



## Designated according to The Construction Products (Amendment etc.) (EU Exit) Regulations 2020

UK Technical Assessment	UKTA-0836-22/6452 of 8/11/2022
Technical Assessment Body issuing the UK Technical Assessment:	British Board of Agrément
Trade name of the construction product:	Powell Gee Self Drilling Screws for Insulated Panels
Product family to which the construction product belongs:	Product Area Code 33
Manufacturer:	Powell Gee & Co Ltd Unit 36 Atcham Business Park Atcham Shrewsbury SY4 4UG
Manufacturing plant(s):	Powell Gee & Co Ltd Unit 36 Atcham Business Park Atcham Shrewsbury SY4 4UG
This UK Technical Assessment contains:	20 pages including one Annex which forms an integral part of the document
This UK Technical Assessment is issued in accordance with The Construction Products (Amendment etc.) (EU Exit) Regulations 2020 on the basis of:	UKAD 330047-01-0602 – <i>Fastening Screws for Sandwich Panels</i>

**Communication of this UK Technical Assessment, including transmission by electronic means, shall be in full. However, partial reproduction may be made with the written consent of the British Board of Agrément. Any partial reproduction must be identified as such.**

## 1 Technical description of the product

The Powell Gee High Thread Light Section and Heavy Section fastening screws are self-drilling screws manufactured of carbon steel or stainless steel and completed with galvanized washers. The pre-hardened carbon steel screws are coated by a dip/spin bake process which gives a 500hrs salt spray test coating, and a scratch resistant coating without the Cr6 toxicity present in normal galvanizing/electro plating processes.

The materials used for the fasteners are:

- Hardened SAE 1022 carbon steel with a minimum tensile strength of 14.1 kN for a 5.5 mm diameter fastener. Denoted CS in this document.
- A4 (316) austenitic stainless steel with a minimum tensile strength of 10.4 kN for a 5.5 mm diameter fastener. Stainless steel fasteners have a welded carbon steel tip. Denoted SS in this document.

**Table 1: Powell Gee Fastening Screws Range for Sandwich Panels**

<b>Characteristic</b>	<b>Values</b>
<b>Fastener material codes</b>	CS: carbon steel SS: stainless steel
<b>Fastener diameter</b>	5.5 mm
<b>Point-side substrate thickness codes</b>	LS: light section 1.2 – 3.5 mm – coarse pitch thread HS: heavy section 4 – 12.5 mm – fine pitch thread
<b>Fastener lengths</b>	60-250 mm for light section substrates 76-250 mm for heavy section substrates
<b>Threaded length</b>	Additional length of coarse thread directly beneath the head flange.
<b>Fastener head types</b>	All fasteners have a 5/16" (~8 mm) Hex head with a 1/2" (12.3 mm) diameter lip. They may have an additional plastic cap. Heads are not intended to be used without washers.
<b>Washer types</b>	Conical washers of galvanized or stainless steel with an EPDM (ethylene propylene diene monomer) seal bonded to the inner face
<b>Washer diameter codes</b>	16, 19 or 29 (for 16, 19 or 29 mm diameter)
<b>Washer material codes</b>	W – galvanized steel S – stainless steel

**Table 2: Nominal Sizes of Fasteners (mm)**

	<b>Light Section Carbon Steel High Thread</b>	<b>Light Section Stainless Steel High Thread</b>	<b>Heavy Section Carbon Steel High Thread</b>	<b>Heavy Section Stainless Steel High Thread</b>
<b>Nominal length</b>	60, 75, 100, 115, 130, 150, 170, 190, 210, 250	70, 85, 110, 125, 145, 175, 250	76, 92, 102, 120, 130, 155, 190, 210, 250	80, 95, 115, 135, 155, 190, 155, 250
<b>Nominal diameter</b>	5.5	5.5	5.5	5.5

Annex A provides details of the products' specifications. Example of connections made with the fastening screws covered in this UKTA are also shown in Annex A. The fastening screws used to connect metal members and sheeting are subject to shear and tension forces acting on the connections.

## **2 Specification of the intended use(s) in accordance with the applicable UK Assessment Document (hereinafter UKAD)**

The screws in this assessment are intended to be used for connecting Composite Insulating Panels (Sandwich Panels or CIP panels) to steel framing members. Examples of connections are shown in Annex A.

The component to be fastened (head-side) is referred to as substrate I, while the framing member (point-side) is referred to as substrate II. Substrate I may refer to either the inner or the outer steel sheet of the sandwich panel, depending on the property under consideration. The screws may be used for indoor and outdoor applications with a corrosion category class C1 up to C3 in accordance with EN ISO 12944-2. The use of stainless-steel screws is advised for class C3.

The fastening screws are intended to be used with connections under predominantly static loads, such as wind and dead loads.

Under the provisions of this UKTA and the assessment methods carried out in the corresponding evaluation report, the fastening screws may have an assumed intended working life of 25 years when installed in accordance with the manufacturer's instructions.

