

BUILDING

STEEL PROFILES

SADEF
A voestalpine company



READY-TO-ASSEMBLE PROFILES FOR STEEL STRUCTURES

INTRODUCTION

ROOF PURLINS AND SIDE RAILS

FLOOR FRAMES

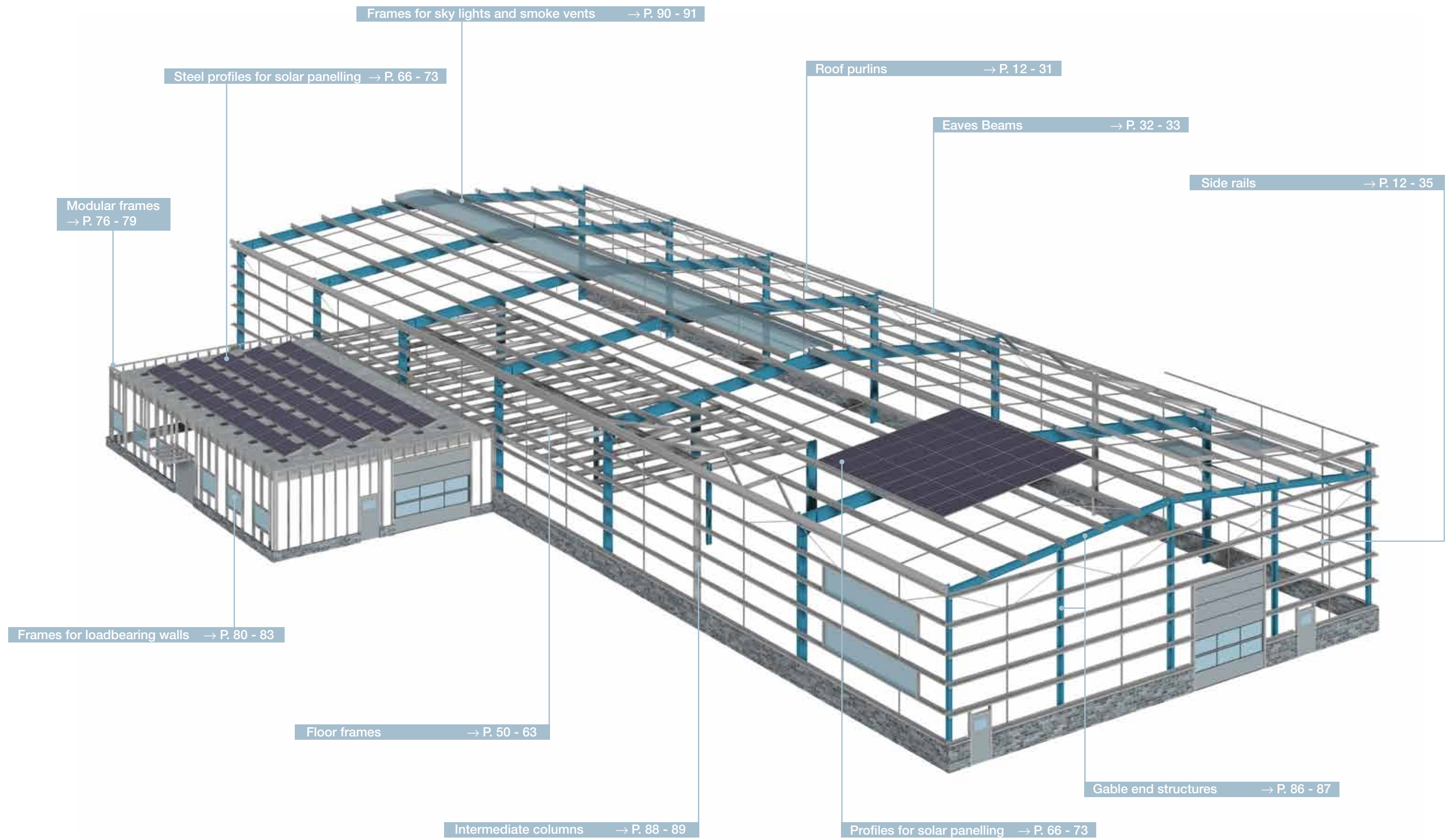
STEEL PROFILES FOR SOLAR PANELLING

MISCELLANEOUS CONSTRUCTIONS

BUILDING SECTIONS RANGE

INTRODUCTION

- WHAT HAS SADEF TO OFFER? p. 06
- WHO IS SADEF? p. 08
- WHY SADEF? p. 09





FACTS AND FIGURES

- Subsidiary of the voestalpine steel group
- 65 years of experience in cold roll forming
- Over 550 employees
- 35 rolling mills and 200 km daily output of sections
- In house design & engineering department employing more than 20 enthusiastic structural engineers
- Excellent technical know-how
- CE-certified solutions
- In house surface treatment (powder coating)
- Intelligent ready-to-assemble solutions

MORE THAN
65 YEARS OF
EXPERIENCE

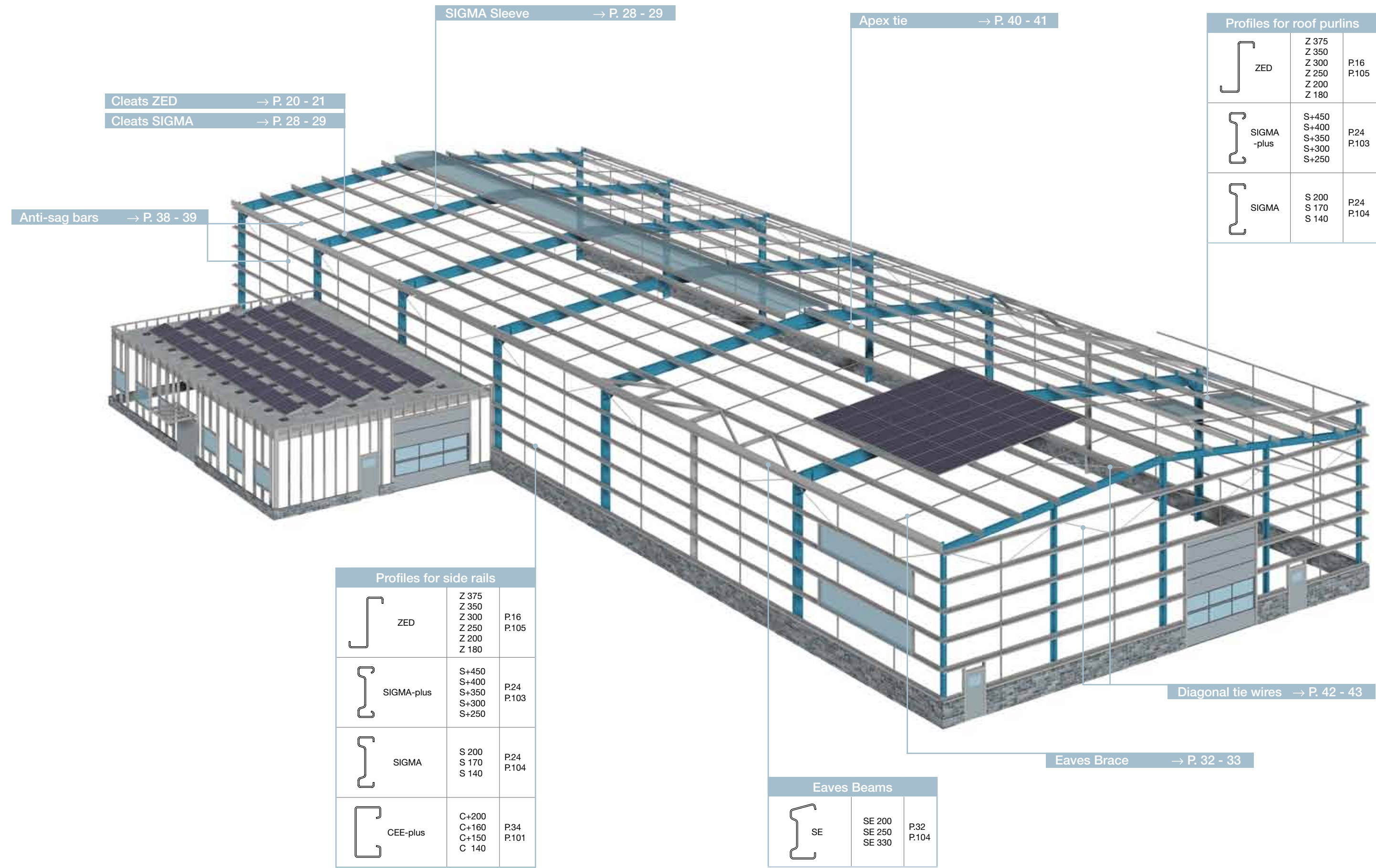


CERTIFICATES



ROOF PURLINS AND SIDE RAILS

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SADEF offers you a wide range of ZED sections for spans up to 18 m. The sections are suitable for any substructure.

The shape of the ZED section allows us to nest the sections, and to create an optimal beam system.

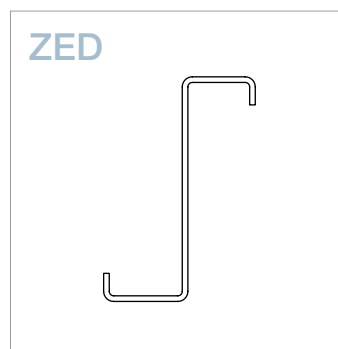
SADEF ZED sections can be used as single span beams, double span beams or as continuous overlap beams. The **optimal beam system** is, in most cases, a continuous overlap beam. The best solution for projects with a bigger roof slope is ZED sections. SADEF will be pleased to advise your design department.

