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Authorised and notified according to Article 10 of the Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products

MEMBER OF EOTA

European Technical Approval ETA-08/0006

This ETA replaces the previous ETA with the same number and validity from 2008-01-23 to 2013-01-23

Trade name:	SIMA Gerber Connectors type 1-150, 1-180, 2-125, 2-150, 2-180, 2-200, 3-120, 3-140, 3-140 Stainless, 3-160, 3-160 Stainless, 3-180, 3-180 Stainless
Holder of approval:	Sima Industri ApS Industrivej Nord 40 DK-7490 Aulum Tel. +45 97 47 26 11 Fax +45 97 47 37 11 Internet www.simaindustri.dk
Generic type and use of construction product:	Three-dimensional nailing plate (timber to timber cantilever bracket)
Valid from: to:	2012-12-21 2017-12-21
Manufacturing plant:	Sima Industri ApS Industrivej Nord 40 DK-7490 Aulum
This European Technical Approval contains:	27 pages including 2 annexes which form an integral part of the document

I LEGAL BASIS AND GENERAL CONDITIONS

1 This European Technical Approval is issued by ETA-Danmark A/S in accordance with:

- Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products[1)], as amended by Council Directive 93/68/EEC of 22 July 1993[2)].

- Bekendtgørelse 559 af 27-06-1994 (afløser bekendtgørelse 480 af 25-06-1991) om ikrafttræden af EF direktiv af 21. december 1988 om indbyrdes tilnærmelse af medlemsstaternes love og administrative bestemmelser om byggevarer.

- Common Procedural Rules for Requesting, Preparing and the Granting of European Technical Approvals set out in the Annex to Commission Decision 94/23/EC[3)].

- EOTA Guideline ETAG 015 *Three-dimensional nailing plates,* September 2002 edition.

2 ETA-Danmark A/S is authorized to check whether the provisions of this European Technical Approval are met. Checking may take place in the manufacturing plant. Nevertheless, the responsibility for the conformity of the products to the European Technical Approval and for their fitness for the intended use remains with the holder of the European Technical Approval.

3 This European Technical Approval is not to be transferred to manufacturers or agents of manufacturers other than those indicated on page 1, or manufacturing plants other than those indicated on page 1 of this European Technical Approval.

4 This European Technical Approval may be withdrawn by ETA-Danmark A/S pursuant to Article 5(1) of Council Directive89/106/EEC.

5 Reproduction of this European Technical Approval including transmission by electronic means shall be in full. However, partial reproduction can be made with the written consent of ETA-Danmark A/S. In this case partial reproduction has to be designated as such. Texts and drawings of advertising brochures shall not contradict or misuse the European Technical Approval.

6 This European Technical Approval is issued by ETA-Danmark A/S in English.
This version corresponds fully to the version circulated within EOTA. Translations into other languages have to be designated as such.

1) Official Journal of the European Communities N° L40, 11 Feb 1989, p 12.
2) Official Journal of the European Communities N° L220, 30 Aug 1993, p 1.
3) Official Journal of the European Communities N° L 17, 20 Jan 1994, p 34.

II SPECIAL CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

1 Definition of product and intended use

Definition of the product
SIMA Industri Gerber Connectors type 1-150, 1-180, 2-125, 2-150, 2-180, 2-200, 3-120, 3-140, 3-140 Stainless, 3-160, 3-160 Stainless, 3-180, 3-180 Stainless are one-piece or two-pieces non-welded, cantilever brackets to be used in timber to timber connections fastened with specific nails.

The cantilever brackets are made from pre-galvanized steel Grade S 250 GD + Z275 according to EN 10326:2004 or stainless steel 1.4401 or 1.4404 according to EN 10088 with a minimum characteristic yield stress of 235 MPa or a minimum ultimate tensile strength of 330 MPa.. Dimensions, hole positions, steel type and typical installations are shown in Annex A.

In addition, the cantilever brackets can be hot dipped galvanized according to EN ISO 1461 with a zinc coating thickness of approximately 55 µm.

Intended use
The cantilever brackets are intended for use in making end-grain to end-grain connections between wood based beams (joists or purlins) in a cantilever system, where requirements for mechanical resistance and stability and safety in use in the sense of the Essential Requirements 1 and 4 of Council Directive 89/106/EEC shall be fulfilled.

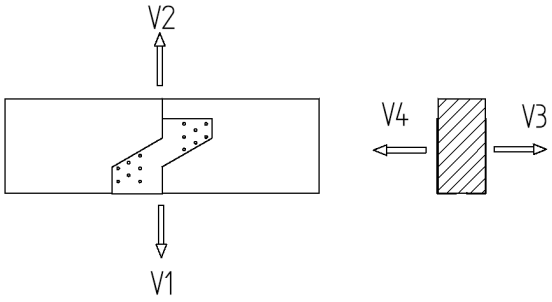
The cantilever brackets can be installed as connections between wood based members such as:

- Structural solid timber classified to C14-C40 according to EN 338 / EN 14081,
- Glulam classified to GL24-GL36 according to EN 1194 / EN 14080,
- LVL according to EN 14374,
- Parallam PSL,
- Intrallam LSL,
- Duo- and Triobalken,
- Layered wood plates,
- Kreuzbalken with minimum thickness of 80 mm
- I-beams with backer blocks on both sides of the web in the header and web stiffeners in the joist
- Plywood according to EN 636

However, the calculation methods are only allowed for a characteristic wood density of up to 350 kg/m^3. Even though the wood based material may have a larger density, this must not be used in the formulas for the load-carrying capacities of the fasteners.

Annex B gives the tables for the characteristic load-carrying capacities of the cantilever bracket connections.
The design of the connections shall be in accordance with Eurocode 5 or a similar national Timber Code.

It is assumed that the forces acting on the cantilever bracket connection are the following $V_1 = F_1$, $V_2 = F_2$, $V_3 = F_3$ *and* $V_4 = F_4$, as shown in the figure below. The forces shall act in the middle of the cantilever bracket. It is assumed that the forces F_1, F_2, F_3 *and* F_4 are acting right at the end of each beam.



The cantilever brackets are intended for use for connections subject to static or quasi static loading.

The zinc-coated hangers are for use in timber structures subject to dry, internal conditions defined by the service classes 1 and 2 of EN 1995-1-1:2004, (Eurocode 5).

The cantilever brackets which are hot dipped galvanized according to EN ISO 1461 with a zinc coating thickness of approximately 55 µm and cantilever brackets made from stainless steel are intended for use in more corrosive environments defined by service class 3 of EN 1995-1-1:2004, (Eurocode 5).

The nails and screws to be used in combination with stainless steel brackets shall be made from suitable stainless material.

Assumed working life
The assumed intended working life of the cantilever brackets for the intended use is 50 years, provided that they are subject to appropriate use and maintenance.

The information on the working life should not be regarded as a guarantee provided by the manufacturer or ETA-Danmark A/S. An “assumed intended working life” means that it is expected that, when this working life has elapsed, the real working life may be, in normal use conditions, considerably longer without major degradation affecting the essential requirements.

2 Characteristics of product and assessment

ETAG para.	Characteristic		Assessment of characteristic
	2.1	**Mechanical resistance and stability*)**	
6.1.1		Characteristic load-carrying capacity	See Annex B
6.1.2		Stiffness	No performance determined
6.1.3		Ductility in cyclic testing	No performance determined
	2.2	**Safety in case of fire**	
6.2.1		Reaction to fire	The cantilever brackets are made from steel classified as **Euroclass A1** in accordance with EN 13501-1 and EC decision 96/603/EC, amended by EC Decision 2000/605/EC
	2.3	**Hygiene, health and the environment**	
6.3.1		Influence on air quality	No dangerous materials **)
	2.4	**Safety in use**	Not relevant
	2.5	**Protection against noise**	Not relevant
	2.6	**Energy economy and heat retention**	Not relevant
	2.7	**Related aspects of serviceability**	
6.7.1		Durability	The cantilever brackets have been assessed as having satisfactory durability and serviceability when used in timber structures using the timber species described in Eurocode 5 and subject to the conditions defined by service class 1, 2 and 3
6.7.2		Serviceability	
6.7.3		Identification	See Annex A

*) See page 5 of this ETA

**) In accordance with http://europa.eu.int-/comm/enterprise/construction/internal/dangsub/dangmain.htm In addition to the specific clauses relating to dangerous substances contained in this European Technical Approval, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the EU Construction Products Directive, these requirements need also to be complied with, when and where they apply.

Safety principles and partial factors

The characteristic load-carrying capacities have been calculated without considering different ratios between the partial factors for timber connections and steel cross sections. Therefore, in the end use calculation based on this ETA, this shall be considered.

The values in annex B have been determined by multiplying the calculated resistance of the connection by k_{mod} to consider load duration and service classes in accordance with EC 5.

2.1 Mechanical resistance and stability

See annex B for characteristic load-carrying capacity in the directions F_1, F_2, F_3 and F_4

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

Connector nails in accordance to ETA 09/0273
The load bearing capacities of the cantilever brackets has been determined based on the use of Paslode Connector nails 4,0 x 40 mm in accordance with the ETA approval 09/0273 for the nails. The capacity of the connection may not be higher than the load mentioned in this ETA.
The capacities of the nails used in calculations are:

$F_{ax,Rk}$ = 0,998kN
$F_{V,Rk}$ = 1,885kN

The cantilever brackets are mounted using either full or half nailing.