The indications given in this document cannot be interpreted as a guarantee given by the manufacturer but are regarded as means for choosing the appropriate 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**

### **3.1 Mechanical resistance and stability (BWR1)**

The mechanical performance and stability has been determined as the characteristic shear and axial resistance of the fastening screws covered by this UKTA. Values are given in Annex A.

The axial resistance  $N_{R,k}$  is taken as the minimum of the pull through and pull out resistances for the connection.

$$N_{R,k} = \min [N_{R,k, \text{Pull through}}, N_{R,k, \text{Pull out}}]$$

Derivation of design resistance values to be used when designing in accordance with Eurocode 3 shall be taken as described in 3.8.2.

### **3.2 Safety in case of fire (BWR 2)**

<b>Essential characteristic</b>	<b>Performance</b>
Reaction to Fire	Class A1, in accordance with the provisions of the EC decision 96/603/EC (as amended) without the need for further testing.
Fire resistance	Not relevant

### **3.3 Hygiene, health and the environment (BWR3)**

Not relevant

### **3.4 Safety in use (BWR4)**

Not relevant

### **3.5 Protection against noise (BWR5)**

Not relevant

### **3.6 Energy economy and heat retention (BWR6)**

Not relevant

### **3.7 Sustainable use of natural resources (BWR 7)**

No performance assessed

## **3.8 General Aspects Related to the Performance of the Product**

### **3.8.1 Manufacturing**

The Powell Gee Light Section and Heavy Section fastening screws are manufactured in accordance with the provisions of this UK Technical Assessment using the manufacturing process assessed and detailed in the technical documentation.

The UK Technical Assessment is issued for the products covered based on agreed data/information that has been deposited with British Board of Agrément and which identifies the products that have been assessed and judged.

Changes to the products or the manufacturing process, that may result in the information submitted and held on file being incorrect, should be confirmed with British Board of Agrément before any modifications are implemented.

British Board of Agrément will decide on that basis whether or not such changes may affect the performance characteristics detailed in the UKTA and consequently the validity of the UKCA marking. In that case additional assessment or modifications to the UKTA and the corresponding evaluation report may be necessary.

### **3.8.2 Design of Connections Using the Product**

The High Thread Light Section and Heavy section fastening screws are designed for use in service class 2 or 3 of EC5, thus being partly or fully exposed to external weather. They can be used in environmental conditions that fall under category C3 in accordance with EN ISO 12944-2. The use of stainless-steel screws is advised for class C3.

For connections made with steel members and as described in the Annexes of this UKTA it is not required to consider and evaluate the limitations of the connections with regards to temperature effects. For other types of connections, the effect of temperature shall be considered for design purposes as long as the effect on the connections is not significant. Other types of connections affected by temperature are not covered by this UKTA.

The characteristic capacities declared in this UKTA are based on the dimensions, material properties, minimum effective length (minimum screw-in length in substrates) and nominal substrates thicknesses provided by the manufacturer and as stated in the UKTA and its Annex.

To verify the design of connections made with the fastening screws listed in this UKTA, the method given in EN 1990 is used to derive the design capacities based on the characteristic performance capacities stated the Annex of this document.

Therefore, the design capacities to be used when designing in accordance with EN 1993-1-3 shall be derived using the following formulas:

Design shear resistance

$$V_{R,d} = V_{R,k} / \gamma_M$$

Design axial resistance

$$N_{R,d} = N_{R,k} / \gamma_M$$

Where  $\gamma_M = 1.33$  and no other values are given in national regulations.

Where combined tension and shear forces occur within the connection, the interaction equation of EN 1993-1-3, section 8.3 (8) must be verified, as follows:

$$(N_{S,d} / N_{R,d}) + (V_{S,d} / V_{R,d}) \leq 1.0$$

Where  $N_{S,d}$  and  $V_{S,d}$  are the engineering design values for normal and shear forces respectively and  $N_{R,d}$  and  $V_{R,d}$  are the design resistance values in the connections for normal and shear forces respectively.

### **3.8.3 Installation**

The fitness of the fastener assembly for the intended use is given under the conditions that installation complies with the manufacturer's instructions which shall be made available to the installers.

The faces of the components to be fastened together shall be brought into contact before the assembly is tightened and the tightening torque shall be sufficient to slightly compress the EPDM bonded seal.

When the installation instructions are followed, no bi-metallic corrosion should occur.

For connections where only shear forces occur, the substrates I and II are directly connected to each other and so the fasteners do not incur additional bending forces. The fastening screws are connected perpendicular to the surface of the connection elements which provides an accurate load bearing of the connection.

The installer shall fix the High Thread fastening screws Light Section and Heavy Section in accordance with the provisions of this UKTA.

It is the manufacturer's responsibility to ensure that the specific instructions for installation are provided to the purchaser. This information may be made by reproduction of the respective parts of the UK Technical Assessment.

In addition, all data for installation and intended use shall be shown clearly on the package and/or on an enclosed instruction sheet.

### **3.8.4 Packaging, Transport and Storage**

The products should be packed in boxes bearing the manufacturer's name, product type, nominal size, quantity, date of manufacture and batch reference details.