WE OFFER A COMPREHENSIVE SERVICE INCLUDING:

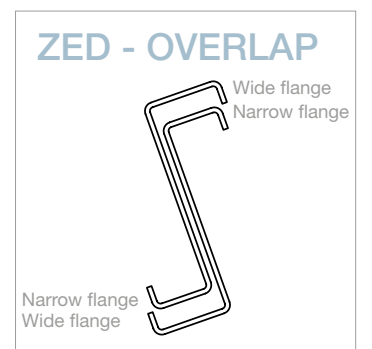
- Detailed quotation according to the prevailing standards:
- Strength calculation
 - Production drawings
 - Assembly overview
 - ISO certified

Tailor-made parts and components:

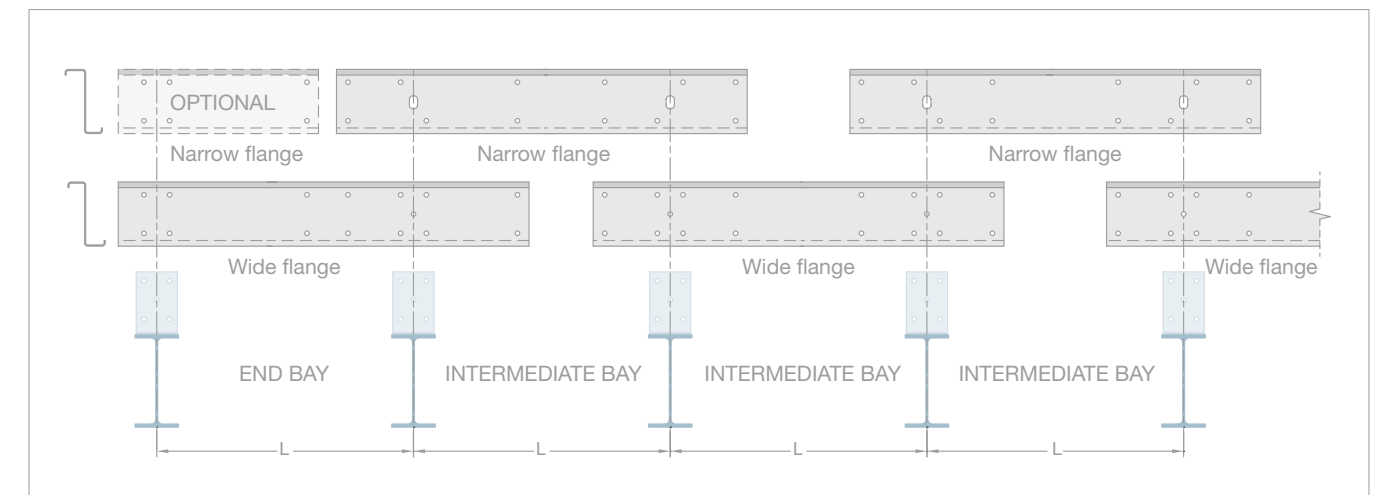
- Ready to assemble
- Delivered just-in-time
- Clear marking
- All accessories inclusive
- Professional packing
- CE certified



SADEF ZED-sections have one wide and one narrow flange. Nesting the sections in an overlap system creates a continuous beam resting on the intermediate supports of the primary structure.

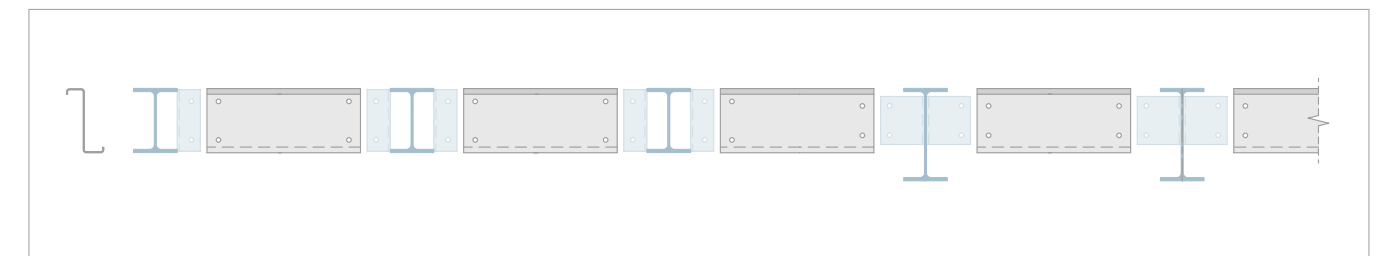


OVERLAP BEAM WITH QA-SYSTEM



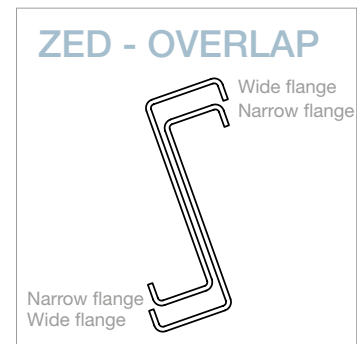
- Nesting narrow flange inside wide flange creates an overlap.
- Nesting of beams results in a double section at intermediate beam supports (where loads are to be transferred) thus ensuring that the material is used to its optimum efficiency.
- Several possibilities for optimizing the beam system: adjust the overlap length (between 5 and 15% of the span), use heavier beams or a double 'nested' beam on end bays. (see OPTION)
- Faster and safer assembly is achieved using the QA-system.

SINGLE SPAN BEAMS (ASSEMBLY BETWEEN SPANS)

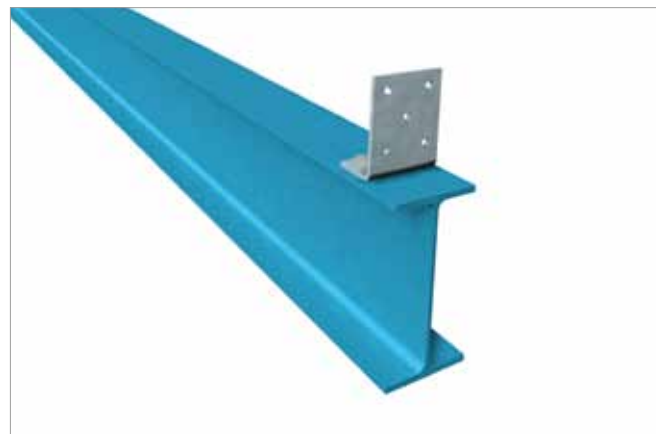


SADEF QA-system (Quick Assembly System) will save **considerable assembly** time. ZED sections are therefore fitted separately to the individual cleats and subsequently connected to the nesting purlin, without loosening the bolts of the initial assembly.

QA-SYSTEM: SAFE, FAST AND EASY-TO-INSTALL

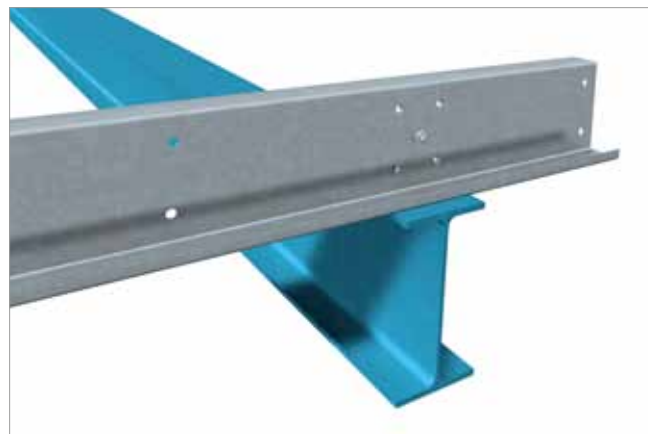


STEP A



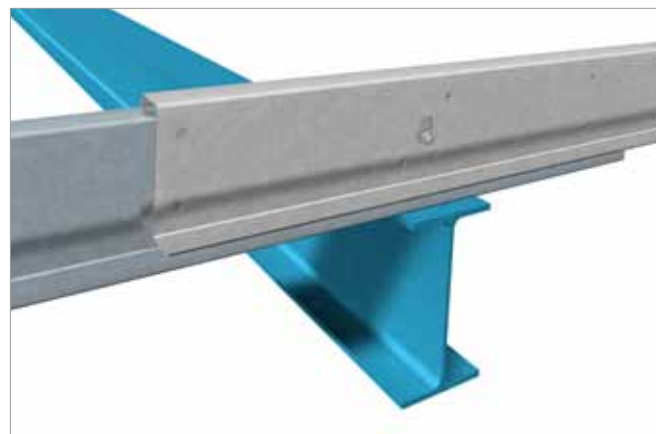
→ Standard cleat with 5 holes.

STEP B



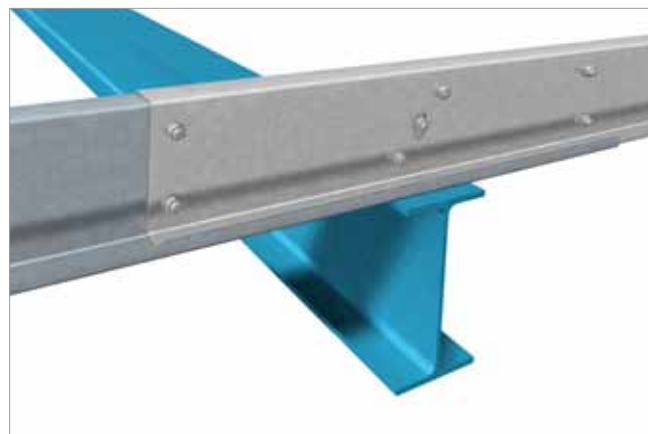
→ Fitting the 1st ZED-section using central bolt hole only.

STEP C



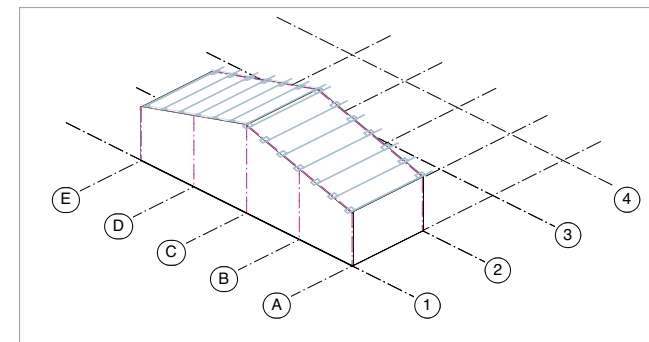
→ Nesting the 2nd purlin (small flange down) into the 1st one
Thanks to the special perforations in these ZED sections, the overlap can be made without loosening the central bolt.

STEP D



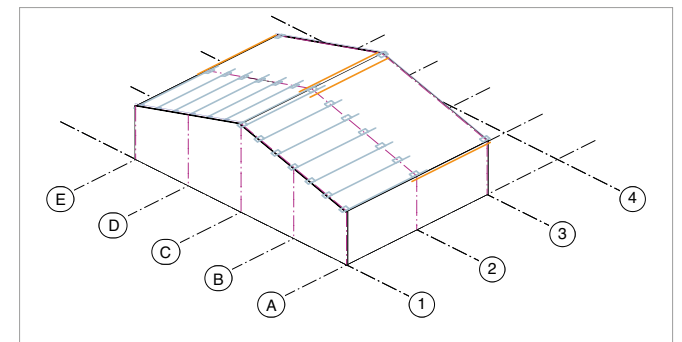
→ Overlap is created by assembling both purlins to the cleats through prepierced holes.

STEP 1



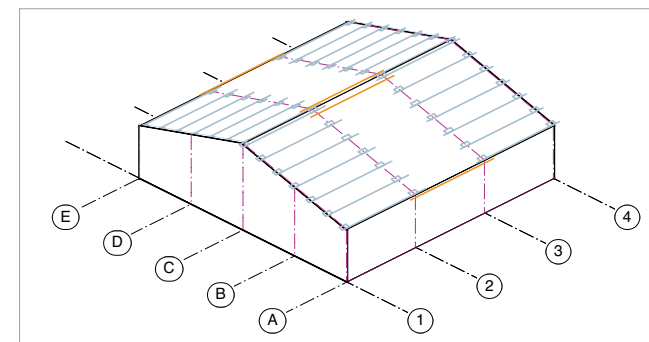
→ The ZED sections are fitted with wide flange down and bolted to cleats on axis 2, only using the central hole. See **STEP B**.

