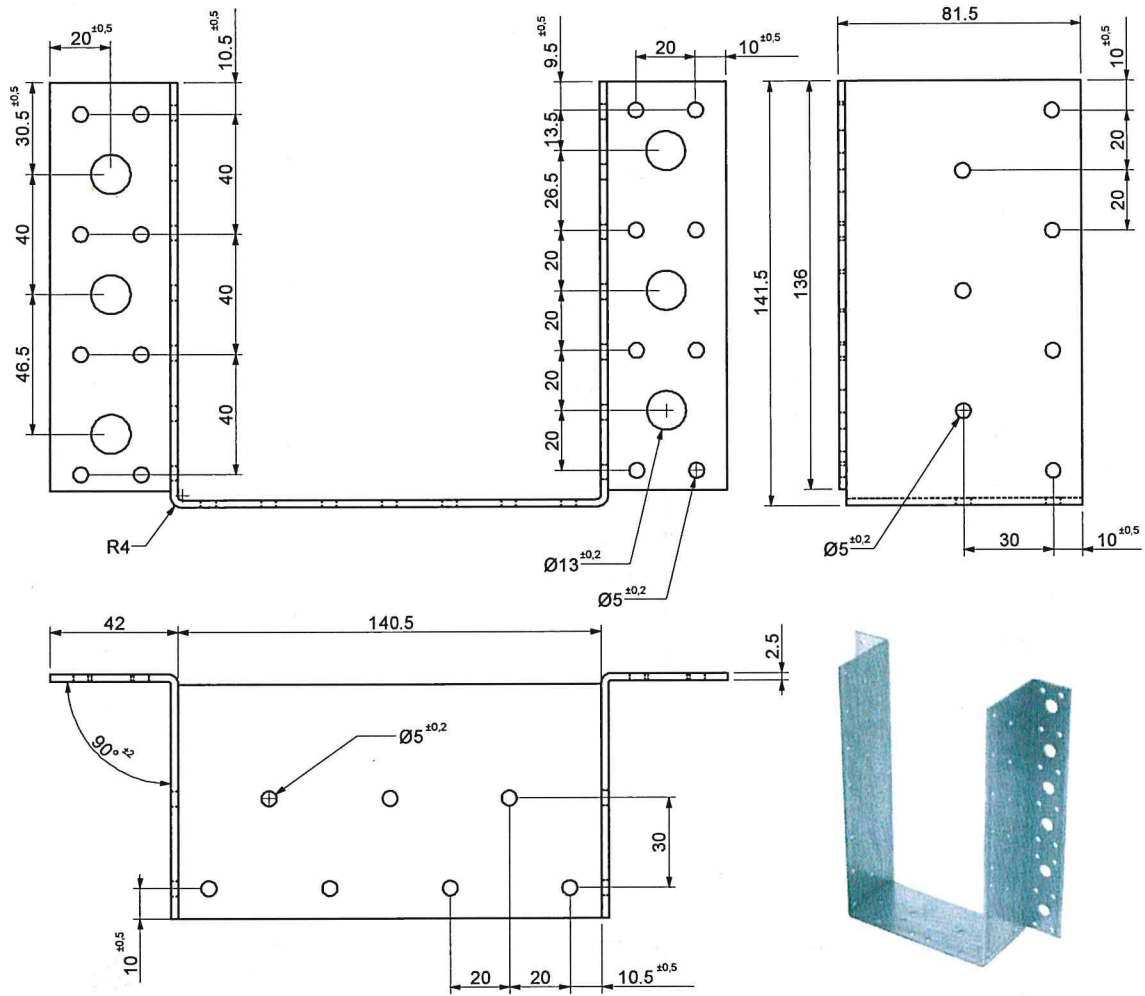


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1113

**Annex A20
of ETA N° 19/0535**

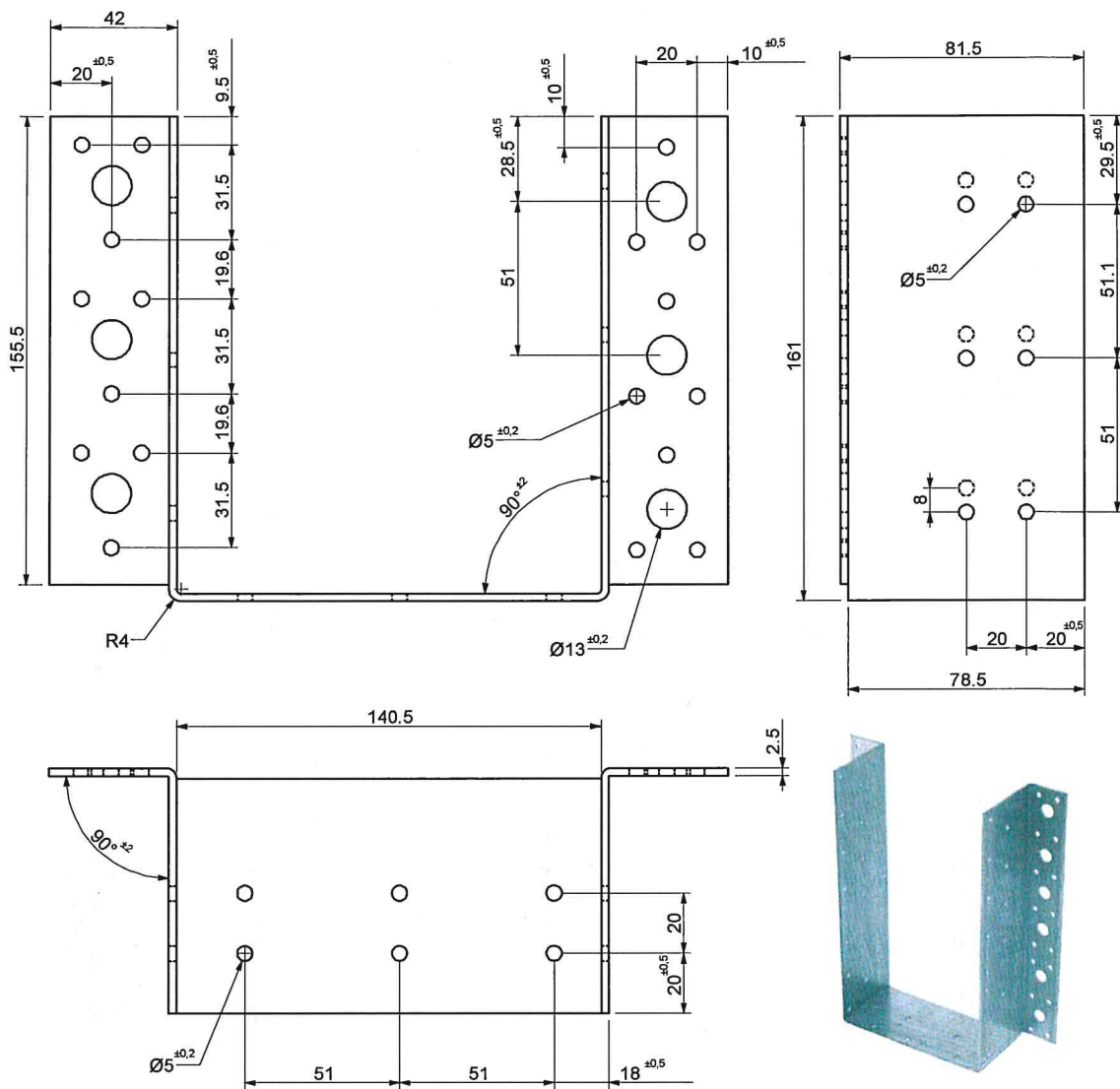


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1114

Annex A21
of ETA N° 19/0535

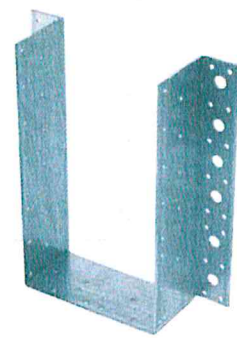
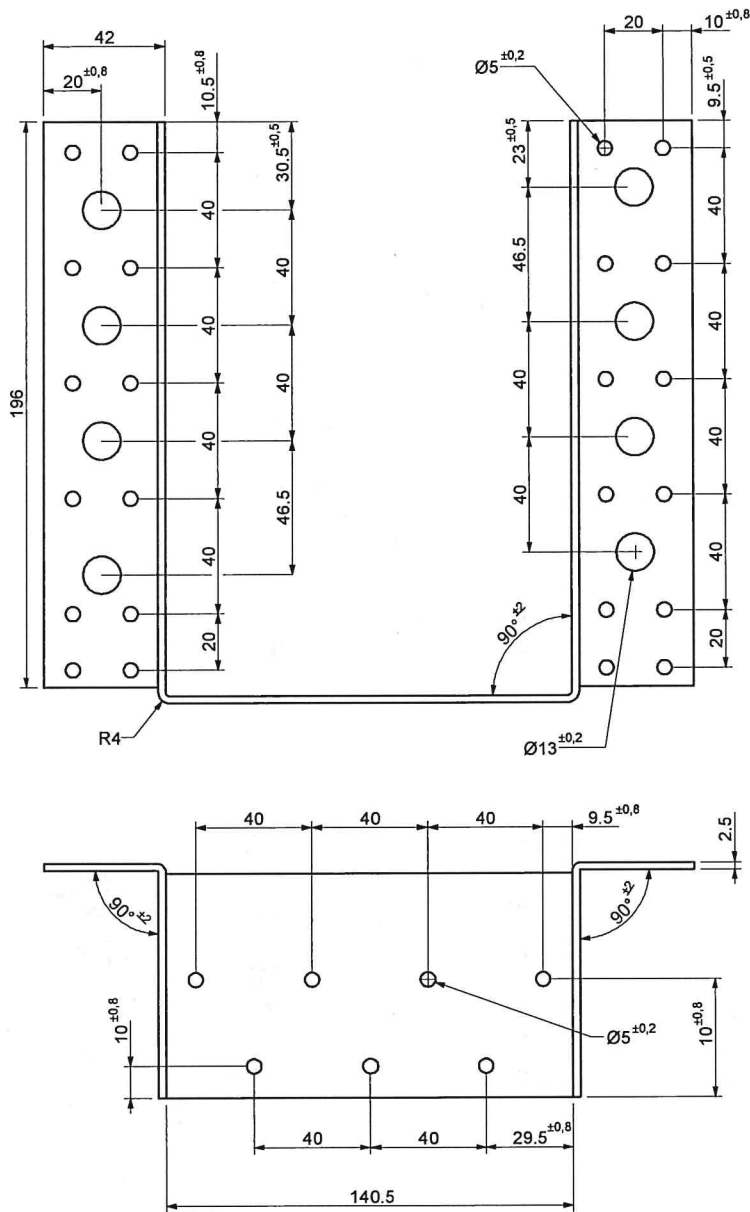


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1115

Annex A22
of ETA N° 19/0535

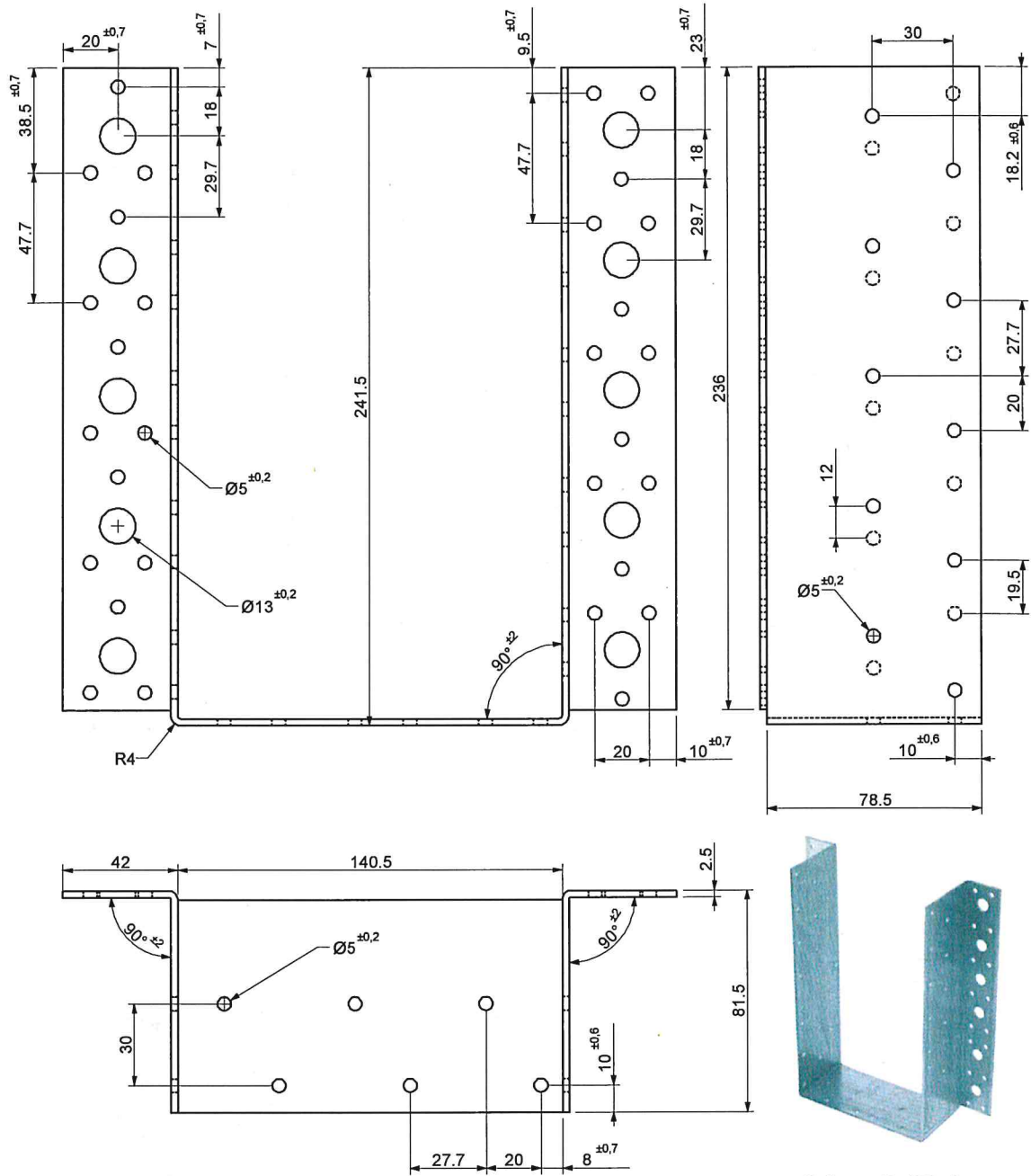


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1116

Annex A23
of ETA N° 19/0535

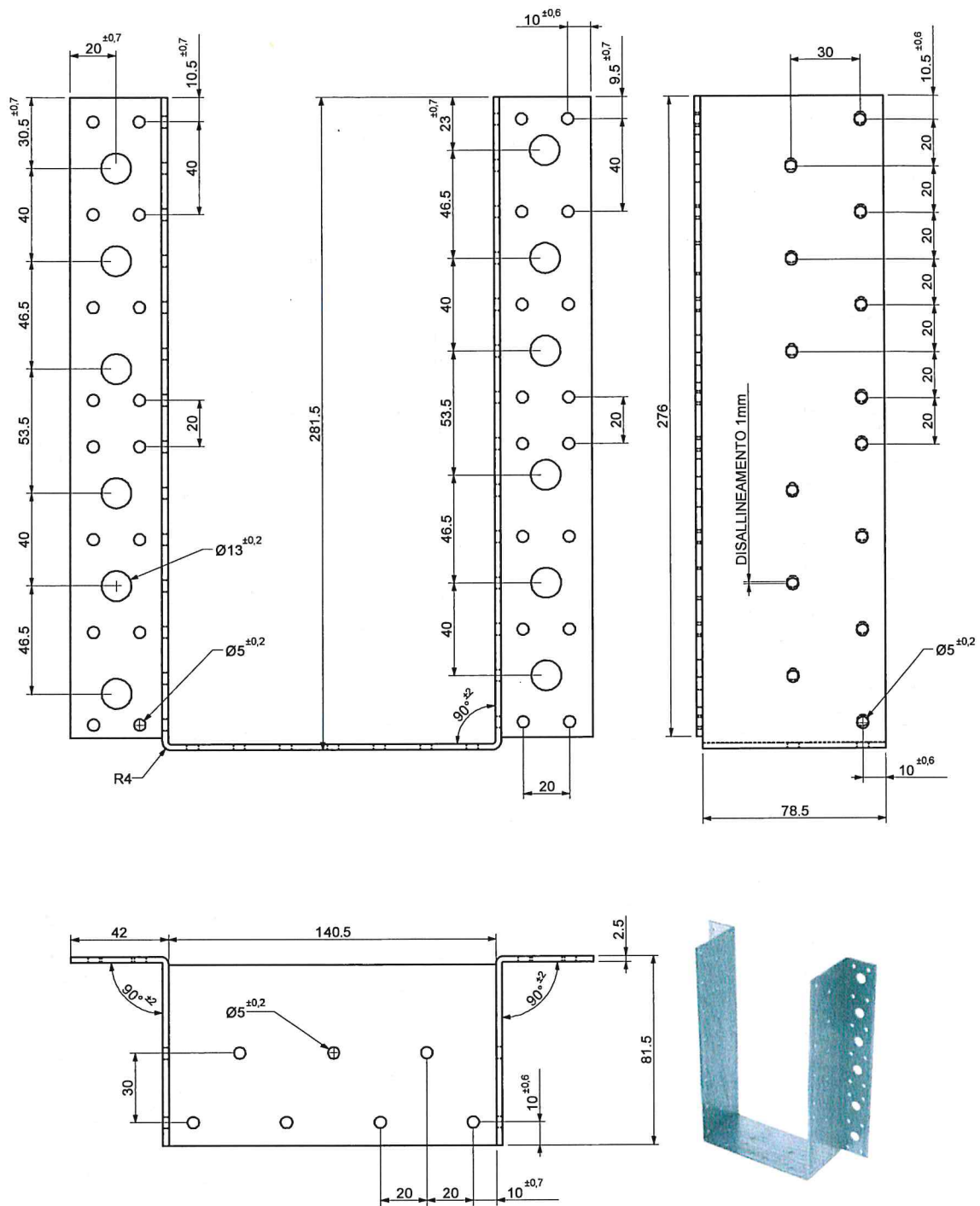


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1117

Annex A24
of ETA N° 19/0535

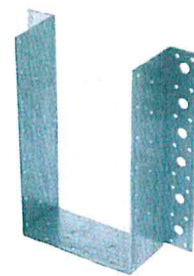
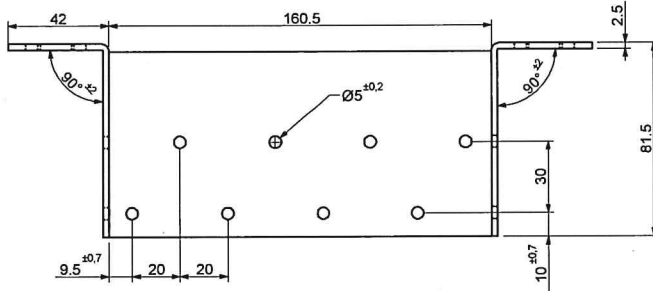
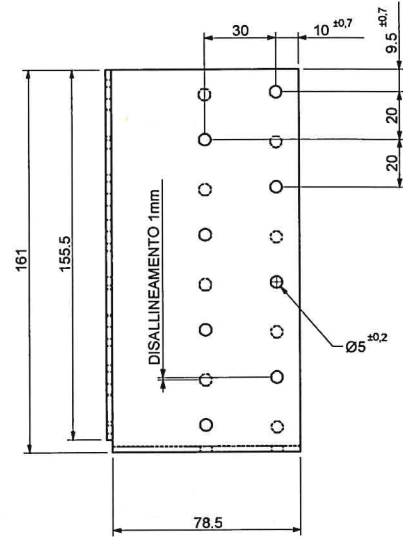
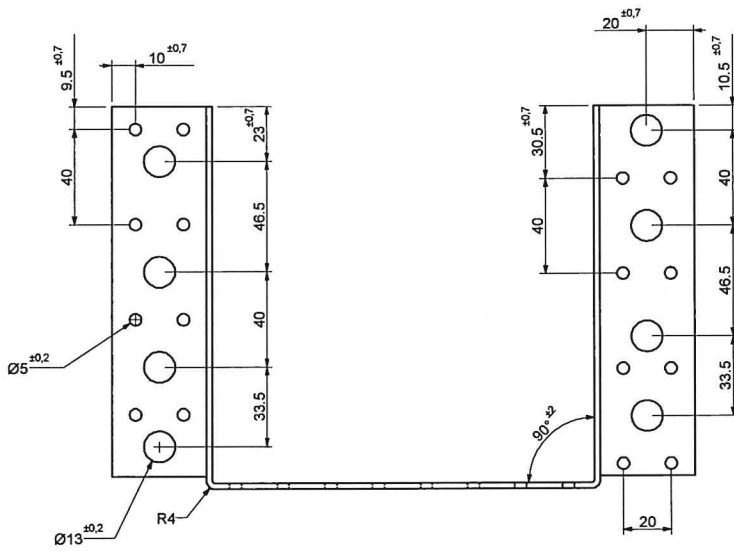


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1118

Annex A25
of ETA N° 19/0535

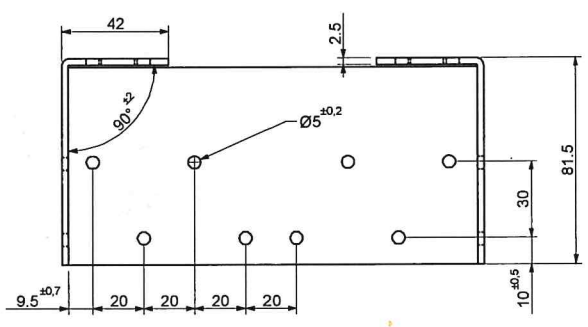
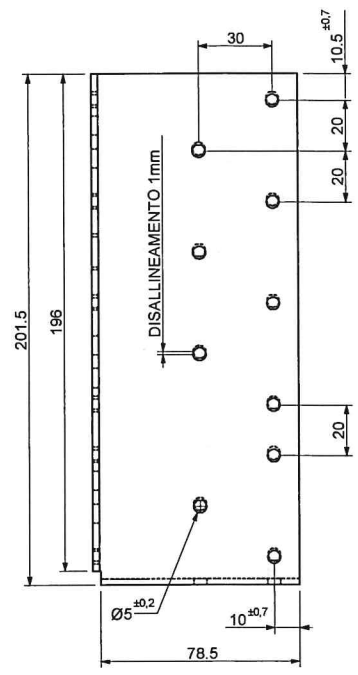
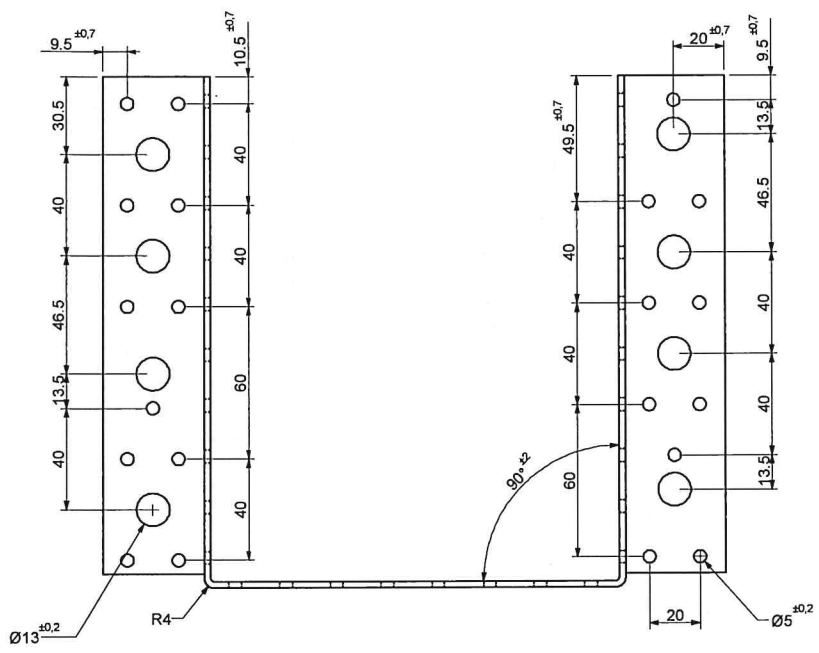


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1121

Annex A28
of ETA N° 19/0535

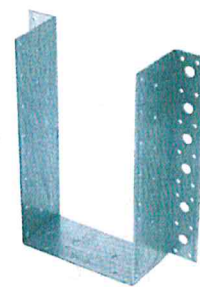
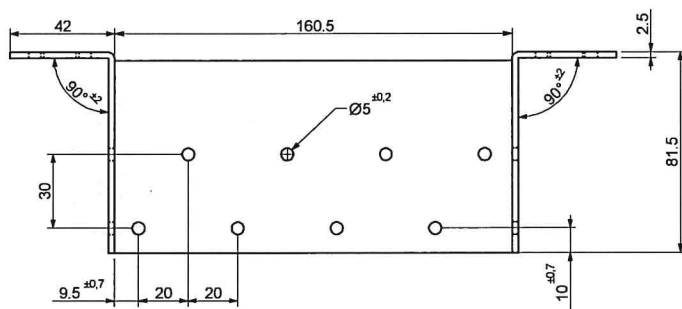
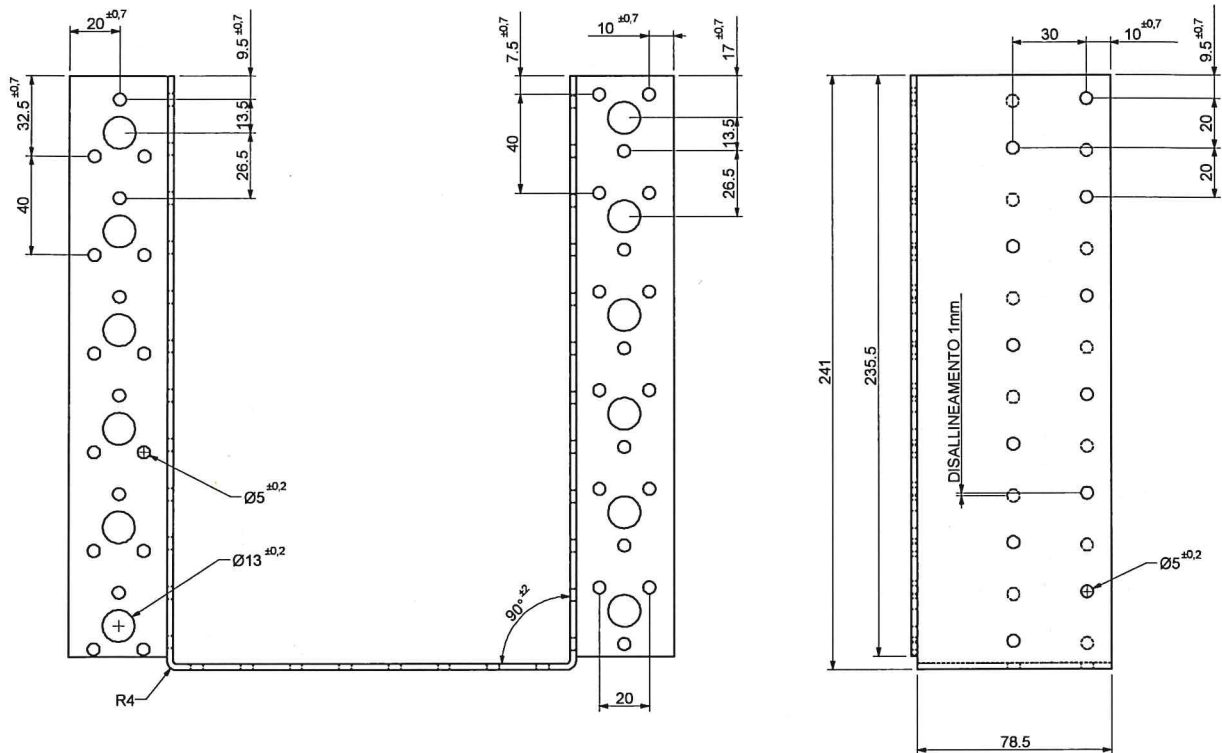


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1548

Annex A29
of ETA N° 19/0535

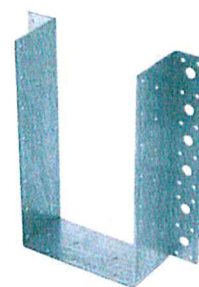
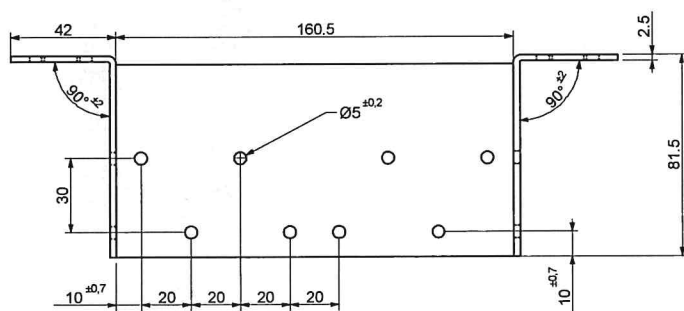
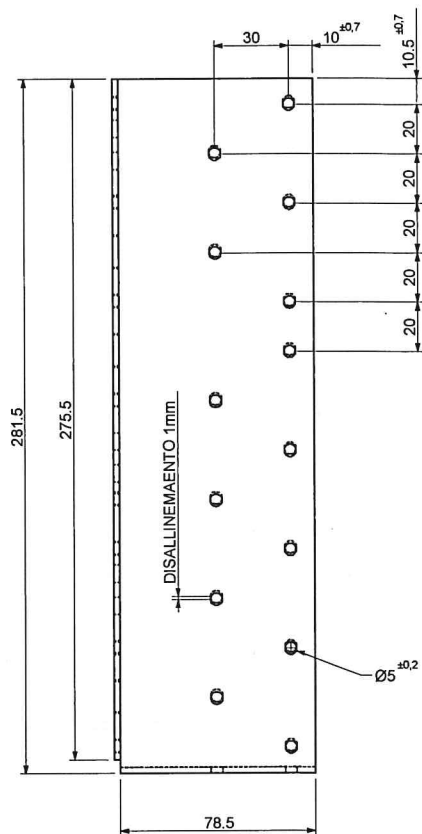
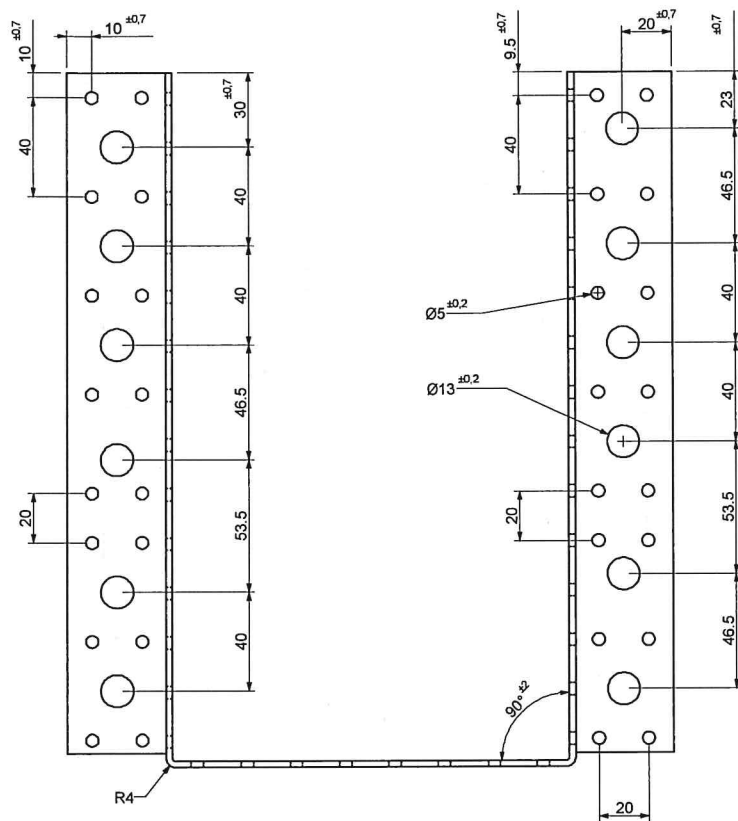


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1122

Annex A30
of ETA N° 19/0535

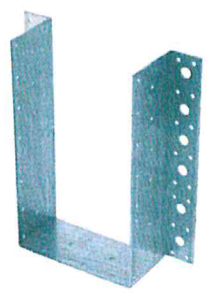
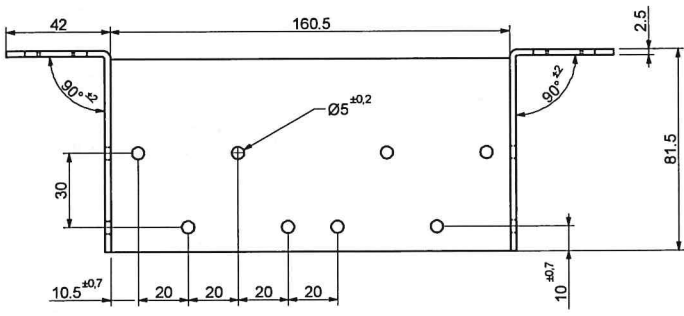
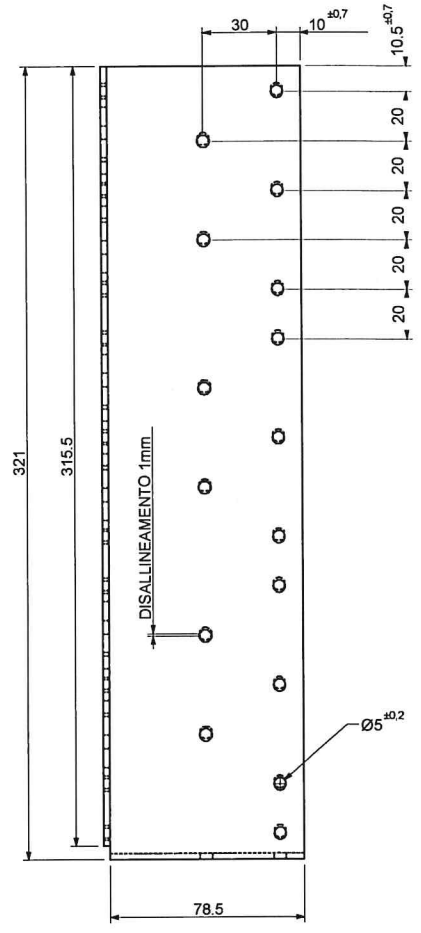
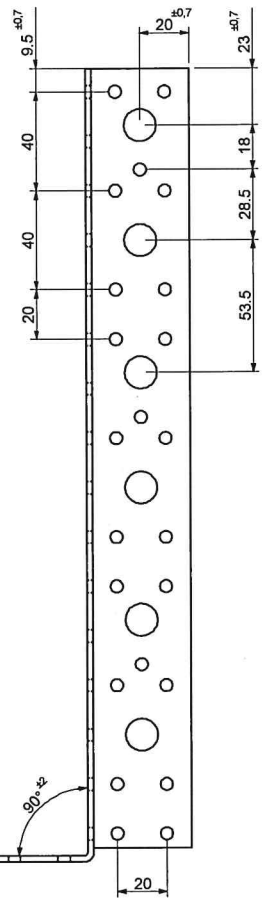
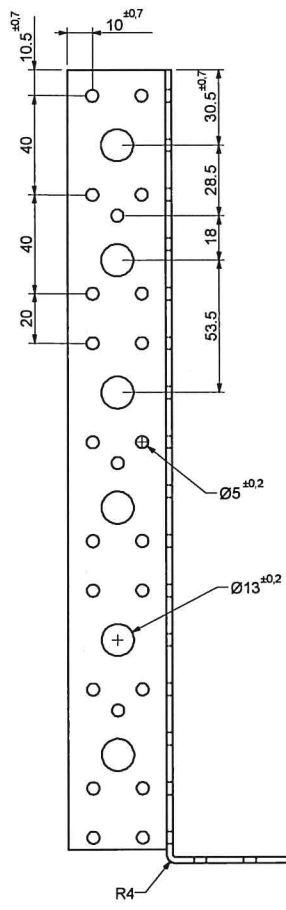