### **3.8.5 Use, maintenance and repair**

The assessment of the fitness for use is based on the assumption that maintenance is not required during the assumed intended working life. Should repair of the installation prove necessary, fasteners should be replaced.

## **4 Assessment and verification of constancy of performance (hereinafter AVCP) system applied**

### **4.1 System of assessment and verification of constancy of performance**

According to UKAD 330047-01-0602 and Annex V of the Construction Products Regulation (Regulation (EU) 305/2011 as brought into UK law and amended, the system of assessment and verification of constancy of performance (AVCP) 2+ applies.

## **5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable UKAD**

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with the British Board of Agrément and made available to the UK Approved Bodies involved in the conformity attestation process.

### **5.1 UKCA marking for the product/ system must contain the following information:**

- Identification number of the Approved Body
- Name/address of the manufacturer of the product/ system
- Marking with intention of clarification of intended use
- Number of certificate of constancy of performance
- Date of marking
- UKTA number.

On behalf of the British Board of Agrément



Date of Issue: 8 November 2022

**Hardy Giesler**  
Chief Executive Officer



**British Board of Agrément,**  
1<sup>st</sup> Floor Building 3  
Hatters Lane  
Croxley Park  
Watford  
WD18 8YG

## ANNEX A

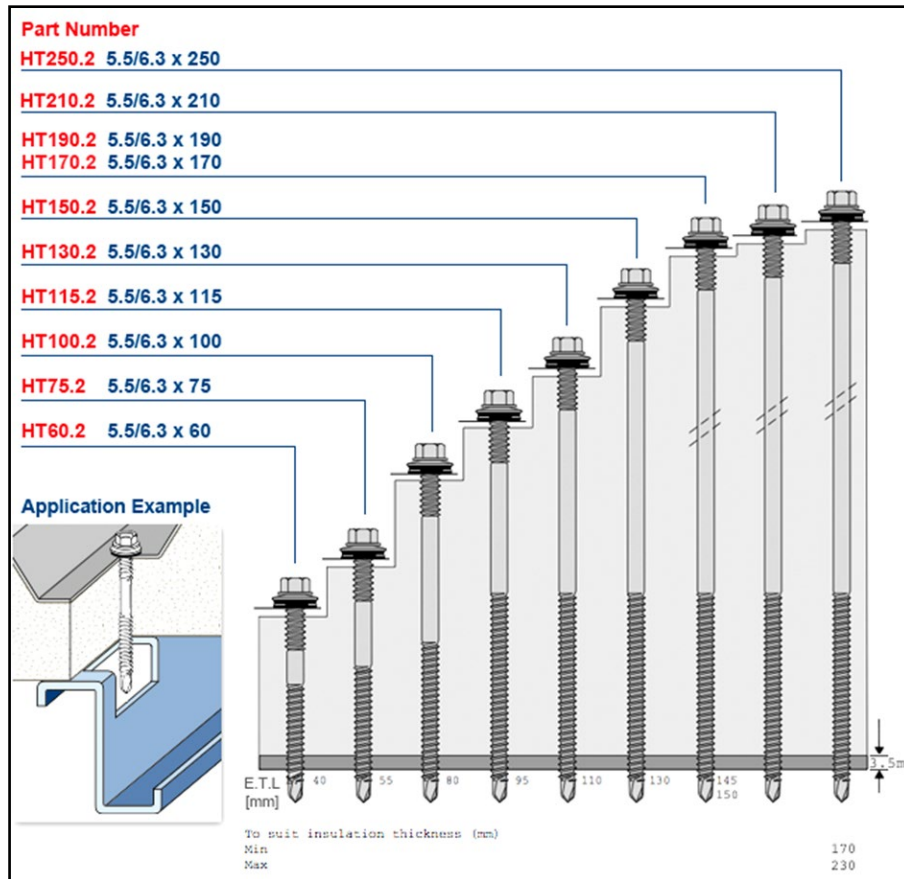
### Product Description and Application

#### A.1.1 Carbon Steel Fastening Screws for Light Section Framing

Table A1.1.1: Product Description

Characteristic	Values
<b>Intended use</b>	For fastening Composite Insulated Panels with steel inner and outer skins as roofing or cladding to light steel framing members, typically of cold rolled profile.
<b>Fastener type</b>	Self drilling, self tapping fastener for permanent installations
<b>Fastener material</b>	Hardened SAE 1022 carbon steel with a minimum tensile strength of 14.1 kN for a 5.5 mm diameter fastener.
<b>Fastener diameter</b>	5.5 mm
<b>Fastener thread</b>	Coarse pitch thread. Pitch of 1.81 mm Additional length of coarse thread 6.3mm diameter directly beneath the head flange
<b>Point-side substrate thickness</b>	Suitable for light section framing of 1.2 – 3.5 mm
<b>Fastener lengths</b>	60-250 mm from head flange to tip
<b>Fastener head types</b>	All fasteners have a 5/16" (~8 mm) Hex head with a 1/2" (12.3 mm) diameter flange. They may have an additional plastic cap. Heads are not intended to be used without washers
<b>Washer type</b>	Conical washer of galvanized steel with an EPDM (ethylene propylene diene monomer) seal bonded to the inner face
<b>Washer diameters</b>	16, 19 or 29 (for 16, 19 or 29 mm diameter)
<b>Head side substrate I specification</b>	Composite Insulated Panel (CIP or sandwich panel) for roofing or cladding. Minimum steel specification for panel skins S250GD with Z45 galvanized coating. Insulation is permanently bonded to the skins.
<b>Point side substrate II specification</b>	Cold Rolled Profile (CRP) for framing. Minimum steel specification S250GD with Z45 galvanized coating.