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

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

2.7 Related aspects of serviceability

2.7.1 Corrosion protection in service class 1 and 2.
In accordance with ETAG 015 the cantilever brackets shall have a zinc coating weight of minimum Z275. The steel employed is S250 GD with Z275 according to EN 10326:2004

2.7.2 Corrosion protection in service class 3.
In accordance with Eurocode 5 the cantilever brackets which are hot dipped galvanized according to EN ISO 1461 with a zinc coating thickness of approximately 55 µm and cantilever brackets made from stainless steel are intended for use in service class 1,2 and 3 according to EN 1995 (Eurocode 5)

3 Attestation of Conformity and CE marking

3.1 Attestation of Conformity system

The system of attestation of conformity is 2+ described in Council Directive 89/106/EEC (Construction Products Directive) Annex III.

a) Tasks for the manufacturer:

(1) Factory production control,
(2) Initial type testing of the product,

b) Tasks for the notified body:

(1) Initial inspection of the factory and the factory production control,
(2) Continuous surveillance

3.2 Responsibilities

3.2.1 Tasks of the manufacturer

3.2.1.1 Factory production control

The manufacturer has a factory production control system in the plant and exercises permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer are documented in a systematic manner in the form of written policies and procedures. This production control system ensures that the product is in conformity with the European Technical Approval.

The manufacturer shall only use raw materials supplied with the relevant inspection documents as laid down in the control plan[1]. The incoming raw materials shall be subject to controls and tests by the manufacturer before acceptance. Check of materials, such as sheet metal, shall include control of the inspection documents presented by suppliers (comparison with nominal values) by verifying dimension and determining material properties, e.g. chemical composition, mechanical properties and zinc coating thickness.

The manufactured components are checked visually and for dimensions.

The control plan, which is part of the technical documentation of this European Technical Approval, includes details of the extent, nature and frequency of testing and controls to be performed within the factory production control and has been agreed between the approval holder and ETA-Danmark A/S.

The results of factory production control are recorded and evaluated. The records include at least the following information:

- Designation of the product, basic material and components;
- Type of control or testing;
- Date of manufacture of the product and date of testing of the product or basic material and components;
- Result of control and testing and, if appropriate, comparison with requirements;
- Signature of person responsible for factory production control.

The records shall be presented to ETA-Danmark A/S on request

3.2.1.1 Initial type testing of the product

For initial type-testing the results of the tests performed as part of the assessment for the European Technical Approval shall be used unless there are changes in the production line or plant. In such cases the necessary initial type testing has to be agreed between ETA-Danmark A/S and the notified body

3.2.2. Tasks of notified bodies

3.2.2.1 Initial inspection of the factory and the factory production control

The approved body should ascertain that, in accordance with the control plan, the factory, in particular the staff and equipment, and the factory production control, are suitable to ensure a continuous and orderly manufacturing of the cantilever brackets with the specifications given in part 2.

3.2.2.2 Continuous surveillance

The approved body shall visit the factory at least twice a year for routine inspections. It shall be verified that the system of factory production control and the specified manufacturing processes are maintained, taking account of the control plan.

The results of product certification and continuous surveillance shall be made available on demand by the certification body to ETA-Danmark A/S. Where the provisions of the European Technical Approval

1 The control plan has been deposited at the ETA-Danmark A/S and is only made available to the approved bodies involved in the conformity attestation procedure.

and the control plan are no longer fulfilled, the certificate of conformity shall be withdrawn by the approved body.

3.3 CE marking

The CE marking shall be affixed on each packaging of cantilever brackets. The initials "CE" shall be followed by the identification number of the notified body and shall be accompanied by the following information:

- Name or identifying mark of the manufacturer
- The last two digits of the year in which the marking was affixed (production year)
- Number of the European Technical Approval
- Name and size of product
- Number of the ETA Guideline (ETAG no. 015)
- Number of the EC Certificate of Conformity

4 Assumptions under which the fitness of the product for the intended use was favourably assessed

4.1 Manufacturing

SIMA Industri Gerber Connectors type 1-150, 1-180, 2-125, 2-150, 2-180, 2-200, 3-120, 3-140, 3-140 Stainless, 3-160, 3-160 Stainless, 3-180, 3-180 Stainless are manufactured in accordance with the provisions of this European Technical Approval using the manufacturing processes as identified in the inspection of the plant by the notified inspection body and laid down in the technical documentation.

4.2 Installation

Cantilever bracket connections

A cantilever brackets connection is deemed fit for its intended use under following conditions:

- Cantilever brackets can be fastened to wood-based members by nails.
- There shall be nails in all holes or a partial nailing pattern as shown in Annex A and prescribed in Annex B can be used.
- The characteristic capacity of the cantilever bracket connection is calculated according to the manufacturer's technical documentation
- The cantilever bracket connection is designed in accordance with Eurocode 5 or an appropriate National Code.
- The gap between the end of the beams, where contact stresses can occur during loading shall be limited. This means that the gap between the ends of the beams connected shall be maximum 3 mm.
- The thickness of the beam shall be at least $l+4d$, where l is the length of the nails in the beam and d the diameter. This is in accordance with Eurocode 5.
- For all types of cantilever brackets except type 3:
  The cross section of the beam to be carried shall have sharp edges at the lower side against the bottom plate, i.e. it shall be without wane.
- For Cantilever Bracket type 2:
  The cross section of the carrying beam shall have sharp edges at the top side against the top plate, i.e. it shall be without wane.
- The depth of the beam shall be so large that the top of the beam is at least 20 mm above the upper nail in the side of the beam.
- Cantilever brackets made from stainless steel shall only be fastened with fasteners made from suitable stainless steel. Zinc-coated cantilever brackets shall not be fastened with fasteners of stainless steel.
- Nails to be used shall have a diameter, which fits the holes of the cantilever brackets. They shall have a diameter which is not smaller than the diameter of the hole minus 1 mm.

The execution of the connection shall be in accordance with the approval holder's technical literature.

4.3 Maintenance and repair

Maintenance is not required during the assumed intended working life.
Should repair prove necessary, it is normal to replace the cantilever bracket.

Thomas Bruun
Manager, ETA-Danmark

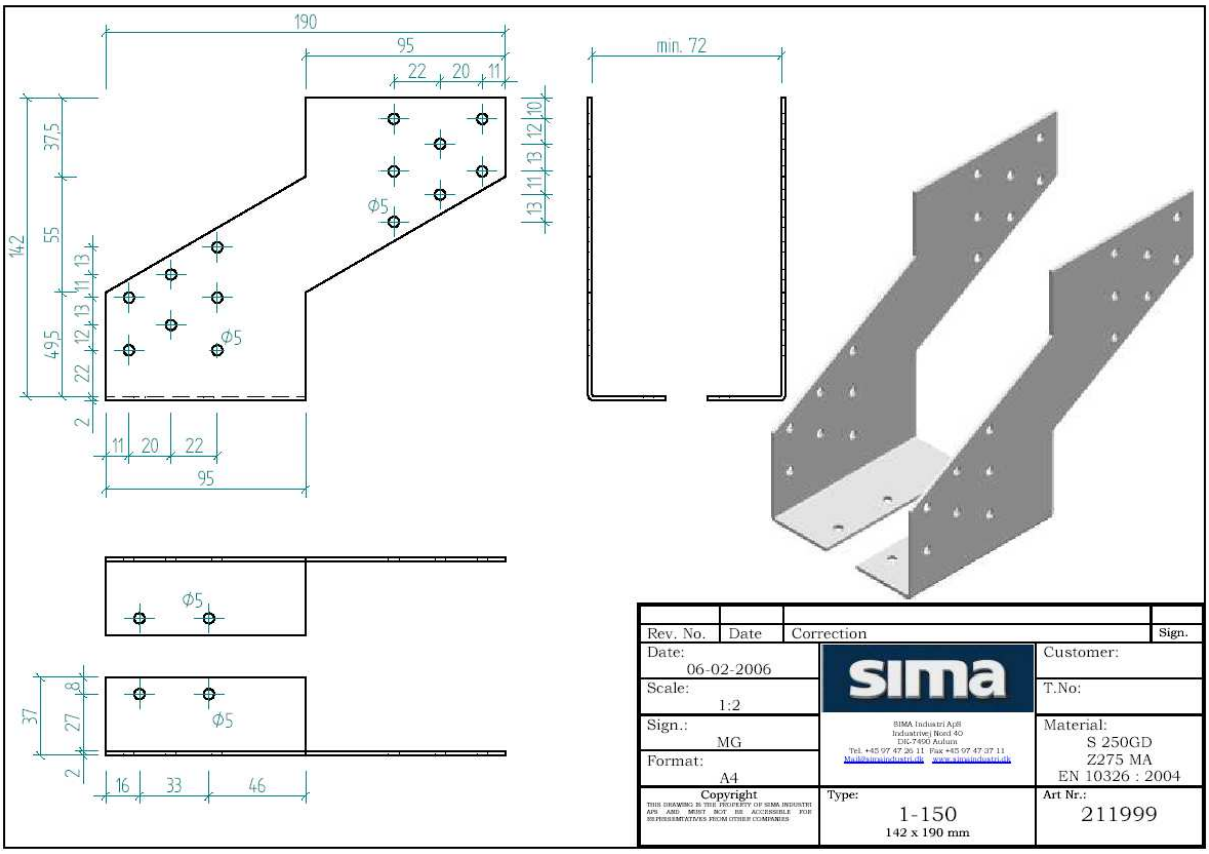
Annex A
Product details and definitions

Fastener specification

Nail and screw type	Nail and screw size (mm)		Finish	ETA
	Diameter	Length		
Paslode Connector nail	4,0	40	Electroplated zinc	09/0273

Cantilever bracket specification

Cantilever brackets type 3 can be fastened by full or partial nailing. For the bracket specification the following indications apply:
Holes marked in green are used in case of half nailing
Holes marked with green and blue are used in case of full nailing
Holes marked with red are never used
Note that the drawings, hole positions etc. also apply for brackets which are hot dipped galvanized according to EN ISO 1461 with a zinc coating thickness of approximately 55 µm.