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1123

Annex A31
of ETA N° 19/0535

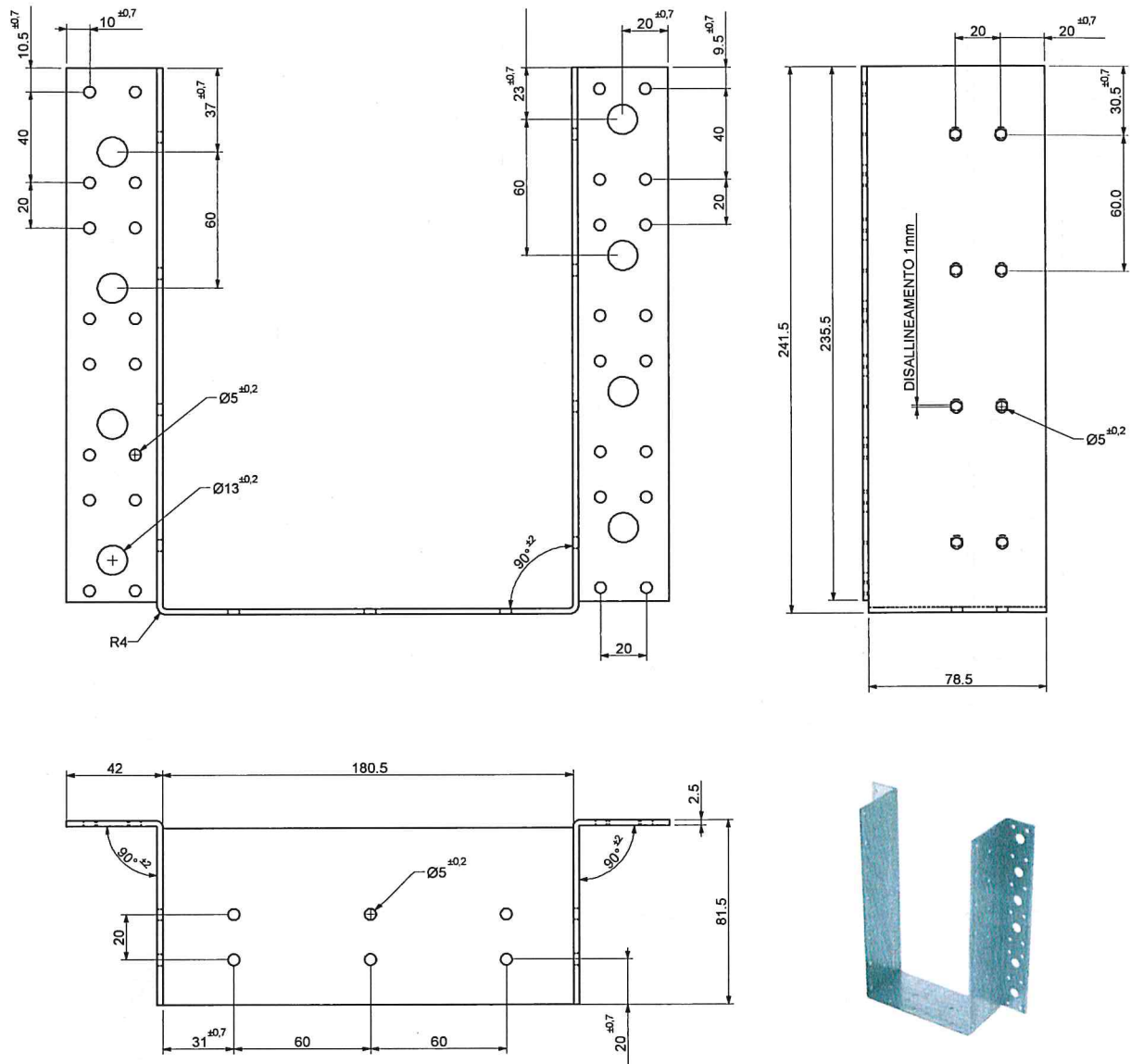


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1124

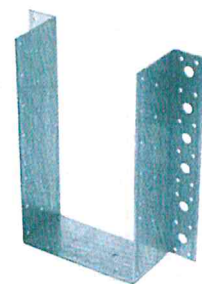
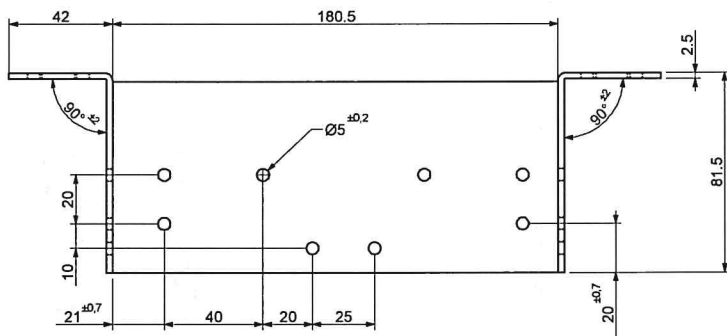
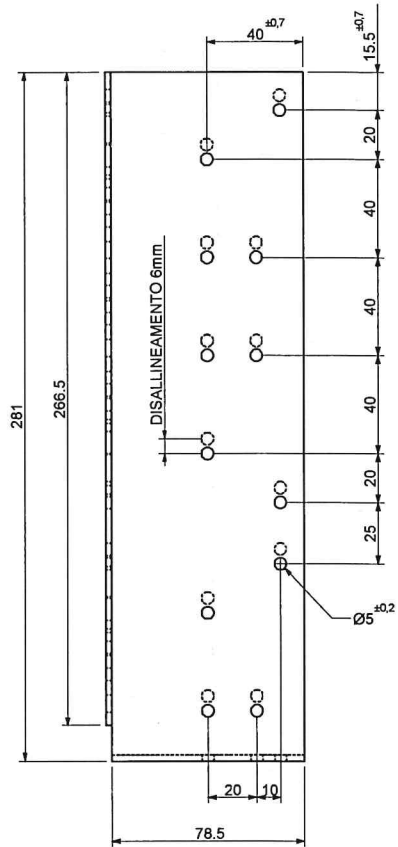
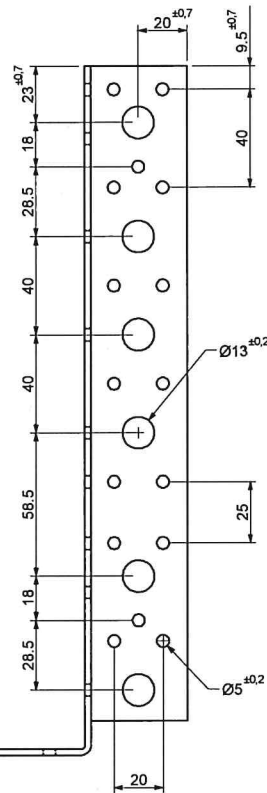
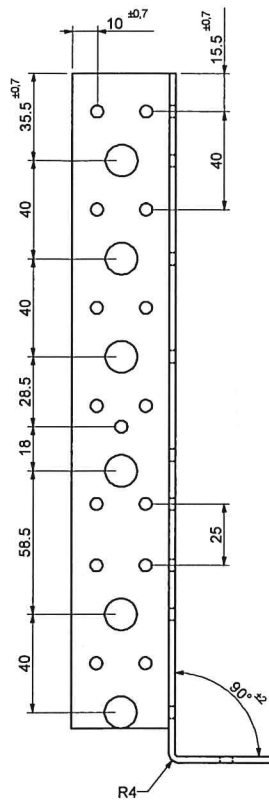
Annex A32
of ETA N° 19/0535



SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1125

Annex A33
of ETA N° 19/0535

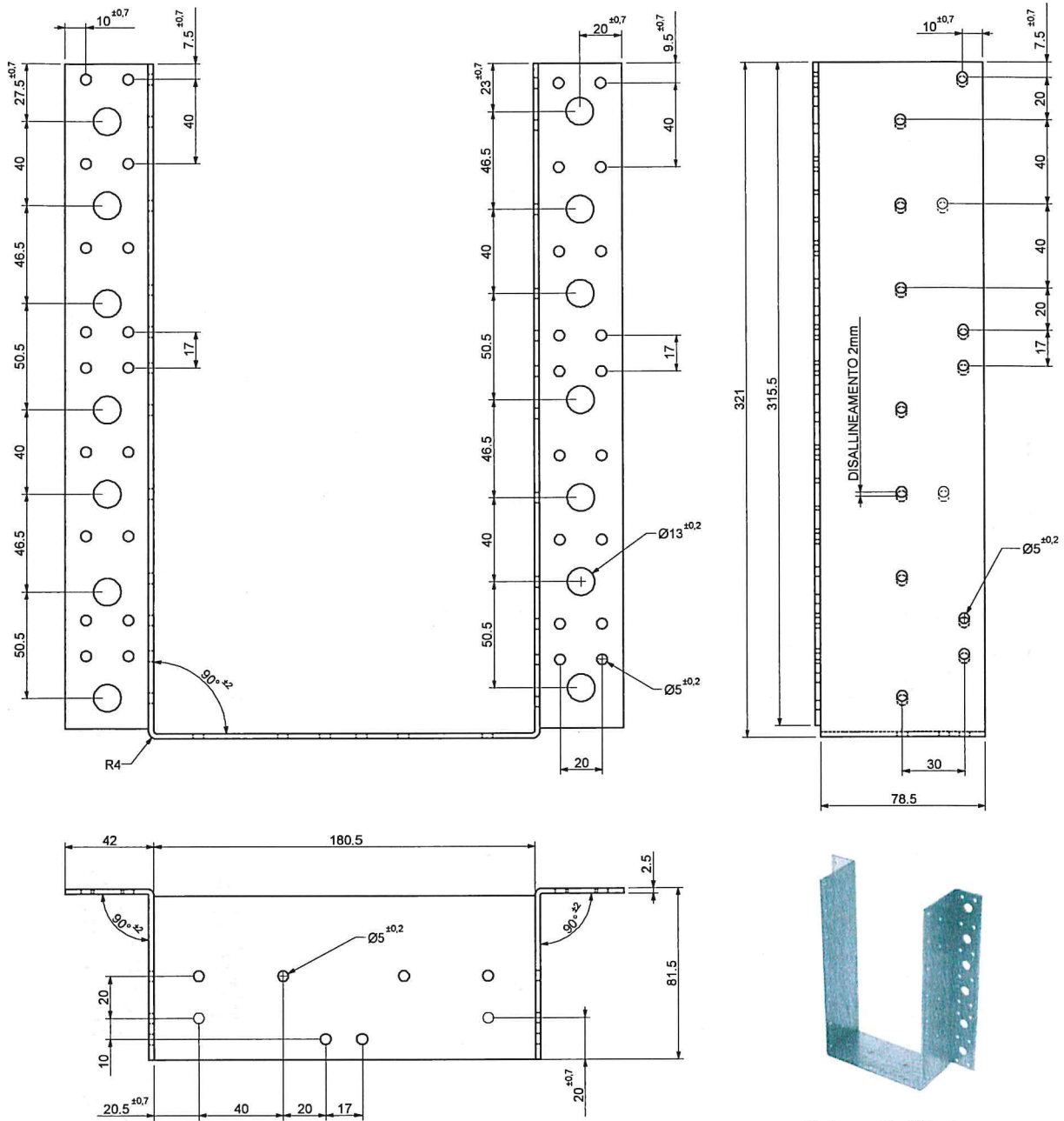


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1126

Annex A34
of ETA N° 19/0535

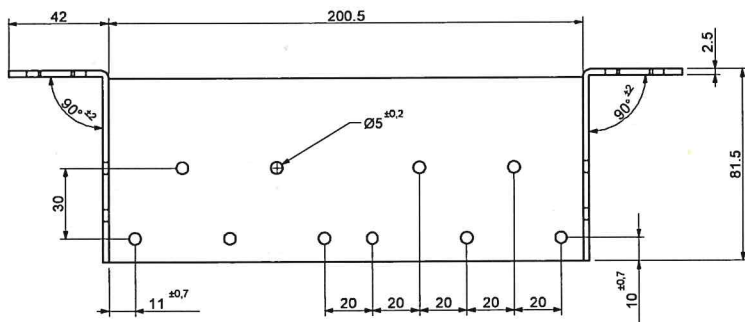
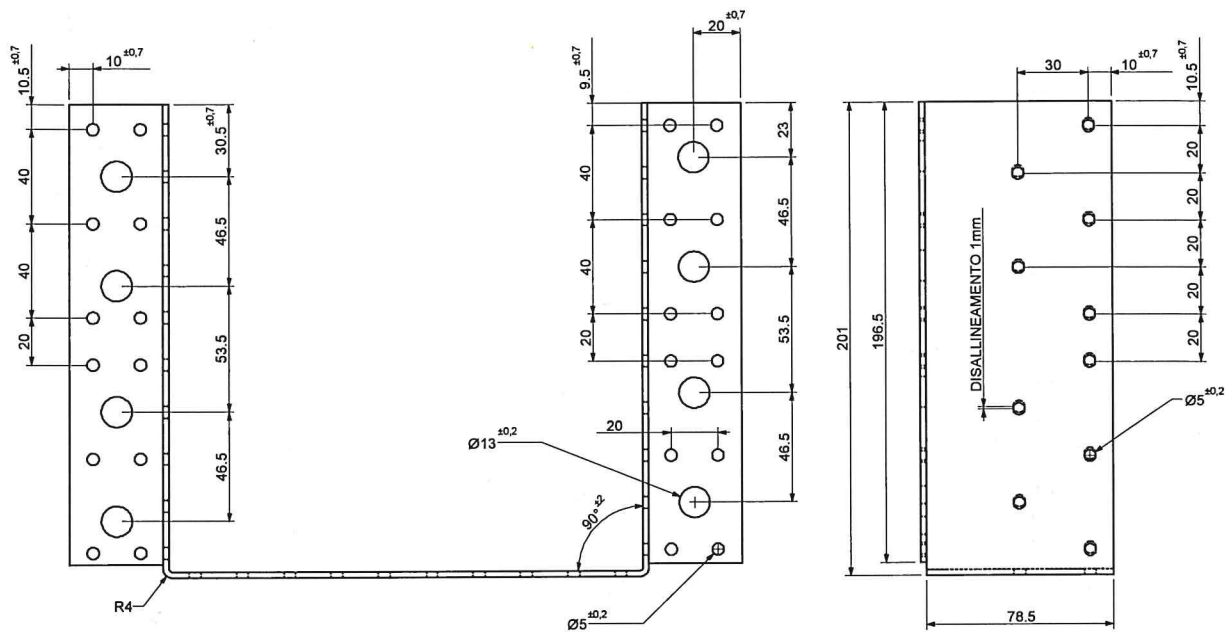


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1127

Annex A35
of ETA N° 19/0535

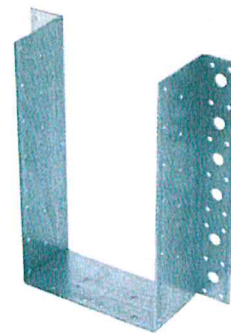
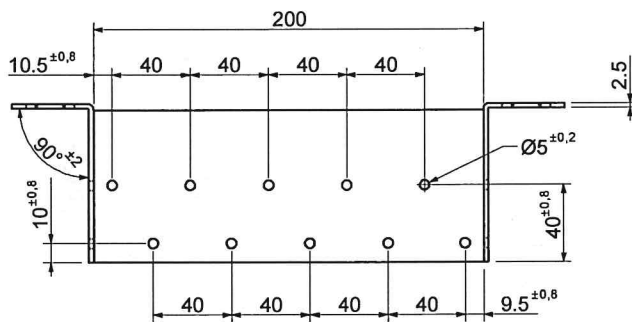
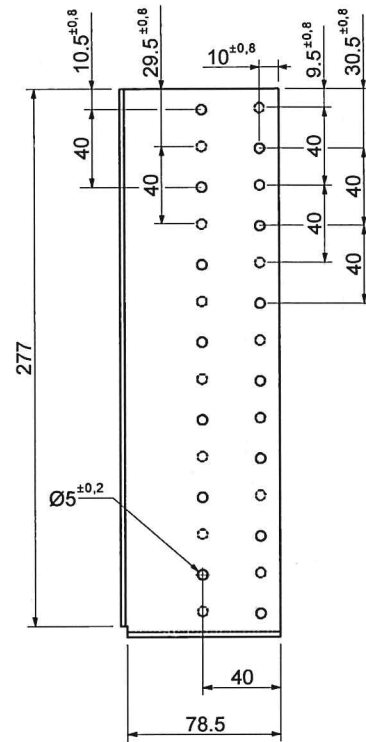
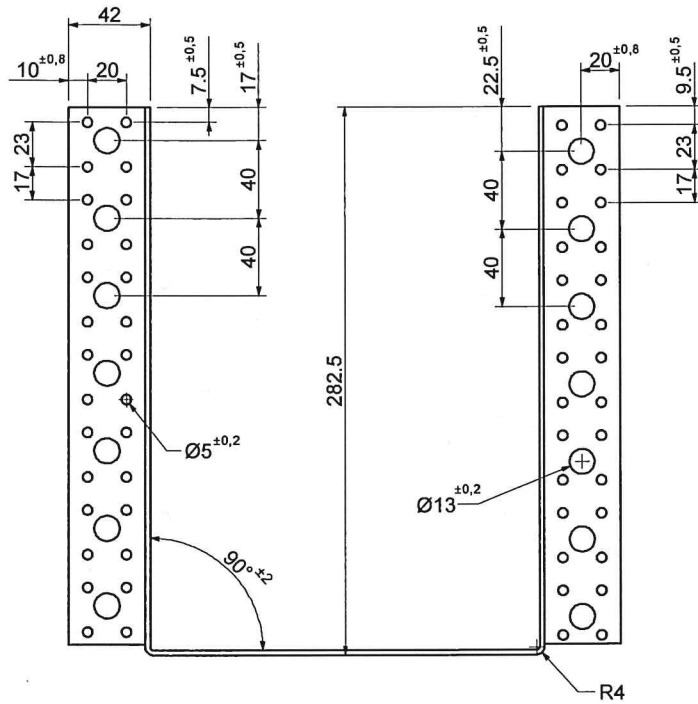


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1128

**Annex A36
of ETA N° 19/0535**

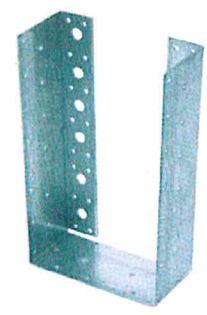
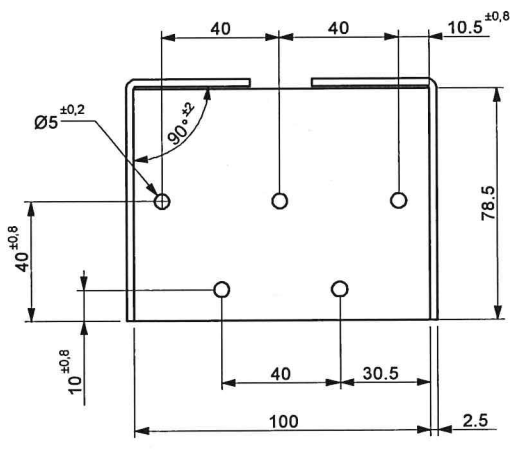
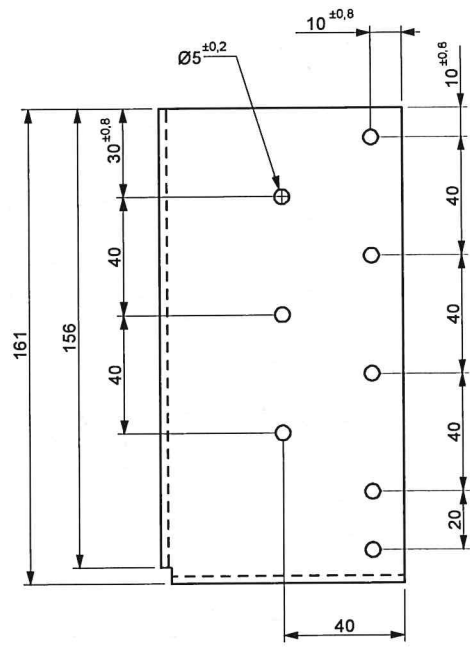
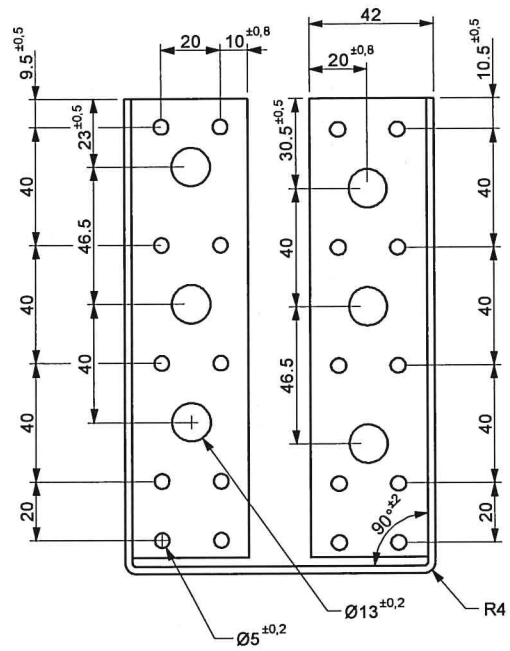


Schematic 3D view
of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1129

Annex A37
of ETA N° 19/0535

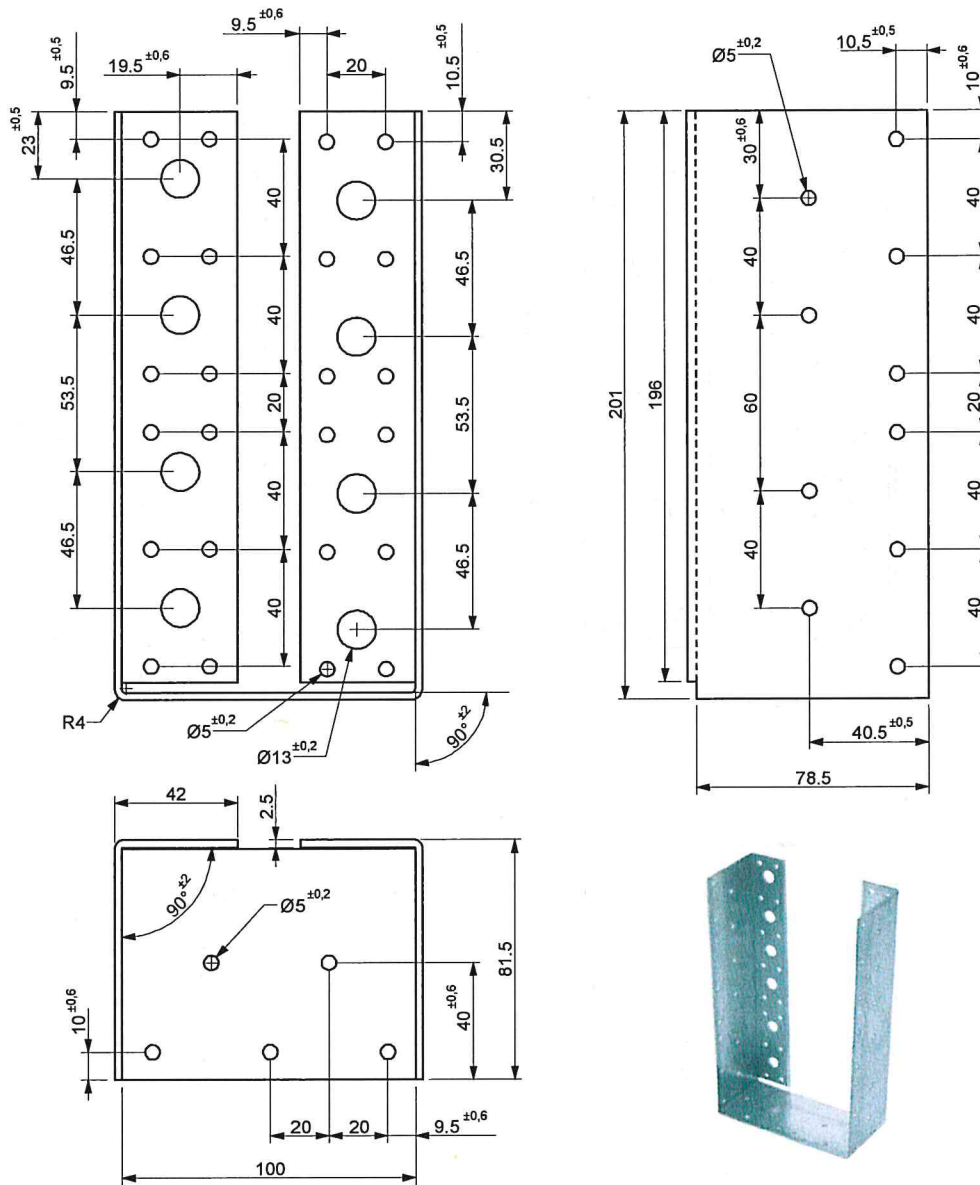


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1140

Annex A38
of ETA N° 19/0535

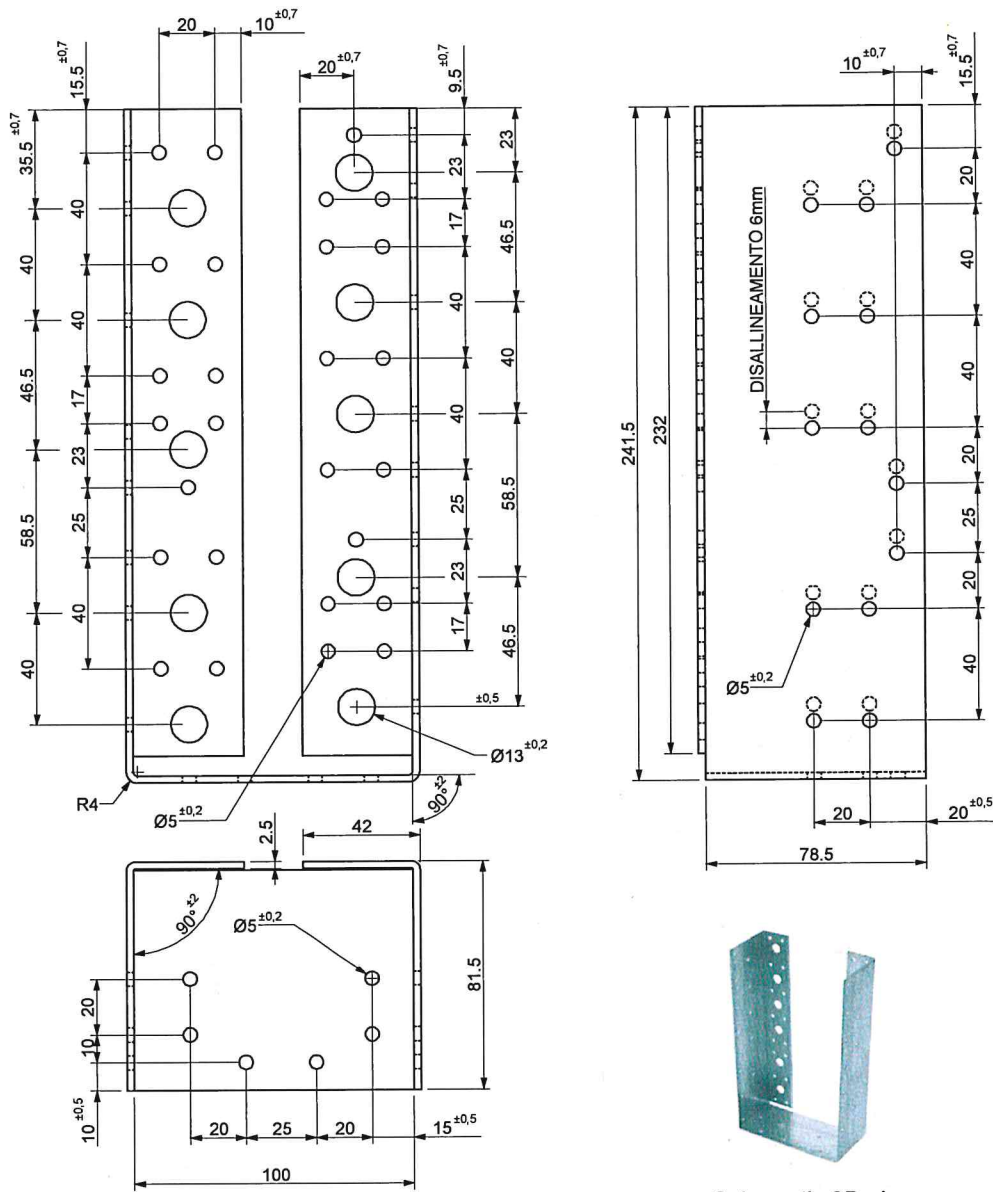


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1141

Annex A39
of ETA N° 19/0535

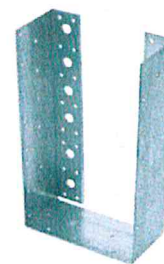
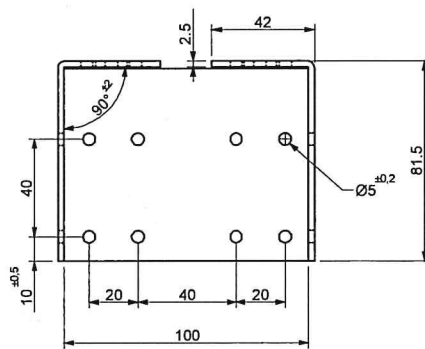
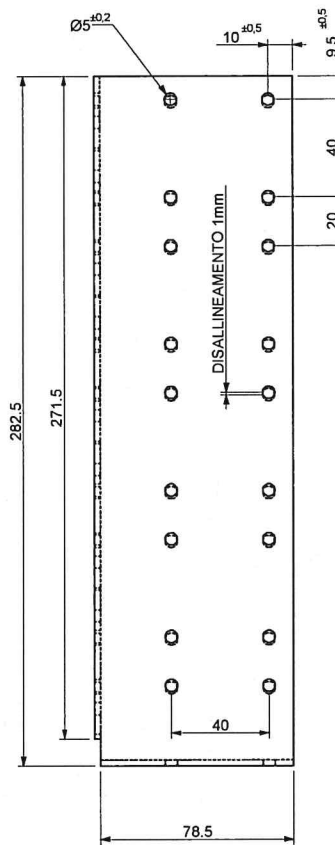
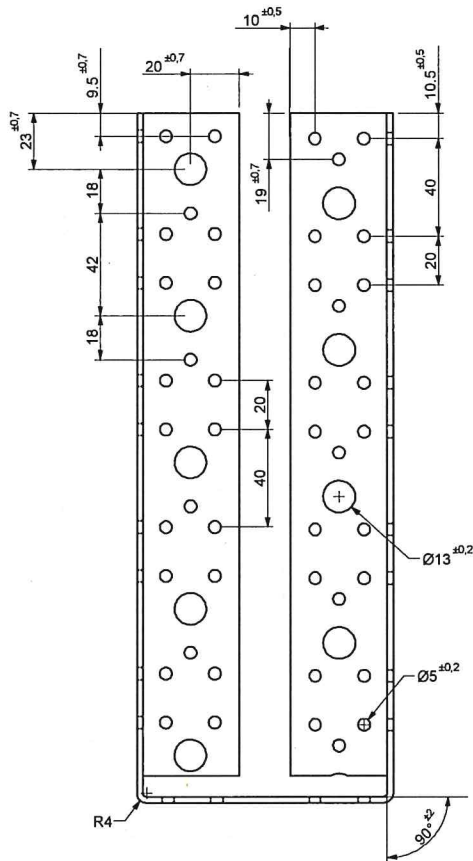


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1142

Annex A40
of ETA N° 19/0535

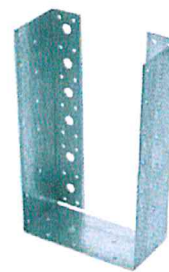
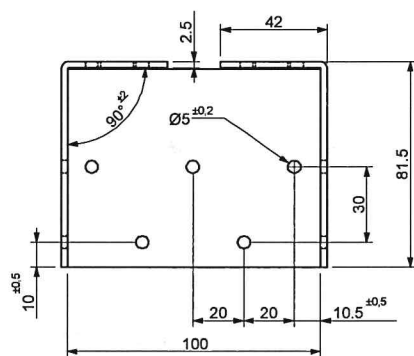
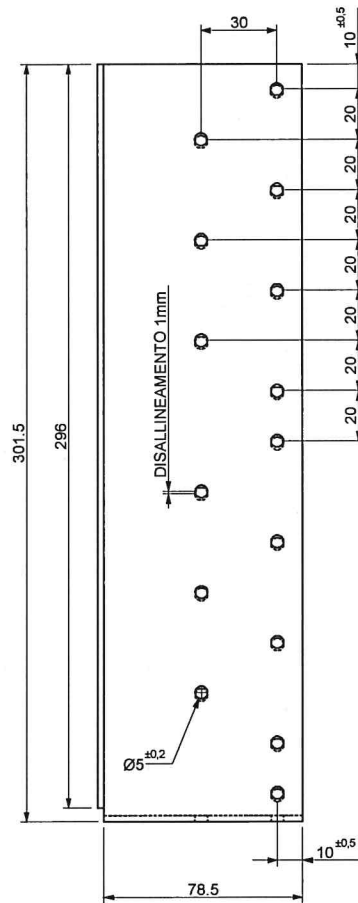
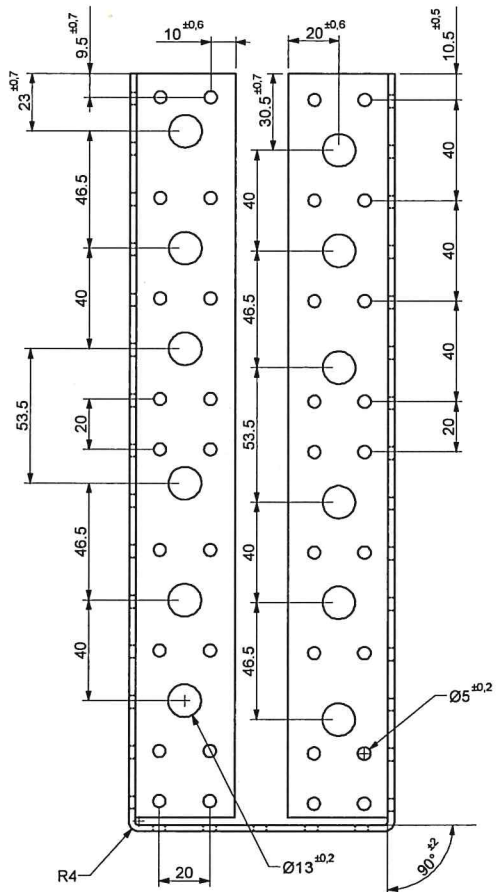