ETL: Effective threaded length

Code example – HT60.2 means 60 mm length from flange to tip with point type 2 and a high thread beneath the flange.

**Table A1.1.2: Characteristic Values for Shear  $V_{R,k}$  and Axial  $N_{R,k}$  Resistance of Connections**

	Minimum sheeting thickness $t_{N,I}$ (mm)	Washer type and diameter	Framing member thickness $t_{N,II}$ (mm)			
			$\geq 1.20$	$\geq 1.50$	$\geq 1.90$	$\geq 2.40$
$V_{R,k}$	0.5	WS $\geq 16$ mm	-	-	-	-
	0.7	WS $\geq 16$ mm	1.96	2.21	2.21	2.21
$N_{R,k}$	0.5	WS $\geq 16$ mm	1.71	1.98	1.98	1.98
	0.5	WS $\geq 19$ mm	1.71	2.08	2.08	2.08
	0.7	WS $\geq 16$ mm	1.71	2.86	3.05	3.05
	0.7	WS $\geq 19$ mm	1.71	2.86	3.05	3.05

WS = galvanized conical washer with EPDM seal

Shear values are relevant to the specified thickness of the inner steel sheet of the sandwich panel. Shear values for thinner sheets may be calculated in proportion to the reduction in sheet thickness (EN 1993-1-3 Table 8.2)

Axial values are relevant to the specified thickness of the outer steel sheet of the sandwich panel.

Design values for shear and axial resistance have been derived from the characteristic values above as follows:

$$V_{R,d} = V_{R,k} / \gamma_M \text{ for shear resistance}$$

$$N_{R,d} = N_{R,k} / \gamma_M \text{ for axial resistance}$$

Where:

$\gamma_M$  is the material specific partial factor.  $\gamma_M$  has been taken as 1.33. Other values may be applied by national regulation.

**Table A1.1.3 Design Values for Shear  $V_{R,d}$  and Axial  $N_{R,d}$  Resistance of Connections**

	Minimum sheeting thickness $t_{N,i}$ (mm)	Washer type and diameter	Framing member thickness $t_{N,II}$ (mm)			
			$\geq 1.20$	$\geq 1.50$	$\geq 1.90$	$\geq 2.40$
$V_{R,d}$	0.5	WS $\geq 16$ mm	-	-	-	-
	0.7	WS $\geq 16$ mm	1.47	1.66	1.66	1.66
$N_{R,d}$	0.5	WS $\geq 16$ mm	1.29	1.49	1.49	1.49
	0.5	WS $\geq 19$ mm	1.29	1.56	1.56	1.56
	0.7	WS $\geq 16$ mm	1.29	2.15	2.30	2.30
	0.7	WS $\geq 19$ mm	1.29	2.15	2.30	2.30

WS = galvanized conical washer with EPDM seal

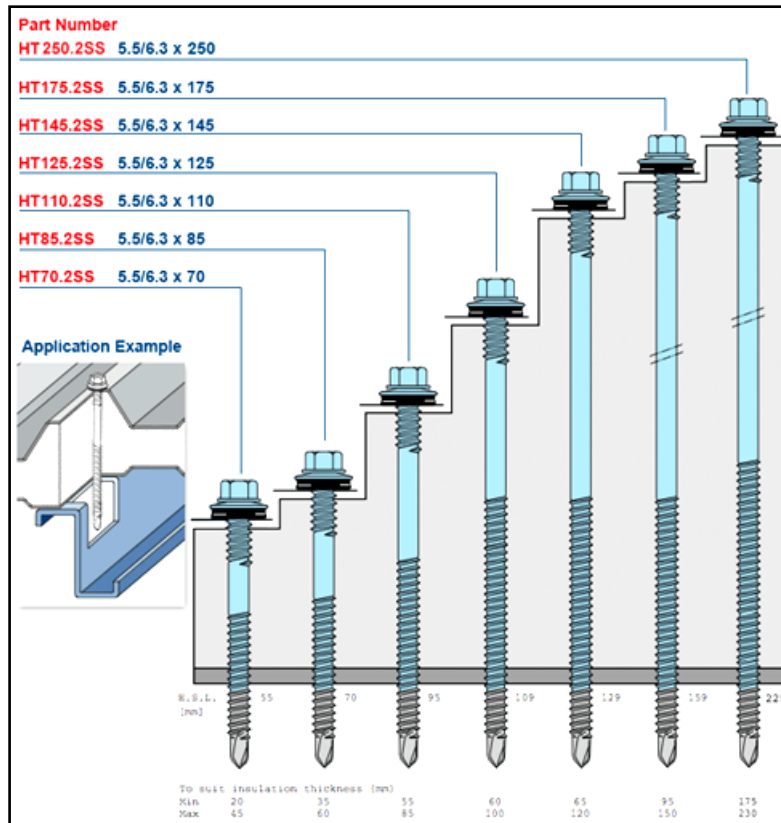
Shear values are relevant to the specified thickness of the inner steel sheet of the sandwich panel. Shear values for thinner sheets may be calculated in proportion to the reduction in sheet thickness (EN 1993-1-3 Table 8.2)