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Scale: 1:2			T.No:
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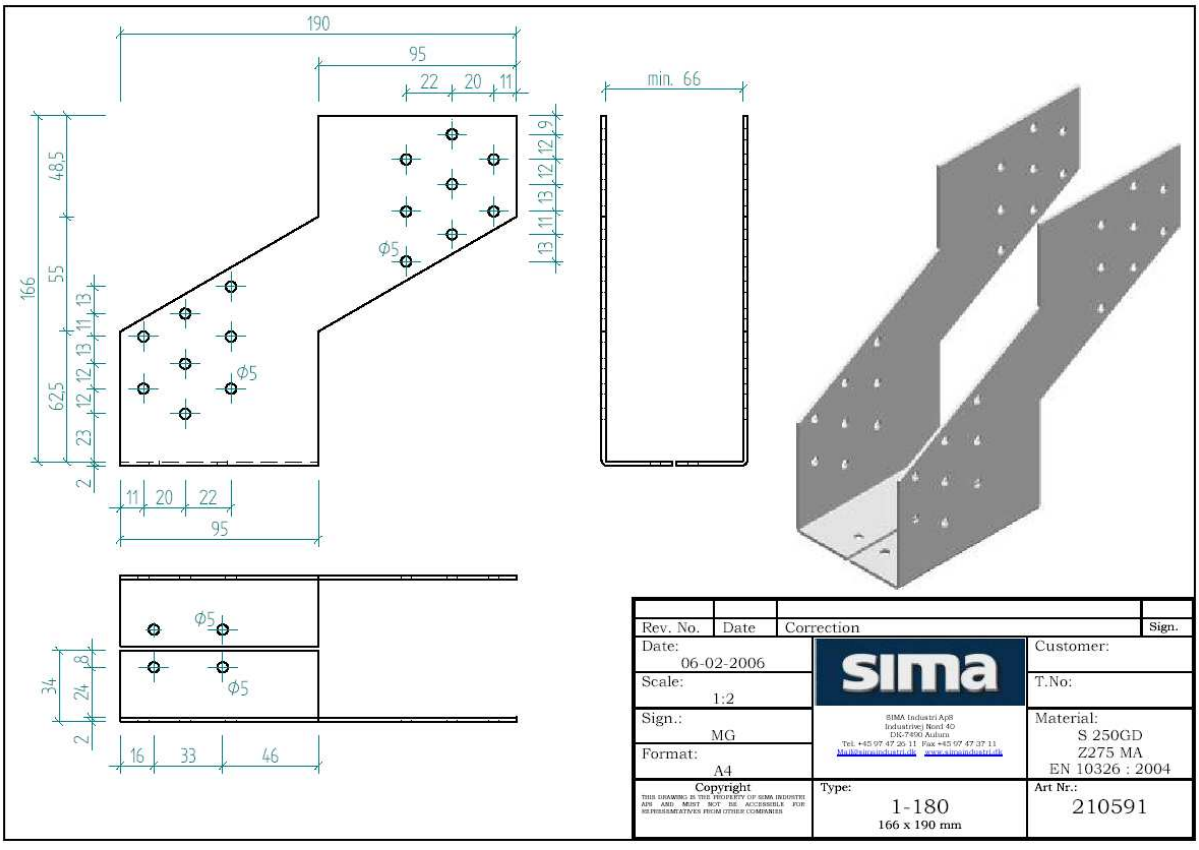

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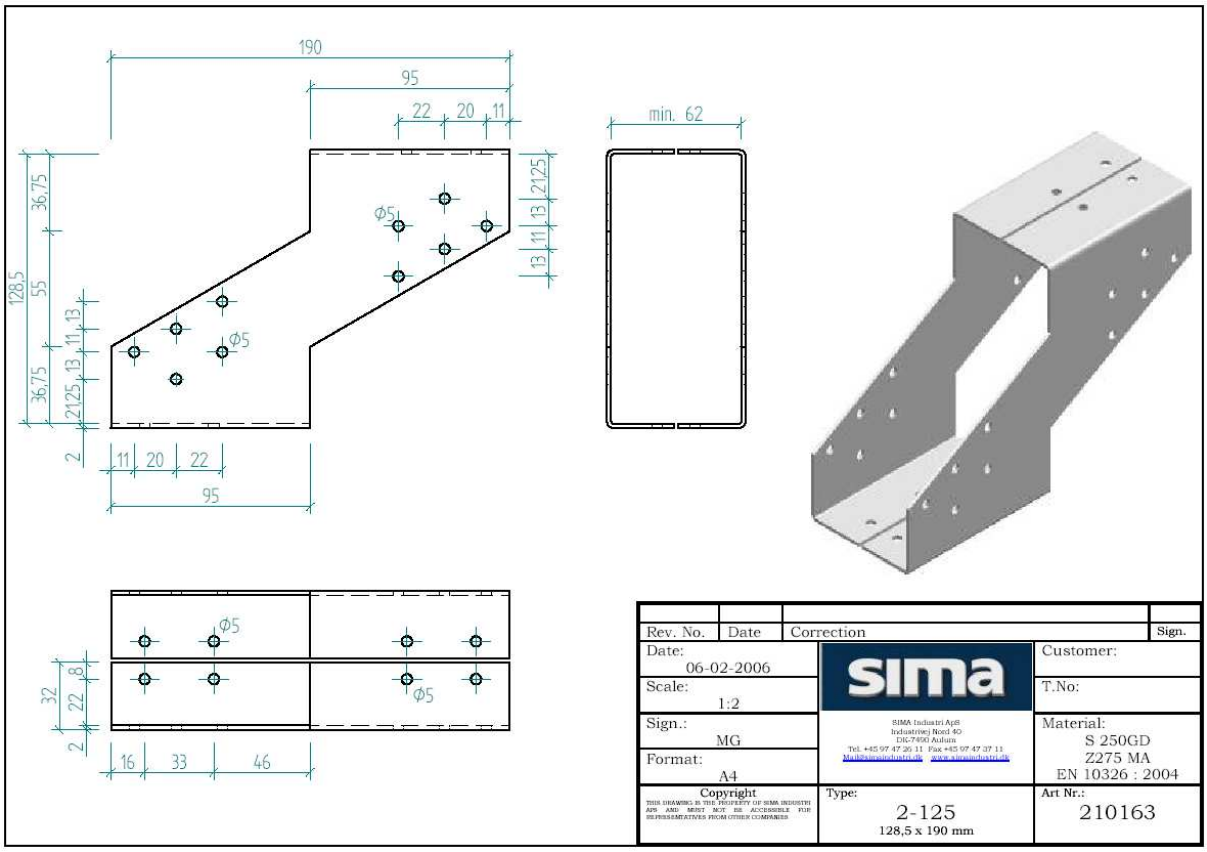