STEP 2



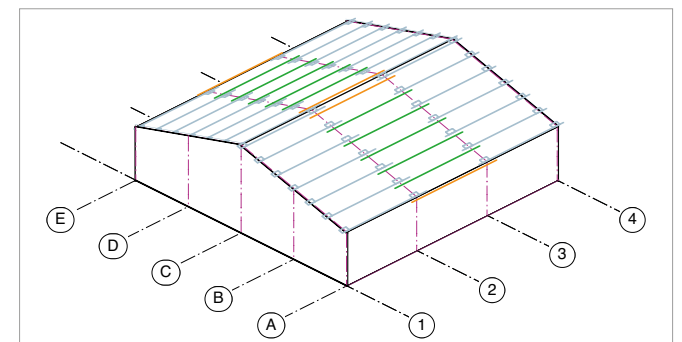
→ If ZED sections are supposed to brace the rafter on axis 3, these sections are fully bolted on axis 2 and fitted to axis 3 with 1 temporary bolt.

STEP 3



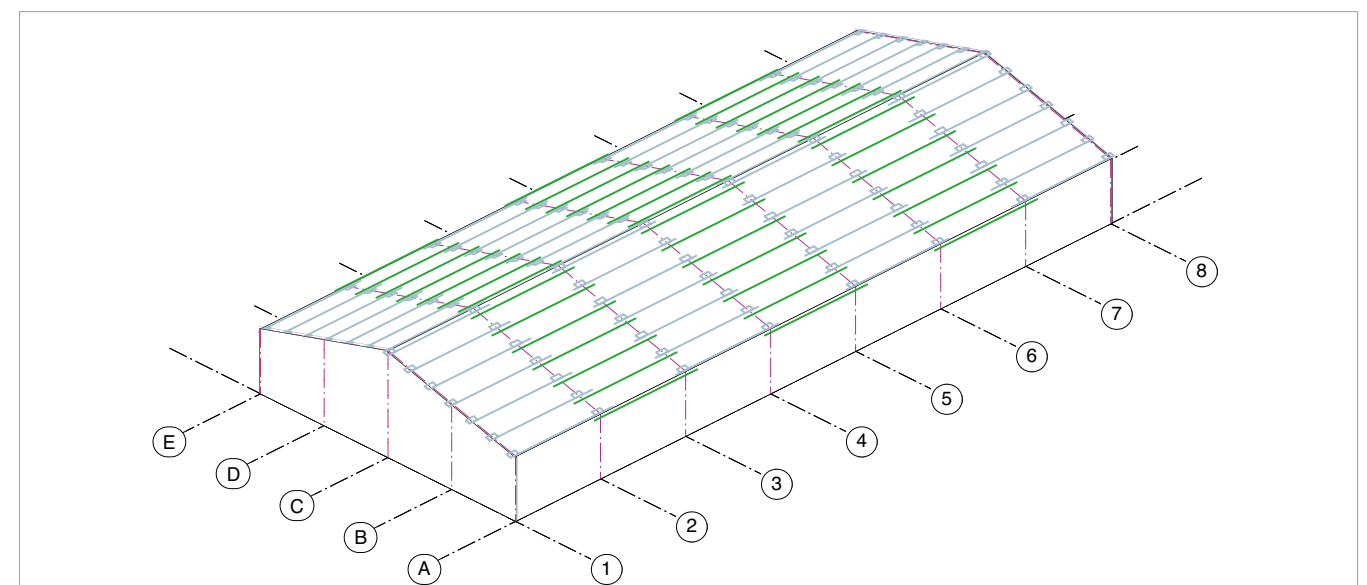
→ The ZED sections of bay 3 are fitted to axes 3 and 4 with the wide flange down and with only the central bolt, as per **STEP B**.

STEP 4



→ Missing ZED purlins of bay 2 are fully bolted with the narrow flange to axes 2 and 3. See **STEP C and D**.

STEP 5



→ The remaining bays can be fitted by repeating **STEPS 2-3 & 4**.

Remark: The client has to inform SADEF about the assembly sequence (especially the first field to be assembled)

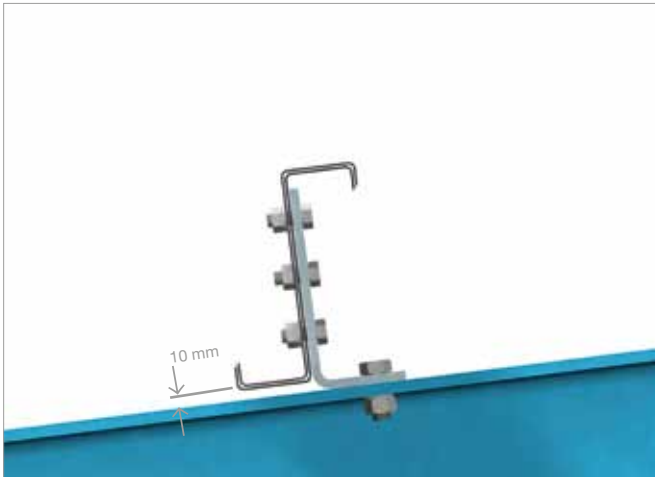
CLEATS

SADEF sections are fitted to the substructure by means of cleats. ZED-purlins should be bolted to the cleats with their top flanges pointing to the roof ridge.

To avoid web crippling, a 10 mm clearance between main frame and SADEF beams is required. This is achieved by the offset hole position in beams and cleats.

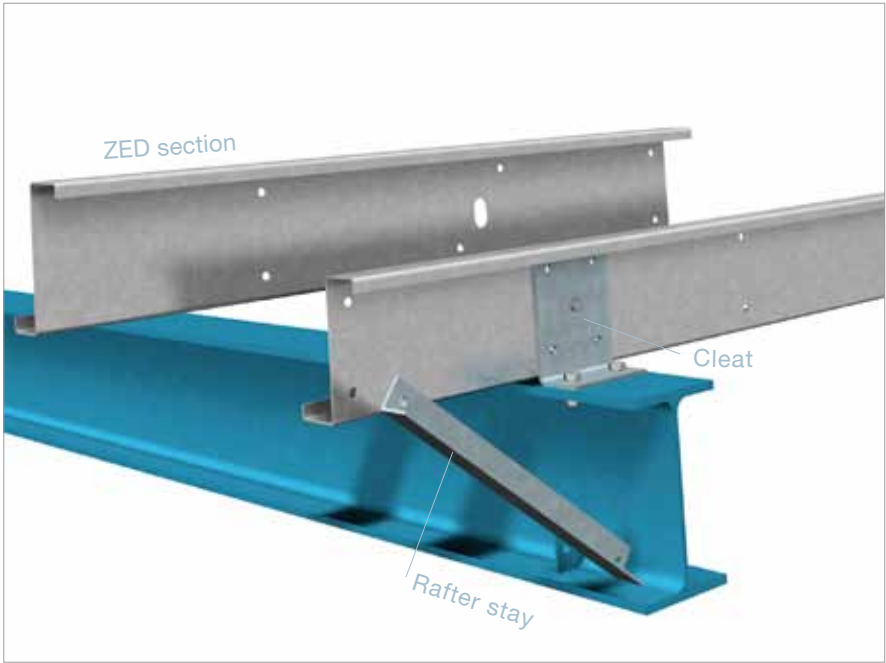
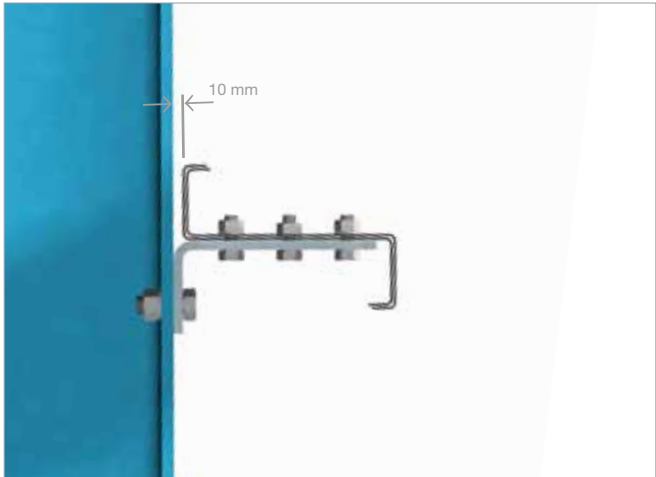
Cleats are also necessary for transmitting the roof diaphragm forces to the substructure. SADEF-cleats are made from HSLA-steel grades and are hot-dip galvanized.

ROOF - CLEATS



+/- 10 mm clearance between Sadeif ZED sections and substructure

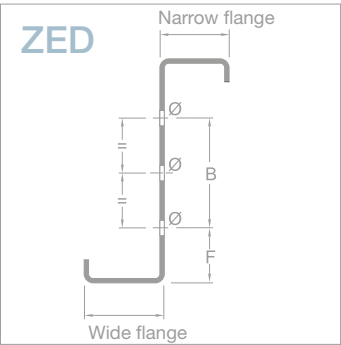
SIDE RAIL - CLEATS



RAFTER STAYS

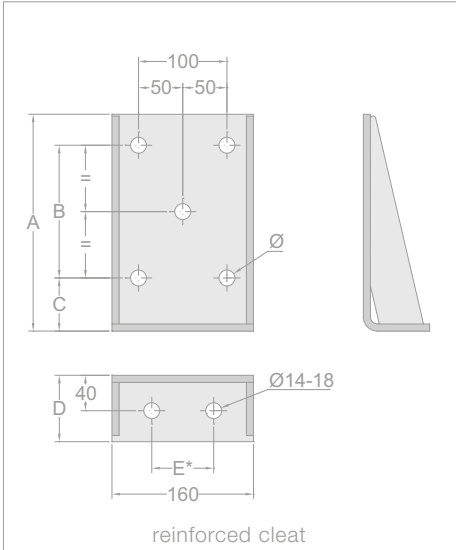
Rafter stays can be fixed in the holes at the end of the overlap. Please inform SADEF if rafter stays are to be used. This element will then be taken into consideration for the strength calculations.

Depending on the substructure geometry either standard (EZED) or reinforced (EZEDXX) cleats can be used. Both types are suitable for the QA-system.