Axial values are relevant to the specified thickness of the outer steel sheet of the sandwich panel.

## A1.2: Stainless Steel Fastening Screws for Light Section Framing

Table A1.2.1: Product Description

Characteristic	Values
Intended use	For fastening Composite Insulated Panels with steel inner and outer skins as roofing or cladding to light steel framing members, typically of cold rolled profile.
Fastener type	Self drilling, self tapping fastener for permanent installations
Fastener material	A2 (304) austenitic stainless steel with a minimum tensile strength of 10.4 kN for a 5.5 mm diameter fastener. Stainless steel fasteners have a welded carbon steel tip.
Fastener diameter	5.5 mm
Fastener thread	Coarse pitch thread. Pitch of 1.80 mm Additional length of coarse thread 6.3mm diameter directly beneath the head flange
Point-side substrate thickness	Suitable for light section framing of 1.2 – 3.5 mm
Fastener lengths	70-250 mm from head flange to tip
Fastener head types	All fasteners have a 5/16" (~8 mm) Hex head with a 1/2" (12.3 mm) diameter flange. They may have an additional plastic cap. Heads are not intended to be used without washers
Washer type	Conical washer of stainless steel with an EPDM (ethylene propylene diene monomer) seal bonded to the inner face
Washer diameters	16, 19 or 29 (for 16, 19 or 29 mm diameter)
Head side substrate I specification	Composite Insulated Panel (CIP or sandwich panel) for roofing or cladding. Minimum steel specification for panel skins S250GD with Z45 galvanized coating. Insulation is permanently bonded to the skins.
Point side substrate II specification	Cold Rolled Profile (CRP) for framing. Minimum steel specification S250GD with Z45 galvanized coating.



ESL – effective stainless length. Hardened carbon steel tip

Code example – HT70.2SS means 70 mm length from flange to tip with point type 2 and a high thread beneath the flange. SS is stainless steel.

**Table A1.2.2: Characteristic Values for Shear  $V_{R,k}$  and Axial  $N_{R,k}$  Resistance of Connections**

	Minimum sheeting thickness $t_{N,I}$ (mm)	Washer type and diameter	Framing member thickness $t_{N,II}$ (mm)			
			$\geq 1.20$	$\geq 1.50$	$\geq 1.90$	$\geq 2.40$
$V_{R,k}$	0.5	SS $\geq 16$ mm	-	-	-	-
	0.7	SS $\geq 16$ mm	1.96	2.21	2.21	2.21
$N_{R,k}$	0.5	SS $\geq 16$ mm	1.42	1.98	1.98	1.98
	0.5	SS $\geq 19$ mm	1.42	2.08	2.08	2.08
	0.7	SS $\geq 16$ mm	1.42	2.59	3.05	3.05
	0.7	SS $\geq 19$ mm	1.42	2.59	3.05	3.05

SS = stainless conical washer with EPDM seal

Shear values are relevant to the specified thickness of the inner steel sheet of the sandwich panel. Shear values for thinner sheets may be calculated in proportion to the reduction in sheet thickness (EN 1993-1-3 Table 8.2)

Axial values are relevant to the specified thickness of the outer steel sheet of the sandwich panel.

Design values for shear and axial resistance have been derived from the characteristic values above as follows:

$$V_{R,d} = V_{R,k} / \gamma_M \text{ for shear resistance}$$

$$N_{R,d} = N_{R,k} / \gamma_M \text{ for axial resistance}$$

Where:

$\gamma_M$  is the material specific partial factor.  $\gamma_M$  has been taken as 1.33. Other values may be applied by national regulation.