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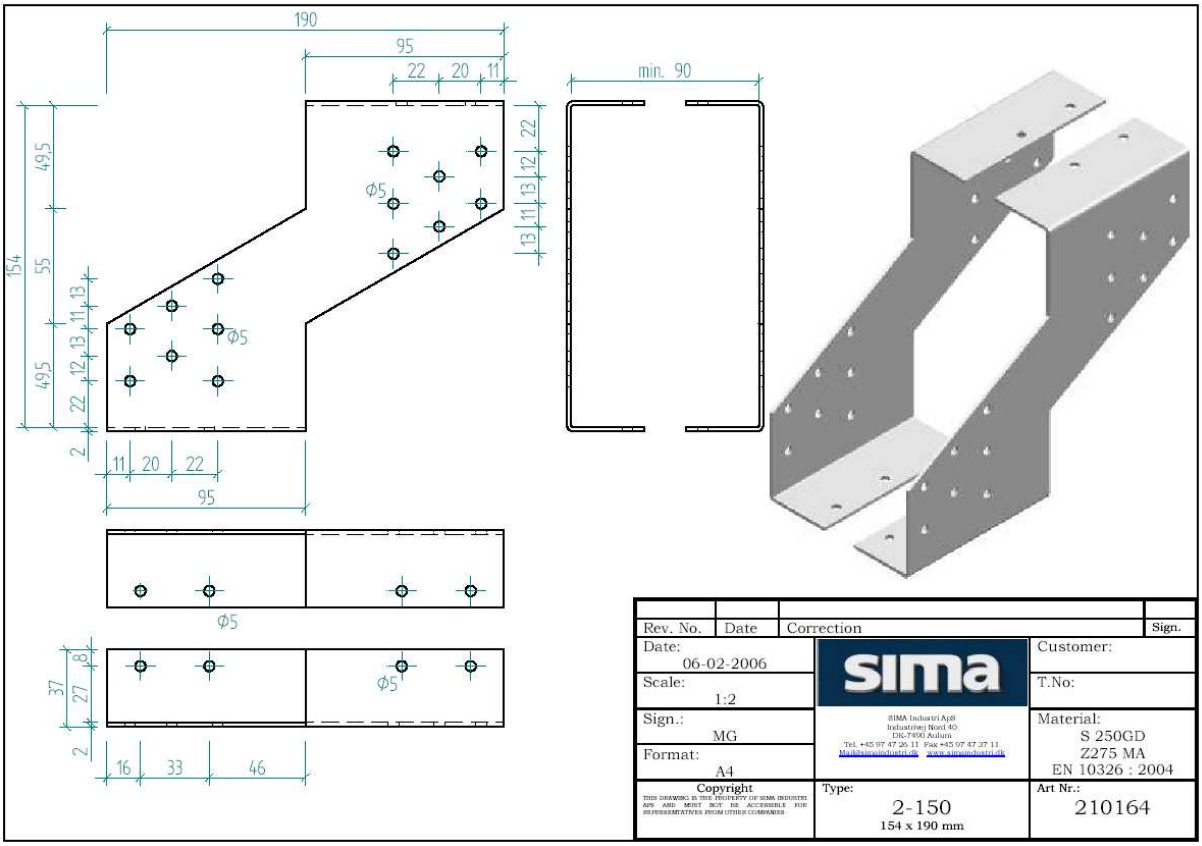

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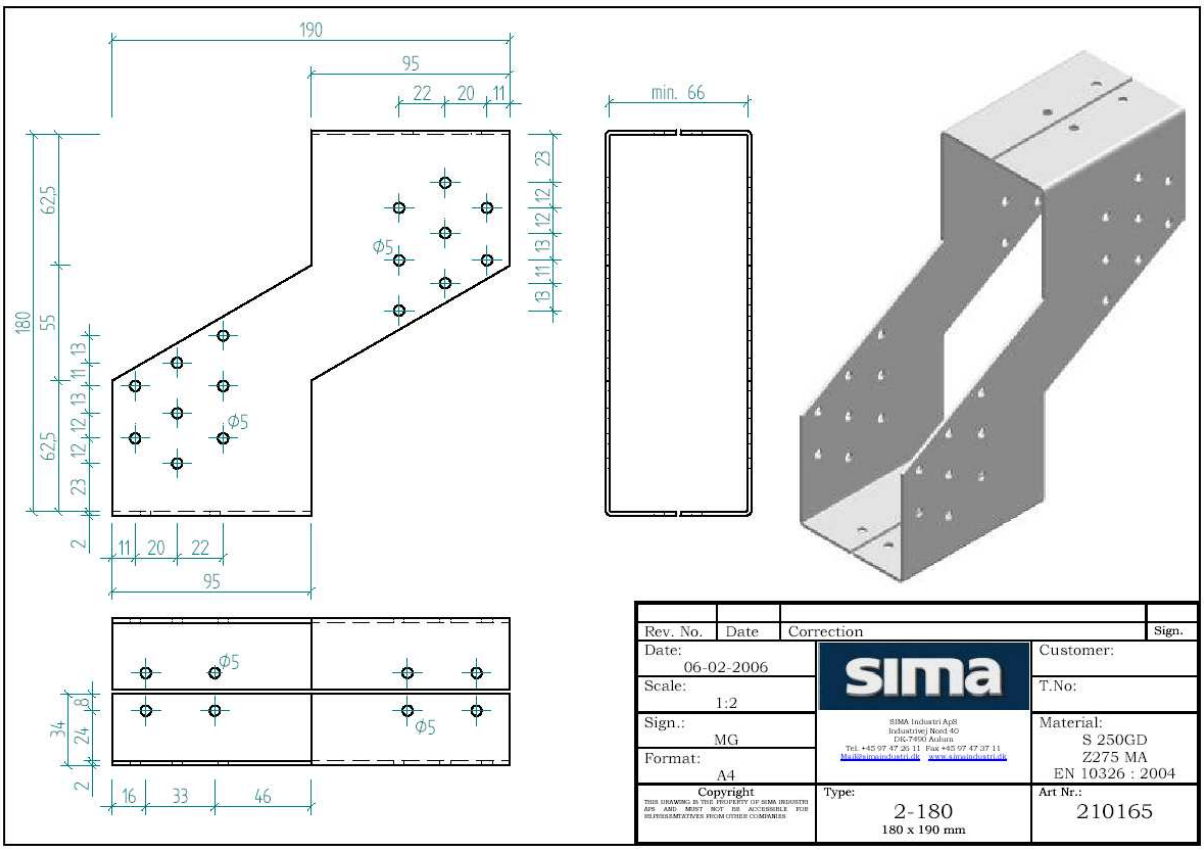

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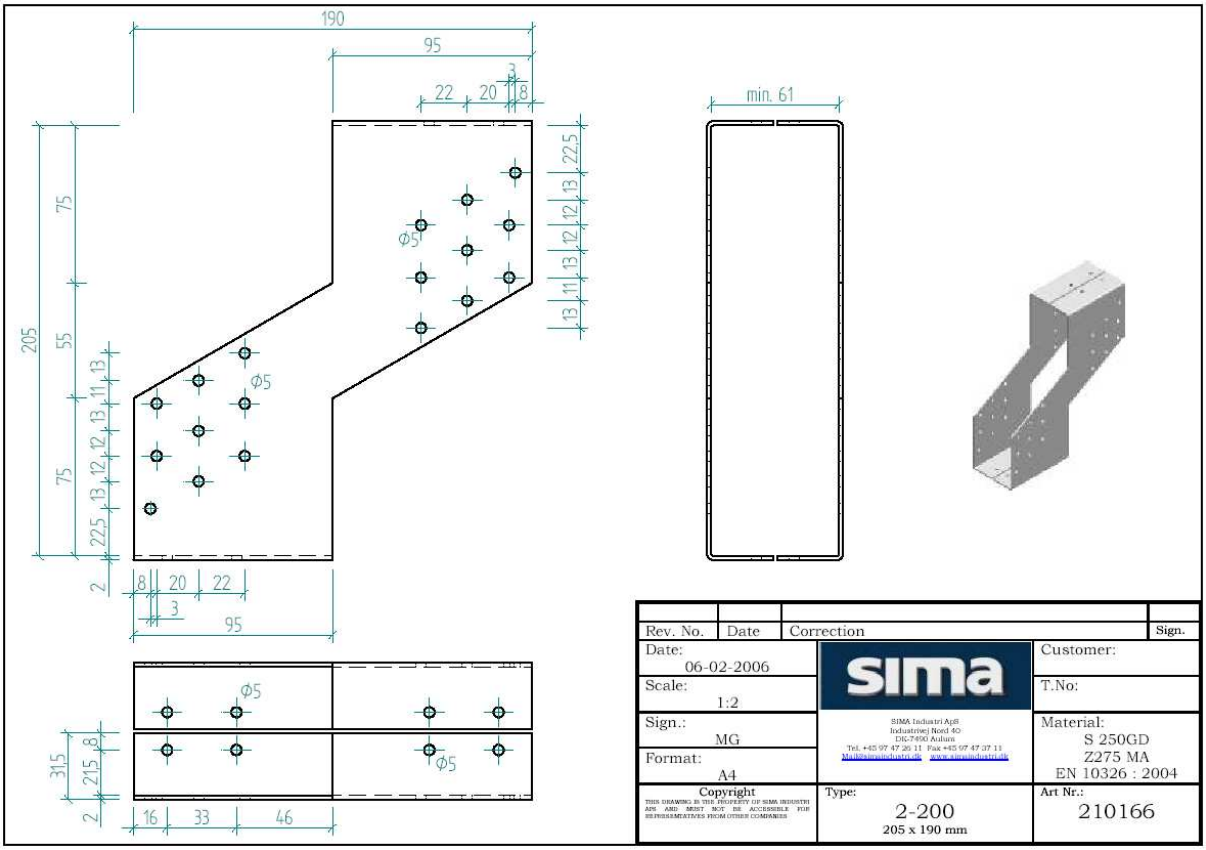

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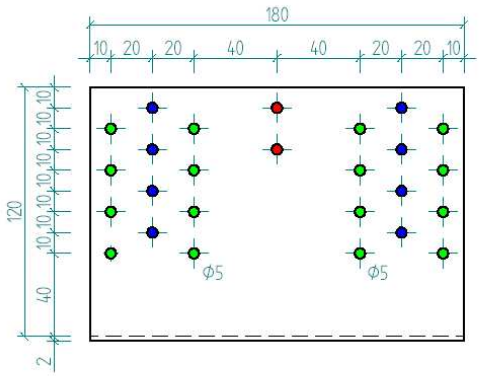