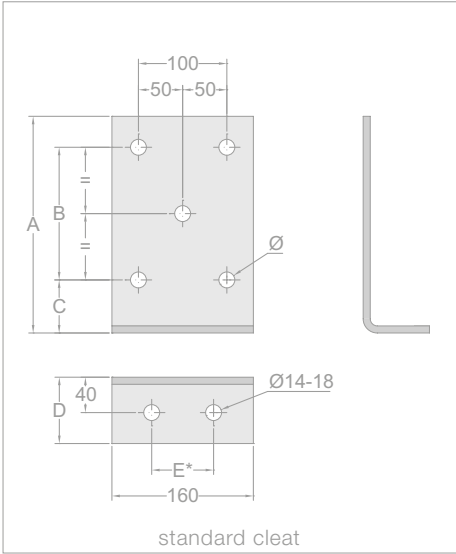


Section properties:
please turn to page 105

TYPE EZEDXX

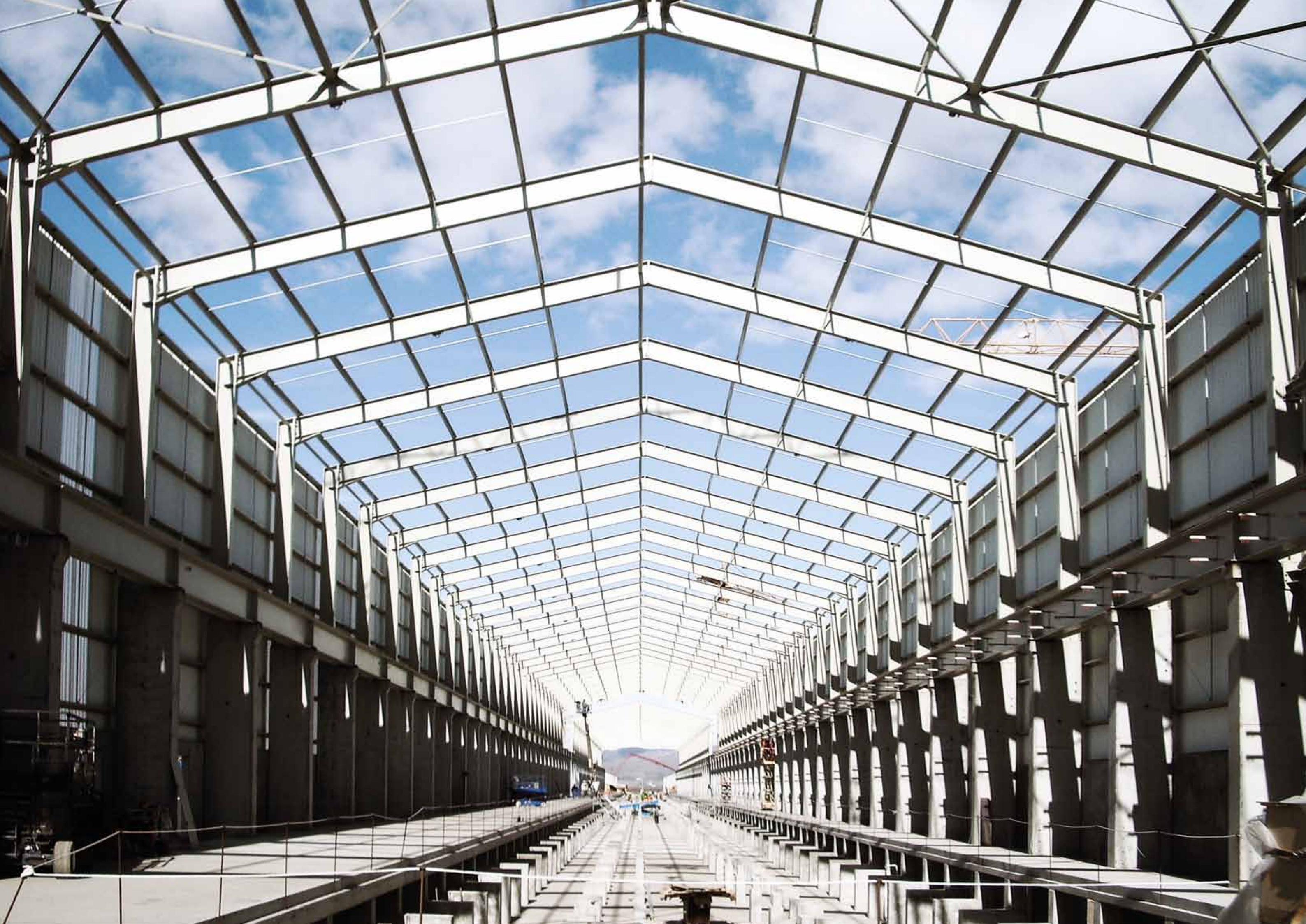


TYPE EZED



ZED - CLEATS							
Type	Section name	A (mm)	B (mm)	C (mm)	D (mm)	F (mm)	Ø (mm)
EZED375XX	Z 375x5	365	265	65	85	60,0	18
	Z 375x4					58,0	
	Z 375x3					57,5	
	Z 375x2,5					57,0	
	Z 375x2					56,5	
EZED350XX	Z 350x4	340	240	65	85	58,0	18
	Z 350x3,5					58,0	
	Z 350x3					57,5	
	Z 350x2,5					57,0	
	Z 350x2					56,5	
EZED300XX	Z 300x5	290	190	65	85	59,5	18
	Z 300x4					58,0	
	Z 300x3,5					58,0	
	Z 300x3					58,0	
	Z 300x2,5					57,0	
	Z 300x2					56,5	
	Z 300x1,75					56,0	
EZED250 EZED250XX	Z 250x4	245	150	60	75	53,5	18
	Z 250x3,5					53,0	
	Z 250x3					52,5	
	Z 250x2,5					52,0	
	Z 250x2					51,5	
	Z 250x1,75					51,5	
	Z 250x1,5					52,0	
EZED200 EZED200XX	Z 200x4	195	100	60	75	53,5	14
	Z 200x3					53,0	
	Z 200x2,5					53,0	
	Z 200x2					52,0	
	Z 200x1,75					52,0	
	Z 200x1,5					52,0	
EZED180 EZED180XX	Z 180x2,5	176	81,5	60	75	52,0	14
	Z 180x2					50,5	
	Z 180x1,75					50,0	
	Z 180x1,5					50,0	
	Z 180x1,25					50,0	

Piercing pattern is symmetrical in the bottom of the cleats.
For alternative piercing patterns: please contact SADEF.
E*: Hole distance variable from 50 to 100 mm with 70 mm (Ø 18 mm) as standard.



SADEF offers you an extensive range of SIGMA sections for spans up to 18 m.

The sections are suitable for virtually any substructure. SADEF SIGMA can be used as single span beams, double span beams or as a continuous beam.

Use continuous sleeve beams for optimum deflection and strength. SADEF will be pleased to advise your design department.

WE OFFER A COMPREHENSIVE SERVICE INCLUDING:

Detailed quotation according to the prevailing standards:

- Strength calculation

- Production drawings

- Assembly overview

- ISO certified

Tailor-made parts and components:

- Ready to assemble

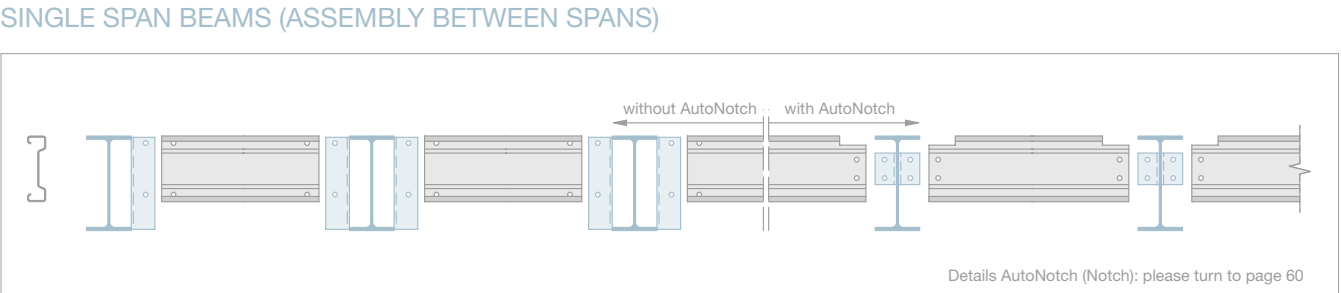
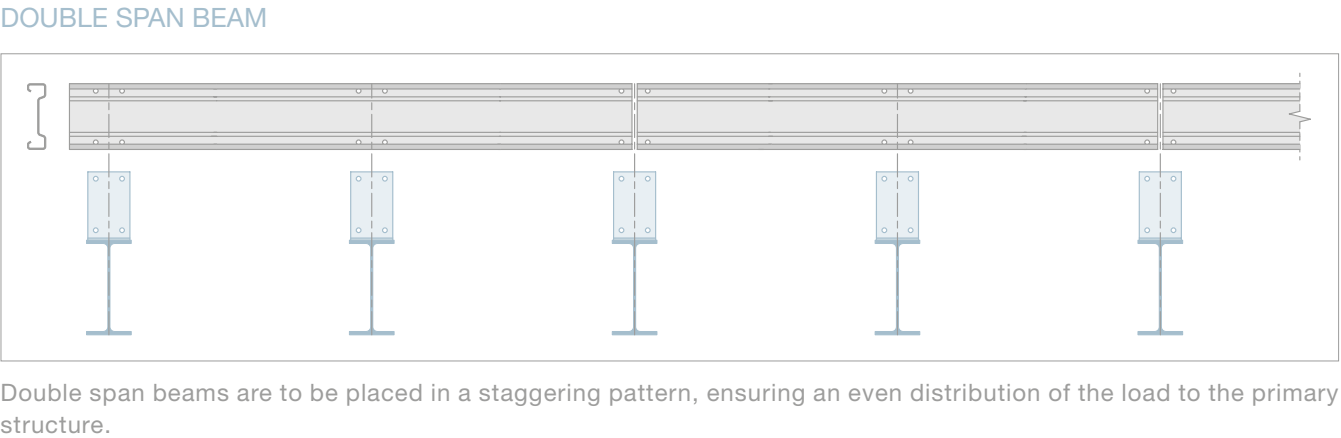
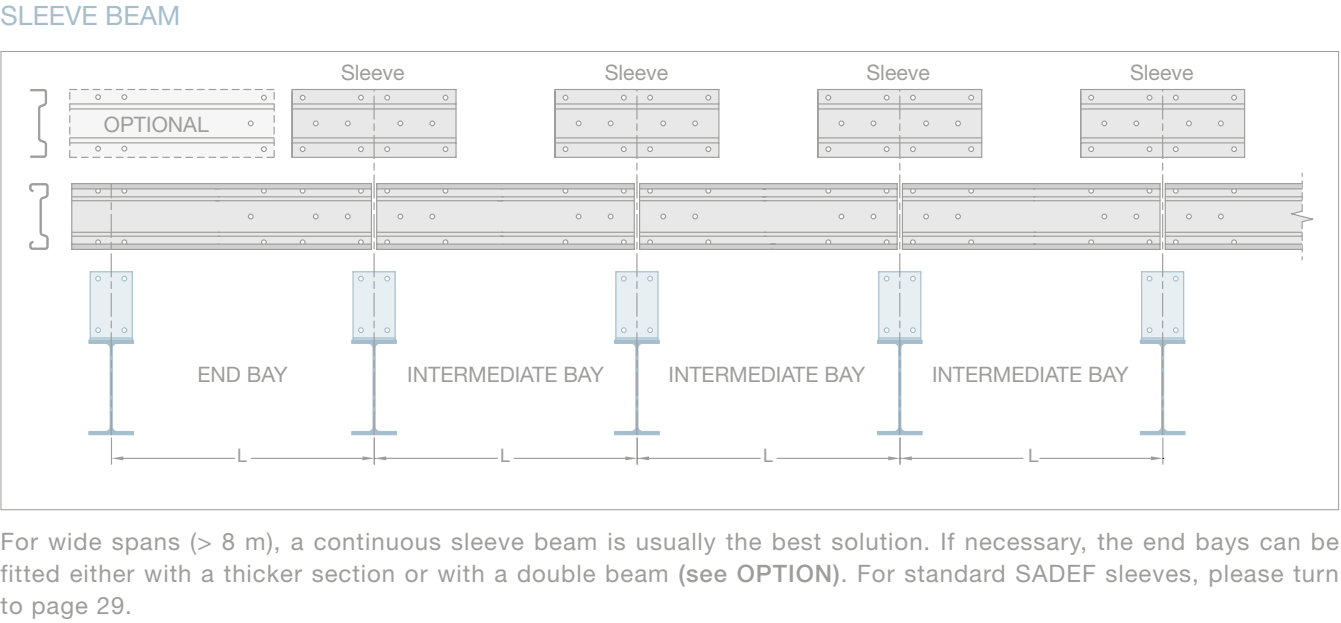
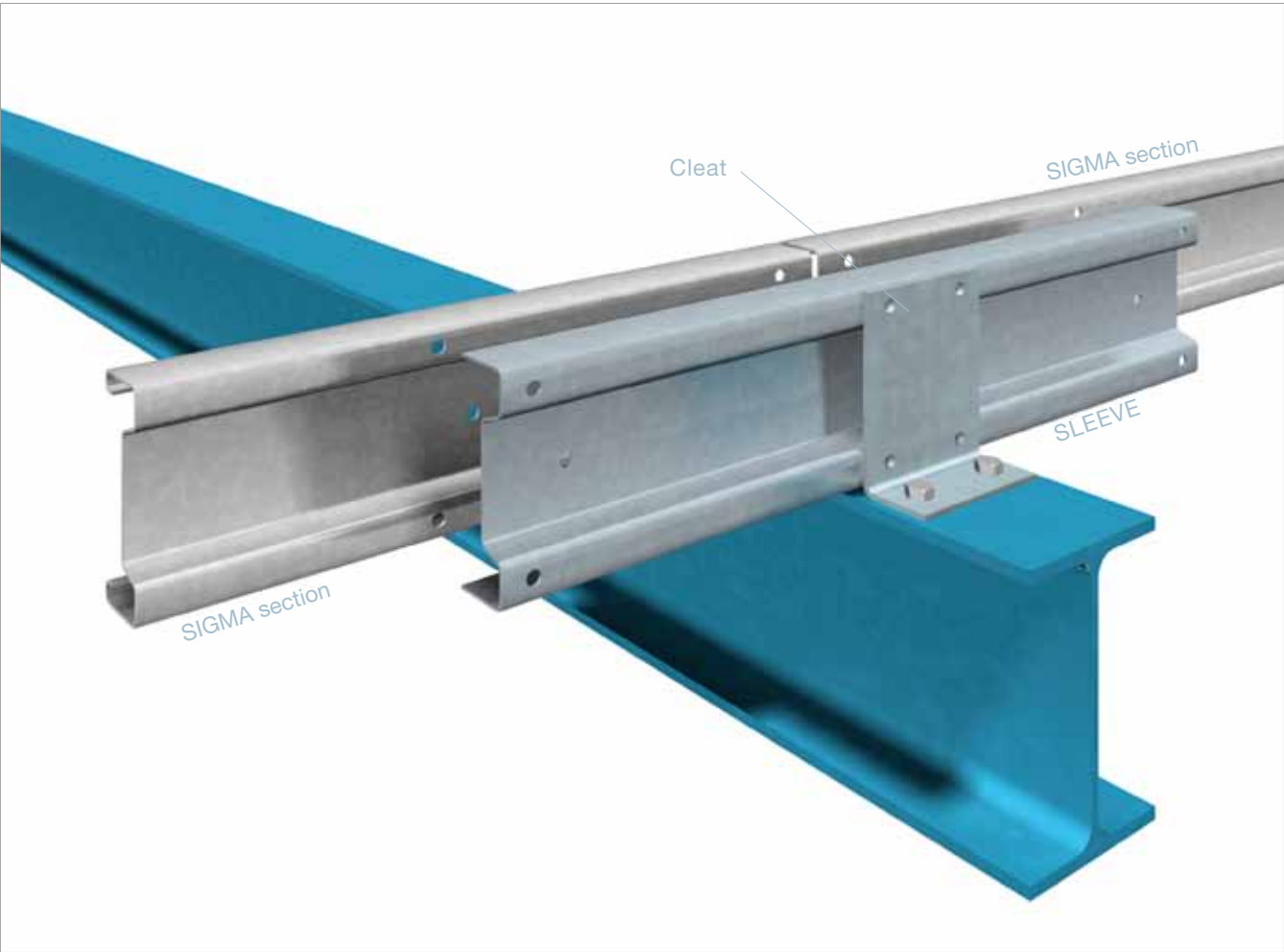
- Delivered just-in-time