**Table A1.2.3: Design Values for Shear  $V_{R,d}$  and Axial  $N_{R,d}$  Resistance of Connections**

	Minimum sheeting thickness $t_{N,i}$ (mm)	Washer type and diameter	Framing member thickness $t_{N,II}$ (mm)			
			$\geq 1.20$	$\geq 1.50$	$\geq 1.90$	$\geq 2.40$
$V_{R,d}$	0.5	SS $\geq 16$ mm	-	-	-	-
	0.7	SS $\geq 16$ mm	1.47	1.66	1.66	1.66
$N_{R,d}$	0.5	SS $\geq 16$ mm	1.07	1.49	1.49	1.49
	0.5	SS $\geq 19$ mm	1.07	1.56	1.56	1.56
	0.7	SS $\geq 16$ mm	1.07	1.95	2.30	2.30
	0.7	SS $\geq 19$ mm	1.07	1.95	2.30	2.30

SS = stainless conical washer with EPDM seal

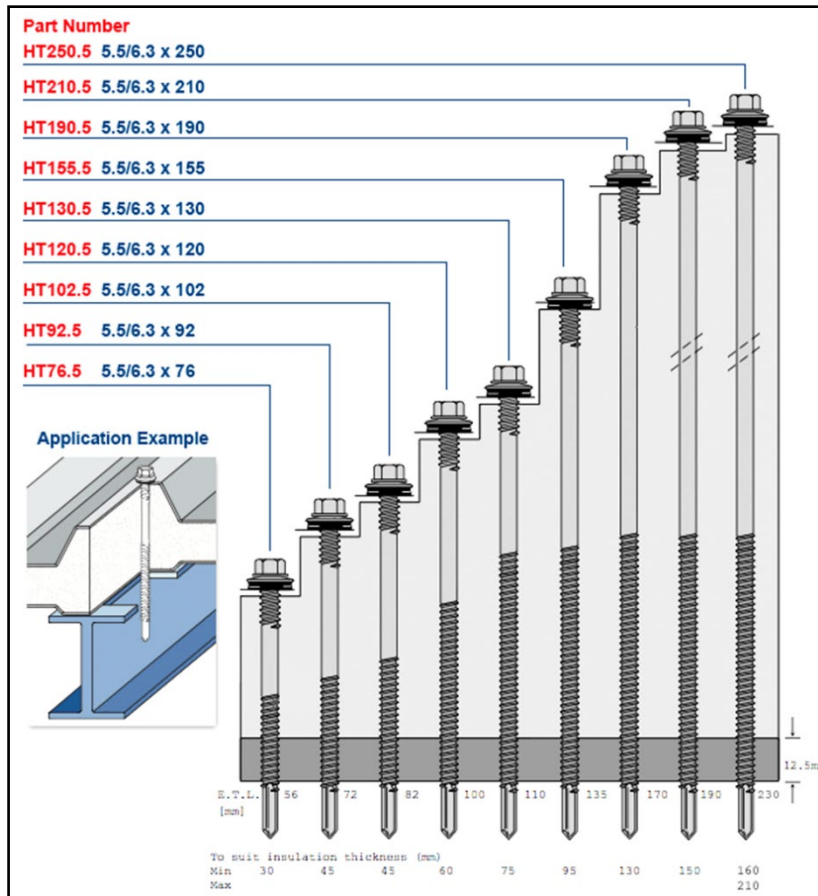
Shear values are relevant to the specified thickness of the inner steel sheet of the sandwich panel. Shear values for thinner sheets may be calculated in proportion to the reduction in sheet thickness (EN 1993-1-3 Table 8.2)

Axial values are relevant to the specified thickness of the outer steel sheet of the sandwich panel.

### A1.3: Carbon Steel Fastening Screws for Heavy Section Framing

Table A1.3.1 Product Description

Characteristic	Values
<b>Intended use</b>	For fastening Composite Insulated Panels with steel inner and outer skins as roofing or cladding to heavy steel framing members, typically of hot rolled profile.
<b>Fastener type</b>	Self drilling, self tapping fastener for permanent installations
<b>Fastener material</b>	Hardened SAE 1022 carbon steel with a minimum tensile strength of 14.1 kN for a 5.5 mm diameter fastener.
<b>Fastener diameter</b>	5.5 mm
<b>Fastener thread</b>	Fine pitch thread. Pitch of 1.06 mm Additional length of coarse thread 6.3mm diameter directly beneath the head flange
<b>Point-side substrate thickness</b>	Suitable for heavy section framing of 4.0 – 12.5 mm
<b>Fastener lengths</b>	76 - 250 mm from head flange to tip
<b>Fastener head types</b>	All fasteners have a 5/16" (~8 mm) Hex head with a 1/2" (12.3 mm) diameter flange. They may have an additional plastic cap. Heads are not intended to be used without washers
<b>Washer type</b>	Conical washer of galvanized steel with an EPDM (ethylene propylene diene monomer) seal bonded to the inner face
<b>Washer diameters</b>	16, 19 or 29 (for 16, 19 or 29 mm diameter)
<b>Head side substrate I specification</b>	Composite Insulated Panel (CIP or sandwich panel) for roofing or cladding. Minimum steel specification for panel skins S250GD with Z45 galvanized coating. Insulation is permanently bonded to the skins.
<b>Point side substrate II specification</b>	Hot Rolled Profile (HRP). Minimum Steel specification S275JR.



ETL: Effective threaded length

Code example – HT76.5 means 76 mm length from flange to tip with point type 5 and a high thread beneath the flange.