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1143

Annex A41
of ETA N° 19/0535

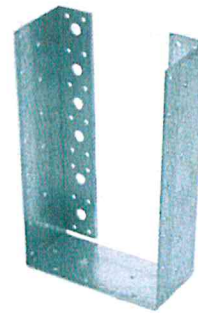
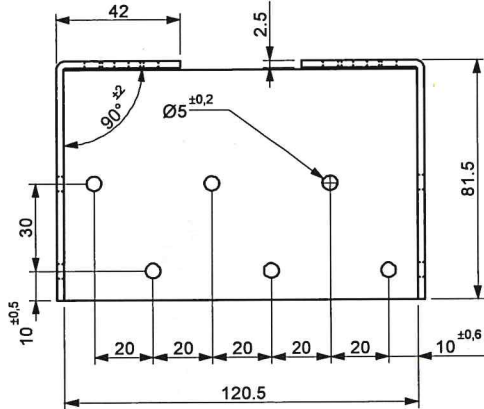
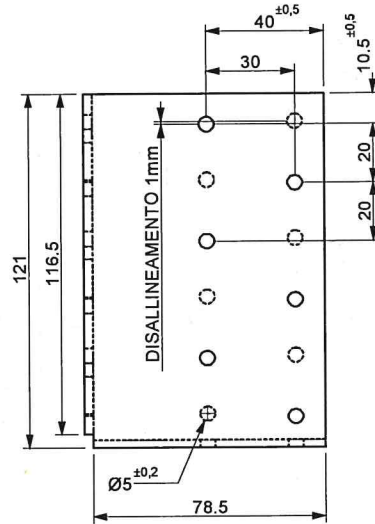
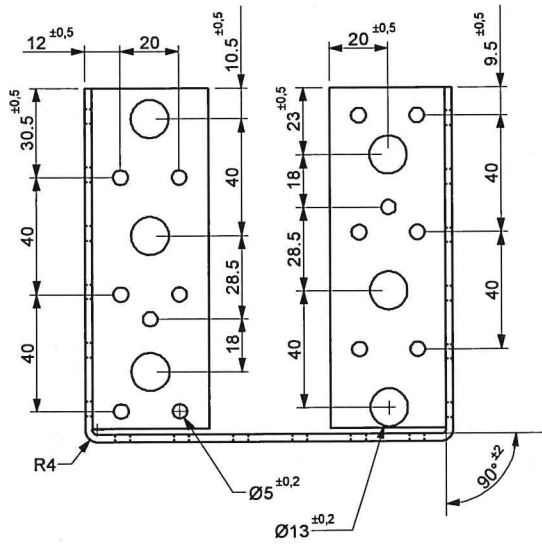


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1144

**Annex A42
of ETA N° 19/0535**

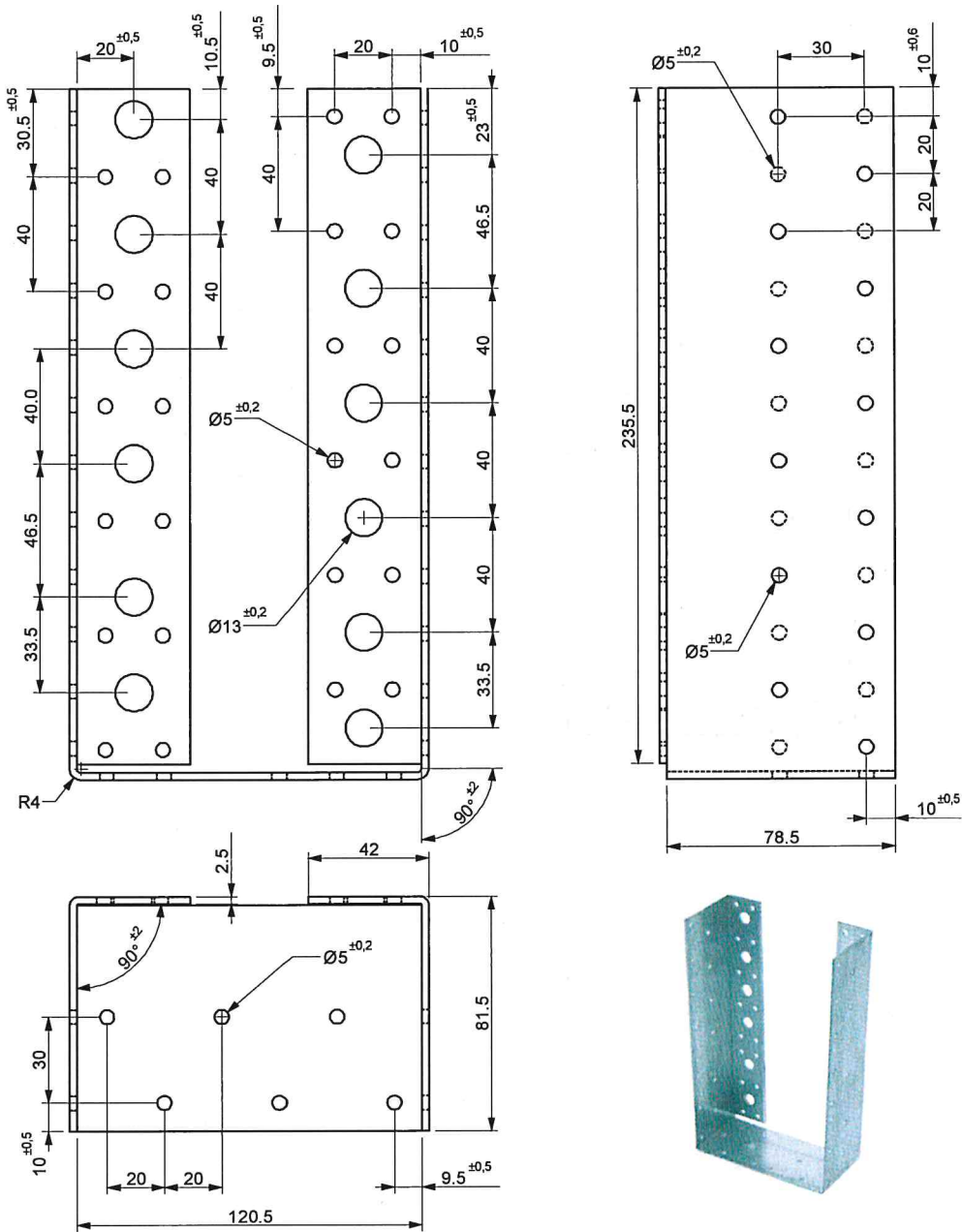


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1146

Annex A44
of ETA N° 19/0535

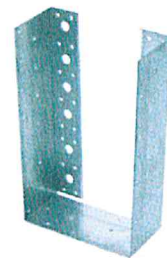
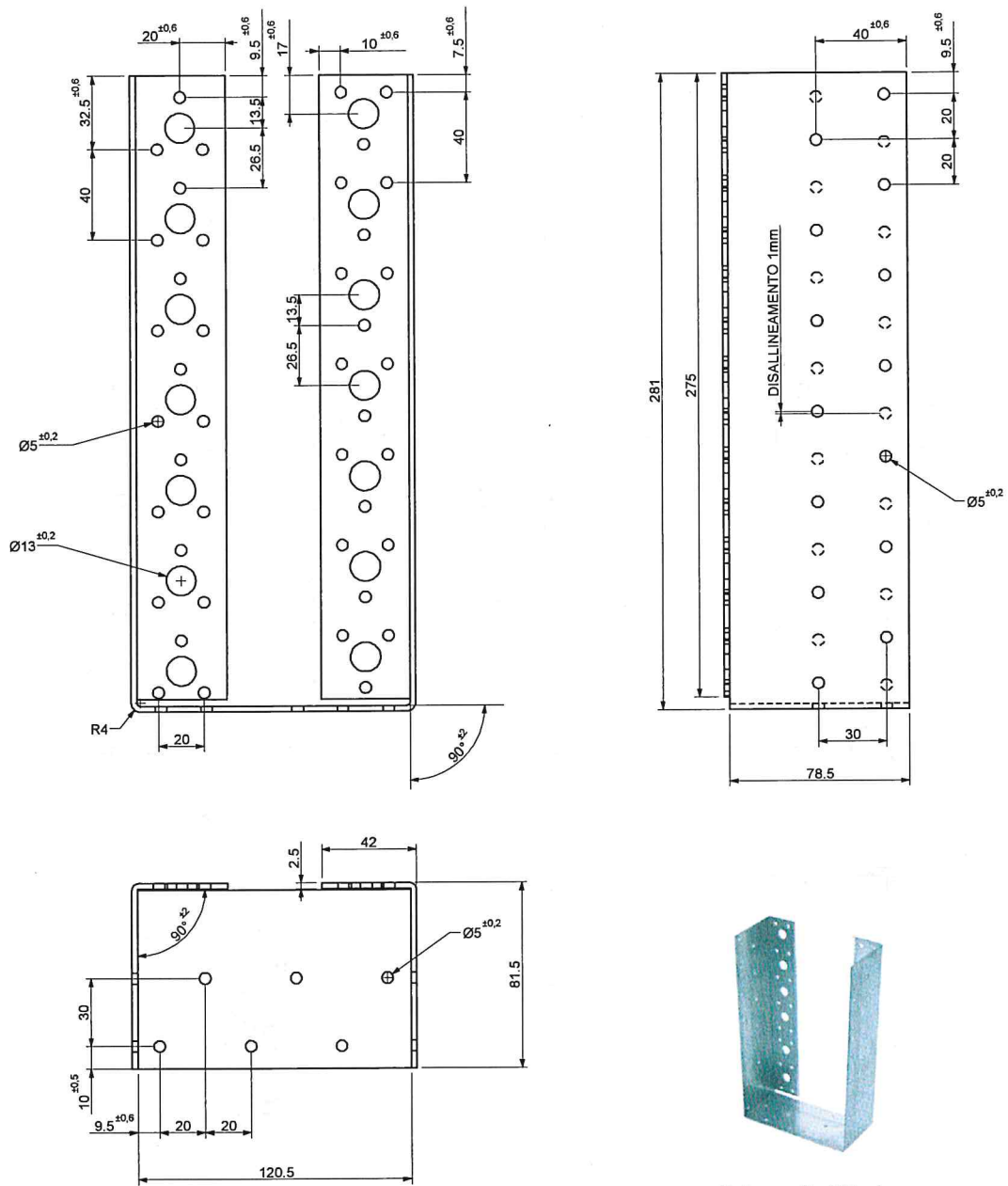


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1150

**Annex A48
of ETA N° 19/0535**

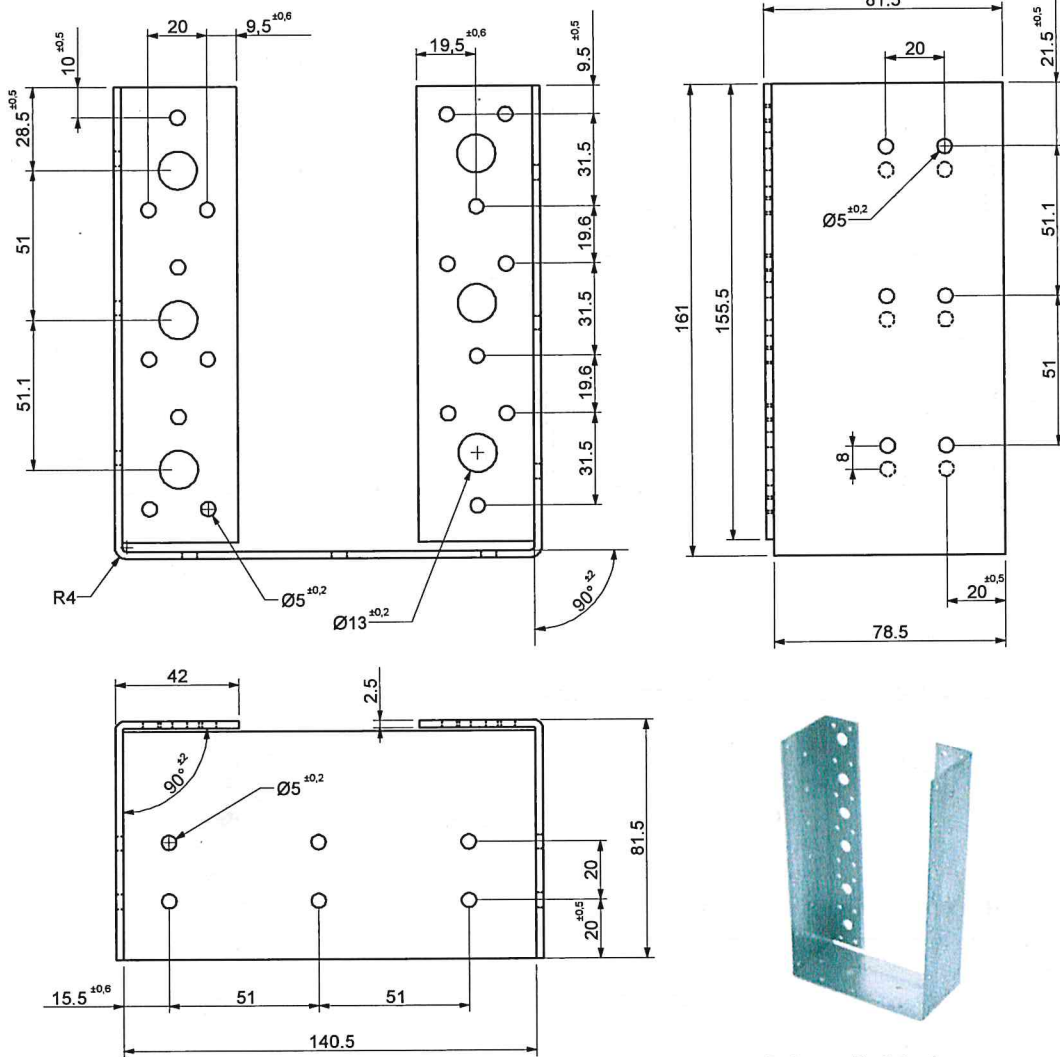


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1151

Annex A49
of ETA N° 19/0535

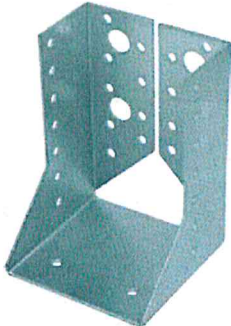
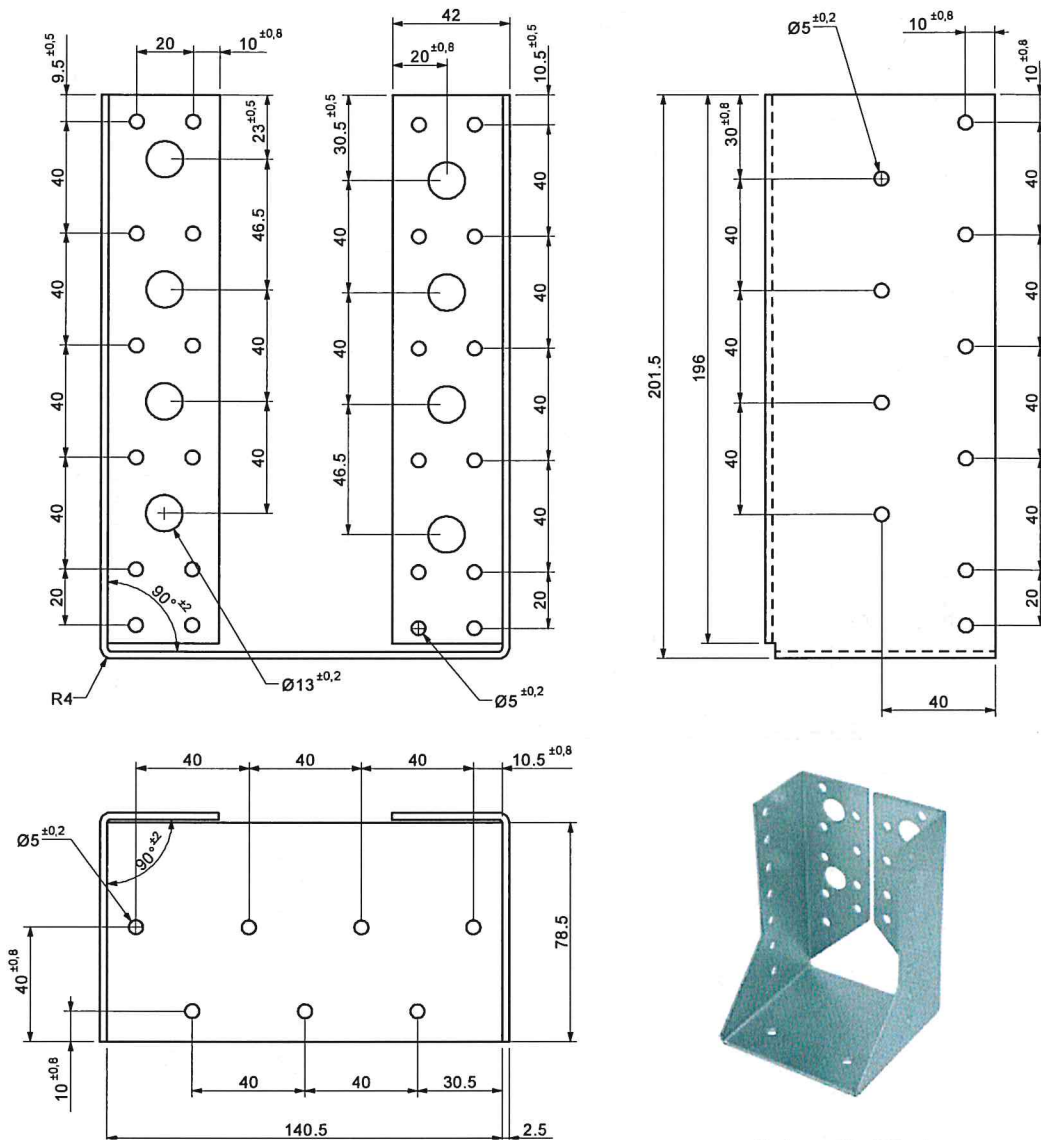


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1155

Annex A53
of ETA N° 19/0535

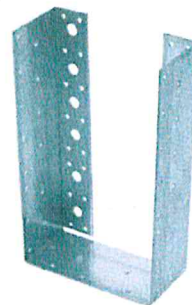
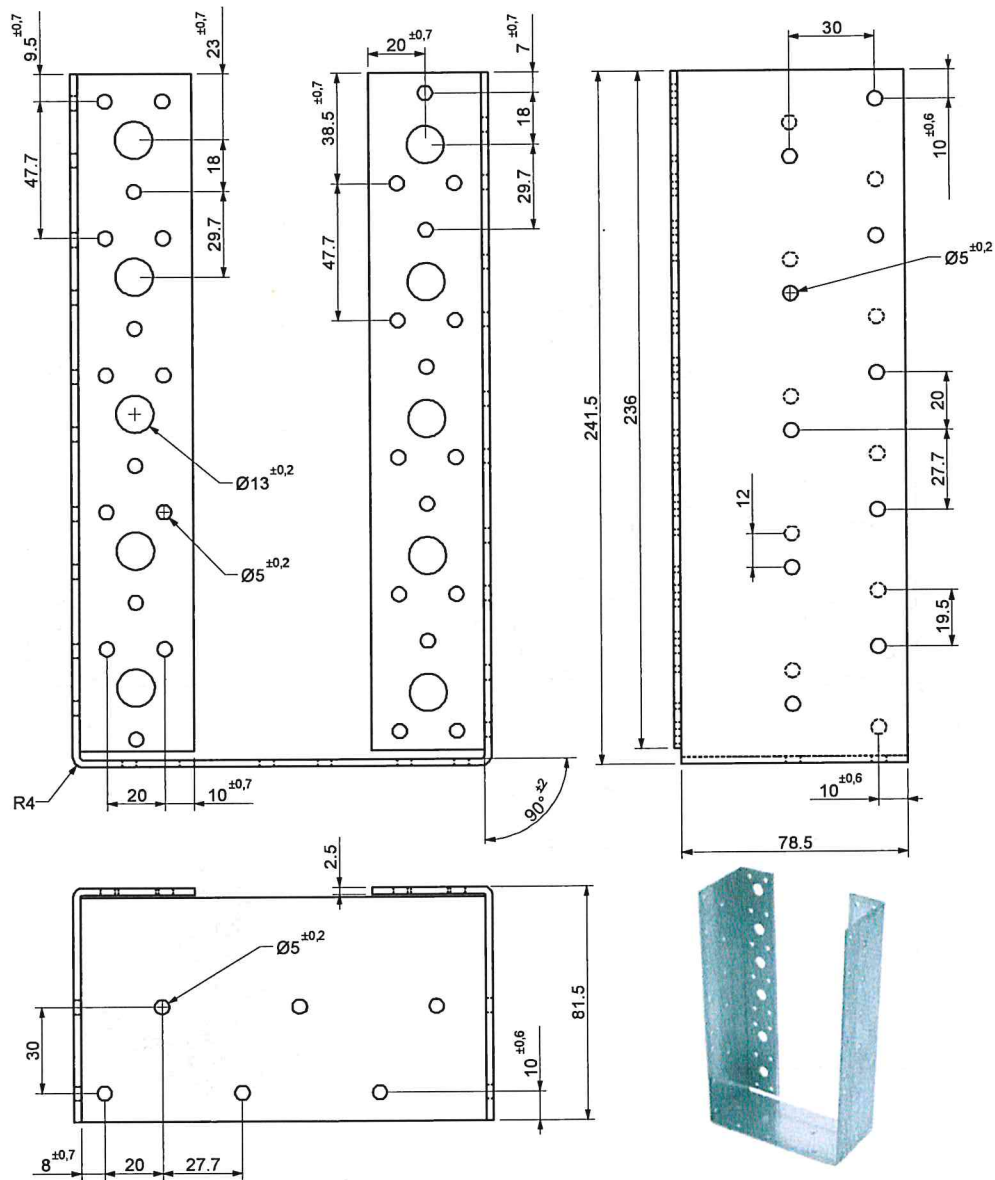


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1156

Annex A54
of ETA N° 19/0535

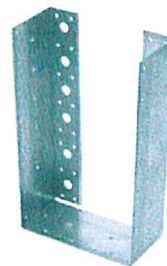
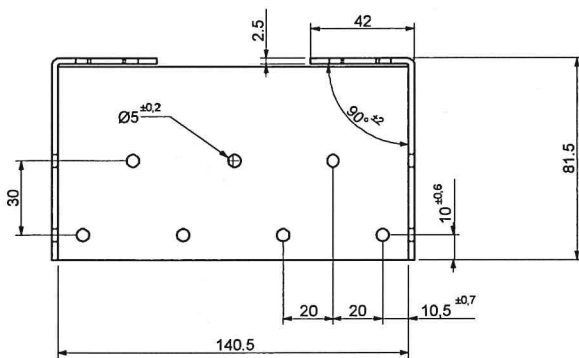
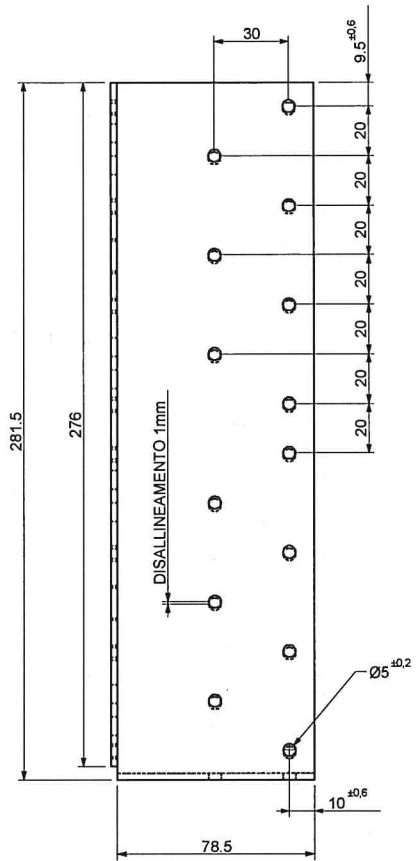
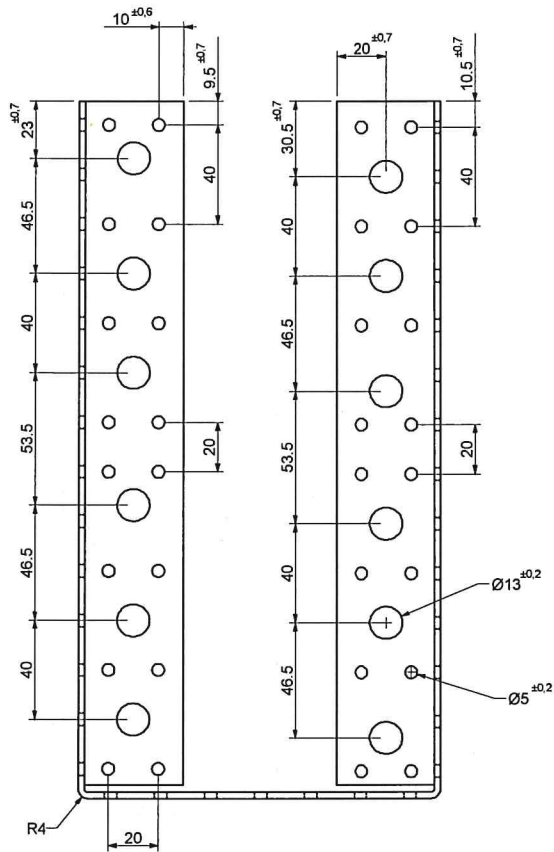


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1157

Annex A55
of ETA N° 19/0535

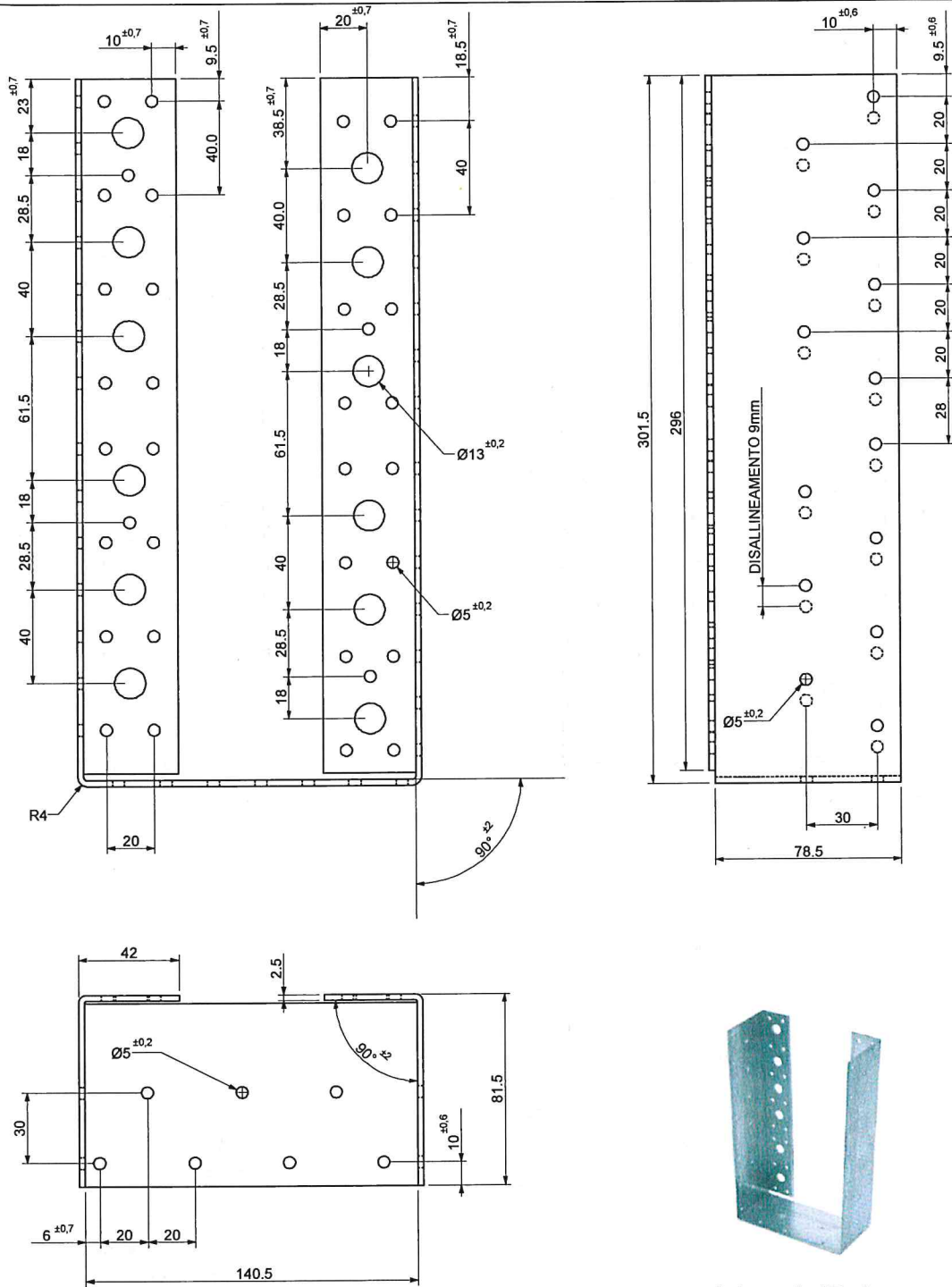


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1158

Annex A56
of ETA N° 19/0535

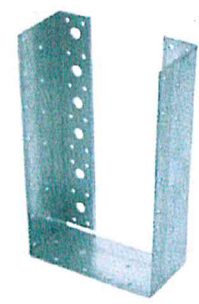
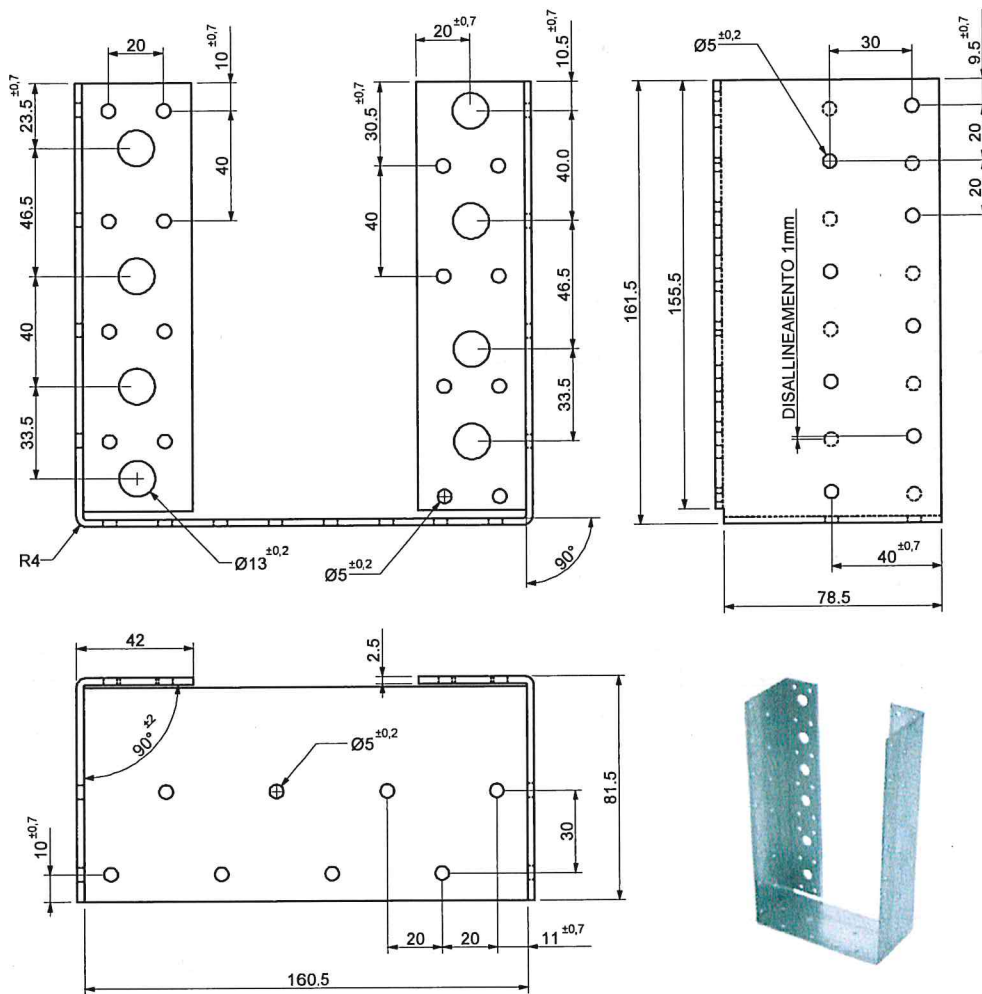