- Clear marking

- All accessories inclusive

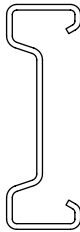
- Professional packing

- CE certified



SIGMA sleeves can be used to create a continuous beam system. The optimum standard sleeve, depth and hole pattern of the sleeves are related to the SADEF SIGMA sections. SADEF has defined the optimal sleeve length for every section depth. (see also bottom of page 29)

SIGMA



SAFE, FAST AND EASY SLEEVE ASSEMBLY

STEP A



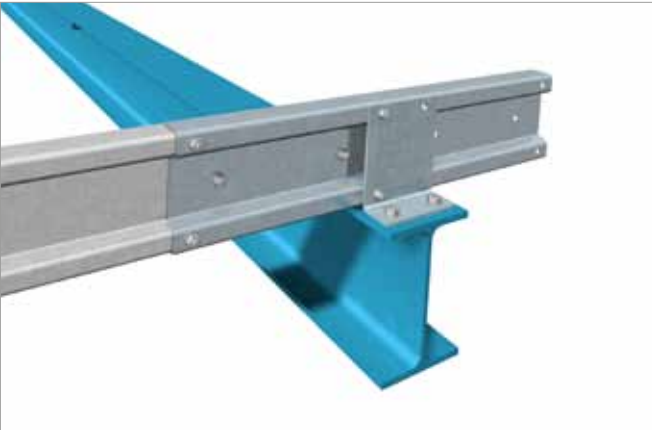
→ Standard cleat with 4 holes.

STEP B



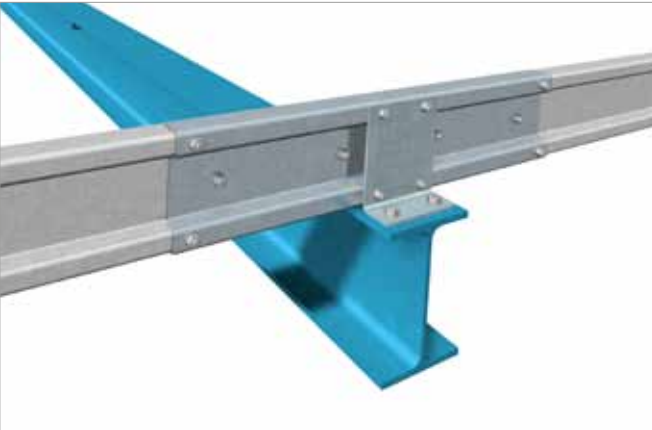
→ SIGMA to sleeve connection on ground level, using 2 or 4 bolts.

STEP C



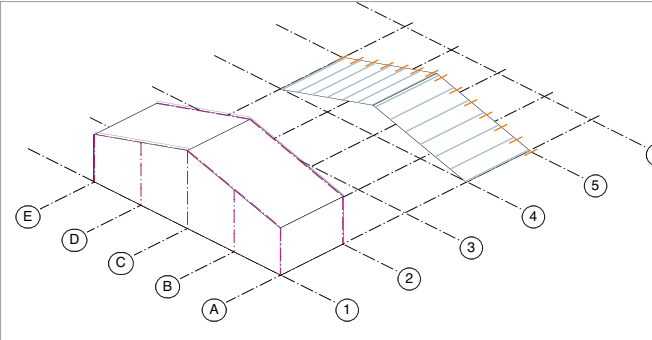
→ Bolting on sleeved SIGMA to cleat, using 2 bolts.

STEP D



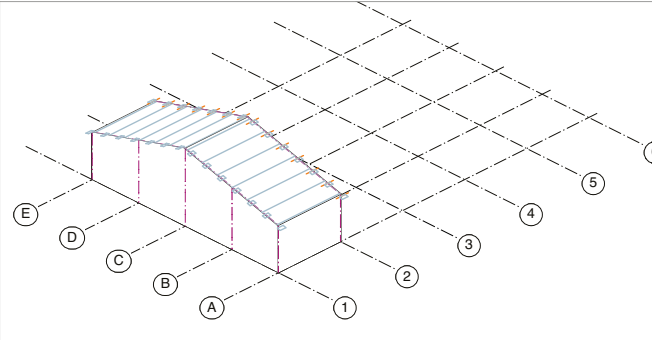
→ Repeat step B and bolt the next sleeved SIGMA to the cleat, using the 2 remaining bolt holes in the cleat.

STEP 1



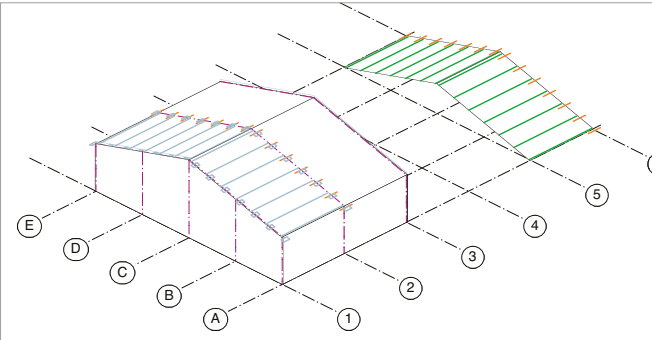
→ Assembly on ground level of Bay 1 SIGMA sections and corresponding sleeves. (cfr. STEP B)

STEP 2



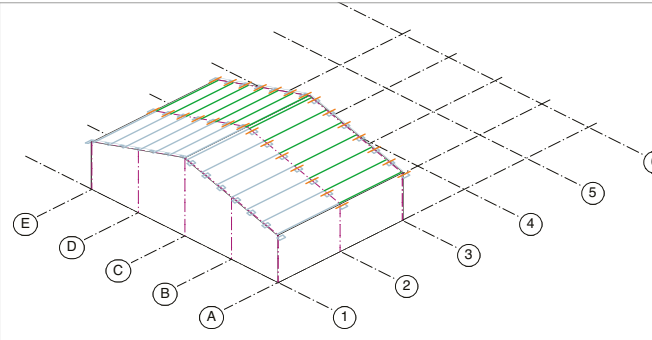
→ Fitting of sleeved SIGMA sections to Bay 1 cleats. (cfr. STEP C)