**Table A1.3.2: Characteristic Values for Shear  $V_{R,k}$  and Axial  $N_{R,k}$  Resistance of Connections**

	Minimum sheeting thickness $t_{N,I}$ (mm)	Washer type and diameter	Framing member thickness $t_{N,II}$ (mm)	
			$\geq 4$	$\geq 8$
$V_{R,k}$	0.5	WS $\geq 16$ mm	-	-
	0.7	WS $\geq 16$ mm	2.59	2.59
$N_{R,k}$	0.5	WS $\geq 16$ mm	1.98	1.98
	0.5	WS $\geq 19$ mm	2.08	2.08
	0.7	WS $\geq 16$ mm	3.05	3.05
	0.7	WS $\geq 19$ mm	3.05	3.05

WS = galvanized conical washer with EPDM seal

Shear values are relevant to the specified thickness of the inner steel sheet of the sandwich panel. Shear values for thinner sheets may be calculated in proportion to the reduction in sheet thickness (EN 1993-1-3 Table 8.2)

Axial values are relevant to the specified thickness of the outer steel sheet of the sandwich panel.

Design values for shear and axial resistance have been derived from the characteristic values above as follows:

$$V_{R,d} = V_{R,k} / \gamma_M \text{ for shear resistance}$$

$$N_{R,d} = N_{R,k} / \gamma_M \text{ for axial resistance}$$

Where:

$\gamma_M$  is the material specific partial factor.  $\gamma_M$  has been taken as 1.33. Other values may be applied by national regulation.

**Table A1.3.3: Design Values for Shear  $V_{R,d}$  and Axial  $N_{R,d}$  Resistance of Connections**

	Minimum sheeting thickness $t_{N,I}$ (mm)	Washer type and diameter	Framing member thickness $t_{N,II}$ (mm)	
			$\geq 4$	$\geq 8$
$V_{R,k}$	0.5	WS $\geq 16$ mm	-	-
	0.7	WS $\geq 16$ mm	1.95	1.95
$N_{R,k}$	0.5	WS $\geq 16$ mm	1.49	1.49
	0.5	WS $\geq 19$ mm	1.56	1.56
	0.7	WS $\geq 16$ mm	2.30	2.30
	0.7	WS $\geq 19$ mm	2.30	2.30

WS = galvanized conical washer with EPDM seal

Shear values are relevant to the specified thickness of the inner steel sheet of the sandwich panel. Shear values for thinner sheets may be calculated in proportion to the reduction in sheet thickness (EN 1993-1-3 Table 8.2)

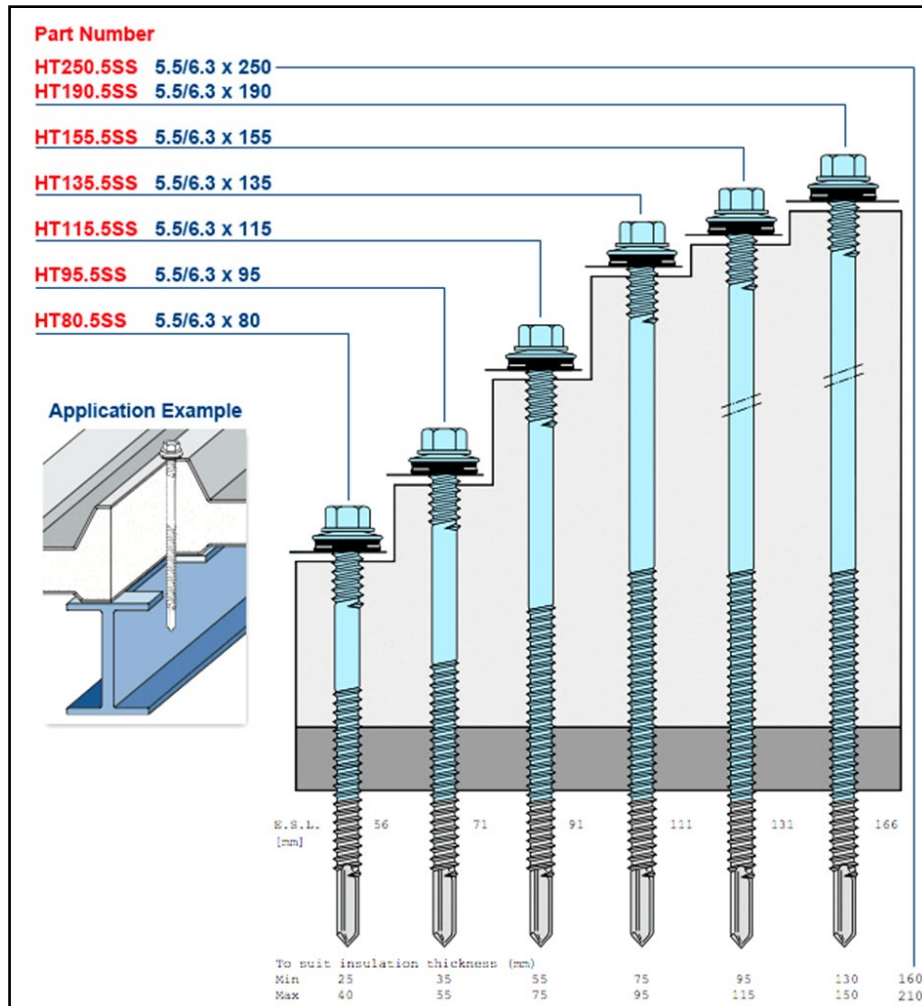
Axial values are relevant to the specified thickness of the outer steel sheet of the sandwich panel.