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1159

Annex A57
of ETA N° 19/0535

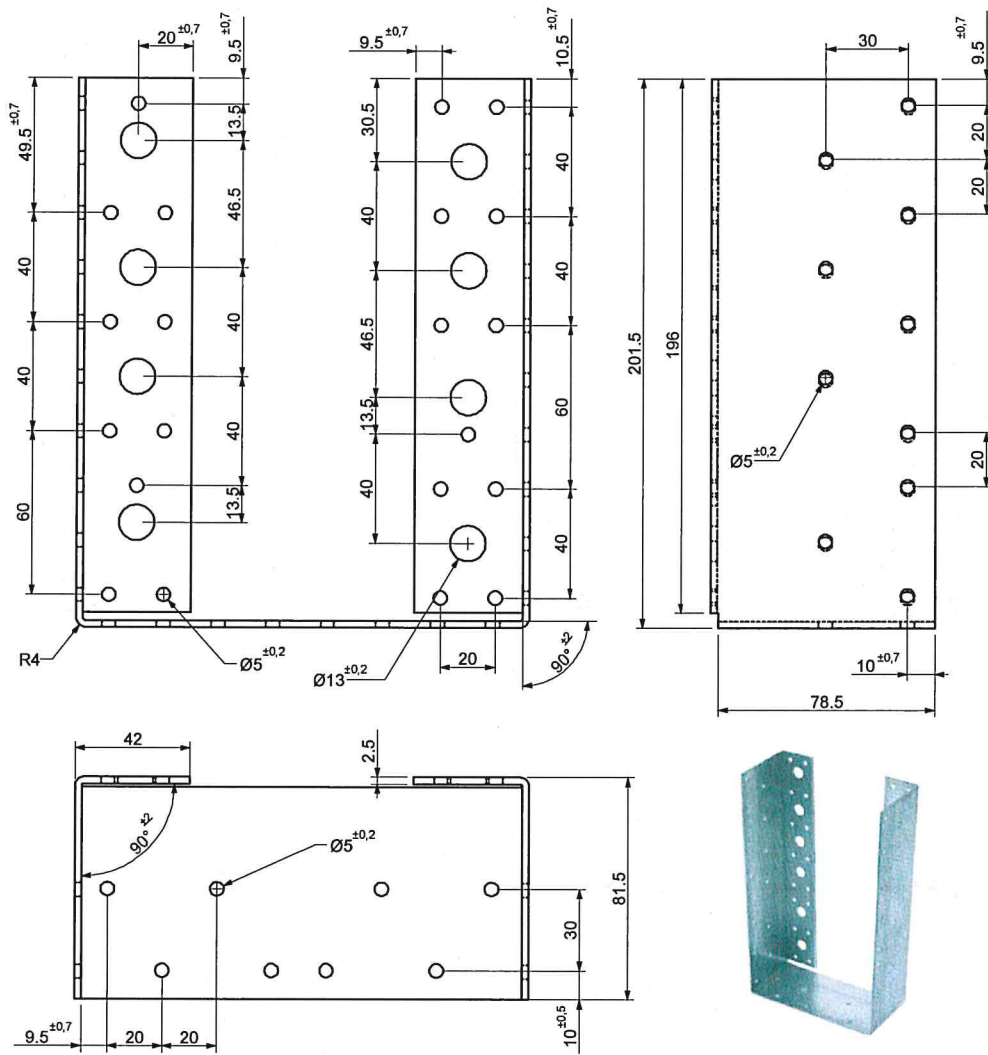


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1161

Annex A59
of ETA N° 19/0535

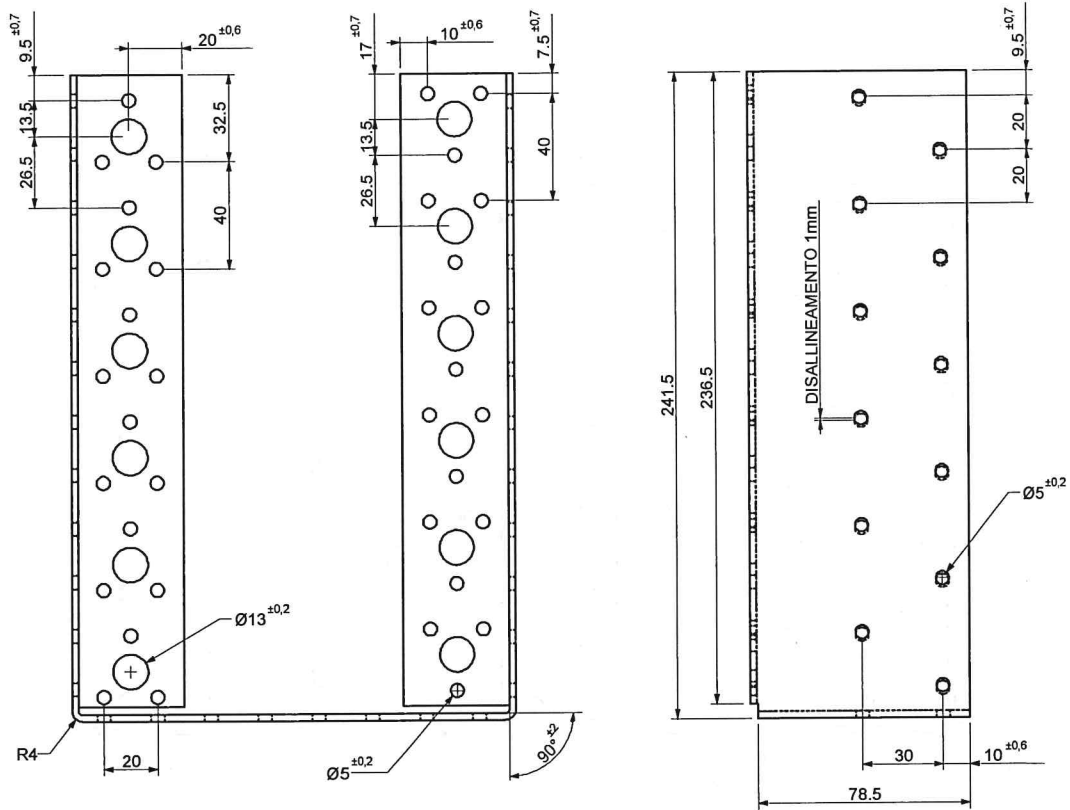


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1549

**Annex A60
of ETA N° 19/0535**

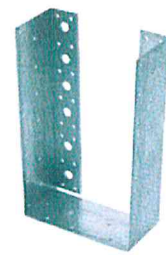
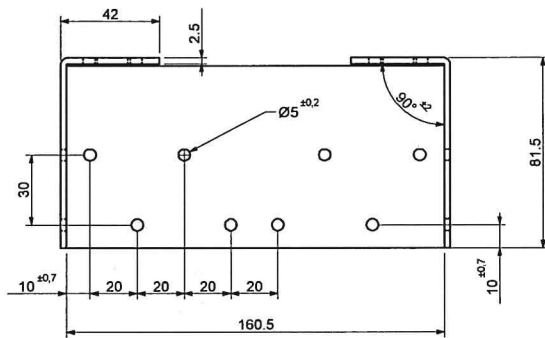
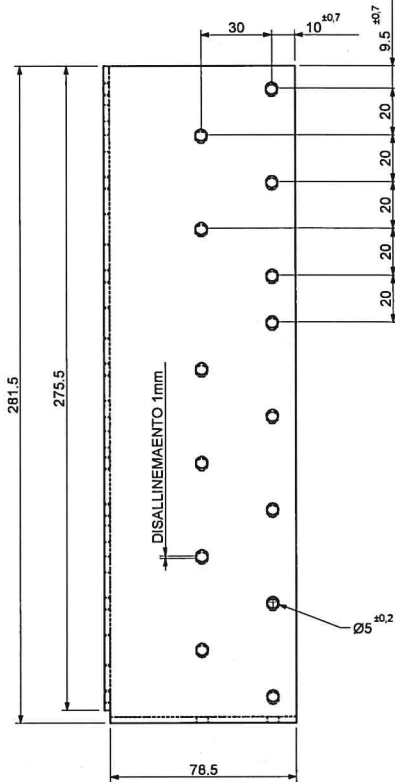
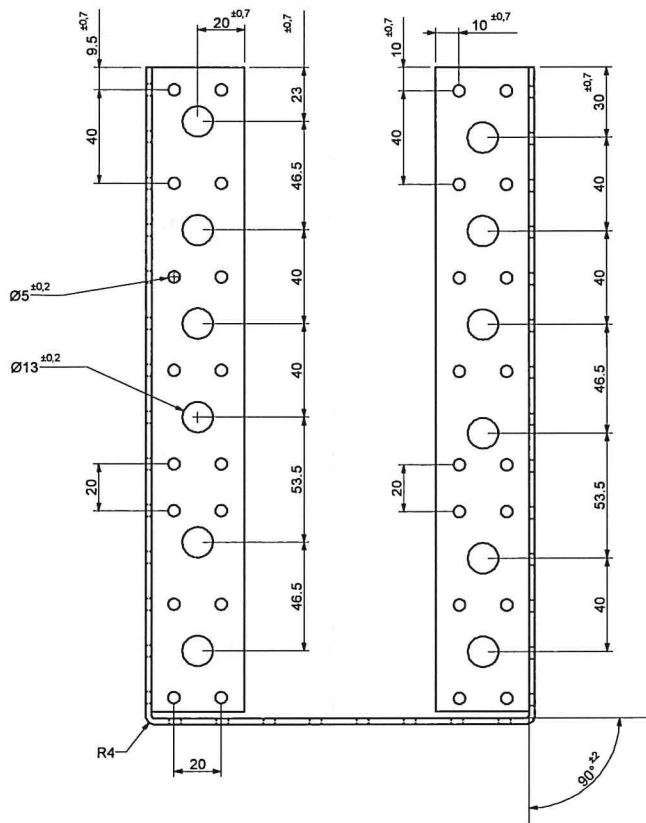


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1162

Annex A61
of ETA N° 19/0535

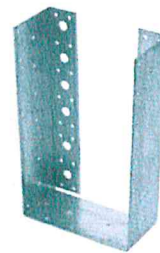
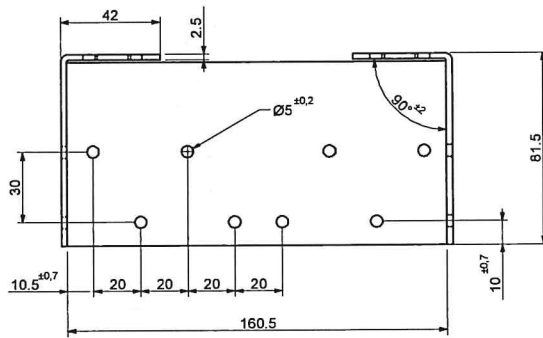
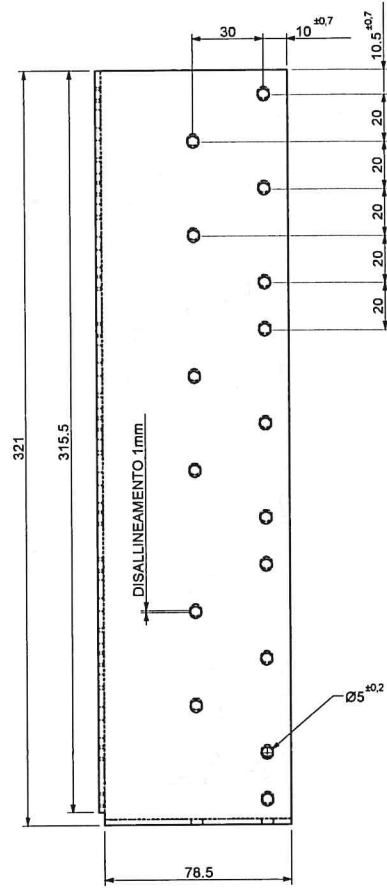
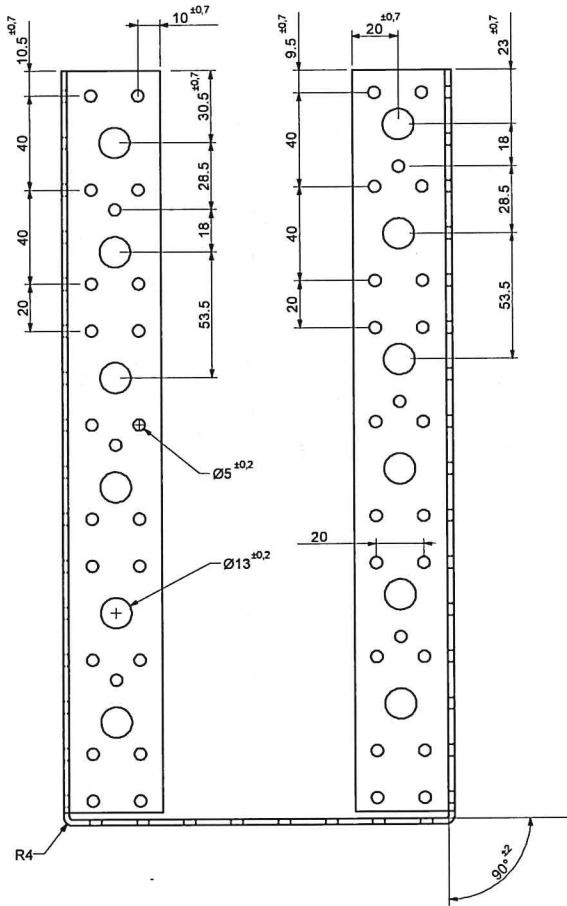


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1163

**Annex A62
of ETA N° 19/0535**

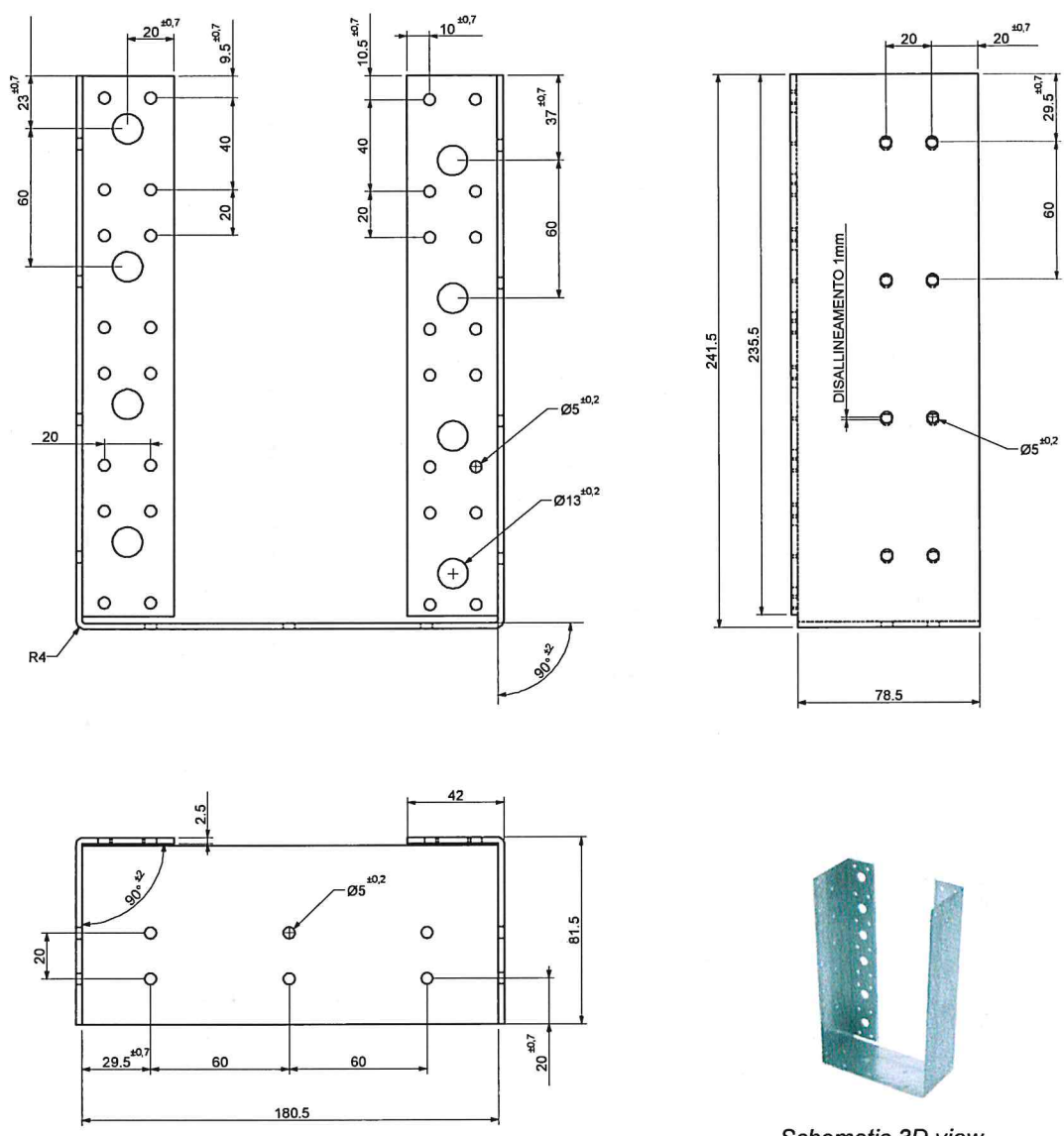


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1164

Annex A63
of ETA N° 19/0535

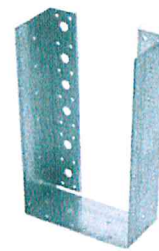
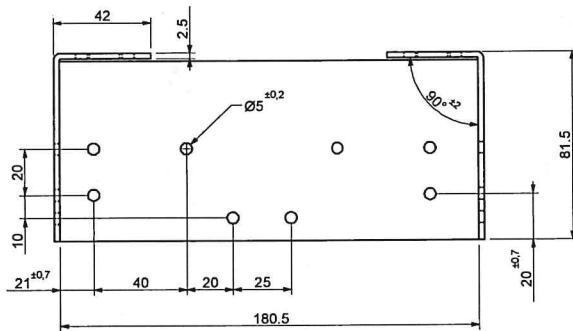
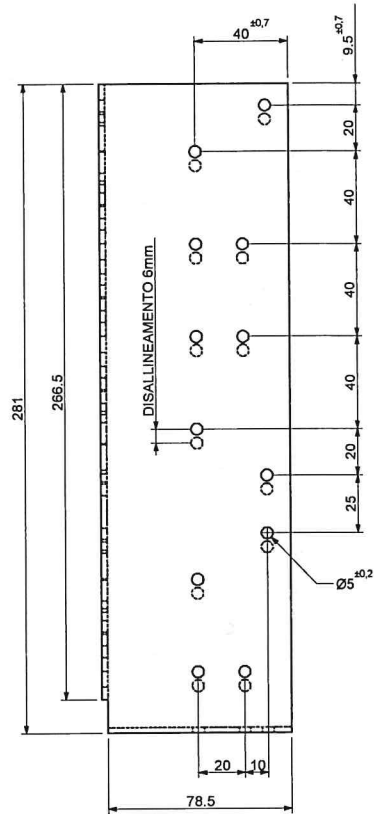
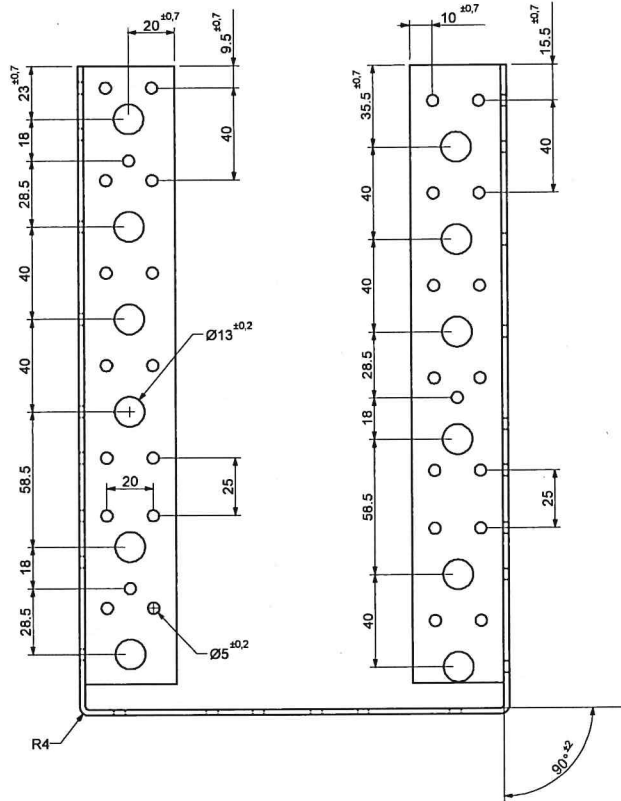


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1165

Annex A64
of ETA N° 19/0535

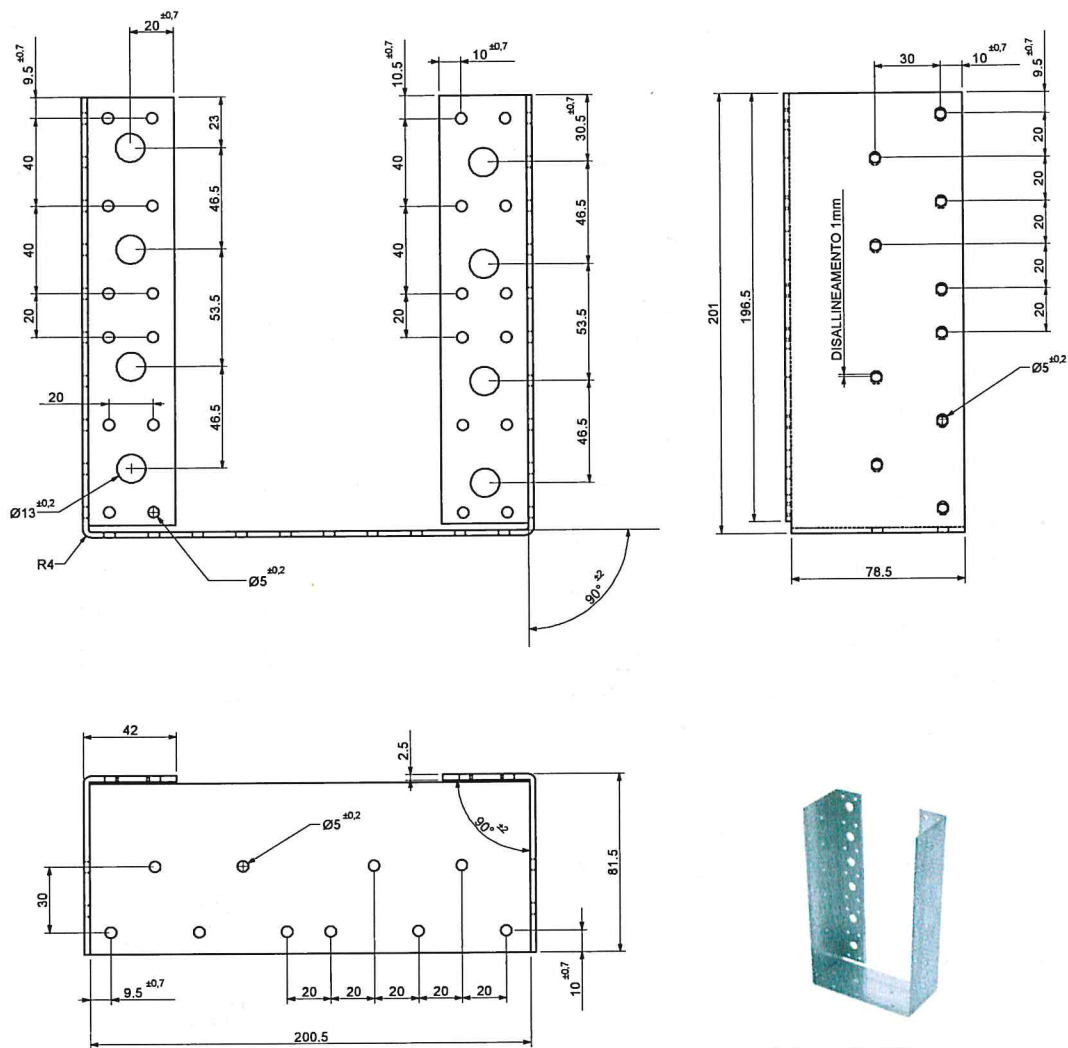


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1166

Annex A65
of ETA N° 19/0535

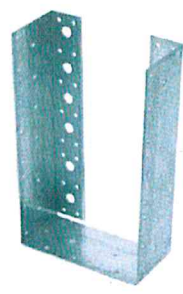
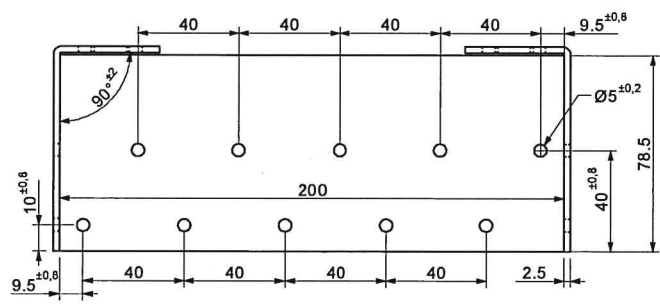
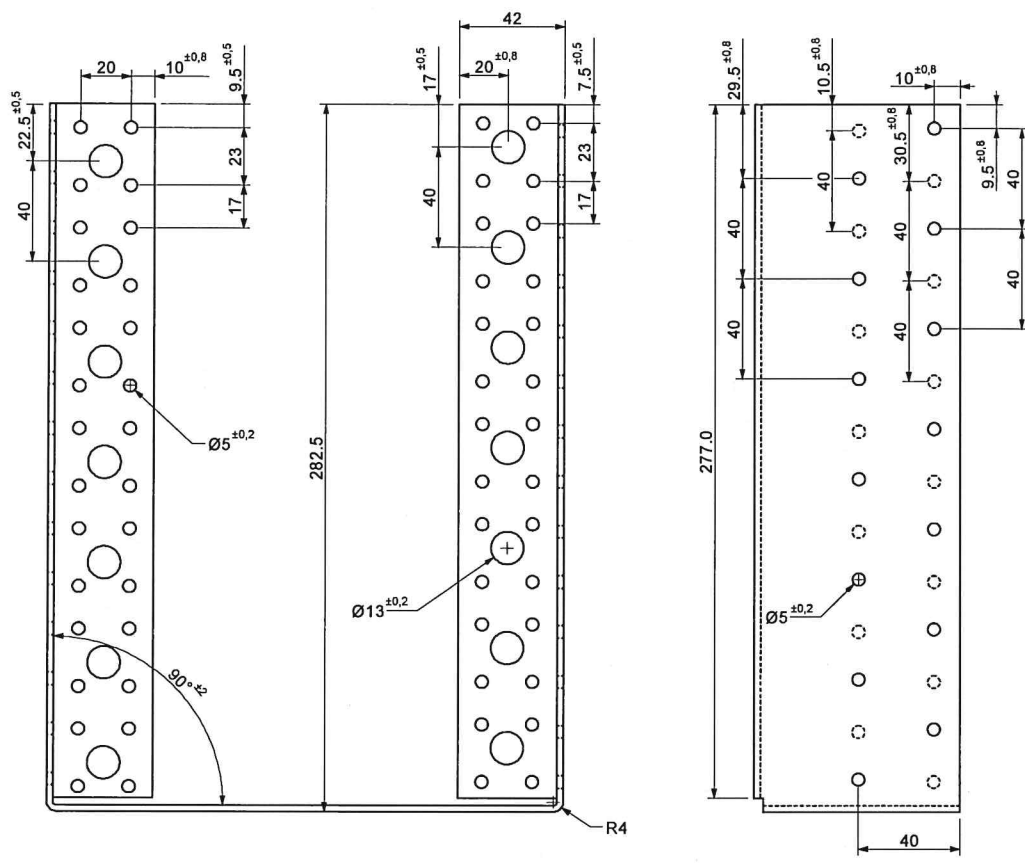


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1168

Annex A67
of ETA N° 19/0535

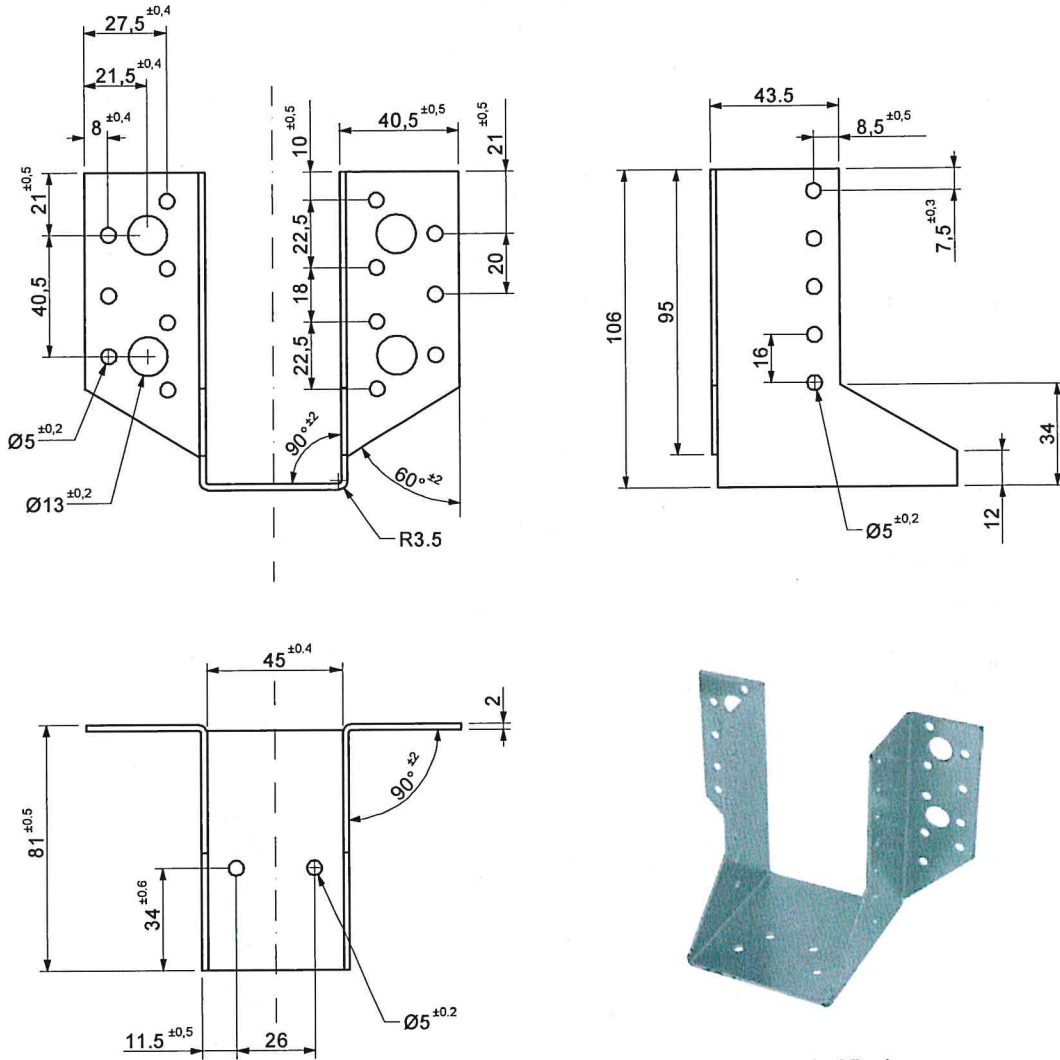


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1169

Annex A68
of ETA N° 19/0535

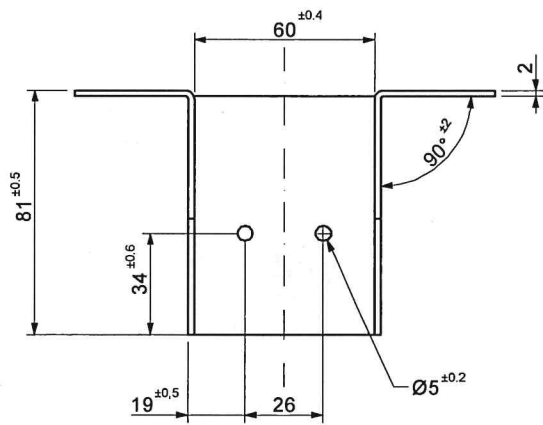
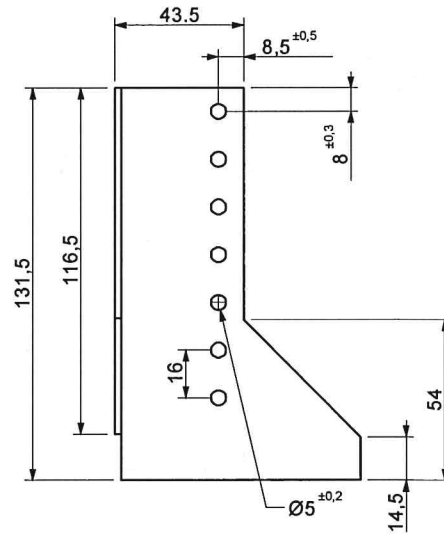
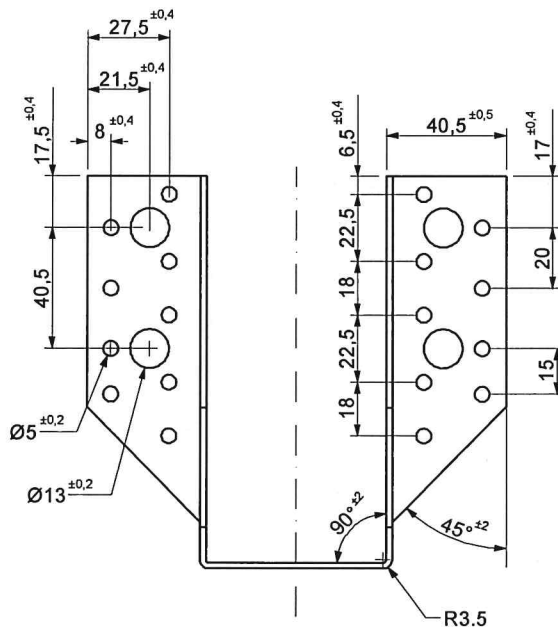


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/373

Annex A69
of ETA N° 19/0535

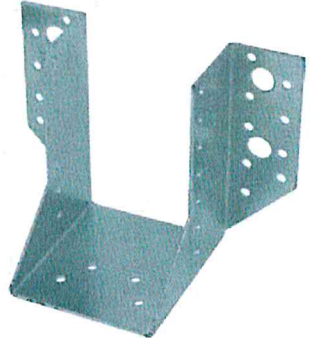
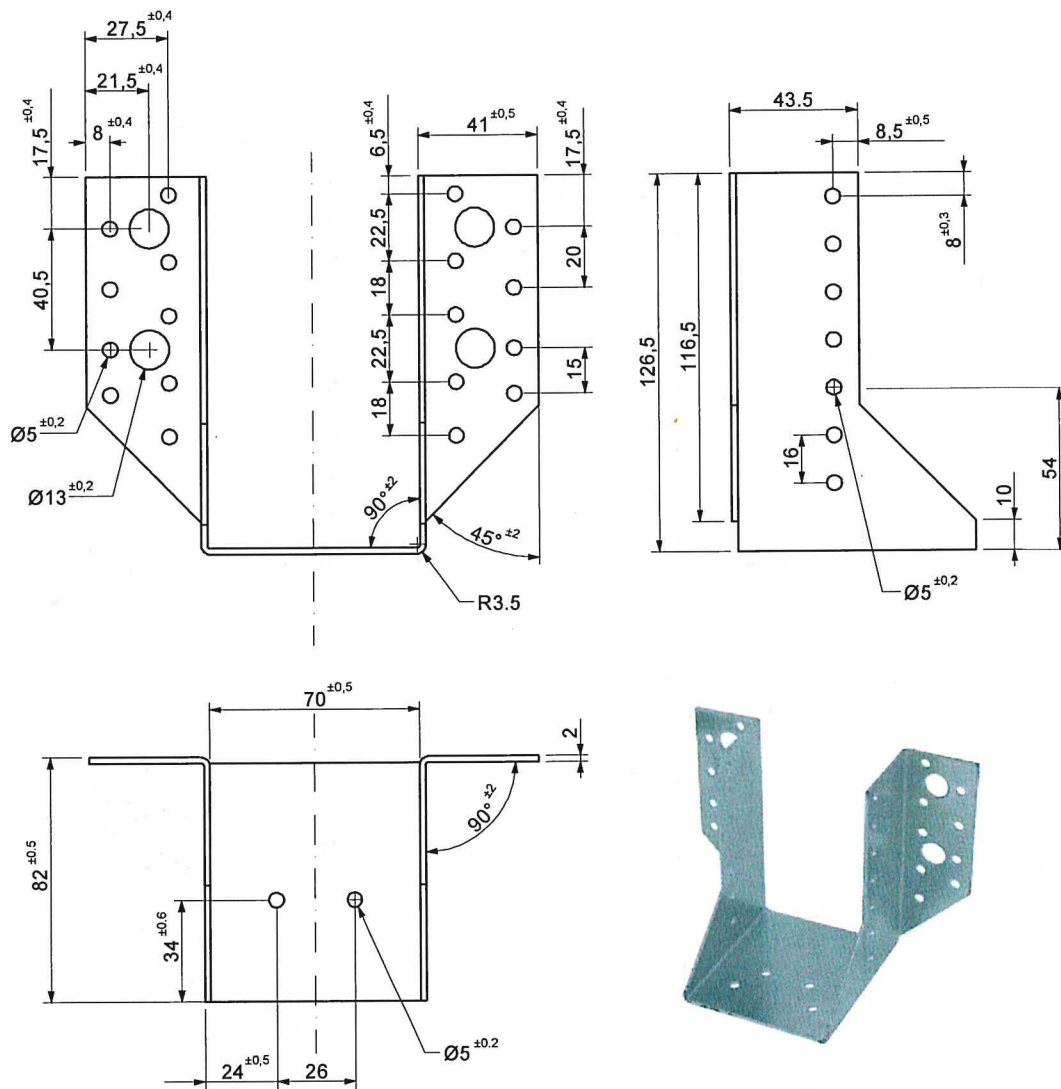