STEP 3



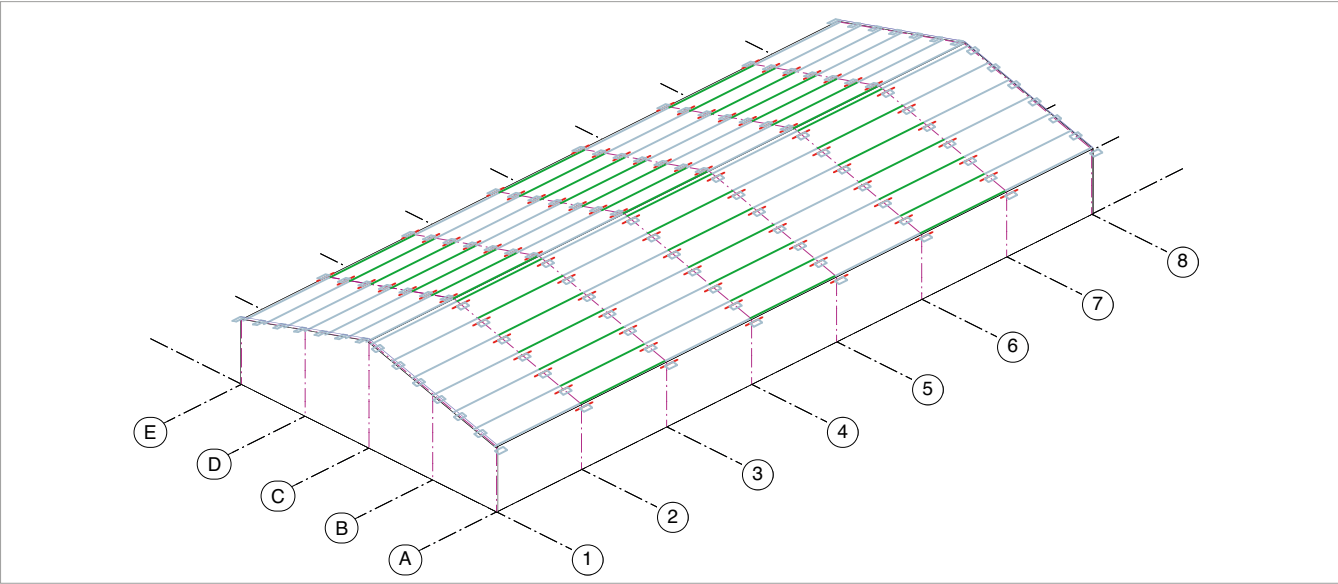
→ Assembly on ground level of Bay 2 (Bay 3, Bay 4...) SIGMA sections and corresponding sleeves. (cfr. STEP B)

STEP 4



→ Fitting of sleeved SIGMA sections to Bay 2 (Bay 3, Bay 4, ...) cleats (cfr. STEPS C & D) STEP 5.

STEP 5



→ Bolting through remaining cleat holes by repeating STEPS 3 & 4.

CLEATS

SADEF sections are fixed to the substructure by means of cleats.

To prevent web crippling, a 10 mm clearance between main frame and SADEF beams is required. This is achieved by the offset hole position in beams and cleats.

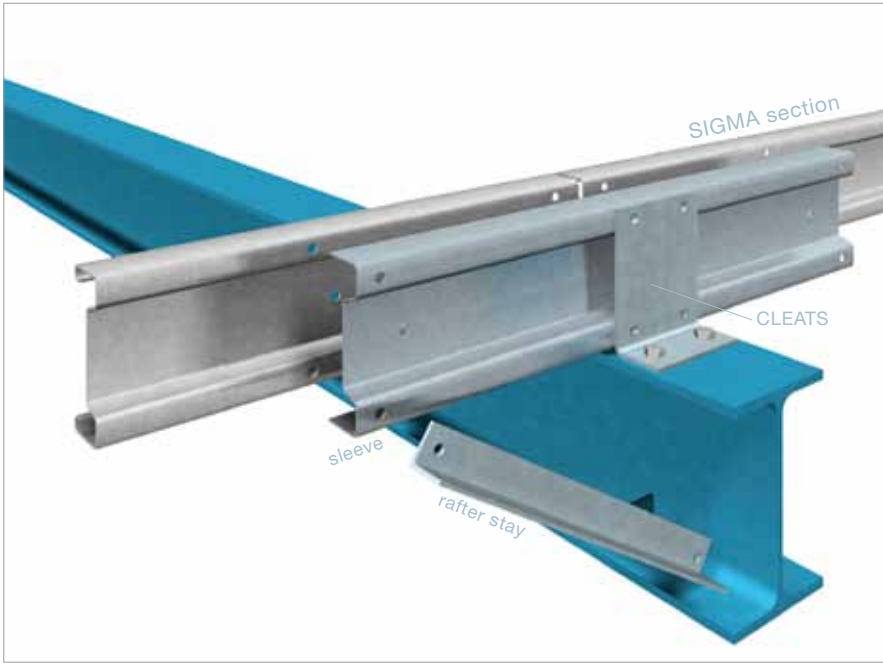
Cleats are also necessary for transmitting the roof diaphragm forces to the substructure. Standard SADEF cleats are made from HSLA-steel grades and are hot-dip galvanized.

ROOF - CLEATS



+/- 10 mm clearance between SadeF SIGMA-sections and substructure is recommended.

SIDE RAIL - CLEATS



RAFTER STAYS

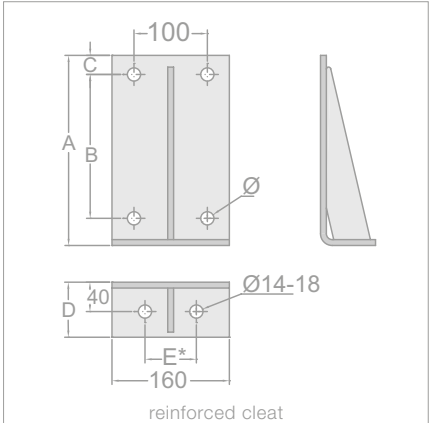
Rafter stays - used for stabilizing the lower flange of the portal frames - can be fixed in the holes at the end of the sleeve. Please inform SADEF if rafter stays are to be used.

SLEEVES

SADEF sleeves are supplied with the SADEF SIGMA sections just-in-time to the site ready for assembly.

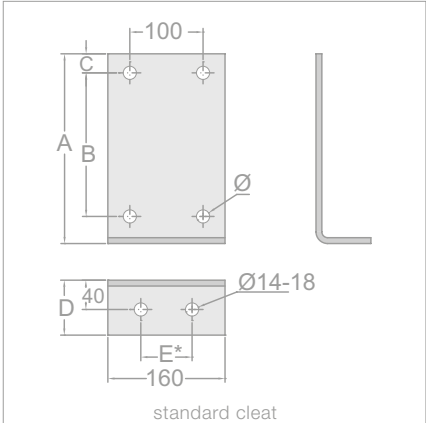
CLEATS

TYPE ESIGX



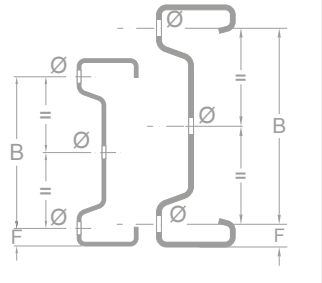
reinforced cleat
Piercing pattern is symmetrical in the bottom of cleats.
For alternative piercing arrangements, please contact SADEF.
E*: Hole distance variable from 50 to 100 mm with 70 mm (Ø 18 mm) as standard.

TYPE ESIG



standard cleat

SIGMA



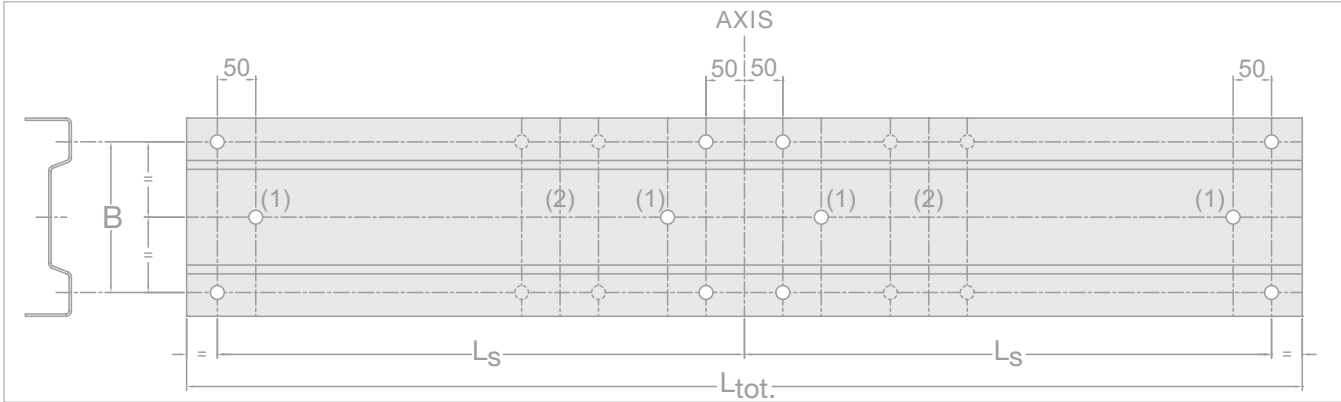
Section properties:
please turn to pages 102 - 103 - 104

SIGMA section			
Type	B (mm)	F (mm)	Ø (mm)
S+400	330	35	18
S+350	296	27	18
S+300	246	27	18
S+250	196	27	18
S 200	162	19	14
S 170	132	19	14
S 140	102	19	14

SLEEVE		
Type	L _{tot} (mm)	L _s (mm)
SL400	2680	1300
SL350	2180	1050
SL300	1880	900
SL250	1580	750
SL200	1260	600
SL170	1110	525
SL140	960	450

Cleats			
Type	A (mm)	C (mm)	D (mm)
ESIG400X	409	34	85
ESIG350X	359	26	85
ESIG300X	309	26	85
ESIG250 ESIG250X	259	26	75
ESIG200X ESIG200	209	18	75
ESIG170 ESIG170X	179	18	75
ESIG140 ESIG140X	149	18	75

SLEEVE



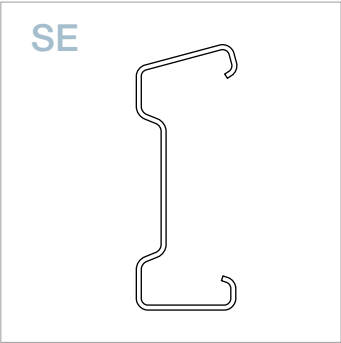
(1) Holes in web centre only for section depth > 200 mm.
(2) Holes to be used only where sleeves are placed off centre. (sleeve+ and sleeve++)