#### A1.4: Stainless Steel Fastening Screws for Heavy Section Framing

Table A1.4.1 Product Description

Characteristic	Values
<b>Intended use</b>	For fastening Composite Insulated Panels with steel inner and outer skins as roofing or cladding to heavy steel framing members, typically of hot rolled profile.
<b>Fastener type</b>	Self drilling, self tapping fastener for permanent installations
<b>Fastener material</b>	A2 (304) austenitic stainless steel with a minimum tensile strength of 10.4 kN for a 5.5 mm diameter fastener. Stainless steel fasteners have a welded carbon steel tip.
<b>Fastener diameter</b>	5.5 mm
<b>Fastener thread</b>	Fine pitch thread. Pitch of 1.06 mm Additional length of coarse thread 6.3mm diameter directly beneath the head flange
<b>Point-side substrate thickness</b>	Suitable for light section framing of 4.0 – 12.5 mm
<b>Fastener lengths</b>	80-250 mm from head flange to tip
<b>Fastener head types</b>	All fasteners have a 5/16" (~8 mm) Hex head with a 1/2" (12.3 mm) diameter flange. They may have an additional plastic cap. Heads are not intended to be used without washers
<b>Washer type</b>	Conical washer of stainless steel with an EPDM (ethylene propylene diene monomer) seal bonded to the inner face
<b>Washer diameters</b>	16, 19 or 29 (for 16, 19 or 29 mm diameter)
<b>Head side substrate I specification</b>	Composite Insulated Panel (CIP or sandwich panel) for roofing or cladding. Minimum steel specification for panel skins S250GD with Z45 galvanized coating. Insulation is permanently bonded to the skins.
<b>Point side substrate II specification</b>	Hot Rolled Profile (HRP). Minimum Steel specification S275JR.



ESL – effective stainless length. Hardened carbon steel tip

Code example – HT80.5SS means 25 mm length from flange to tip with point type 5 and a high thread beneath the flange. SS is stainless steel.

**Table A1.4.2: Characteristic Values for Shear  $V_{R,k}$  and Axial  $N_{R,k}$  Resistance of Connections**

	Minimum sheeting thickness $t_{N,I}$ (mm)	Washer type and diameter	Framing member thickness $t_{N,II}$ (mm)	
			$\geq 4$	$\geq 8$
$V_{R,k}$	0.5	SS $\geq 16$ mm	-	-
	0.7	SS $\geq 16$ mm	2.59	2.59
$N_{R,k}$	0.5	SS $\geq 16$ mm	1.98	1.98
	0.5	SS $\geq 19$ mm	2.08	2.08
	0.7	SS $\geq 16$ mm	3.05	3.05
	0.7	SS $\geq 19$ mm	3.05	3.05

SS = stainless conical washer with EPDM seal

Design values for shear and axial resistance have been derived from the characteristic values above as follows:

$$V_{R,d} = V_{R,k} / \gamma_M \text{ for shear resistance}$$

$$N_{R,d} = N_{R,k} / \gamma_M \text{ for axial resistance}$$

Where:

$\gamma_M$  is the material specific partial factor.  $\gamma_M$  has been taken as 1.33. Other values may be applied by national regulation.

**Table A1.4.3 Design Values for Shear  $V_{R,d}$  and Axial  $N_{R,d}$  Resistance of Connections**

	Minimum sheeting thickness $t_{N,I}$ (mm)	Washer type and diameter	Framing member thickness $t_{N,II}$ (mm)	
			$\geq 4$	$\geq 8$
$V_{R,k}$	0.5	SS $\geq 16$ mm	-	-
	0.7	SS $\geq 16$ mm	1.95	1.95
$N_{R,k}$	0.5	SS $\geq 16$ mm	1.49	1.49
	0.5	SS $\geq 19$ mm	1.56	1.56
	0.7	SS $\geq 16$ mm	2.30	2.30
	0.7	SS $\geq 19$ mm	2.30	2.30

SS = stainless conical washer with EPDM seal

Shear values are relevant to the specified thickness of the inner steel sheet of the sandwich panel. Shear values for thinner sheets may be calculated in proportion to the reduction in sheet thickness (EN 1993-1-3 Table 8.2)

Axial values are relevant to the specified thickness of the outer steel sheet of the sandwich panel.



**British Board of Agrément,**  
1<sup>st</sup> Floor Building 3  
Hatters Lane  
Croxley Park  
Watford  
WD18 8YG