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/375

Annex A70
of ETA N° 19/0535

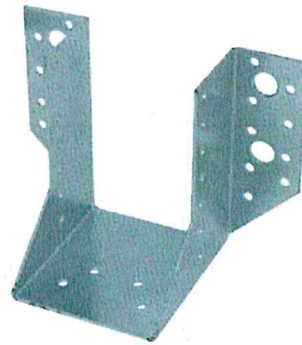
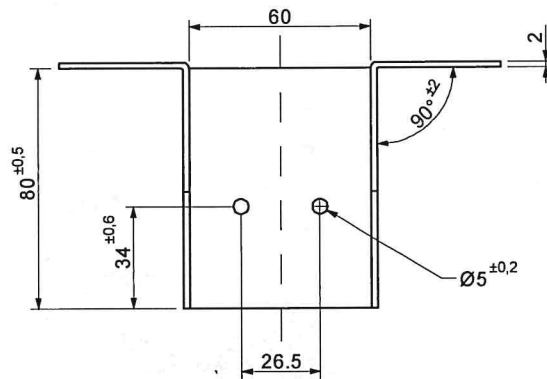
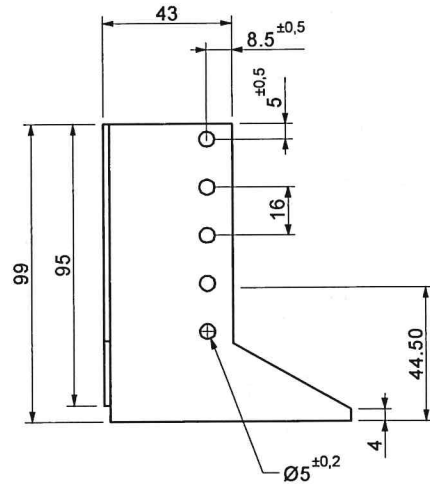
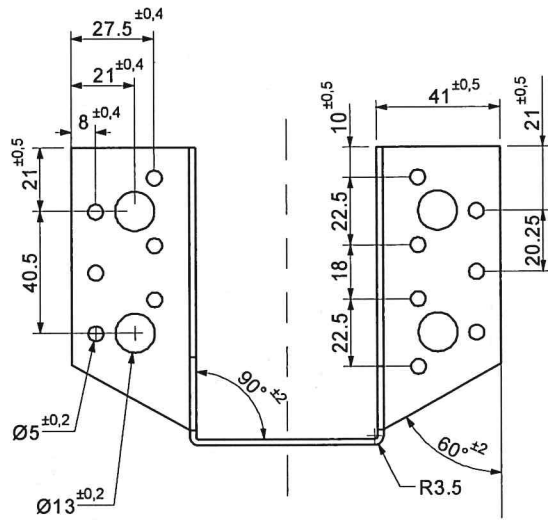


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/377

Annex A71
of ETA N° 19/0535

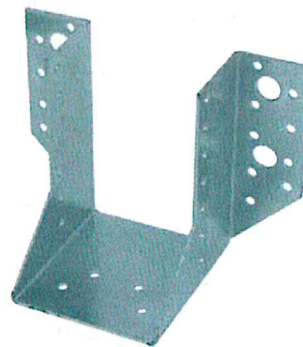
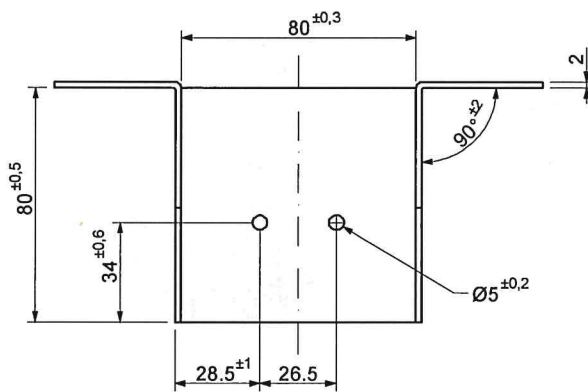
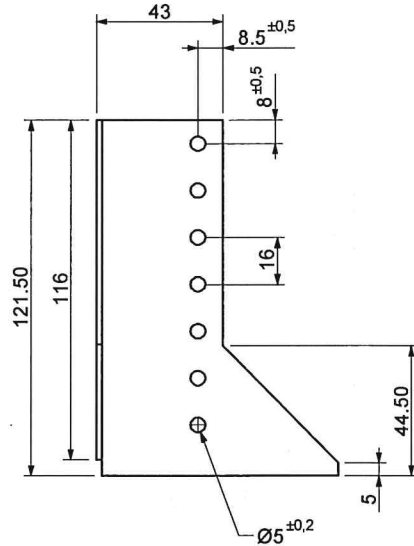
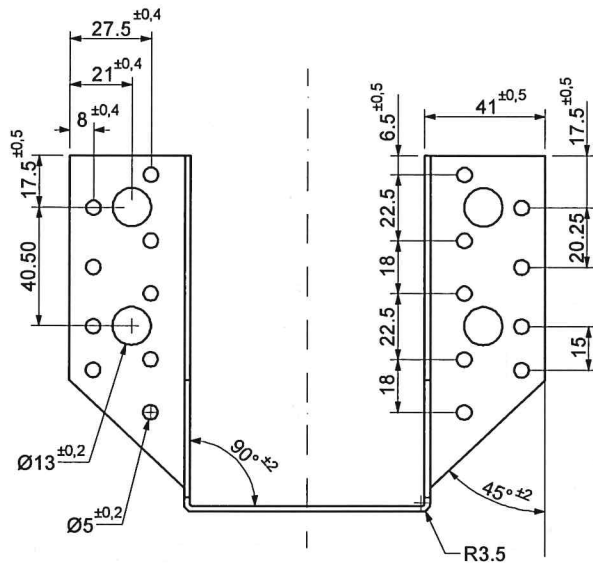


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/381

Annex A73
of ETA N° 19/0535

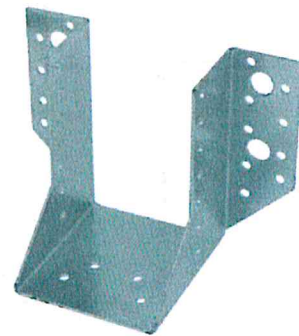
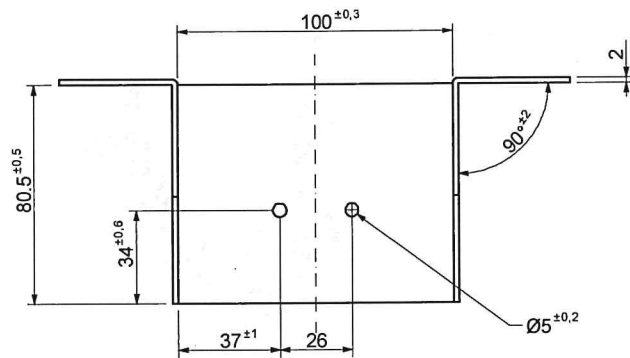
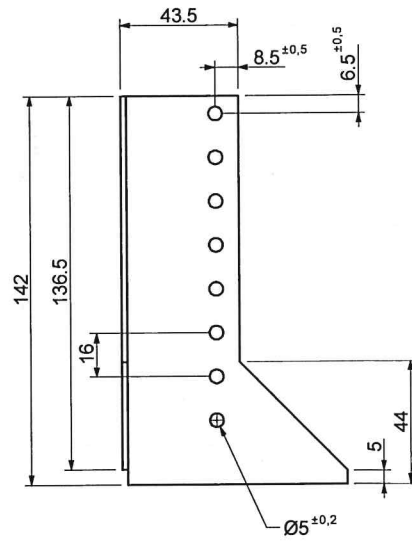
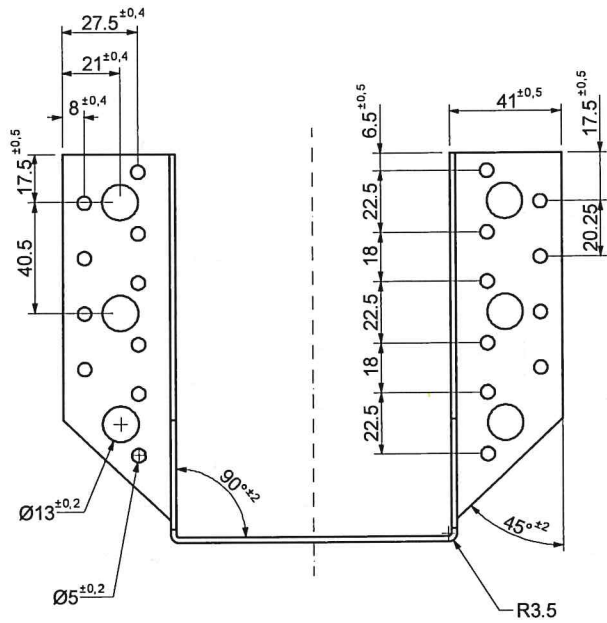


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/382

**Annex A74
of ETA N° 19/0535**

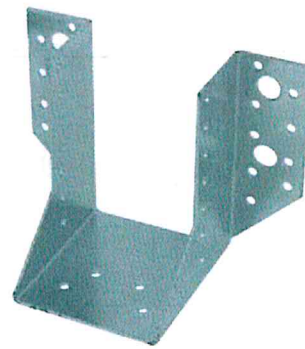
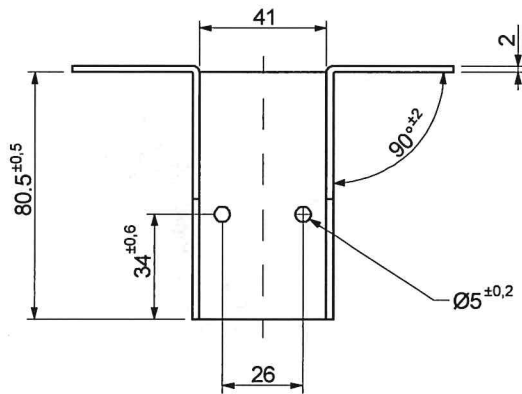
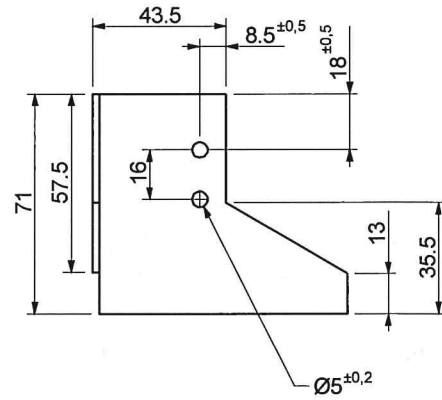
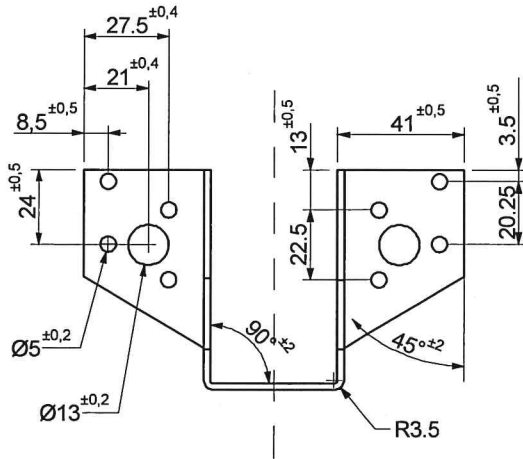


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/383

Annex A75
of ETA N° 19/0535

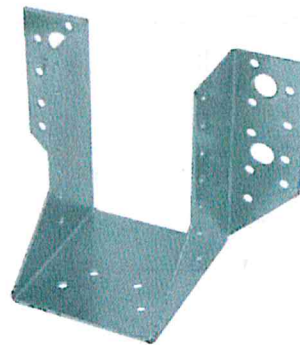
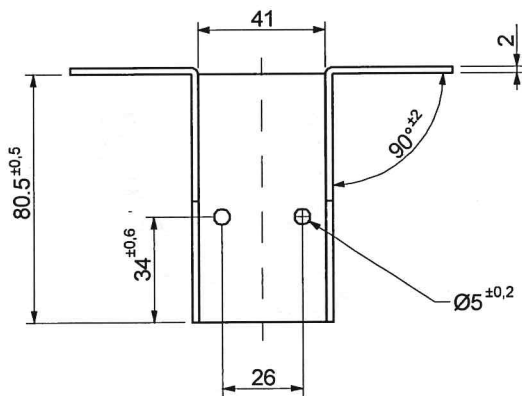
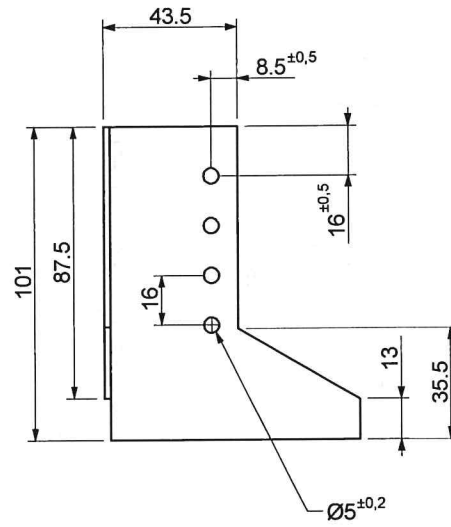
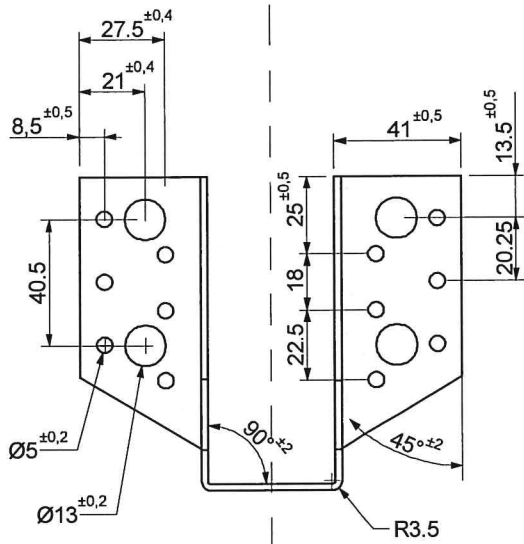


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1050

**Annex A76
of ETA N° 19/0535**

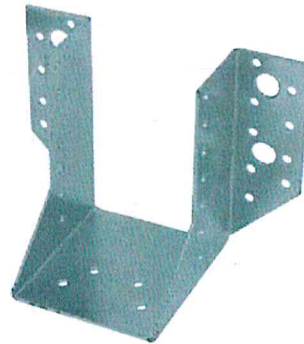
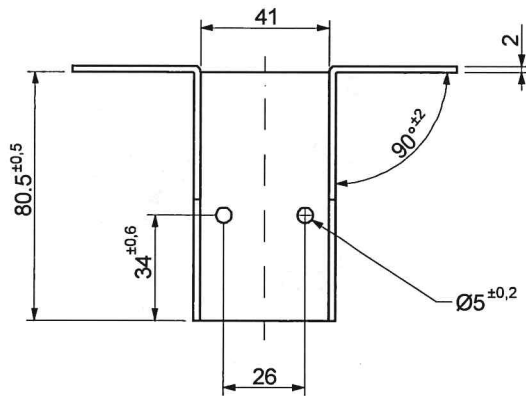
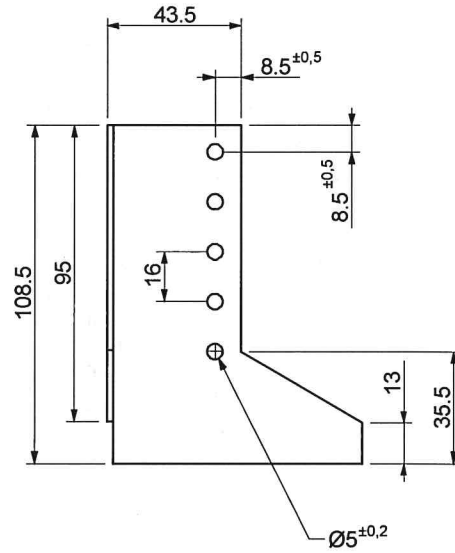
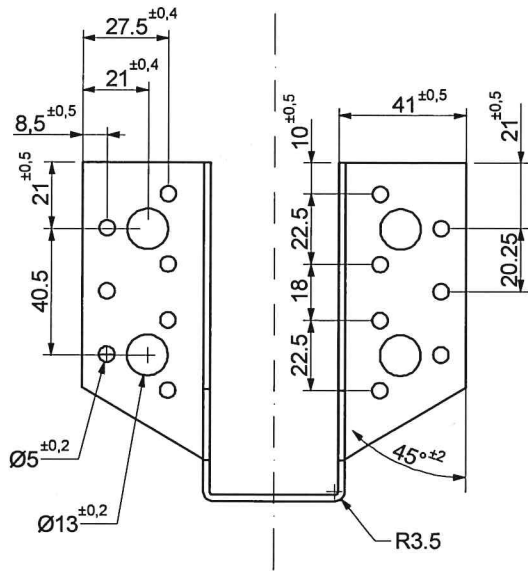


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1051

Annex A77
of ETA N° 19/0535

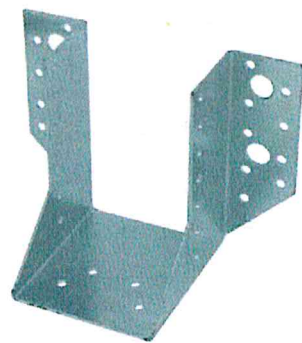
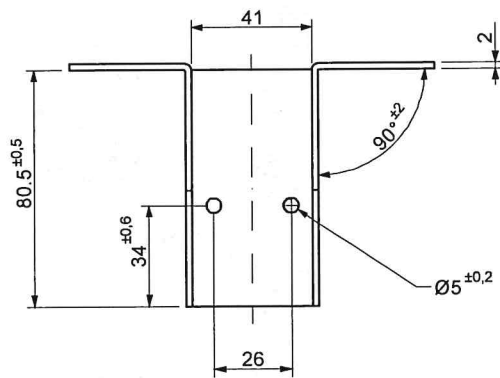
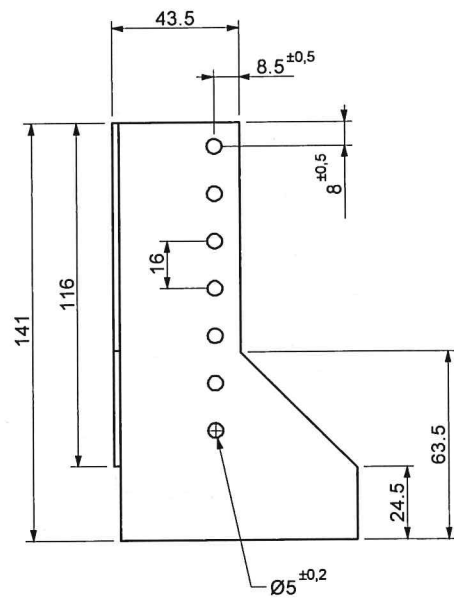
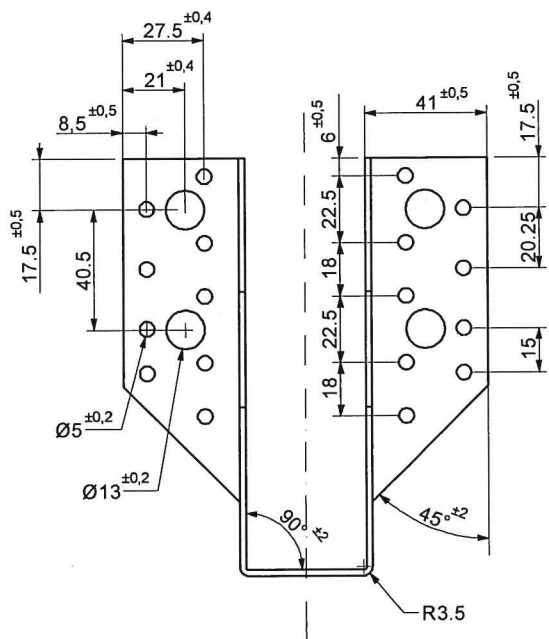


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1052

Annex A78
of ETA N° 19/0535

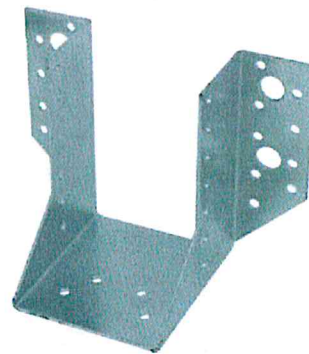
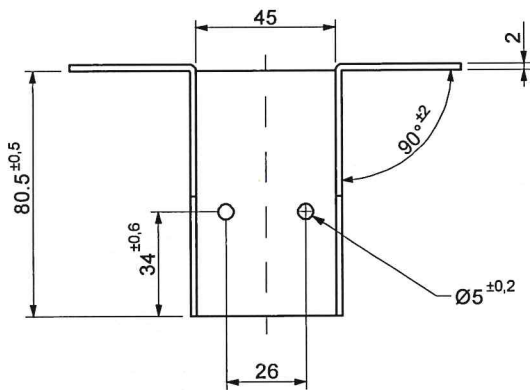
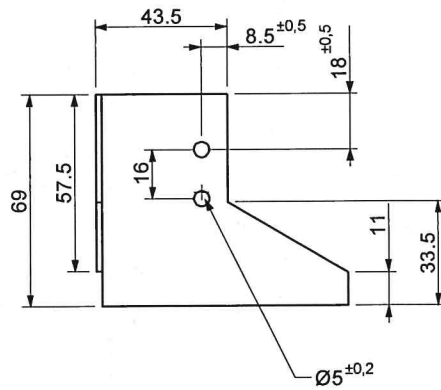
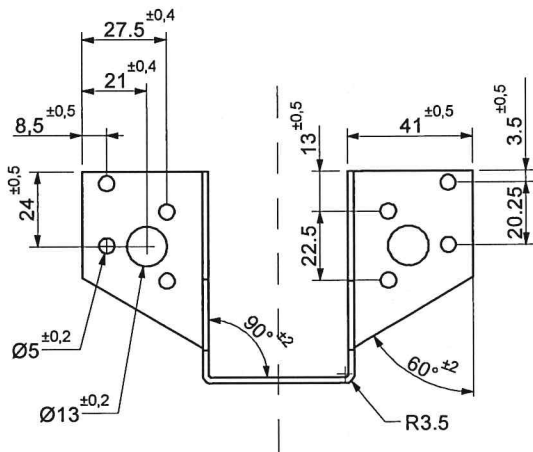


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1053

Annex A79
of ETA N° 19/0535

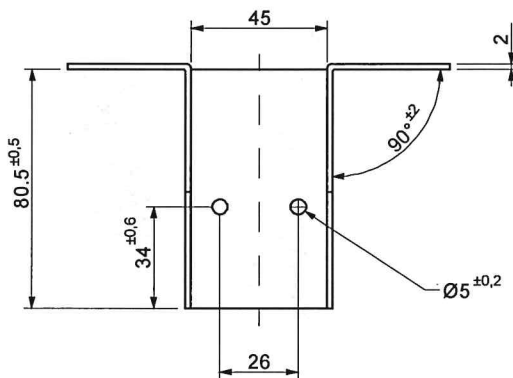
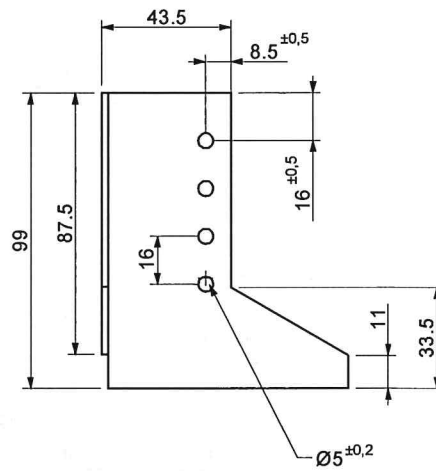
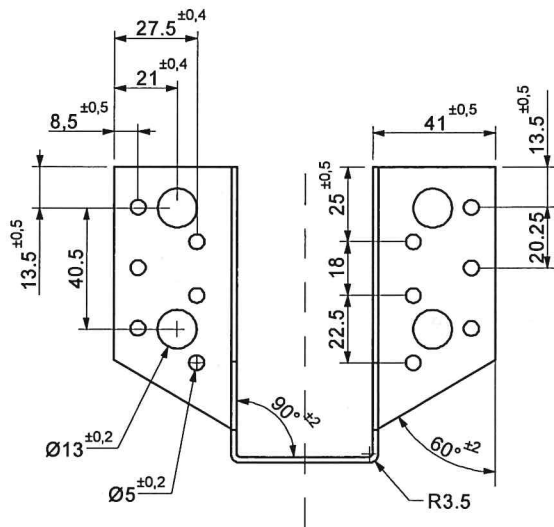


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1055

Annex A81
of ETA N° 19/0535

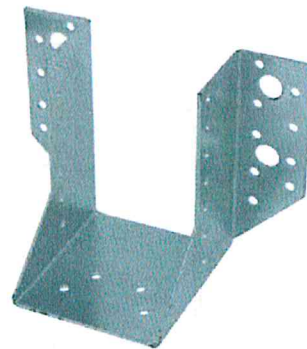
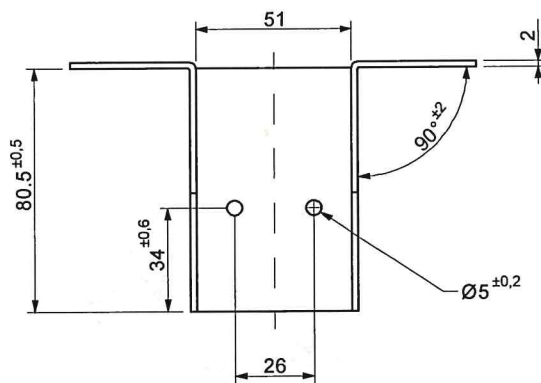
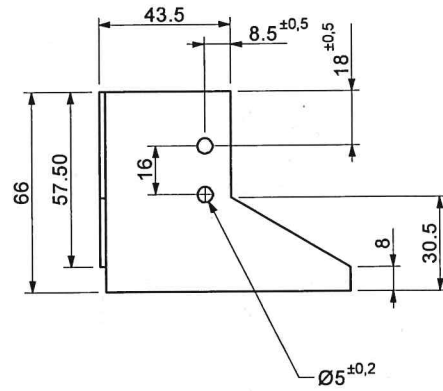
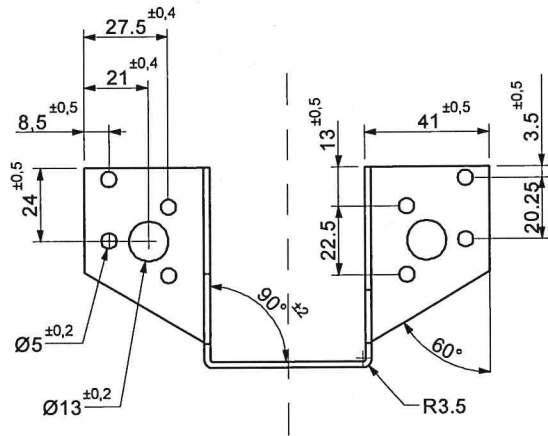


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1056

**Annex A82
of ETA N° 19/0535**

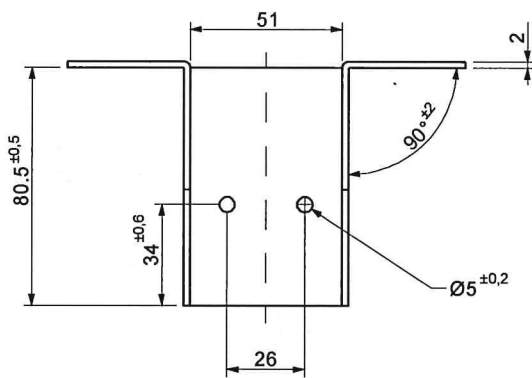
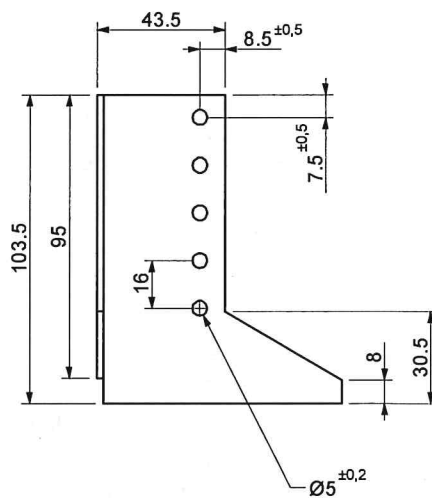
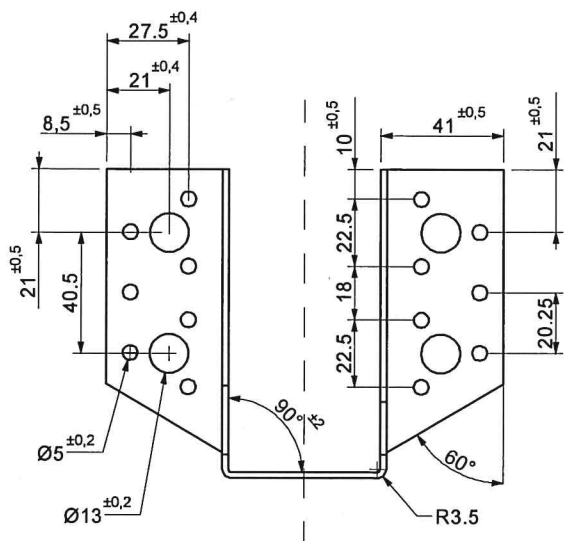


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1060

Annex A85
of ETA N° 19/0535

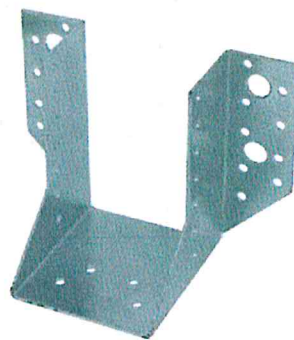
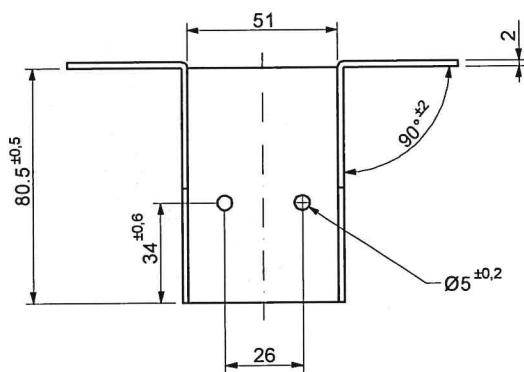
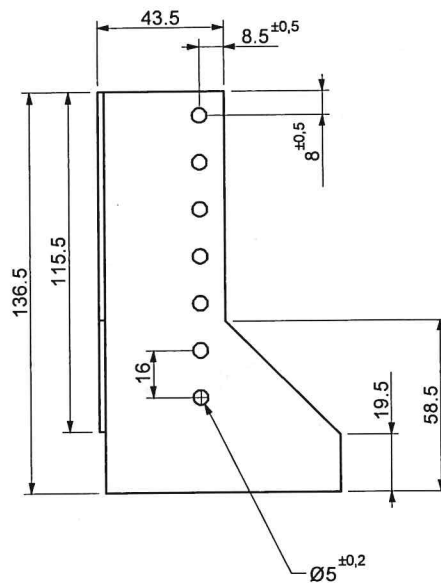
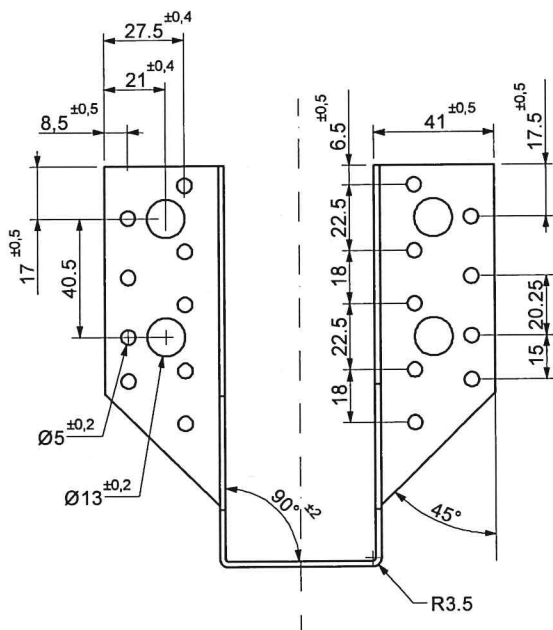