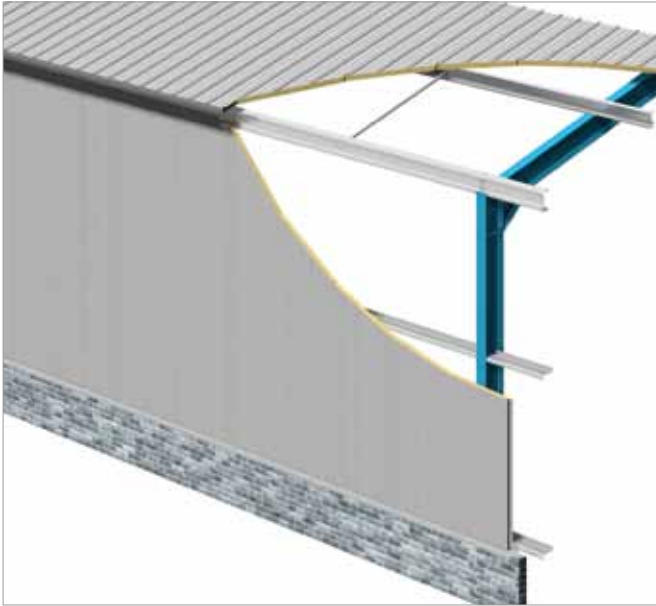
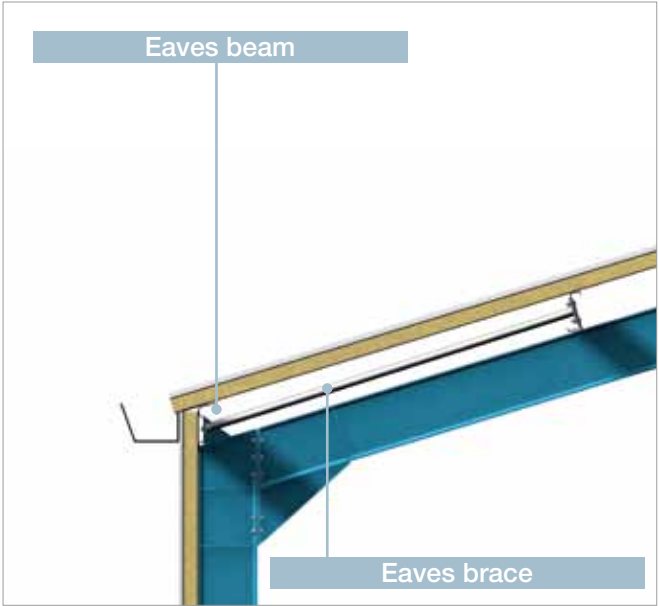
SE - EAVES BEAM

The SADEF SE - section is both roof purlin and side rail, combined into one single section and designed to support the outside gutter.

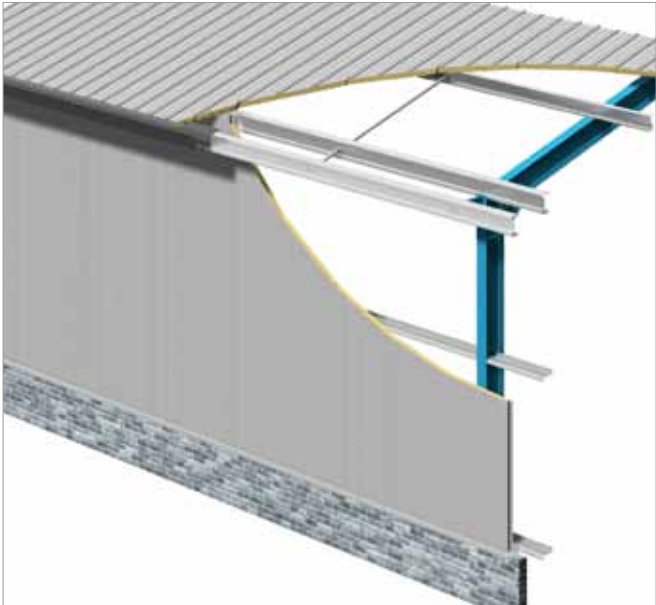
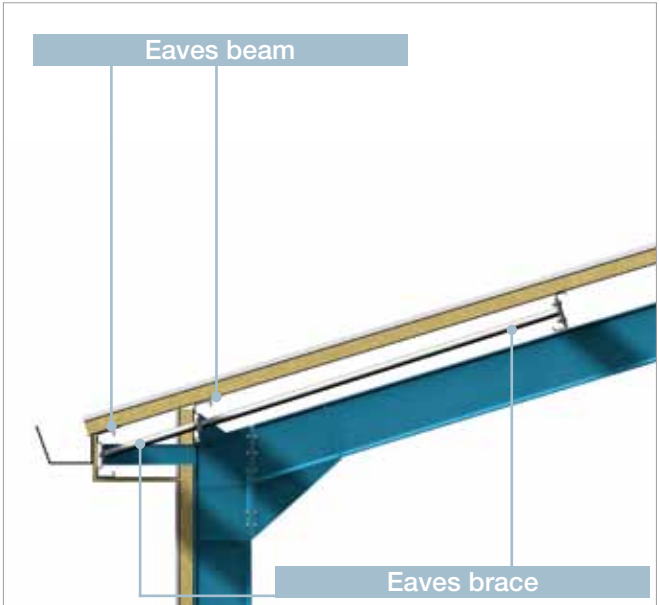
A particularly strong horizontal axis, designed for taking heavy wind loads on the side wall, is its main characteristic. Eaves braces can be used to achieve a light and cost-effective design. (For details: contact SADEF)



OUTSIDE GUTTER FIXED ON WALL CLADDING



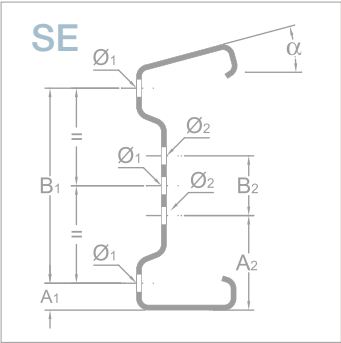
OUTSIDE GUTTER FIXED ON ROOF PROJECTION



SE - EAVES BEAM

Section	Prepierings						AutoNotch	
Type	A1 (mm)	B1 (mm)	Ø1 (mm)	A2 (mm)	B2 (mm)	Ø2 (mm)	V (mm)	W* (mm)
SE 330	27	276	18	100	130	18	≤ 50	≥ 50
SE 250	27	196	18	95	60	18	≤ 50	≥ 50
SE 200	19	162	14	70	60	18	≤ 35	≥ 50

* AutoNotches must be identical at both ends.



Section properties:
please turn to pages 104

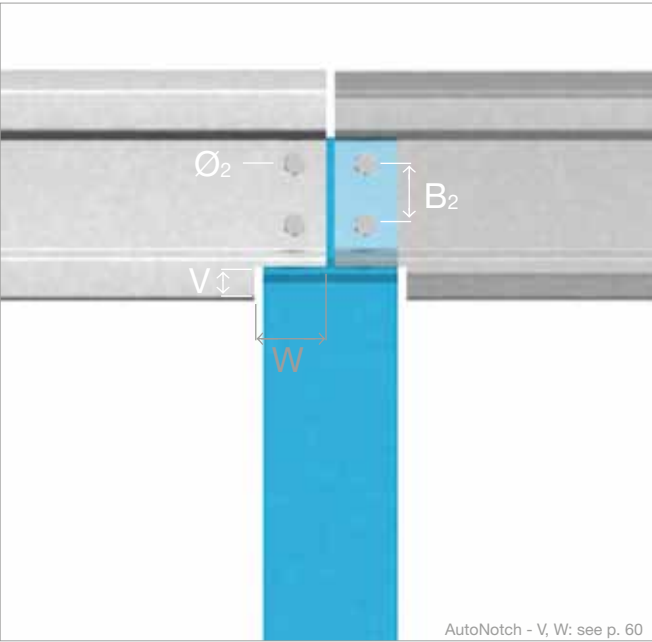
SE-section is suitable for roof slopes up to 26°

ADVANTAGES:

- Easier
- Less components
- Quick assembly
- Closing the gap between roof sheets and wall cladding panels

α - Standard angle of the upper flange	For roof slope
0°	-3° → 3°
6°	4° → 8°
10°	9° → 12°
15°	13° → 17°
20°	18° → 22°
24°	23° → 26°

AutoNotch



AutoNotch - V, W: see p. 60

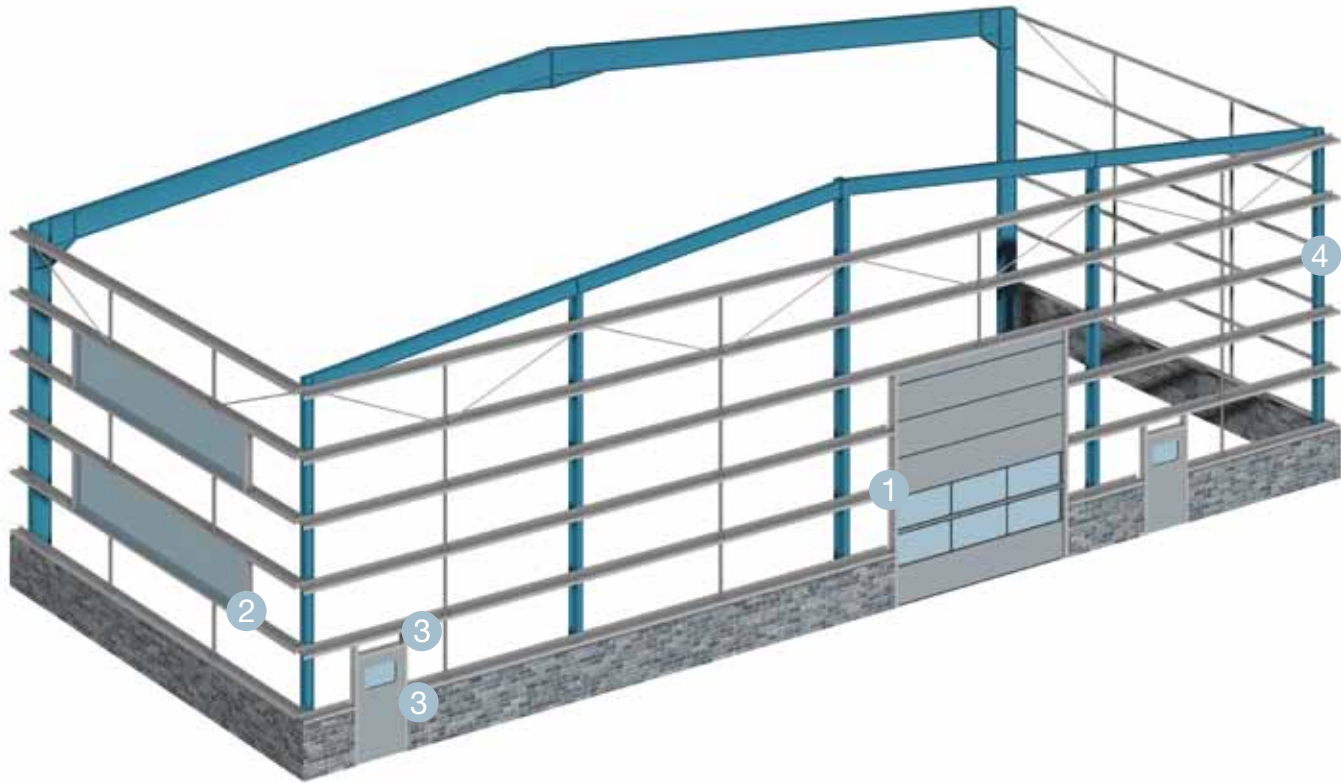
An AutoNotch can be made in the lower flange at the end of the eaves beams.