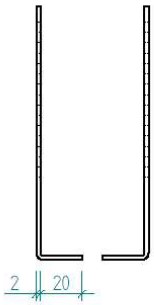

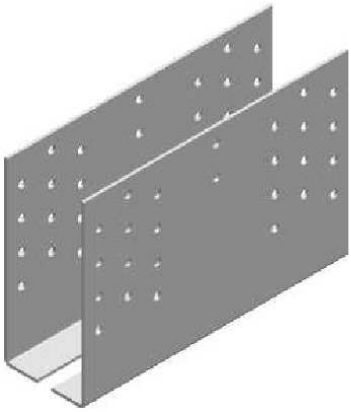

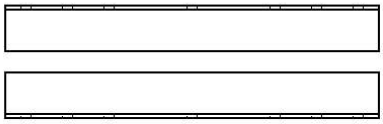

Sømhuller mærkeret med grøn anvendes ved halv udsømning

Sømhuller mærkeret med grøn og blå anvendes ved fuld udsømning

Sømhuller mærkeret med rød anvendes aldrig

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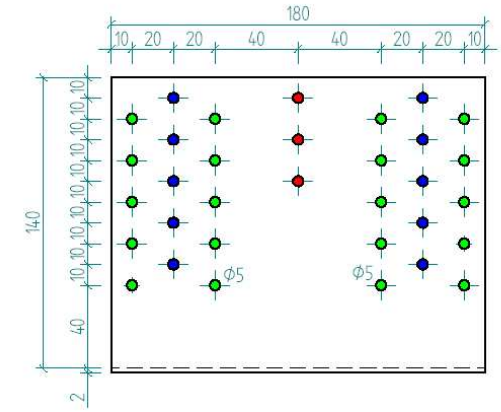