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1061

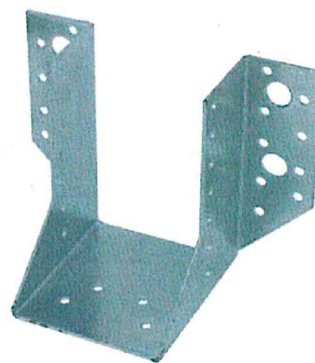
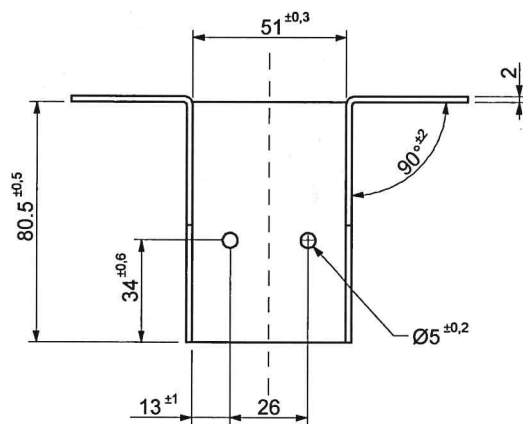
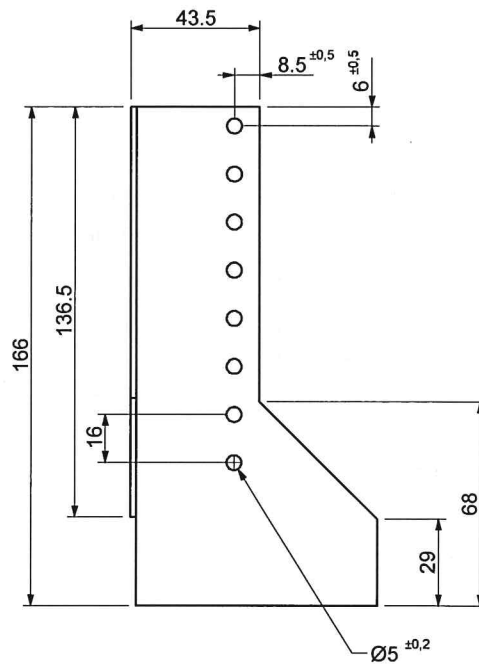
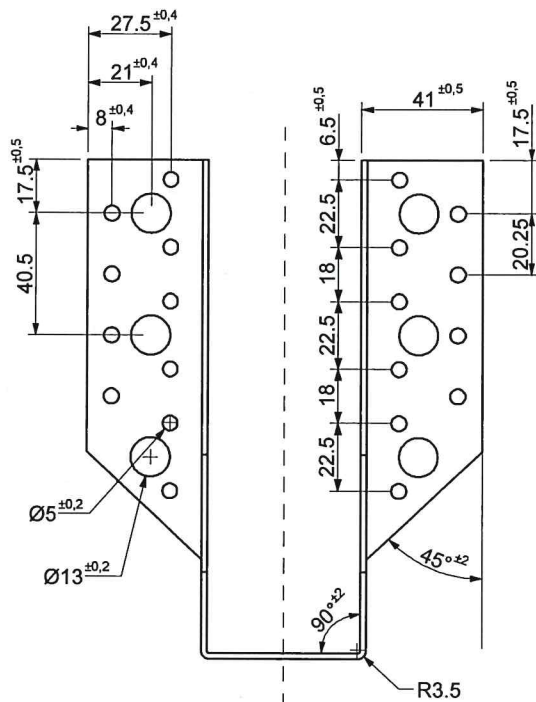
**Annex A86
of ETA N° 19/0535**



SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1062

Annex A87
of ETA N° 19/0535

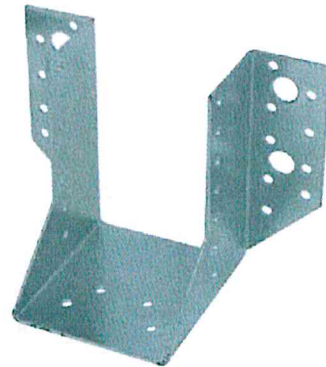
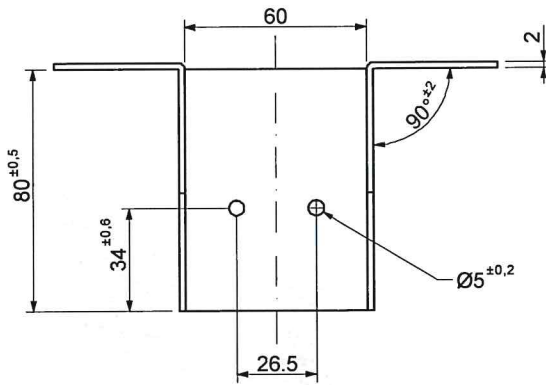
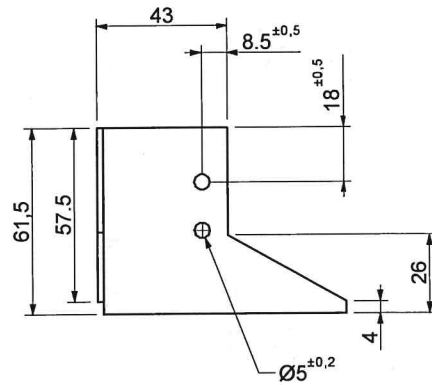
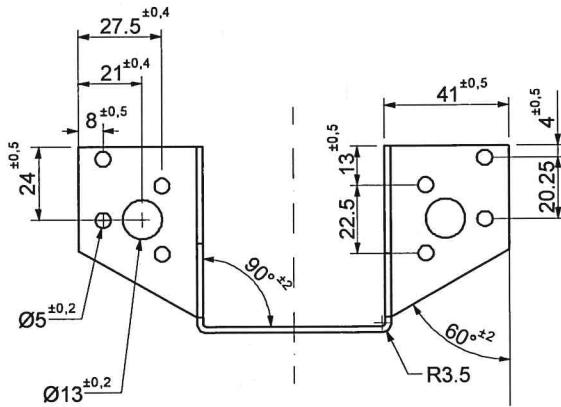


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1063

**Annex A88
of ETA N° 19/0535**

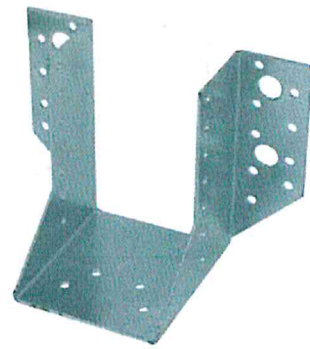
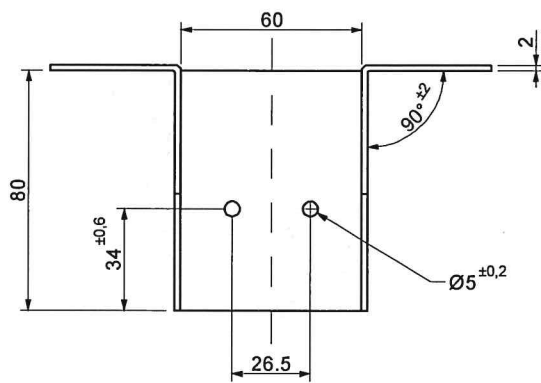
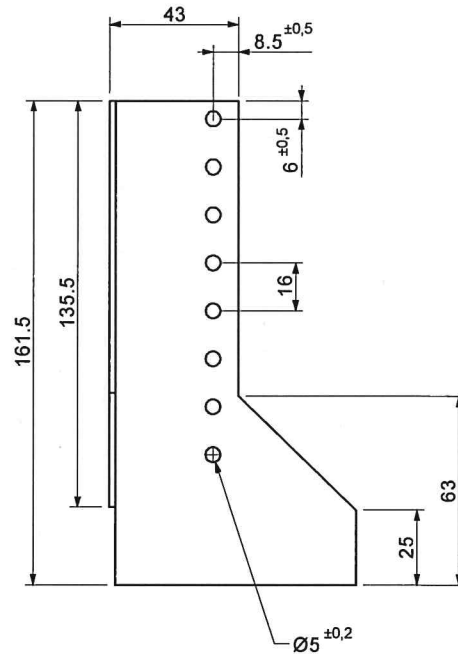
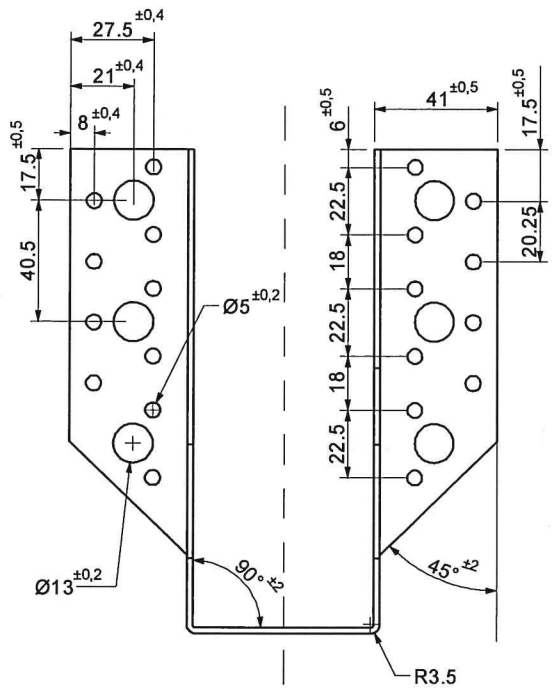


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1064

Annex A89
of ETA N° 19/0535

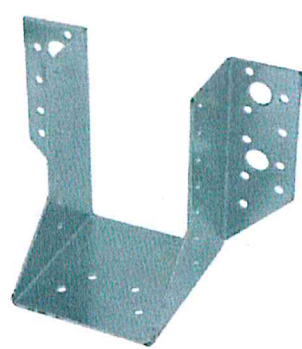
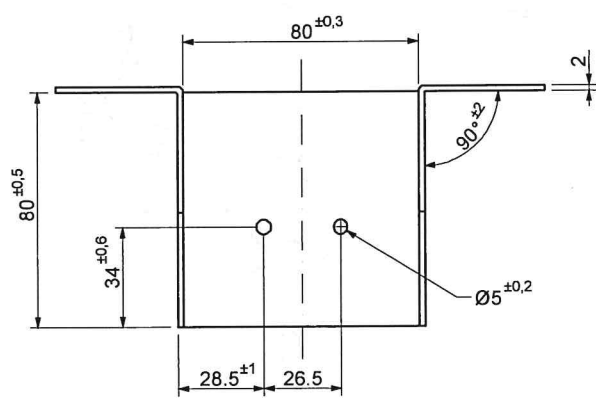
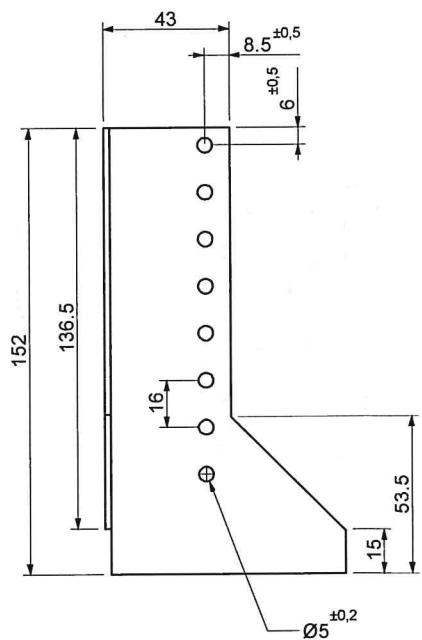
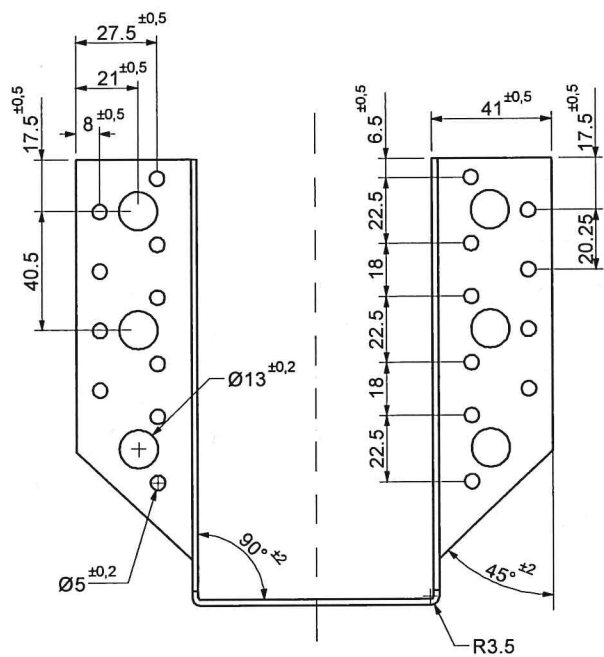


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1065

**Annex A90
of ETA N° 19/0535**

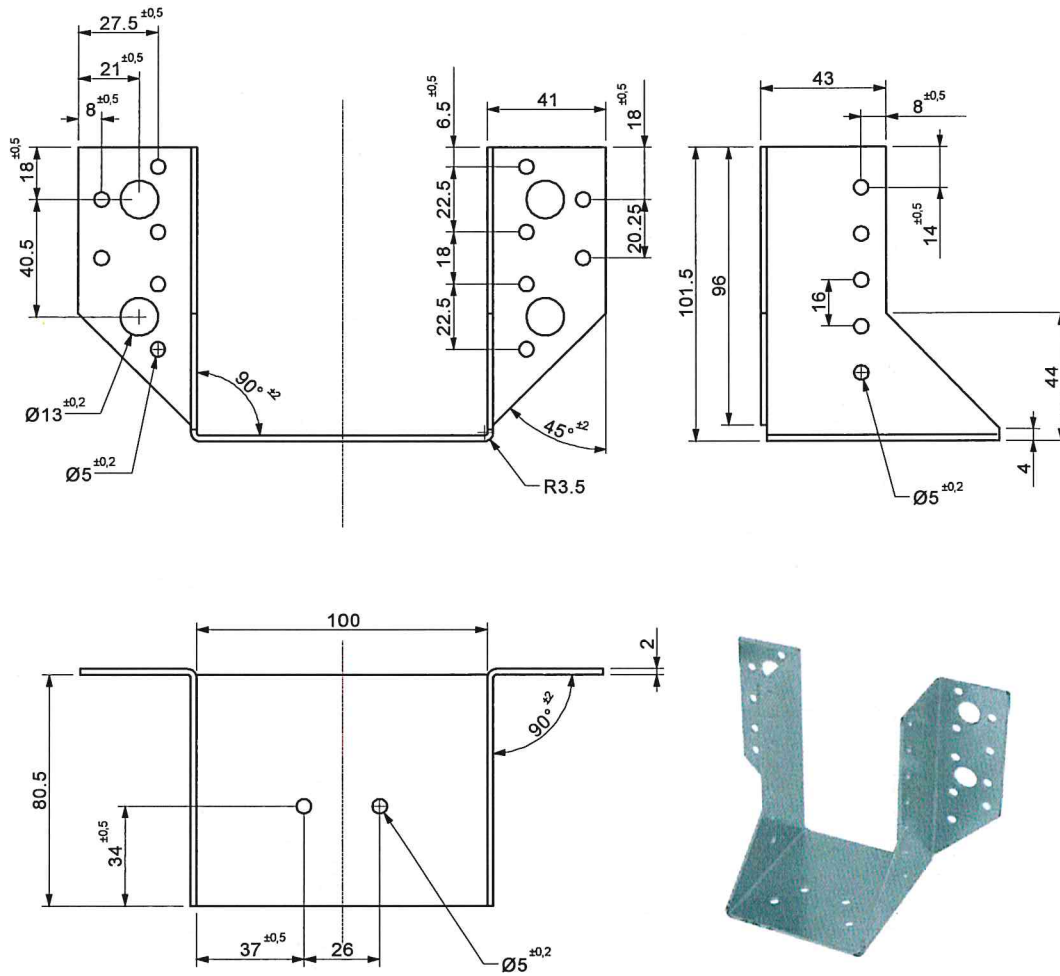


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1068

Annex A93
of ETA N° 19/0535

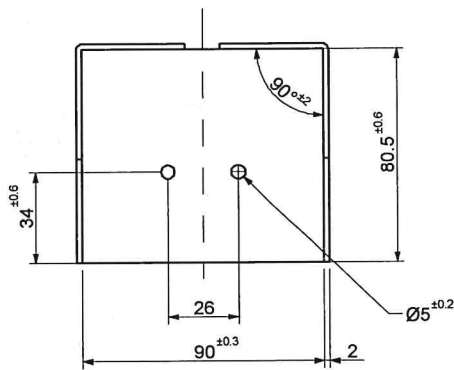
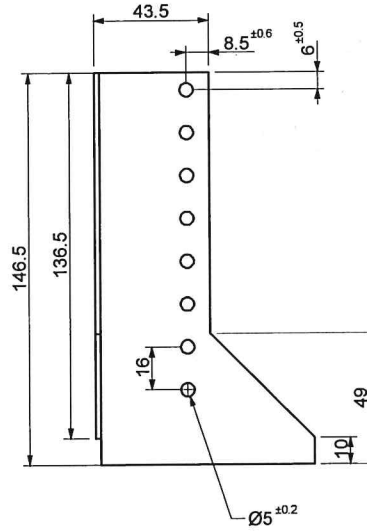
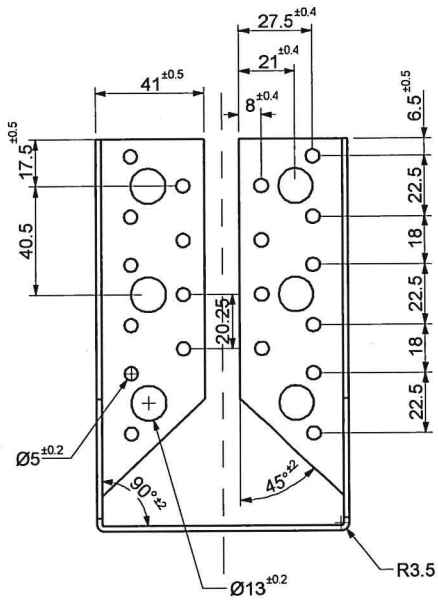


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1069

Annex A94
of ETA N° 19/0535

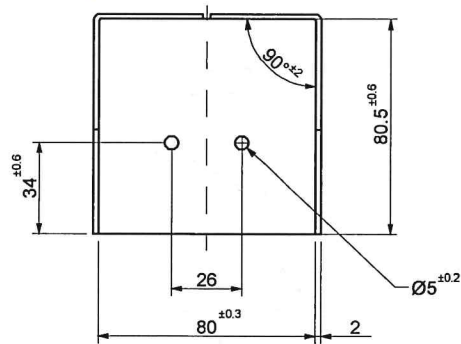
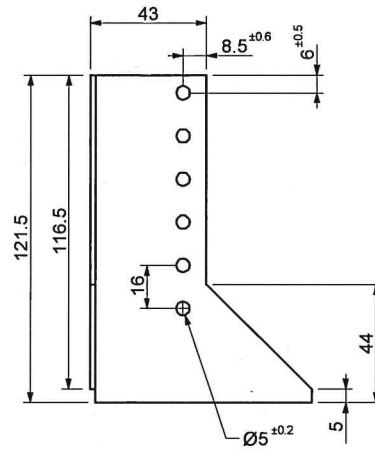
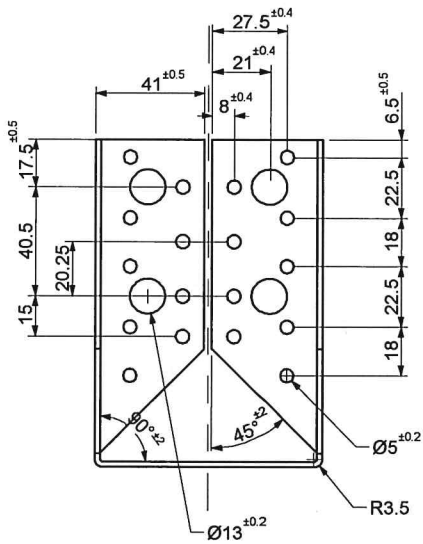


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/655

Annex A95
of ETA N° 19/0535

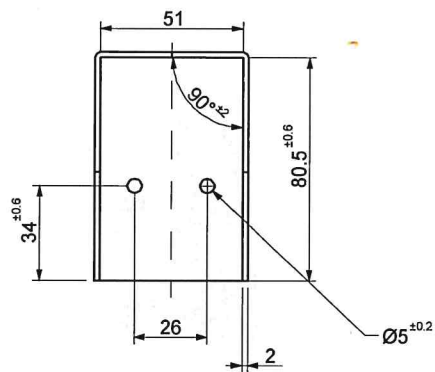
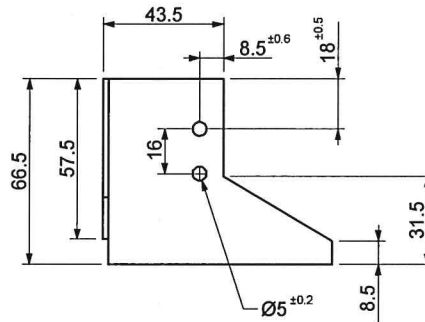
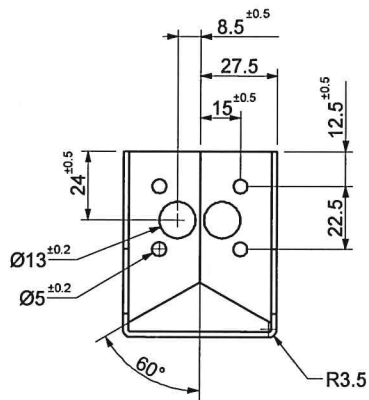


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/656

**Annex A96
of ETA N° 19/0535**

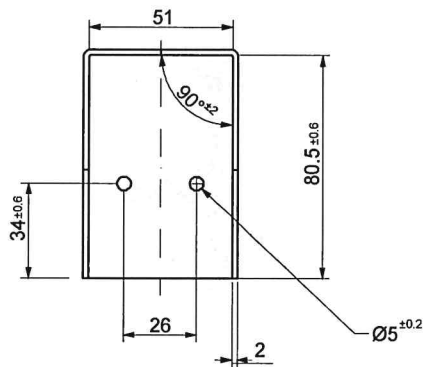
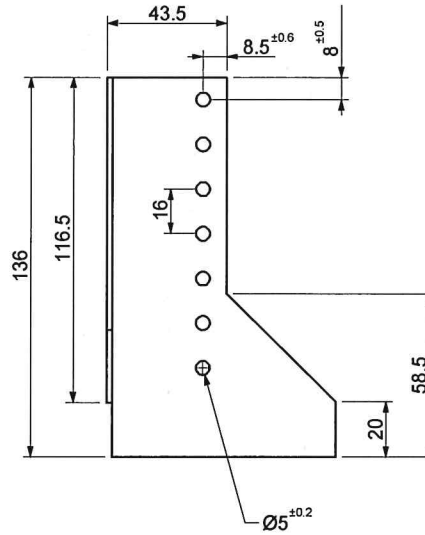
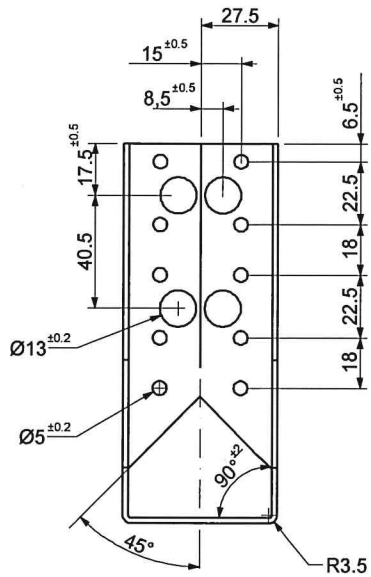


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1081

**Annex A98
of ETA N° 19/0535**

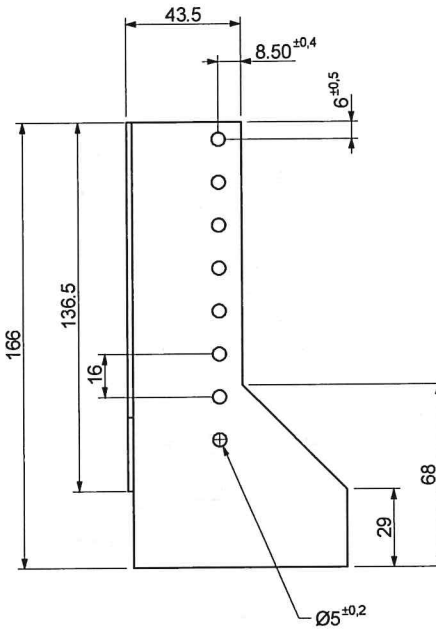
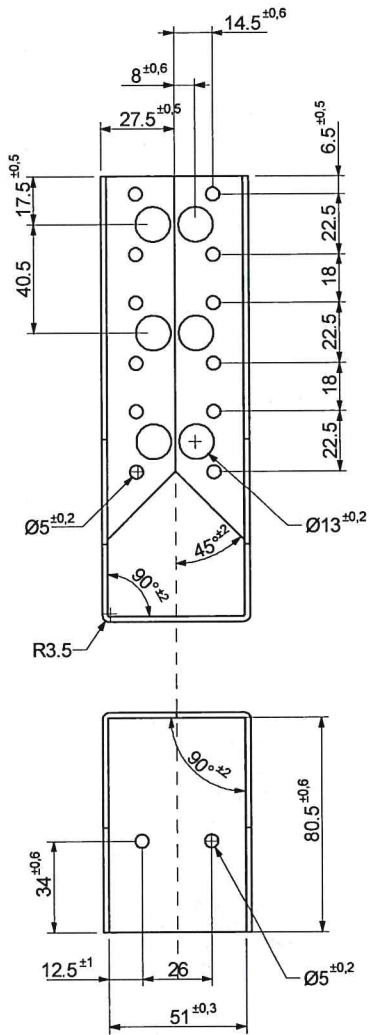


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1083

**Annex A100
of ETA N° 19/0535**

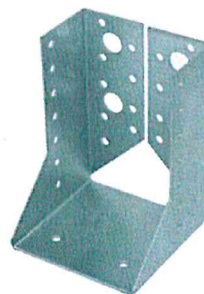
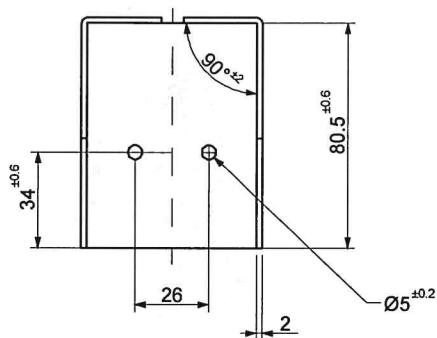
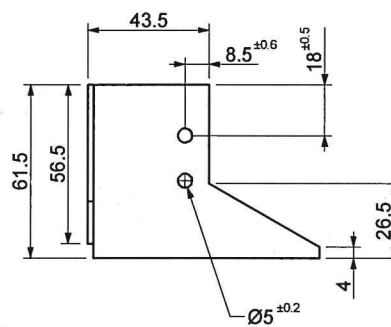
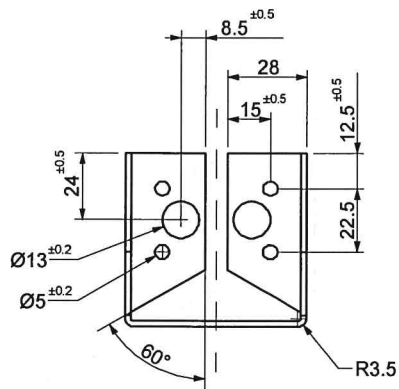


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1084

Annex A101
of ETA N° 19/0535

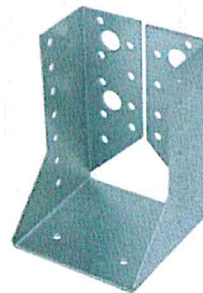
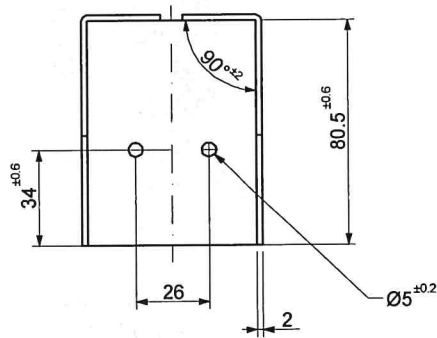
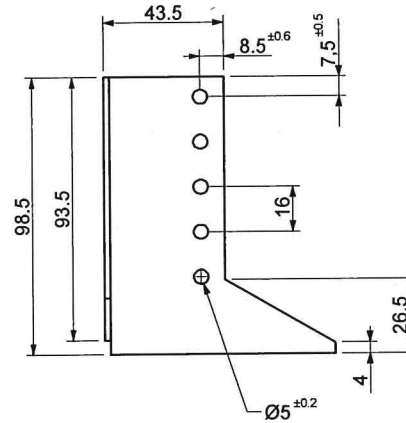
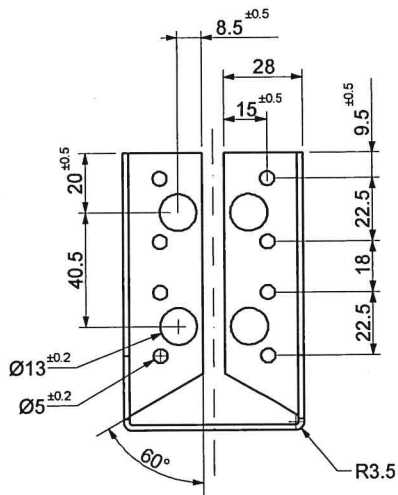


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1085

Annex A102
of ETA N° 19/0535

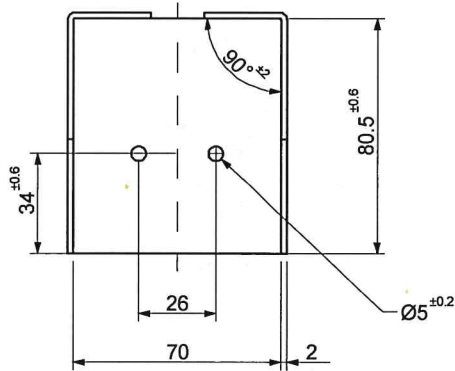
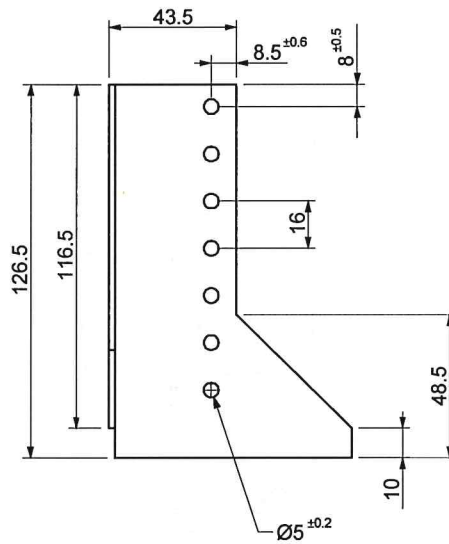
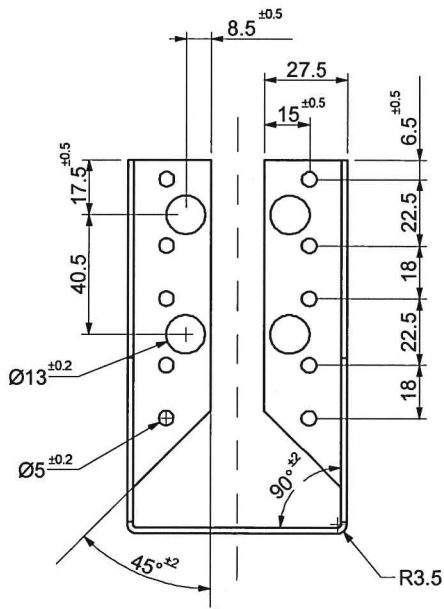


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1086

Annex A103
of ETA N° 19/0535

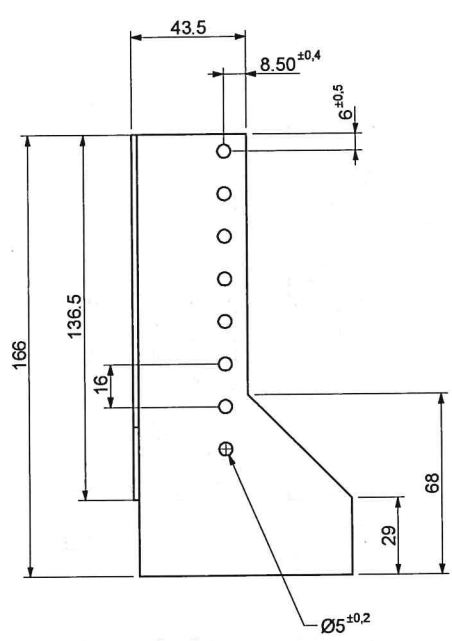
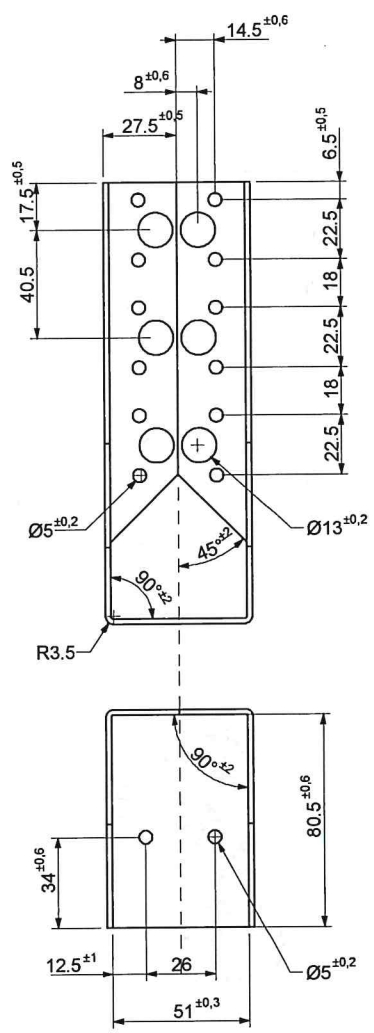


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1089

Annex A106
of ETA N° 19/0535

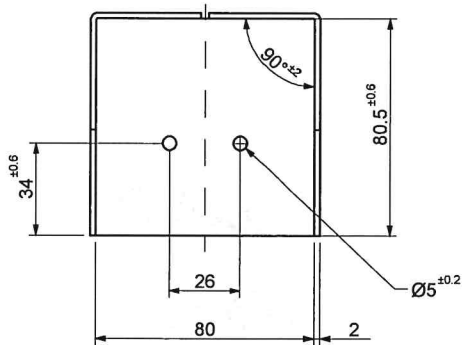
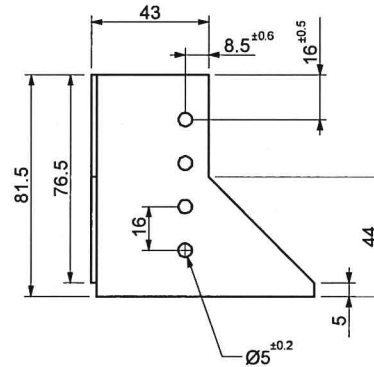
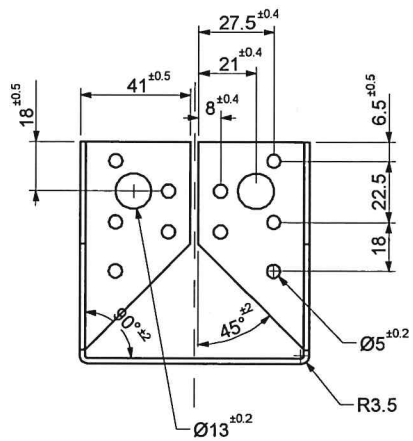