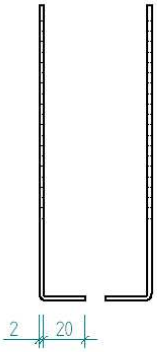

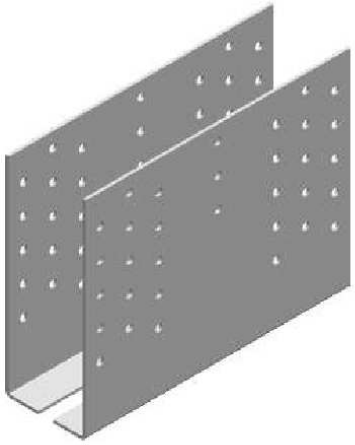

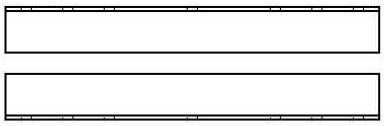

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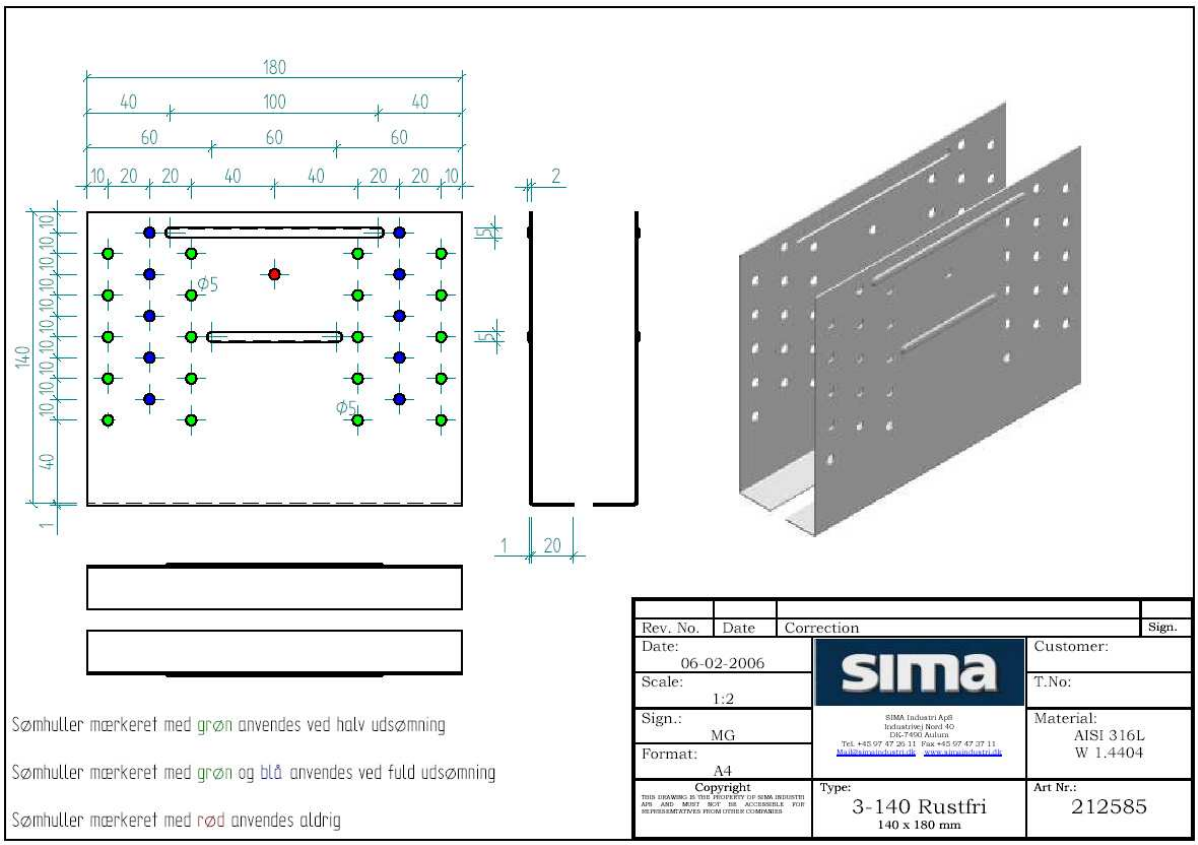
Copyright THIS DRAWING IS THE PROPERTY OF SIMA INDUSTRI APS AND MUST NOT BE ACCESSIBLE FOR REPRESENTATIVES FROM OTHER COMPANIES		Type: 3-140 140 x 180 mm	Art Nr.: 211994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Sømhuller mærkeret med grøn anvendes ved halv udsømning
Sømhuller mærkeret med grøn og blå anvendes ved fuld udsømning
Sømhuller mærkeret med rød anvendes aldrig
Rev. No.
Date
Correction
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Date:
06-02-2006
Scale:
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Sign.:
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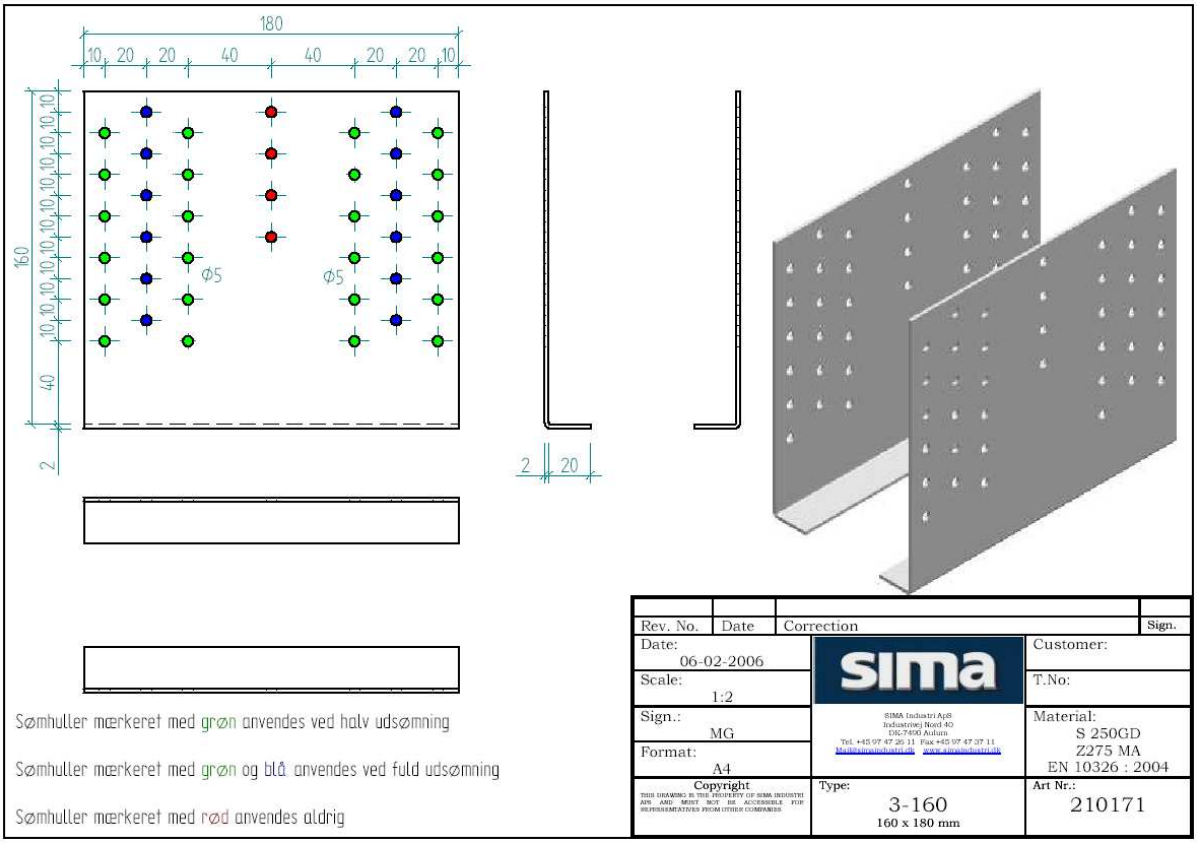
Copyright
SIMA
SIMA Industri ApS
Industriej Nord 40
DK-7490 Aulum
Tel. +45 97 47 26 11 Fax +45 97 47 37 11
Customer:
T.No:
Material:
AISI 316L
W 1.4404
Type:
3-140 Rustfri
140 x 180 mm
Art Nr.:
212585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Sømhuller mærkeret med grøn og blå anvendes ved fuld udsømning
Sømhuller mærkeret med rød anvendes aldrig
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SIMA Industri ApS
Industriej Nord 40
DK-7490 Aulum
Tel. +45 97 47 26 11 Fax +45 97 47 37 11
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EN 10326 : 2004
Type:
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160 x 180 mm
Art Nr.:
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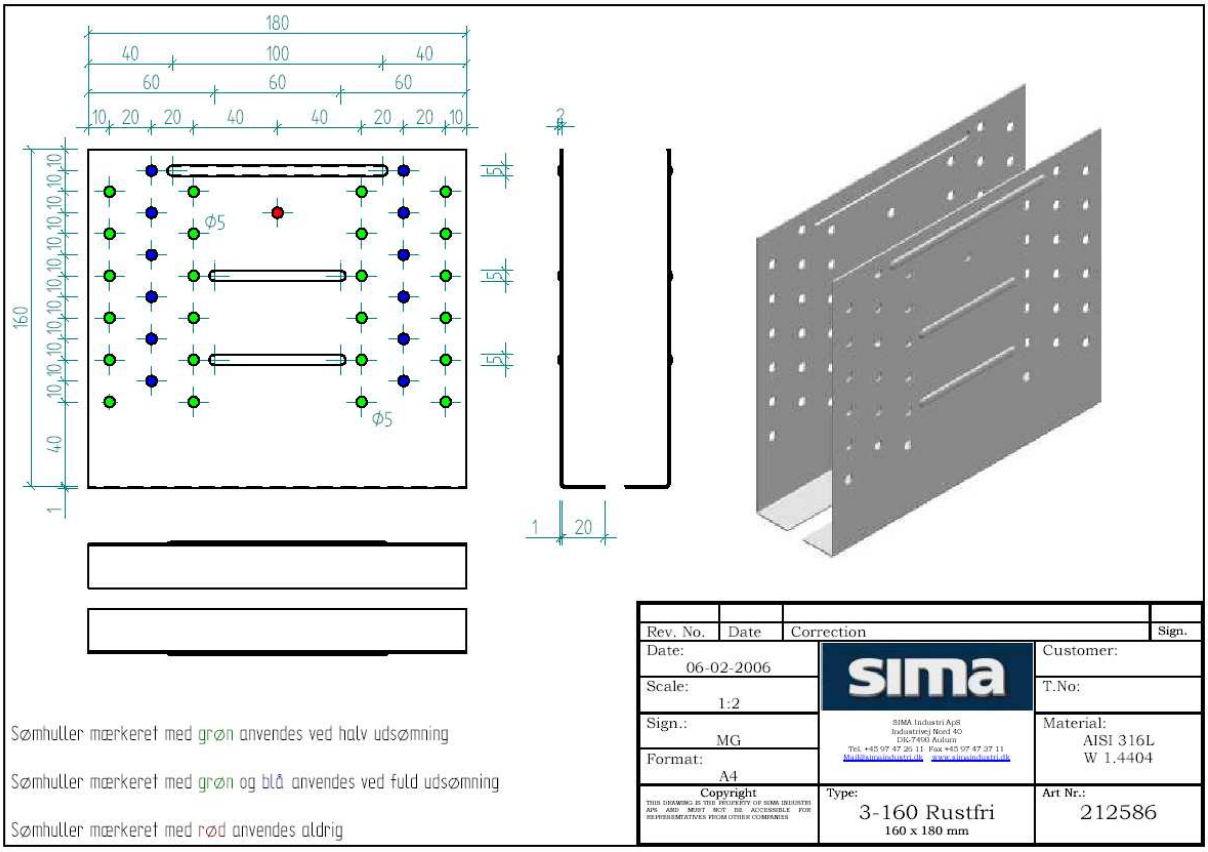
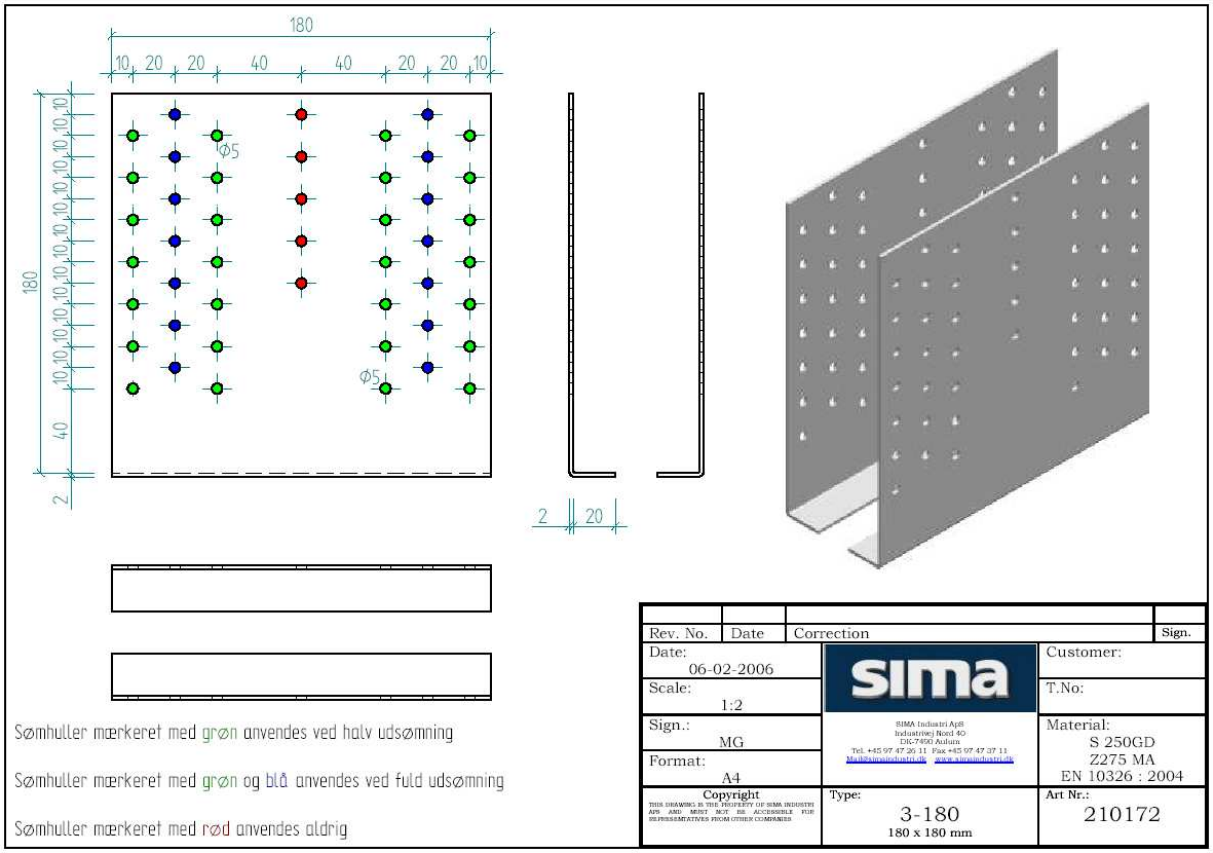


Sømhuller mærkeret med grøn anvendes ved halv udsømning

Sømhuller mærkeret med grøn og blå anvendes ved fuld udsømning

Sømhuller mærkeret med rød anvendes aldrig

Rev. No.	Date	Correction	Sign.
Date: 06-02-2006		SIMA Industri ApS Industrivej Nord 40 DK-7400 Aulum Tel. +45 97 47 26 11 Fax +45 97 47 37 11	Customer:
Scale: 1:2			T.No:
Sign.: MG			Material: AISI 316L W 1.4404
Format: A4			
Copyright THIS DRAWING IS THE PROPERTY OF SIMA INDUSTRI APS AND MUST NOT BE ACCESSIBLE FOR REPRESENTATIVES FROM OTHER COMPANIES		Type: 3-160 Rustfri 160 x 180 mm	Art Nr.: 212586

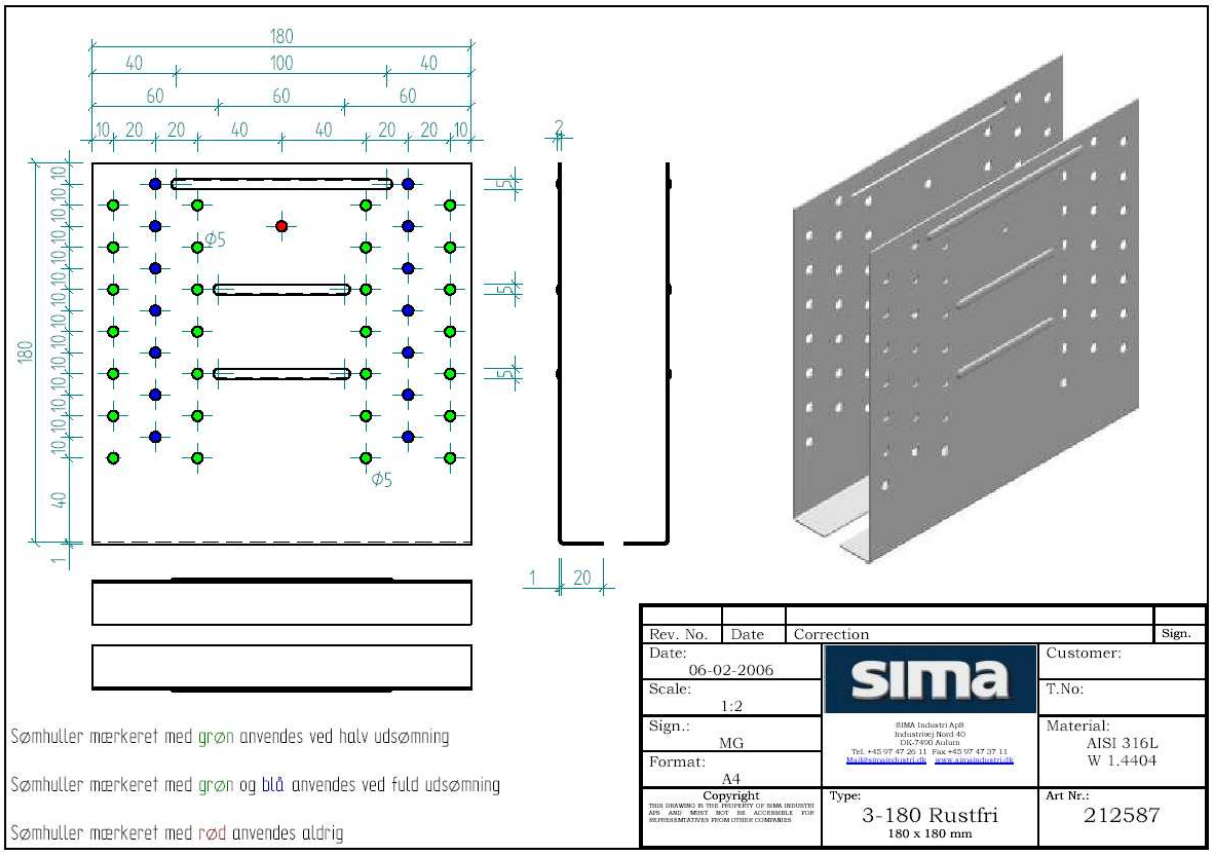


Sømhuller mærkeret med grøn anvendes ved halv udsømning

Sømhuller mærkeret med grøn og blå anvendes ved fuld udsømning

Sømhuller mærkeret med rød anvendes aldrig

Rev. No.	Date	Correction	Sign.
Date: 06-02-2006		SIMA Industri ApS Industrivej Nord 40 DK-7400 Aulum Tel. +45 97 47 26 11 Fax +45 97 47 37 11	Customer:
Scale: 1:2			T.No:
Sign.: MG			Material: S 250GD Z275 MA EN 10326 : 2004
Format: A4			
Copyright THIS DRAWING IS THE PROPERTY OF SIMA INDUSTRI APS AND MUST NOT BE ACCESSIBLE FOR REPRESENTATIVES FROM OTHER COMPANIES		Type: 3-180 180 x 180 mm	Art Nr.: 210172

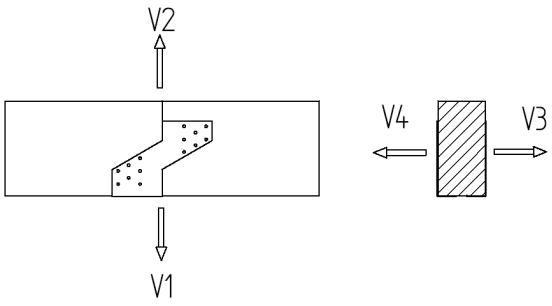


Characteristic capacities of the cantilever bracket connections with nails only.

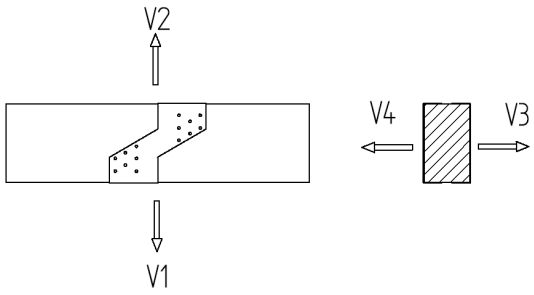
The values are applicable for connectors made from stainless steel with a characteristic yield stress of at least 235 MPa or a characteristic ultimate tensile strength of at least 330 MPa as for ordinary steel of the quality S250GD + Z275 according to EN 10326:2004.

1. Forces

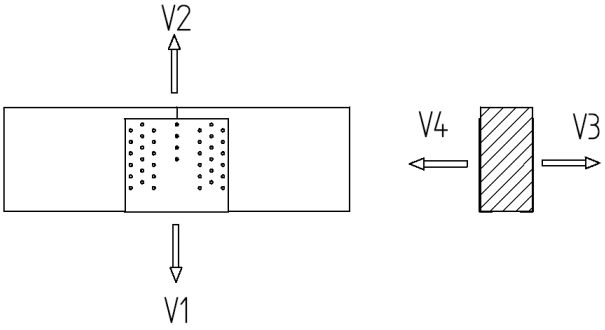
The characteristic load-carrying capacities are for the following force directions:



Type 1 cantilever brackets



Type 2 cantilever brackets



Type 3 cantilever brackets

The directions of the forces are:
V_1 Downward
V_2 Upward
$V_3 = V_4$ Lateral – horizontal

2. Additional conditions

Additionally the following conditions apply:

There shall be nails in all holes or a partial nailing pattern as described in Annex A can be used.
The thickness of the beam shall be at least $l+4d$, where l is the length of the nails in the beam and d the diameter. This is in accordance with Eurocode 5.

Annex B
Characteristic capacities

Two brackets 1-150 pr. connection					
Paslode Connector nails 4,0 x 40	No. of nails pr connection	Load duration	$F1_d$, [kN]	$F2_d$, [kN]	$F3_d$, [kN]
Full nailing	28	P	3,51	2,23	4,09
		L	4,10	2,60	4,77
		M	4,68	2,97	5,46
		S	5,27	3,34	6,14
		I	6,44	4,08	7,50
Characteristic values					
The characteristic values found by calculation			5,85	3,71	6,82
The values have been assessed in accordance with EC 5 Table 3.1- "Values of K_{mod}"					
V1=F1 V2=F2 V3=V4=F3					

Two brackets 1-180 pr. connection					
Paslode Connector nails 4,0 x 40	No. of nails pr connection	Load duration	$F1_d$, [kN]	$F2_d$, [kN]	$F3_d$, [kN]
Full nailing	32	P	3,51	2,23	4,09
		L	4,10	2,60	4,77
		M	4,68	2,97	5,46
		S	5,27	3,34	6,14
		I	6,44	4,08	7,50
Characteristic values					
The characteristic values found by calculation			5,85	3,71	6,82
The values have been assessed in accordance with EC 5 Table 3.1- "Values of K_{mod}"					
V1=F1 V2=F2 V3=V4=F3					

Two brackets 2-125 pr. connection					
Paslode Connector nails 4,0 x 40	No. of nails pr connection	Load duration	$F1_d$, [kN]	$F2_d$, [kN]	$F3_d$, [kN]
Full nailing	20	P	8,13	2,26	2,65
		L	9,49	2,64	3,09
		M	10,84	3,02	3,53
		S	12,20	3,39	3,97
		I	14,91	4,15	4,85
Characteristic values					
The characteristic values found by calculation			13,55	3,77	4,41
The values have been assessed in accordance with EC 5 Table 3.1- "Values of K_{mod}"					
V1=F1 V2=F2 V3=V4=F3					

Two brackets 2-150 pr. connection					
Paslode Connector nails 4,0 x 40	No. of nails pr connection	Load duration	$F1_d$, [kN]	$F2_d$, [kN]	$F3_d$, [kN]
Full nailing	28	P	10,41	2,23	4,09
		L	12,15	2,60	4,77
		M	13,88	2,97	5,46
		S	15,62	3,34	6,14
		I	19,09	4,08	7,50
Characteristic values					
The characteristic values found by calculation			17,35	3,71	6,82
The values have been assessed in accordance with EC 5 Table 3.1- "Values of K_{mod}"					
V1=F1 V2=F2 V3=V4=F3					