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1090

Annex A107
of ETA N° 19/0535

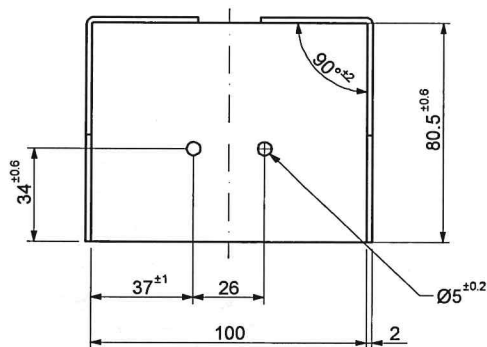
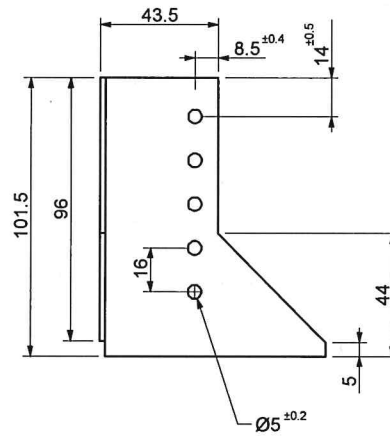
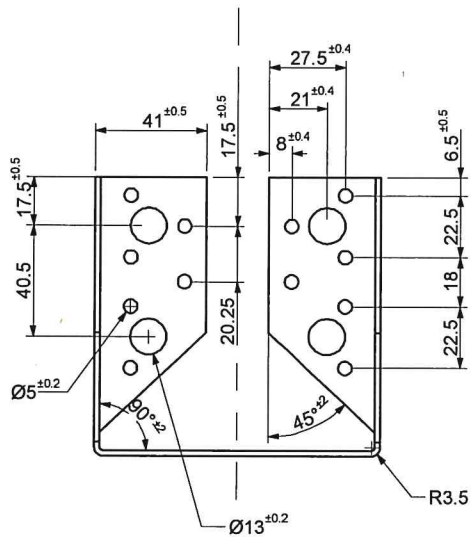


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1091

**Annex A108
of ETA N° 19/0535**



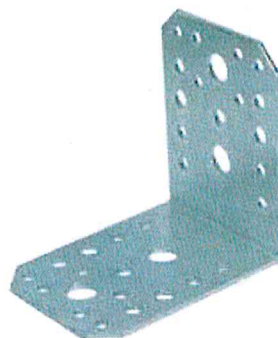
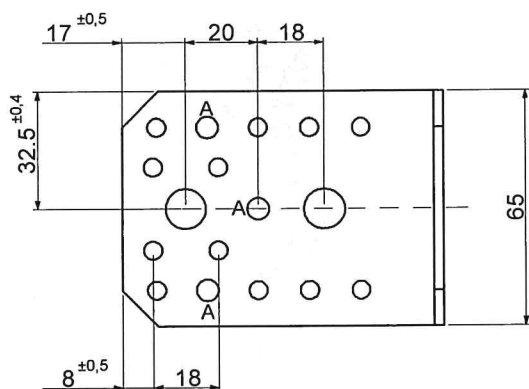
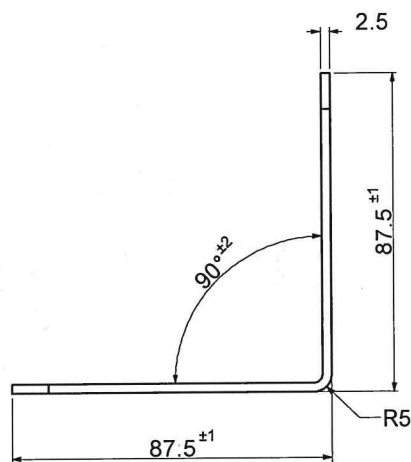
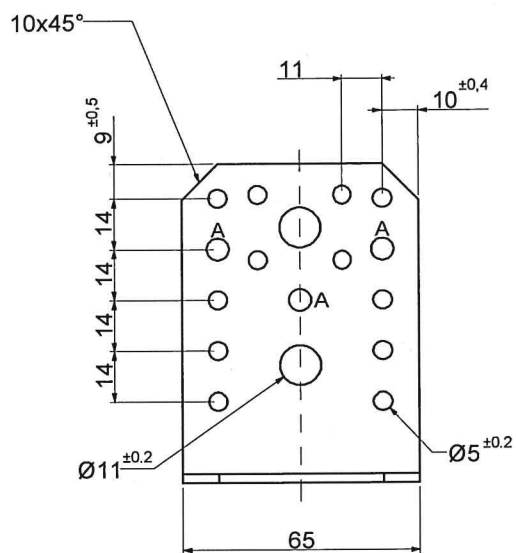
Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Joist Hanger: JH/1093

Annex A110
of ETA N° 19/0535

AB

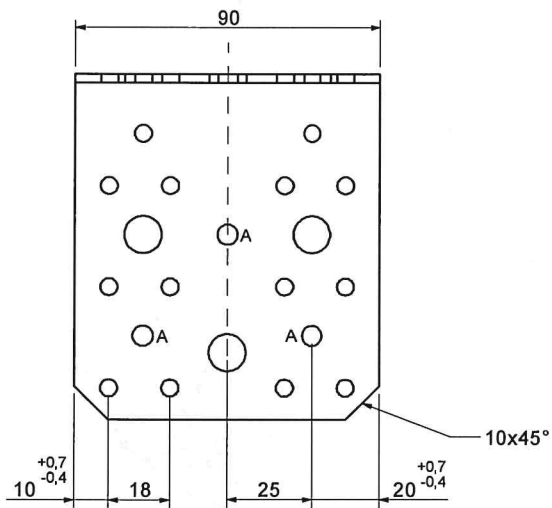
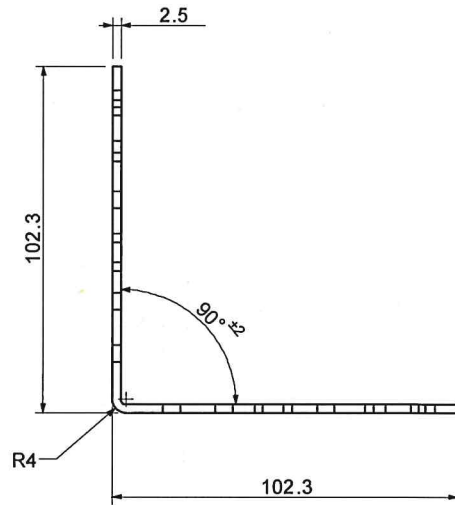
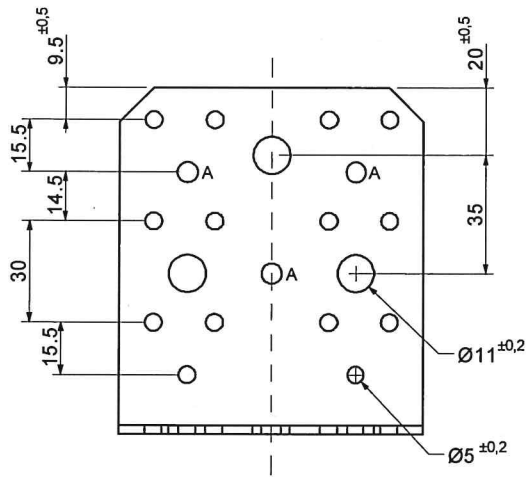


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Angle Bracket: AB/756

Annex A111
of ETA N° 19/0535

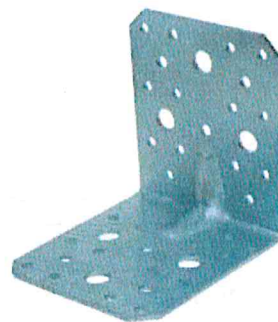
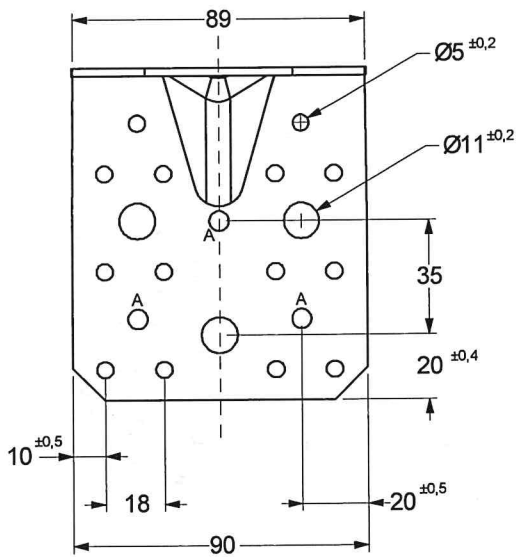
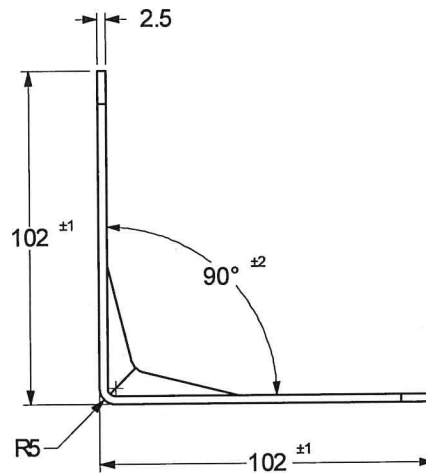
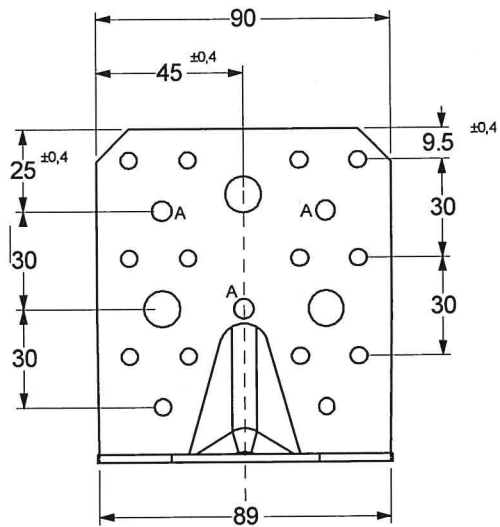


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Angle Bracket: AB/757

Annex A112
of ETA N° 19/0535

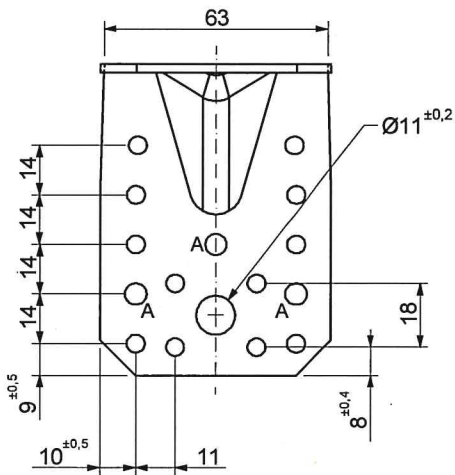
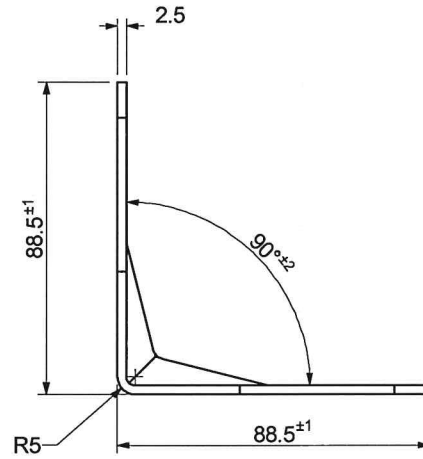
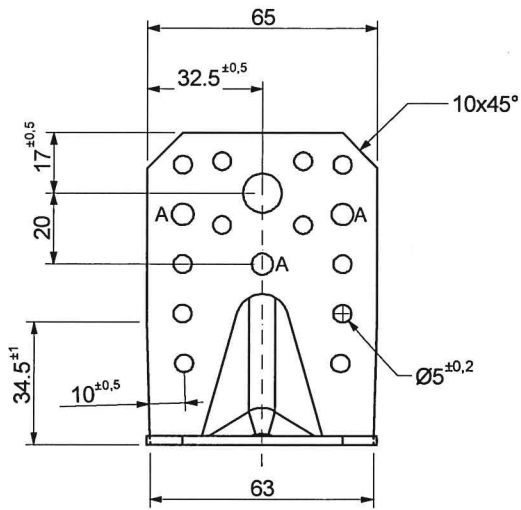


Schematic 3D view
of the product

SIPA NAILING PLATES

Product Description - Angle Bracket: AB/397

Annex A113
of ETA N° 19/0535

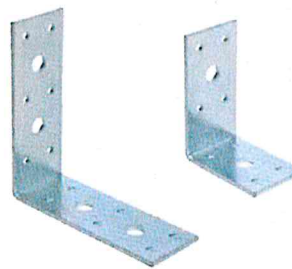
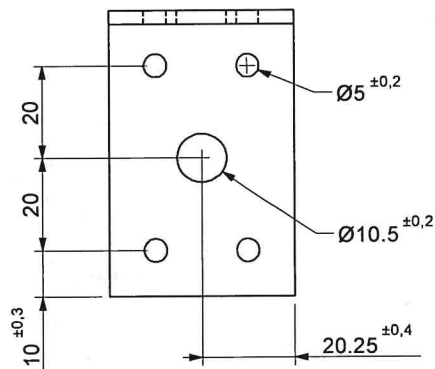
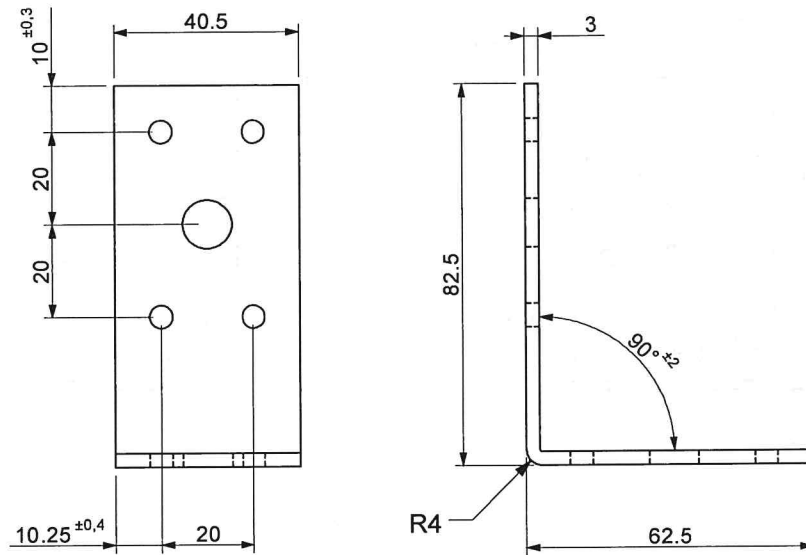


Schematic 3D view
of the product

SIPA NAILING PLATES

Product Description - Angle Bracket: AB/395

**Annex A114
of ETA N° 19/0535**

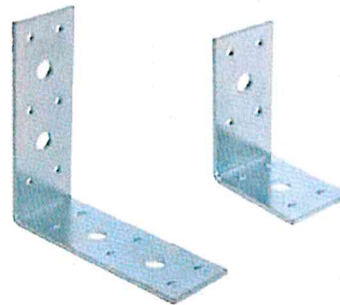
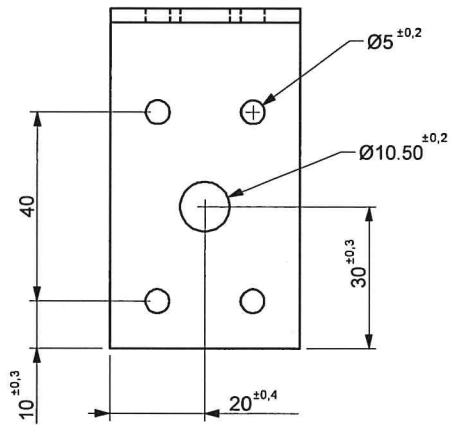
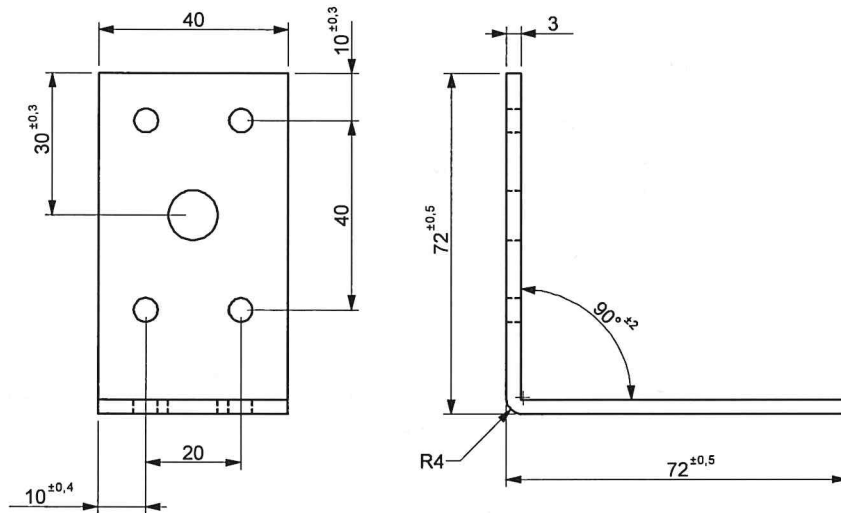


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Angle Bracket: AB/1616

Annex A115
of ETA N° 19/0535

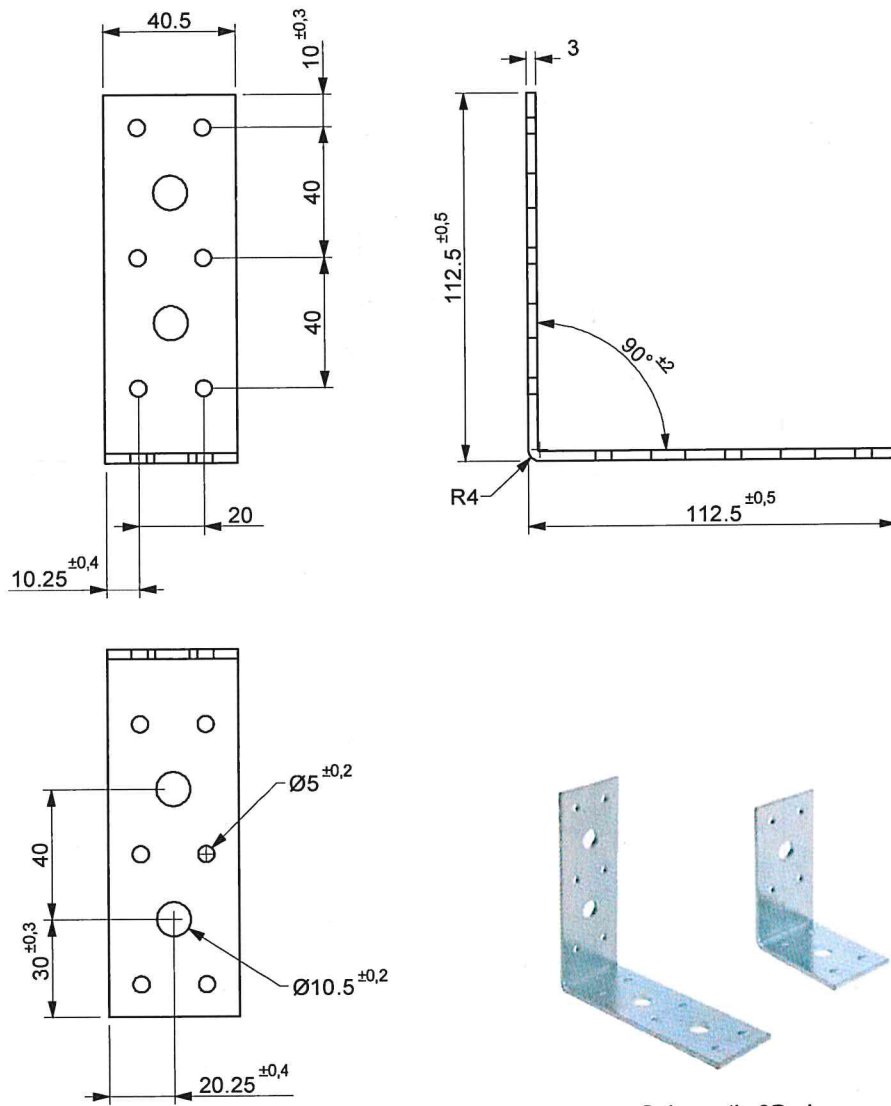


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Angle Bracket: AB/1617

Annex A116
of ETA N° 19/0535

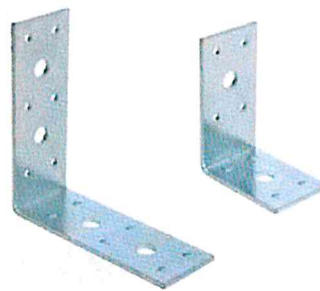
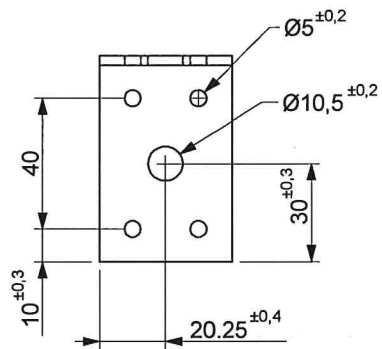
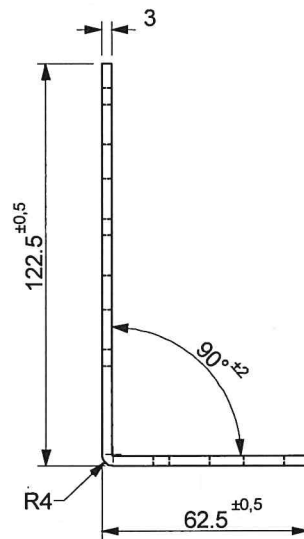
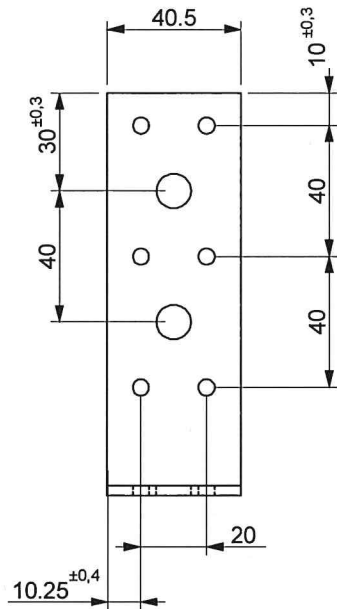


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Angle Bracket: AB/1618

Annex A117
of ETA N° 19/0535



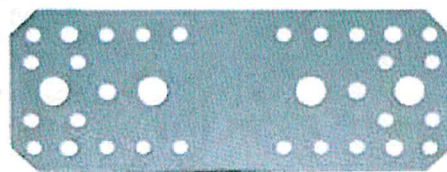
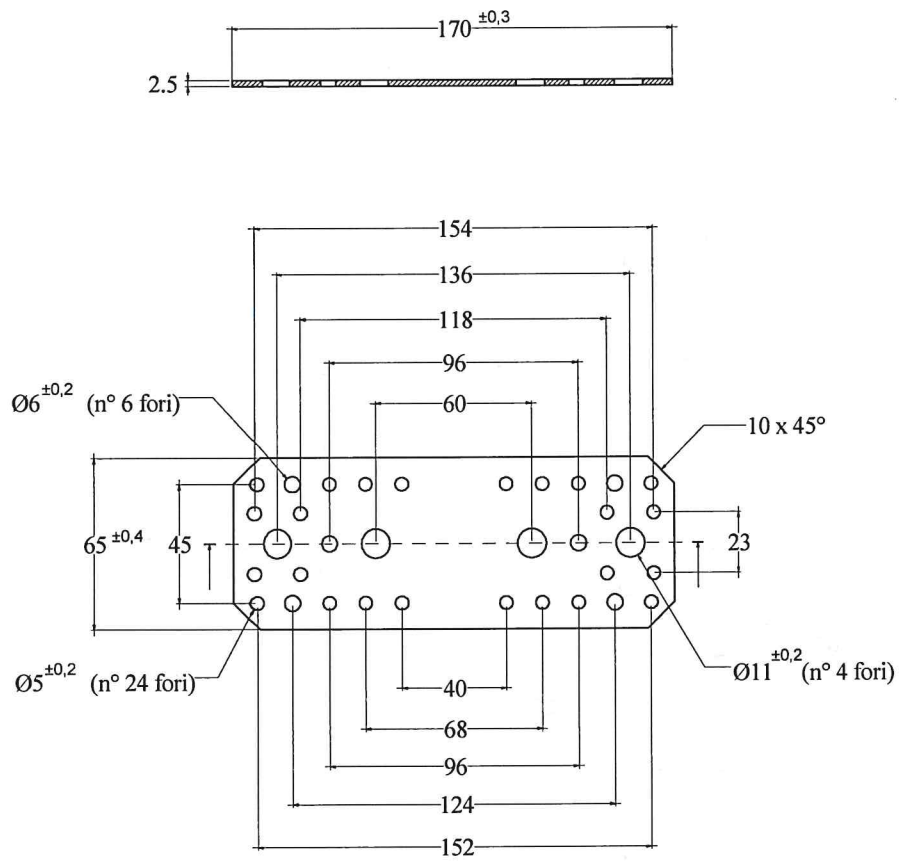
Schematic 3D view of the product

SIPA NAILING PLATES

Product Description - Angle Bracket: AB/1619

Annex A118
of ETA N° 19/0535

RP

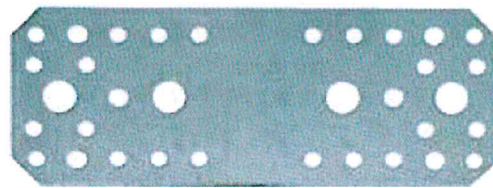
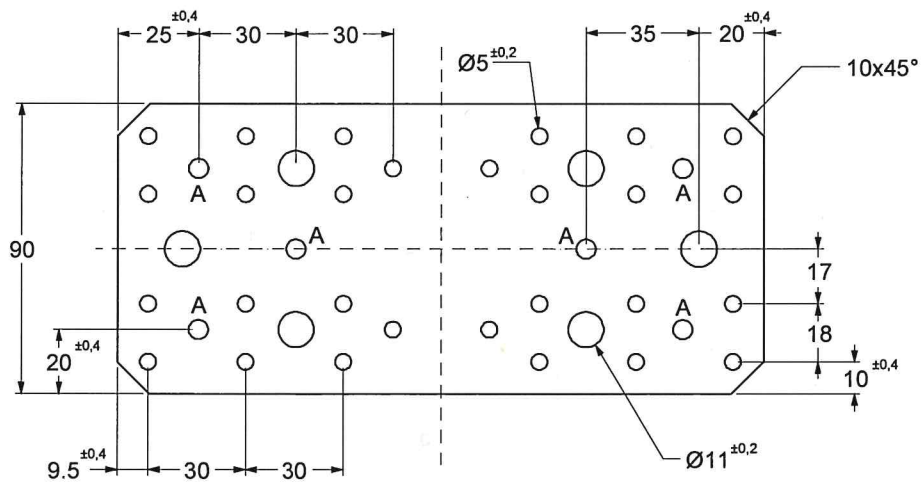


Schematic 3D view
of the product

SIPA NAILING PLATES

Product Description – Restraint Plate: RP/394

Annex A119
of ETA N° 19/0535

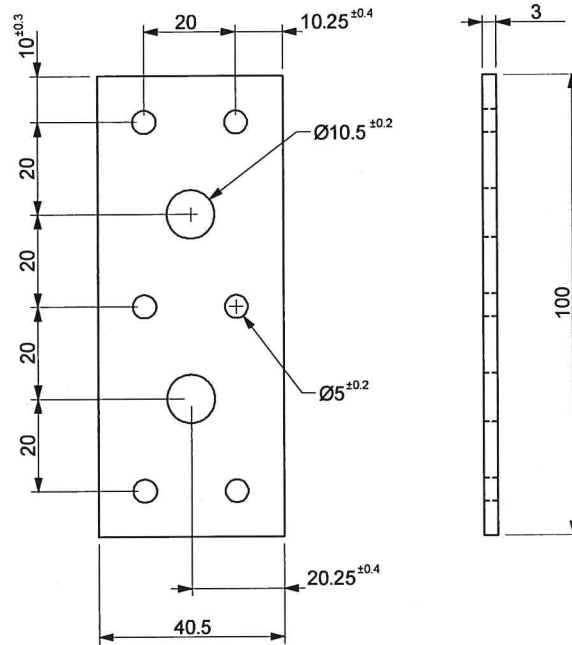


Schematic 3D view
of the product

SIPA NAILING PLATES

Product Description – Restraint Plate: RP/396

**Annex A120
of ETA N° 19/0535**

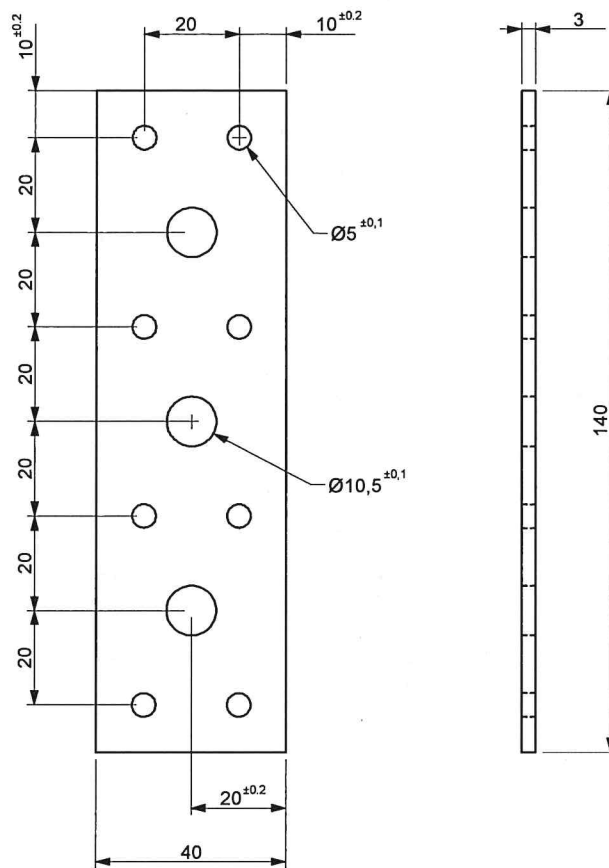


Schematic 3D view
of the product

SIPA NAILING PLATES

Product Description – Restraint Plate: RP/1676

**Annex A121
of ETA N° 19/0535**

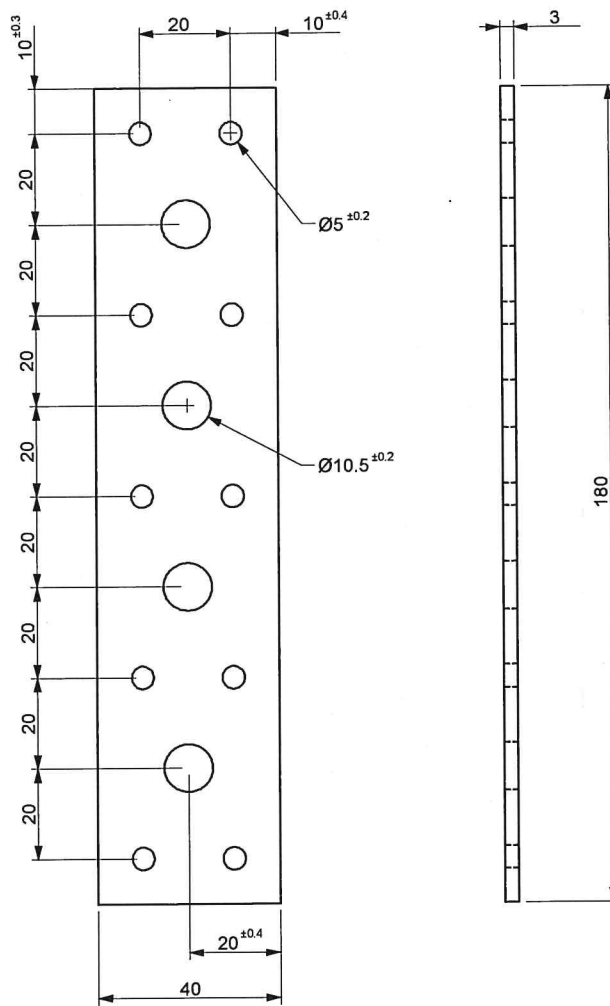


Schematic 3D view
of the product

SIPA NAILING PLATES

Product Description – Restraint Plate: RP/1677

**Annex A122
of ETA N° 19/0535**

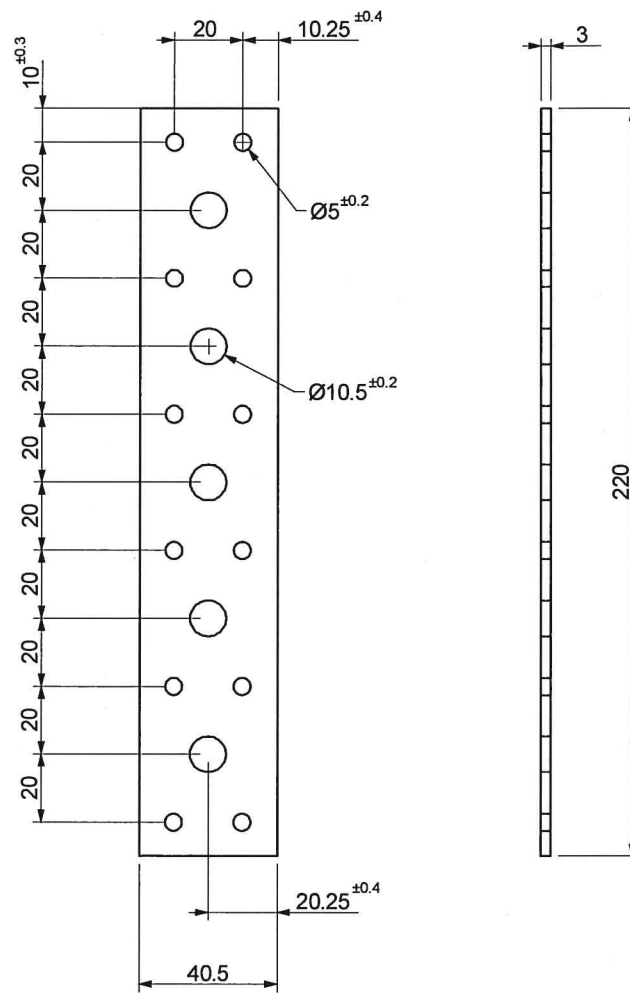


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description – Restraint Plate: RP/1678

**Annex A123
of ETA N° 19/0535**



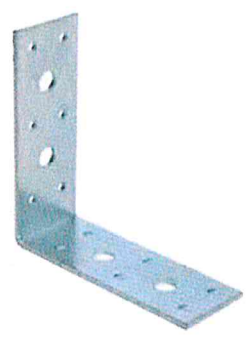
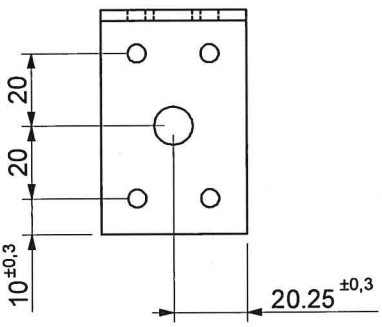
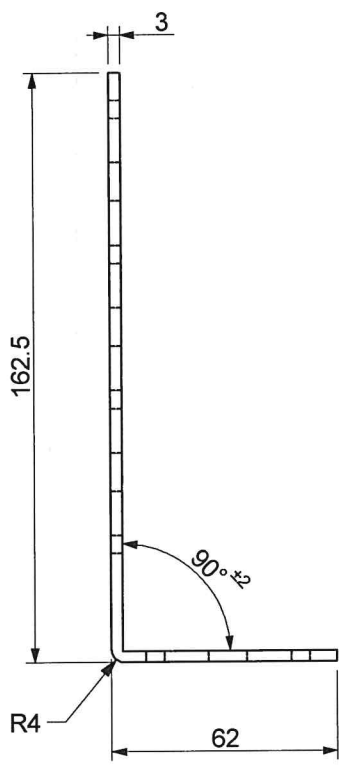
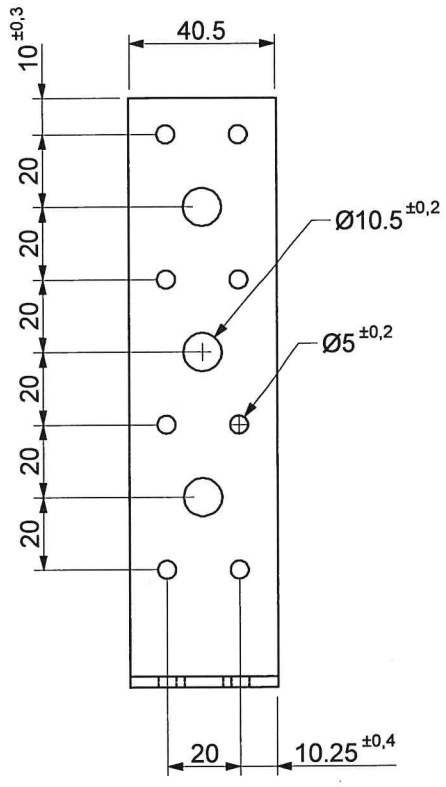
*Schematic 3D view
of the product*

SIPA NAILING PLATES

Product Description – Restraint Plate: RP/1679

**Annex A124
of ETA N° 19/0535**

HD

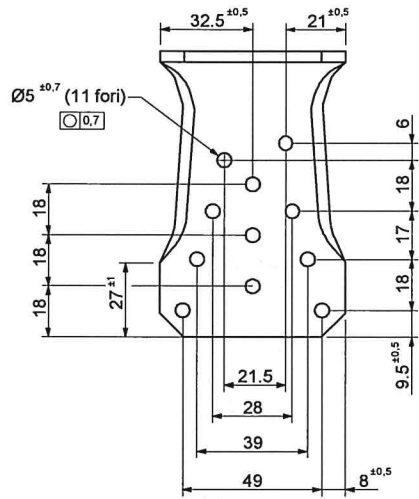
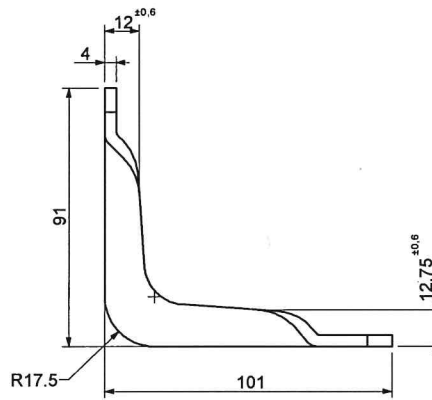
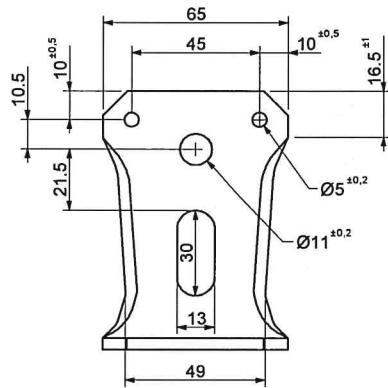


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description – Hold Down: HD/1645

Annex A125
of ETA N° 19/0535

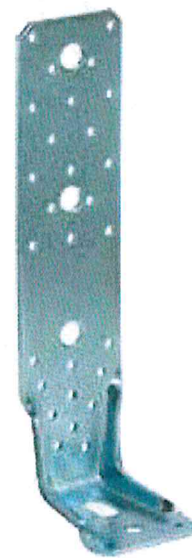
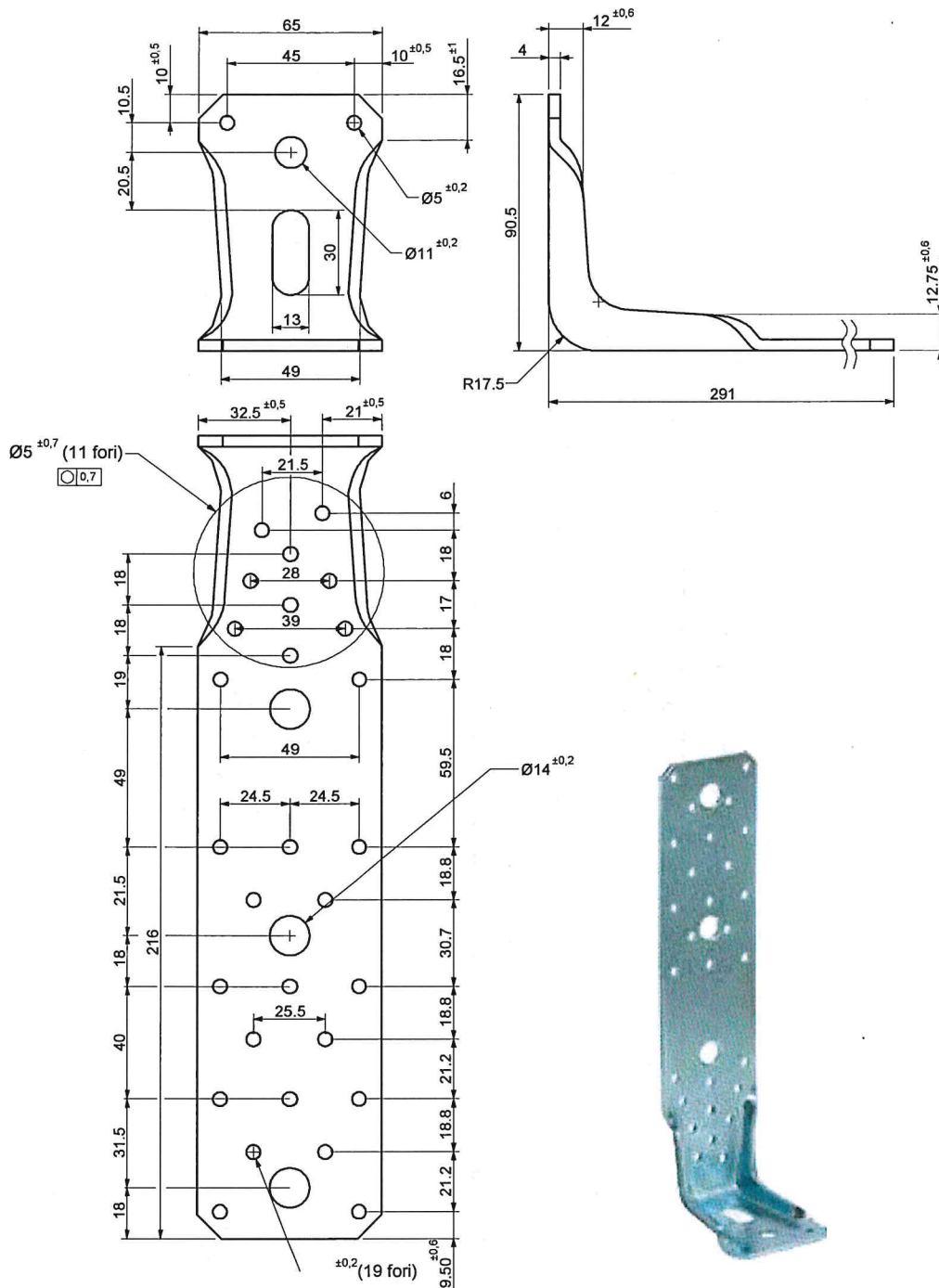


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description – Hold Down: HD/746

Annex A126
of ETA N° 19/0535

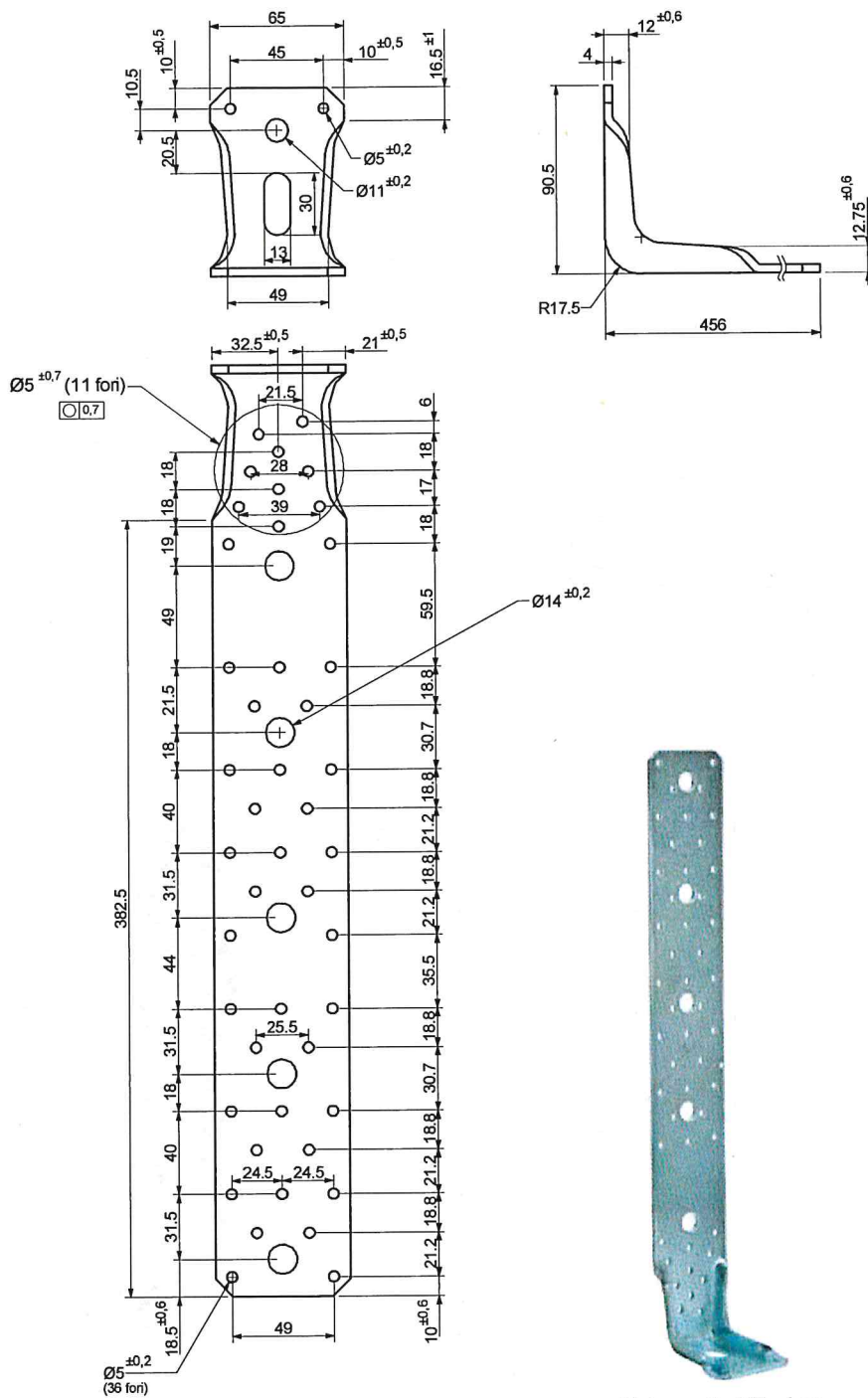


Schematic 3D view of the product

SIPA NAILING PLATES

Product Description – Hold Down: HD/748

**Annex A128
of ETA N° 19/0535**



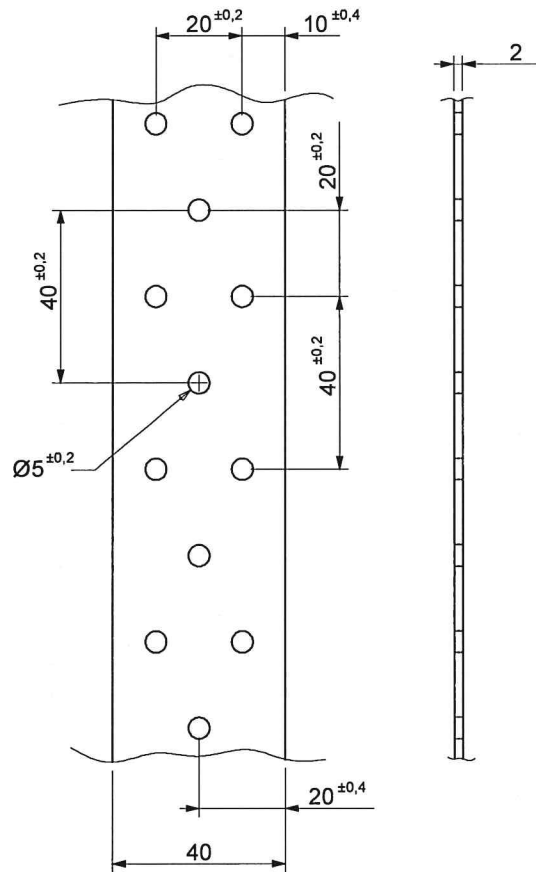
Schematic 3D view of the product

SIPA NAILING PLATES

Product Description – Hold Down: HD/749

Annex A129
of ETA N° 19/0535

RS

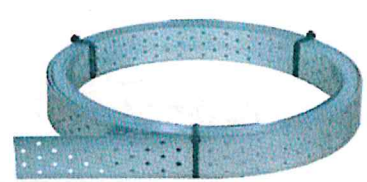
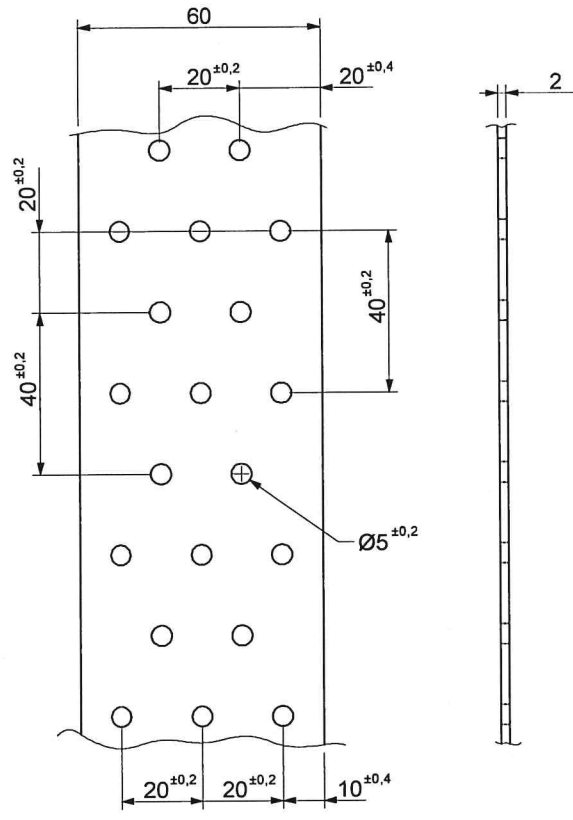


*Schematic 3D view
of the product*

SIPA NAILING PLATES

Product Description – Restraint Strap: RS/758

**Annex A130
of ETA N° 19/0535**

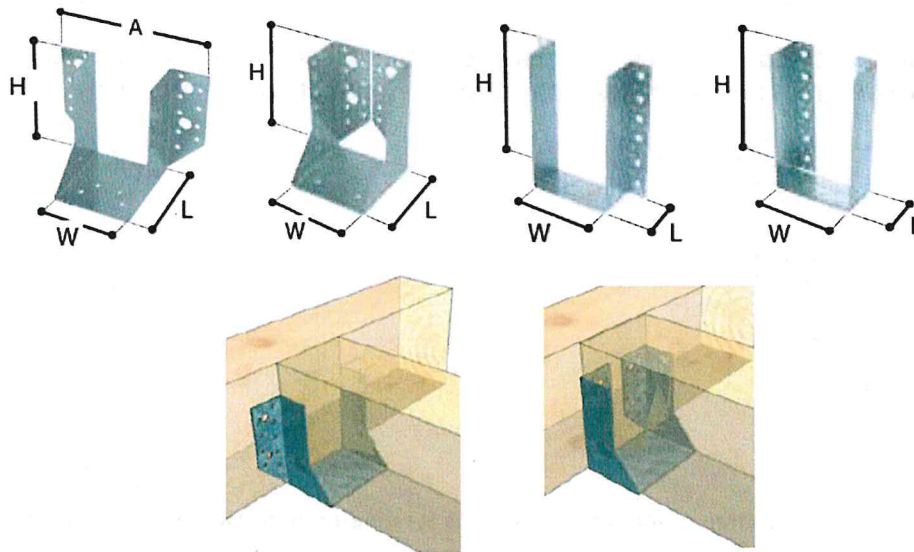


Schematic 3D view of the product

| | |
|---|---|
| SIPA NAILING PLATES | Annex A131 of ETA N° 19/0535 |
| Product Description – Restraint Strap: RS/758 | |

SPECIFICATION OF INTENDED USE AND INSTALLATION INSTRUCTIONS

JOST HANGERS



Schematic 3D view of SIPA Joist Hangers typologies and typical installation

Installation operations

- The secondary timber beam is connected to the horizontal plate (no wane or other defects of timber members in the region of the connection are allowed).
- The nailing plate of secondary timber beam is connected to principal member by means of threaded nails or screws (fasteners shall be inserted in all the holes or in a partial pattern according to Annex C)
- Secondary beam width (W_b) shall be equal to Joist Hanger width (W). A difference equal or less than -3 mm is allowed.
- Minimum value of height (H) of the secondary beam shall be selected such that the distance of threaded nail or screw from the external edge should be higher than $5 \cdot d \geq 20$ mm.
- Pre-drilling of timber members is not allowed.
- If one secondary beam is connected to the principal member, the width of the principal member should be higher than secondary beam width.
- If two secondary beams are connected to the principal member along the same perpendicular line, the width of the principal members shall be higher than:
 - $t_f + 4$ mm (t is the penetration depth of the fastener)
 - $2 \cdot l_f$ (l_f is the total length of the fastener)
- The distance between the centre lines of two consecutive Joist Hangers shall be higher than $A + 100$ mm.

SIPA NAILING PLATES

Intended Use – Installation instructions

Annex B1
of ETA N° 19/0535

Assessment of the performances

The characteristic values of strength and stiffness of timber-to-timber joints have been determined by testing for Angle Brackets, Hold Downs, Restraint Plates and Straps. The method of calculation assisted by testing has been applied in the case of Joist Hangers for assessing the joint strength, whereas the joint stiffness has been experimentally determined for the tested products. The definition of the considered force directions is schematically given in Figure C1 and Figure C2, for end-grain to side-grain and side-grain to side-grain connections, respectively.

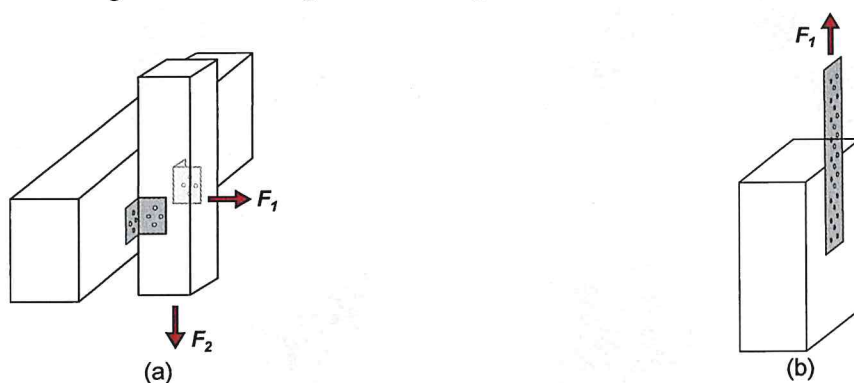


Figure C1: Definition of the force directions for side-grain to side-grain connection.

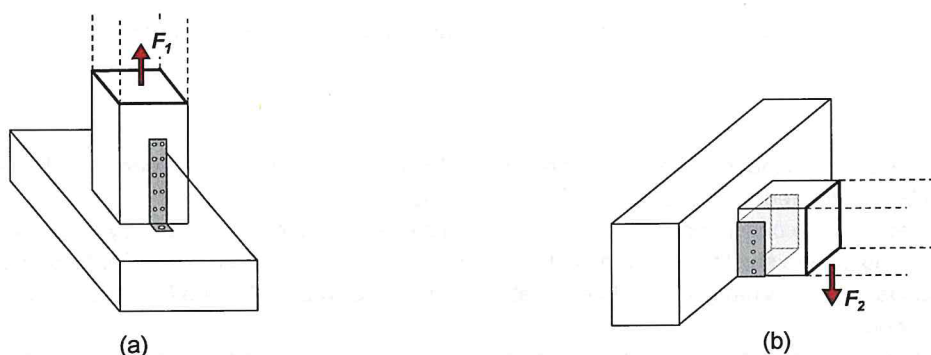


Figure C2: Definition of the force directions for end-grain to side-grain connection.

Strength and stiffness values, as stated in the following tables, are valid on condition that:

- the fasteners specified in Annex A and the nailing patterns depicted in Annex C are adopted;
- there are no wane or other defects reducing the joint capacity in the region of the connection.

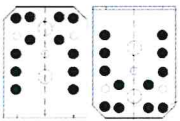
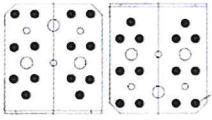
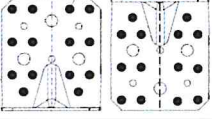
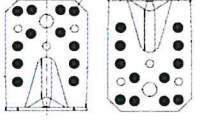

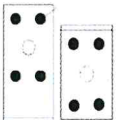
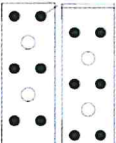
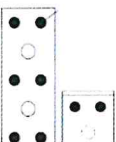
The following materials have been used for the assessment procedure:

- Solid timber classified as C24 according to EN 338:2016 and EN 14081:2016 with density between 301 and 448 kg/m³.
- Glued laminated timber classified as GL24h according to EN 14080:2013 with density between 399 and 428 kg/m³.
- Cross laminated timber (XLAM) according to EN16351:2015 with density between 409 and 504 kg/m³.

The design values shall be determined according to EN 1995-1-1 (Eurocode 5) or similar national Timber Code.

| | |
|--|---------------------------------------|
| SIPA NAILING PLATES | Annex C1 of ETA N° 19/0535 |
| Performances – Assumed joint forces directions | |

Table C1: Angle Brackets: nailing pattern, joint strength and stiffness for the force F_2

| Product ID (-) | Nailing Pattern (-) | F_2^* (kN) | k_{s2}^* (kN/mm) |
|-------------------|---|-----------------|-----------------------|
| AB/756 |  | 13.77 | 2.30 |
| AB/757 |  | 23.14 | 3.43 |
| AB/397 |  | 24.04 | 3.95 |
| AB/395 |  | 15.09 | 2.06 |
| AB/1616 |  | 5.05 | 0.86 |
| AB/1617 |  | 4.45 | 0.82 |
| AB/1618 |  | 6.85 | 0.97 |
| AB/1619 |  | 7.45 | 1.01 |

● Würth Comb Nail mod. 0681 940040 (4mm x 40mm)

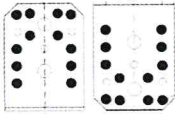
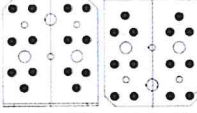
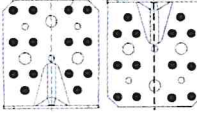
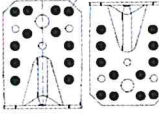
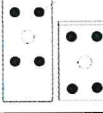
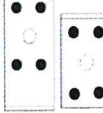
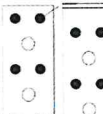
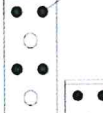
* The values of force and stiffness reported herein are referred to the connection made of two angle brackets installed on the opposite sides of the fastened timber member (see Figure C1)

SIPA NAILING PLATES

Performances – Joint strength and stiffness for Angle Brackets

Annex C2
of ETA N° 19/0535

Table C2: Angle Brackets: nailing pattern, joint strength and stiffness for the force F_1

| Product ID (-) | Nailing Pattern (-) | F_1^* (kN) | k_{S1}^* (kN/mm) |
|-------------------|---|-----------------|-----------------------|
| AB/756 |  | 7.22 | 4.19 |
| AB/757 |  | 10.03 | 5.70 |
| AB/397 |  | 16.14 | 6.01 |
| AB/395 |  | 10.11 | 6.17 |
| AB/1616 |  | 4.91 | 3.73 |
| AB/1617 |  | 4.82 | 3.77 |
| AB/1618 |  | 4.44 | 3.91 |
| AB/1619 |  | 4.91 | 3.73 |

● Würth Comb Nail mod. 0681 940040 (4mm x 40mm)





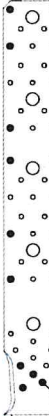
* The values of force and stiffness reported herein are referred to the connection made of two angle brackets installed on the opposite sides of the fastened timber member (see Figure C1)

SIPA NAILING PLATES

Performances – Joint strength and stiffness for Angle Brackets

Annex C3
of ETA N° 19/0535

Table C3: Hold Downs: nailing pattern, joint strength and stiffness for the force F_1

| Product ID (-) | Nailing Pattern (-) | F_1 (kN) | k_{s1} (kN/mm) |
|-------------------|---|---------------|---------------------|
| HD/1645 |  | 9.20 | 1.99 |
| HD/746 |  | 16.18 | 2.73 |
| HD/747 |  | 29.29 | 5.12 |
| HD/748 |  | 29.53 | 6.71 |
| HD/749 |  | 30.60 | 6.72 |

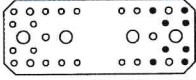
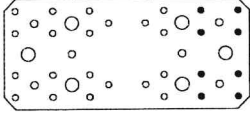




● Würth Comb Nail mod. 0681 940040 (4mm x 75mm)

SIPA NAILING PLATES

Performances – Joint strength and stiffness for Hold Downs

Annex C4
of ETA N° 19/0535

Table C4: Restraint Plates : nailing pattern, joint strength and stiffness for the force F_1

| Product ID (-) | Nailing Pattern (-) | F_1 (kN) | k_{s1} (kN/mm) |
|-------------------|---|---------------|---------------------|
| RP/394 |  | 15.26 | 3.74 |
| RP/396 |  | 17.10 | 4.40 |
| RP/1676 |  | 4.15 | 2.48 |
| RP/1677 |  | 5.99 | 2.05 |
| RP/1678 |  | 7.83 | 1.61 |
| RP/1679 |  | 8.07 | 1.82 |

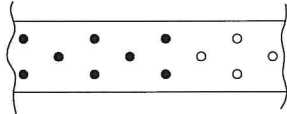
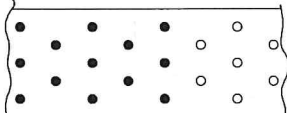
● Würth Comb Nail mod. 0681 940040 (4mm x 40mm)

SIPA NAILING PLATES

Performances – Joint strength and stiffness for Restraint Plates

Annex C5
of ETA N° 19/0535

Table C5: Restraint Straps : nailing pattern, joint strength and stiffness for the force F_1

| Product ID (-) | Nailing Pattern (-) | F_1 (kN) | k_{s1} (kN/mm) |
|-------------------|---|---------------|---------------------|
| RS/758 |  | 15.37 | 4.32 |
| RS/759 |  | 24.47 | 6.21 |

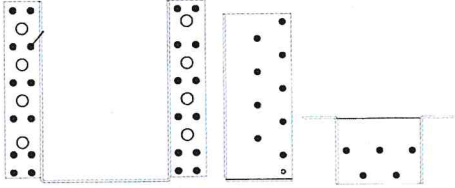
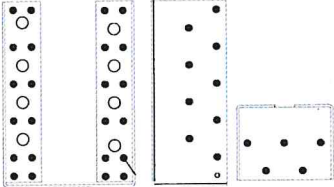
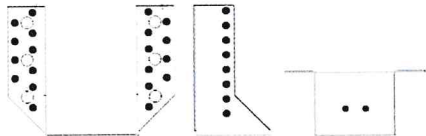
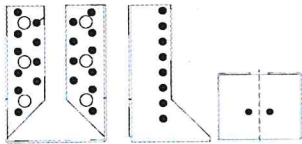
● Würth Comb Nail mod. 0681 940040 (4mm x 40mm)

SIPA NAILING PLATES

Performances – Joint strength and stiffness for Restraint Straps

Annex C6
of ETA N° 19/0535

Table C6: Nailing patterns definition for Joist Hangers

| Product typology (-) | Product family (-) | Nailing Pattern* (-) |
|--|-------------------------------|---|
| Joist Hanger (JH) | Face-Mount Heavy JH |  |
| | Concealed Face-Mount Heavy JH |  |
| | Face-Mount Light JH |  |
| | Concealed Face-Mount Light JH |  |
| <p>● Würth Comb Nail mod. 0681 940040 (4mm x 75mm)</p> | | |

*Nailing pattern scheme adopted for all the products belonging to the corresponding family and assumed for calculation (frontal view - lateral view - top view, are reported in sequence).

SIPA NAILING PLATES

Performances – Nailing patterns

Annex C7
of ETA N° 19/0535

Table C7: Face-Mount Light Joist Hangers: joint strength and stiffness for the forces F_2

| Product ID (-) | F_2 (kN) | k_{s2} (kN/mm) |
|-------------------|---------------|---------------------|
| JH/373 | 19.12 | |
| JH/375 | 24.58 | |
| JH/377 | 24.58 | |
| JH/379 | 27.31 | |
| JH/381 | 19.12 | |
| JH/382 | 24.58 | |
| JH/383 | 30.96 | 5.97 |
| JH/1050 | 10.92 | |
| JH/1051 | 16.39 | |
| JH/1052 | 19.12 | |
| JH/1053 | 24.58 | |
| JH/1054 | 27.31 | |
| JH/1055 | 10.92 | |
| JH/1056 | 16.39 | |
| JH/1057 | 24.58 | |
| JH/1058 | 27.31 | |
| JH/1060 | 10.92 | |
| JH/1061 | 19.12 | |
| JH/1062 | 24.58 | |
| JH/1063 | 27.47 | 4.54 |
| JH/1064 | 10.92 | |
| JH/1065 | 27.31 | |
| JH/1066 | 30.74 | 5.05 |
| JH/1067 | 13.65 | |
| JH/1068 | 27.31 | |
| JH/1069 | 16.39 | |

SIPA NAILING PLATES

Performances – Joint strength and stiffness for Joist Hangers

**Annex C8
of ETA N° 19/0535**

Table C8: Concealed Face-Mount Light Joist Hanger: joint strength and stiffness for the forces F_2

| Product ID (-) | F_2 (kN) | k_{s2} (kN/mm) |
|-------------------|---------------|---------------------|
| JH/655 | 27.31 | |
| JH/656 | 24.58 | |
| JH/657 | 32.51 | 5.74 |
| JH/1081 | 5.46 | |
| JH/1082 | 10.92 | |
| JH/1083 | 13.65 | |
| JH/1084 | 29.04 | 3.68 |
| JH/1085 | 5.46 | |
| JH/1086 | 10.92 | |
| JH/1087 | 13.65 | |
| JH/1088 | 16.39 | |
| JH/1089 | 13.65 | |
| JH/1090 | 22.61 | 2.74 |
| JH/1091 | 13.65 | |
| JH/1092 | 27.31 | |
| JH/1093 | 16.39 | |

SIPA NAILING PLATES

Performances – Joint strength and stiffness for Joist Hangers

**Annex C9
of ETA N° 19/0535**

Table C9: Face-Mount Heavy Joist Hanger: joint strength and stiffness for the forces F_2

| Product ID (-) | F_2 (kN) | k_{s2} (kN/mm) |
|-------------------|---------------|---------------------|
| JH/1100 | 35.21 | 6.04 |
| JH/1101 | 32.77 | |
| JH/1102 | 32.77 | |
| JH/1103 | 49.16 | |
| JH/1104 | 49.16 | |
| JH/1105 | 43.70 | |
| JH/1106 | 16.39 | |
| JH/1107 | 16.39 | |
| JH/1108 | 16.39 | |
| JH/1109 | 49.16 | |
| JH/1110 | 32.77 | |
| JH/1111 | 57.35 | |
| JH/1112 | 54.62 | |
| JH/1113 | 65.54 | |
| JH/1114 | 21.85 | |
| JH/1115 | 24.58 | |
| JH/1116 | 46.49 | 9.24 |
| JH/1117 | 49.16 | |
| JH/1118 | 43.70 | |
| JH/1119 | 43.70 | |
| JH/1120 | 60.08 | |
| JH/1121 | 21.85 | |
| JH/1548 | 27.31 | |
| JH/1122 | 49.16 | |
| JH/1123 | 43.70 | |
| JH/1124 | 54.62 | |
| JH/1125 | 43.70 | |
| JH/1126 | 38.23 | |
| JH/1127 | 49.16 | |
| JH/1128 | 32.77 | |
| JH/1129 | 79.08 | 13.68 |

SIPA NAILING PLATES

Performances – Joint strength and stiffness for Joist Hangers

**Annex C10
of ETA N° 19/0535**

Table C10: Concealed Face-Mount Heavy Joist Hanger: joint strength and stiffness for the forces F_2

| Product ID (-) | F_2 (kN) | k_{s2} (kN/mm) |
|-------------------|---------------|---------------------|
| JH/1140 | 28.51 | 4.37 |
| JH/1141 | 32.77 | |
| JH/1142 | 36.87 | |
| JH/1143 | 49.16 | |
| JH/1144 | 49.16 | |
| JH/1145 | 43.70 | |
| JH/1146 | 16.39 | |
| JH/1147 | 16.39 | |
| JH/1148 | 32.77 | |
| JH/1149 | 54.62 | |
| JH/1150 | 32.77 | |
| JH/1151 | 65.54 | |
| JH/1152 | 54.62 | |
| JH/1153 | 65.54 | |
| JH/1154 | 21.85 | |
| JH/1155 | 24.58 | |
| JH/1156 | 39.41 | 5.93 |
| JH/1157 | 40.96 | |
| JH/1158 | 43.70 | |
| JH/1159 | 43.70 | |
| JH/1160 | 60.08 | |
| JH/1161 | 21.85 | |
| JH/1549 | 27.31 | |
| JH/1162 | 49.16 | |
| JH/1163 | 43.70 | |
| JH/1164 | 54.62 | |
| JH/1165 | 43.70 | |
| JH/1166 | 38.23 | |
| JH/1167 | 49.16 | |
| JH/1168 | 32.77 | |
| JH/1169 | 77.63 | 12.53 |

SIPA NAILING PLATES

Performances – Joint strength and stiffness for Joist Hangers

Annex C11
of ETA N° 19/0535