Two brackets 2-180 pr. connection					
Paslode Connector nails 4,0 x 40	No. of nails pr connection	Load duration	$F1_d$, [kN]	$F2_d$, [kN]	$F3_d$, [kN]
Full nailing	32	P	9,81	2,23	4,09
		L	11,45	2,60	4,77
		M	13,08	2,97	5,46
		S	14,72	3,34	6,14
		I	17,99	4,08	7,50
Characteristic values					
The characteristic values found by calculation			16,35	3,71	6,82
The values have been assessed in accordance with EC 5 Table 3.1- "Values of K_{mod}"					
V1=F1 V2=F2 V3=V4=F3					

Two brackets 2-200 pr. connection					
Paslode Connector nails 4,0 x 40	No. of nails pr connection	Load duration	$F1_d$, [kN]	$F2_d$, [kN]	$F3_d$, [kN]
Full nailing	36	P	9,97	3,51	4,27
		L	11,63	4,10	4,98
		M	13,29	4,68	5,70
		S	14,95	5,27	6,41
		I	18,27	6,44	7,83
Characteristic values					
The characteristic values found by calculation			16,61	5,85	7,12
The values have been assessed in accordance with EC 5 Table 3.1- "Values of K_{mod}"					
V1=F1 V2=F2 V3=V4=F3					

Two brackets 3-120 pr. connection				
Paslode Connector nails 4,0 x 40	No. of nails pr connection	Load duration	$F1_d$, [kN]	$F3_d$, [kN]
Half nailing Holes marked green	32	P	5,89	5,75
		L	6,87	6,71
		M	7,85	7,66
		S	8,83	8,62
		I	10,79	10,54
Characteristic values				
The characteristic values found by calculation			9,81	9,58
The values have been assessed in accordance with EC 5 Table 3.1- "Values of K_{mod}"				
V1=V2=F1 V3=V4=F3				

Two brackets 3-120 pr. connection				
Paslode Connector nails 4,0 x 40	No. of nails pr connection	Load duration	$F1_d$, [kN]	$F3_d$, [kN]
Full nailing Holes marked green and blue	48	P	5,89	5,75
		L	6,87	6,71
		M	7,85	7,66
		S	8,83	8,62
		I	10,79	10,54
Characteristic values				
The characteristic values found by calculation			9,81	9,58
The values have been assessed in accordance with EC 5 Table 3.1- "Values of K_{mod}"				
V1=V2=F1 V3=V4=F3				

Two brackets 3-140 pr. connection				
Paslode Connector nails 4,0 x 40	No. of nails pr connection	Load duration	$F1_d$, [kN]	$F3_d$, [kN]
Half nailing Holes marked green	40	P	8,00	7,19
		L	9,33	8,39
		M	10,66	9,58
		S	12,00	10,78
		I	14,66	13,18
Characteristic values				
The characteristic values found by calculation			13,33	11,98
The values have been assessed in accordance with EC 5 Table 3.1- "Values of K_{mod}"				
V1=V2=F1 V3=V4=F3				

Two brackets 3-140 pr. connection				
Paslode Connector nails 4,0 x 40	No. of nails pr connection	Load duration	$F1_d$, [kN]	$F3_d$, [kN]
Full nailing Holes marked green and blue	60	P	8,00	7,19
		L	9,33	8,39
		M	10,66	9,58
		S	12,00	10,78
		I	14,66	13,18
Characteristic values				
The characteristic values found by calculation			13,33	11,98
The values have been assessed in accordance with EC 5 Table 3.1- "Values of K_{mod}"				
V1=V2=F1 V3=V4=F3				

Two brackets 3-140 stainless pr. connection				
Paslode Connector nails 4,0 x 40	No. of nails pr connection	Load duration	$F1_d$, [kN]	$F3_d$, [kN]
Half nailing Holes marked green	40	P	9,11	7,19
		L	10,63	8,39
		M	12,15	9,58
		S	13,67	10,78
		I	16,71	13,18
Characteristic values				
The characteristic values found by calculation			15,19	11,98
The values have been assessed in accordance with EC 5 Table 3.1- "Values of K_{mod}"				
V1=V2=F1 V3=V4=F3				

Two brackets 3-140 stainless pr. connection				
Paslode Connector nails 4,0 x 40	No. of nails pr connection	Load duration	$F1_d$, [kN]	$F3_d$, [kN]
Full nailing Holes marked green and blue	60	P	9,11	7,19
		L	10,63	8,39
		M	12,15	9,58
		S	13,67	10,78
		I	16,71	13,18
Characteristic values				
The characteristic values found by calculation			15,19	11,98
The values have been assessed in accordance with EC 5 Table 3.1- "Values of K_{mod}"				
V1=V2=F1 V3=V4=F3				

Two brackets 3-160 pr. connection				
Paslode Connector nails 4,0 x 40	No. of nails pr connection	Load duration	$F1_d$, [kN]	$F3_d$, [kN]
Half nailing Holes marked green	48	P	10,42	8,62
		L	12,16	10,06
		M	13,90	11,50
		S	15,63	12,93
		I	19,11	15,81
Characteristic values				
The characteristic values found by calculation			17,37	14,37
The values have been assessed in accordance with EC 5 Table 3.1- "Values of K_{mod}"				
V1=V2=F1 V3=V4=F3				

Two brackets 3-160 pr. connection				
Paslode Connector nails 4,0 x 40	No. of nails pr connection	Load duration	$F1_d$, [kN]	$F3_d$, [kN]
Full nailing Holes marked green and blue	72	P	10,42	8,62
		L	12,16	10,06
		M	13,90	11,50
		S	15,63	12,93
		I	19,11	15,81
Characteristic values				
The characteristic values found by calculation			17,37	14,37
The values have been assessed in accordance with EC 5 Table 3.1- "Values of K_{mod}"				
V1=V2=F1 V3=V4=F3				

Two brackets 3-160 stainless pr. connection				
Paslode Connector nails 4,0 x 40	No. of nails pr connection	Load duration	$F1_d$, [kN]	$F3_d$, [kN]
Half nailing Holes marked green	48	P	11,88	8,62
		L	13,86	10,06
		M	15,84	11,50
		S	17,82	12,93
		I	21,78	15,81
Characteristic values				
The characteristic values found by calculation			19,80	14,37
The values have been assessed in accordance with EC 5 Table 3.1- "Values of K_{mod}"				
V1=V2=F1 V3=V4=F3				

Two brackets 3-160 stainless pr. connection				
Paslode Connector nails 4,0 x 40	No. of nails pr connection	Load duration	$F1_d$, [kN]	$F3_d$, [kN]
Full nailing Holes marked green and blue	72	P	11,88	8,62
		L	13,86	10,06
		M	15,84	11,50
		S	17,82	12,93
		I	21,78	15,81
Characteristic values				
The characteristic values found by calculation			19,80	14,37
The values have been assessed in accordance with EC 5 Table 3.1- "Values of K_{mod}"				
V1=V2=F1 V3=V4=F3				

Two brackets 3-180 pr. connection				
Paslode Connector nails 4,0 x 40	No. of nails pr connection	Load duration	$F1_d$, [kN]	$F3_d$, [kN]
Half nailing Holes marked green	56	P	13,15	10,06
		L	15,34	11,74
		M	17,53	13,42
		S	19,72	15,09
		I	24,10	18,45
Characteristic values				
The characteristic values found by calculation			21,91	16,77
The values have been assessed in accordance with EC 5 Table 3.1- "Values of K_{mod}"				
V1=V2=F1 V3=V4=F3				

Two brackets 3-180 pr. connection				
Paslode Connector nails 4,0 x 40	No. of nails pr connection	Load duration	$F1_d$, [kN]	$F3_d$, [kN]
Full nailing Holes marked green and blue	84	P	13,15	10,06
		L	15,34	11,74
		M	17,53	13,42
		S	19,72	15,09
		I	24,10	18,45
Characteristic values				
The characteristic values found by calculation			21,91	16,77
The values have been assessed in accordance with EC 5 Table 3.1- "Values of K_{mod}"				
V1=V2=F1 V3=V4=F3				

Two brackets 3-180 stainless pr. connection				
Paslode Connector nails 4,0 x 40	No. of nails pr connection	Load duration	$F1_d$, [kN]	$F3_d$, [kN]
Half nailing Holes marked green	56	P	14,99	10,06
		L	17,49	11,74
		M	19,99	13,42
		S	22,49	15,09
		I	27,49	18,45
Characteristic values				
The characteristic values found by calculation			24,99	16,77
The values have been assessed in accordance with EC 5 Table 3.1- "Values of K_{mod}"				
V1=V2=F1 V3=V4=F3				

Two brackets 3-180 stainless pr. connection				
Paslode Connector nails 4,0 x 40	No. of nails pr connection	Load duration	$F1_d$, [kN]	$F3_d$, [kN]
Full nailing Holes marked green and blue	84	P	14,99	10,06
		L	17,49	11,74
		M	19,99	13,42
		S	22,49	15,09
		I	27,49	18,45
Characteristic values				
The characteristic values found by calculation			24,99	16,77
The values have been assessed in accordance with EC 5 Table 3.1- "Values of K_{mod}"				
V1=V2=F1 V3=V4=F3				