CEE-plus

SADEF building systems include a wide range of CEE-Plus sections.

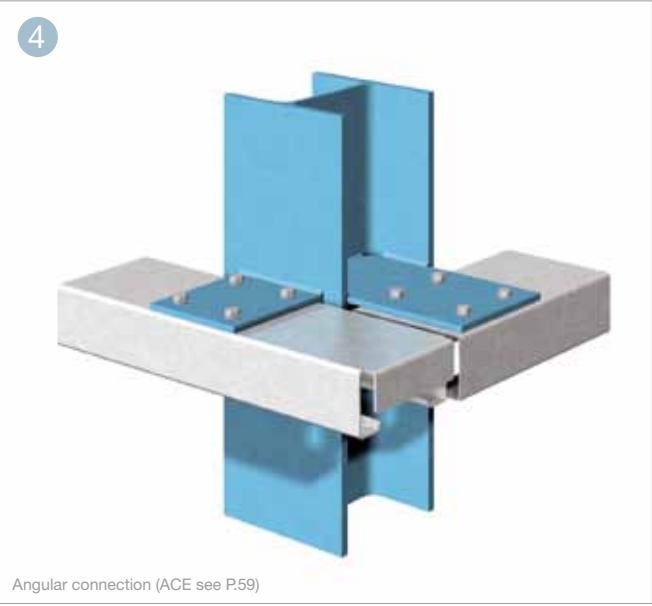
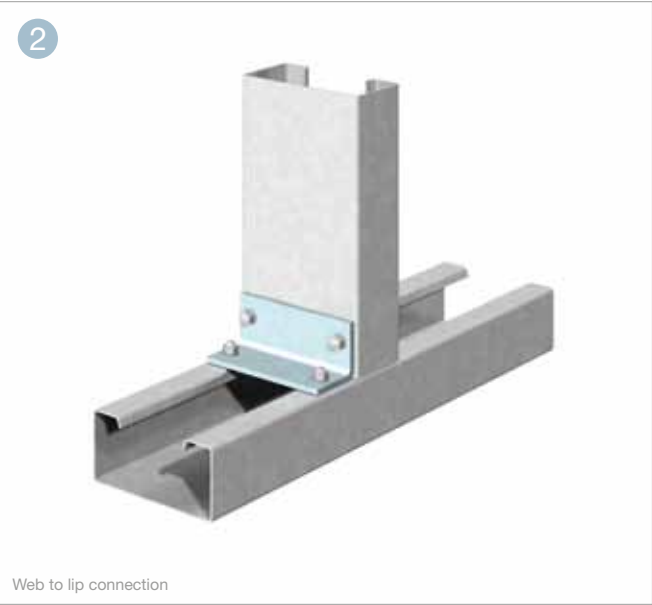
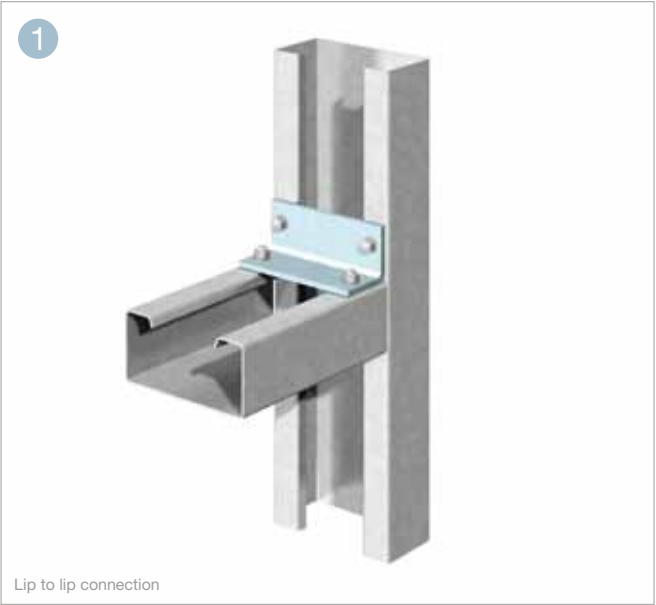
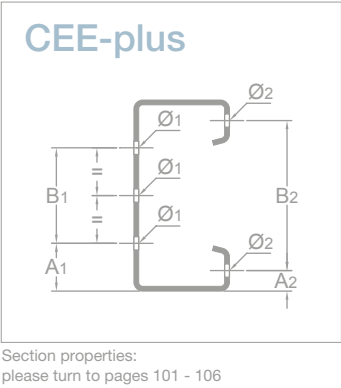
They are mainly used as side rails and particularly where door- or windowframes with flush inner faces are to be incorporated. Bolting can therefore be done through the web or through the profile lips.

Used as side rails, they will be either single or double span beams.



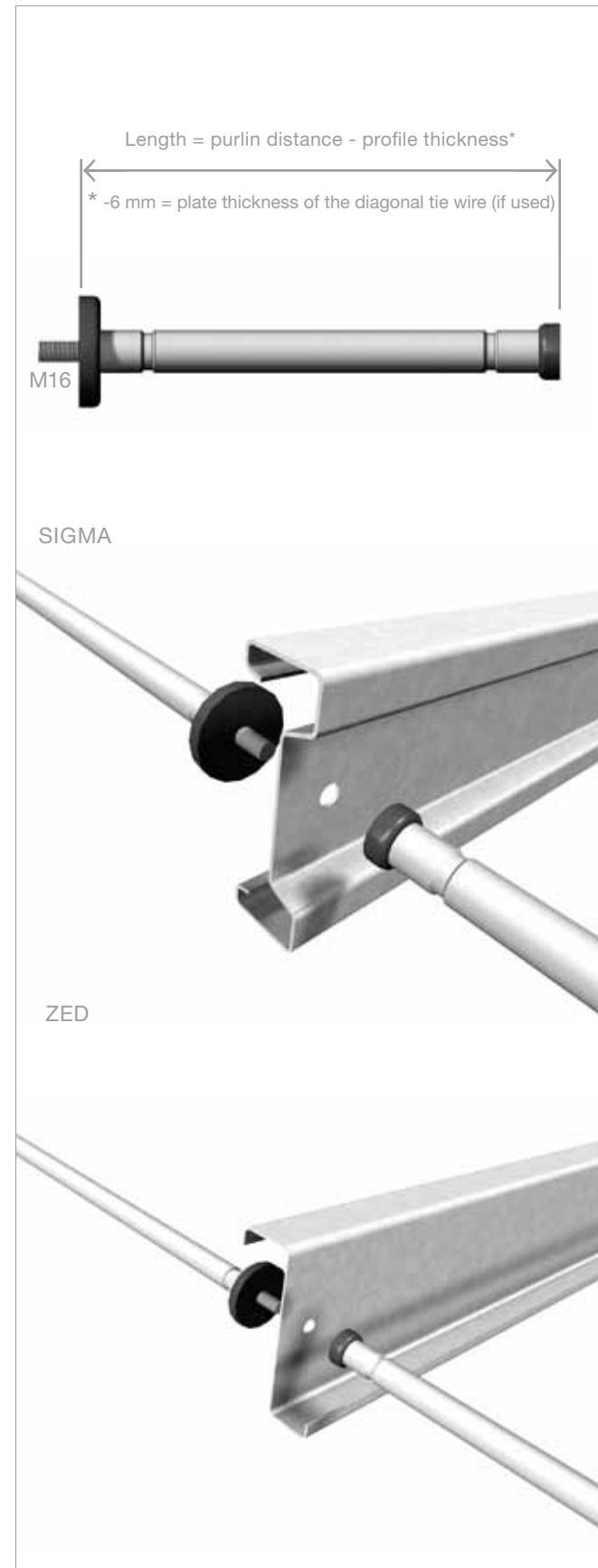
For more information, detailed piercing possibilities and the minimum production batches: please contact SADEF.

Section	Prepiercing					
Type	A1 (mm)	B1 (mm)	Ø1 (mm)	A2 (mm)	B2 (mm)	Ø2 (mm)
C+200	50	100	14 or 18	21,5	157	14
C+160	50	60	14 or 18	21,5	117	14
C+150	45	60	14 or 18	21,5	107	14
C 140	40	60	14 or 18	-	-	-





SADEF - LOCK® - ANTI-SAG BAR



BOLT-ON - ANTI-SAG BAR



AutoConnectEnd (ACE) - SAG BAR



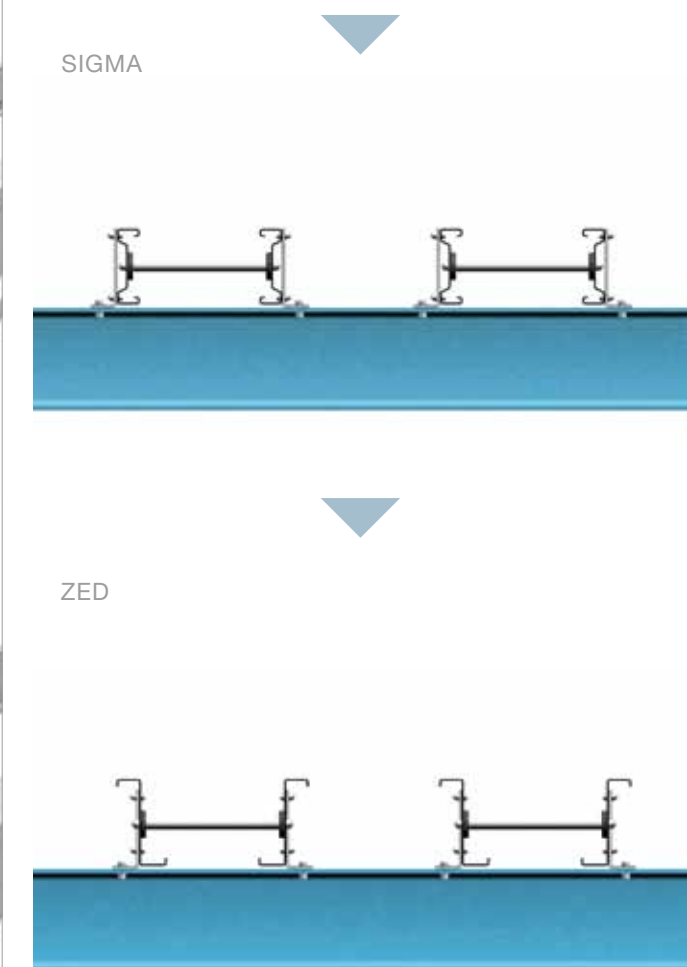
APPLICATION OF ANTI-SAG BARS

Anti-sag bars will be applied for the alignment of purlins and side-rails, or in case the roof sheeting has no stabilising capacity.

In case of important forces in the anti-sag bars, the use of diagonal tie wires is recommended.

ASSEMBLY ANTI-SAG BARS

For flat roofs (< 5% slope) and mezzanine floors the number of anti-sag bars can be reduced by assembling the purlins or joists as follow:

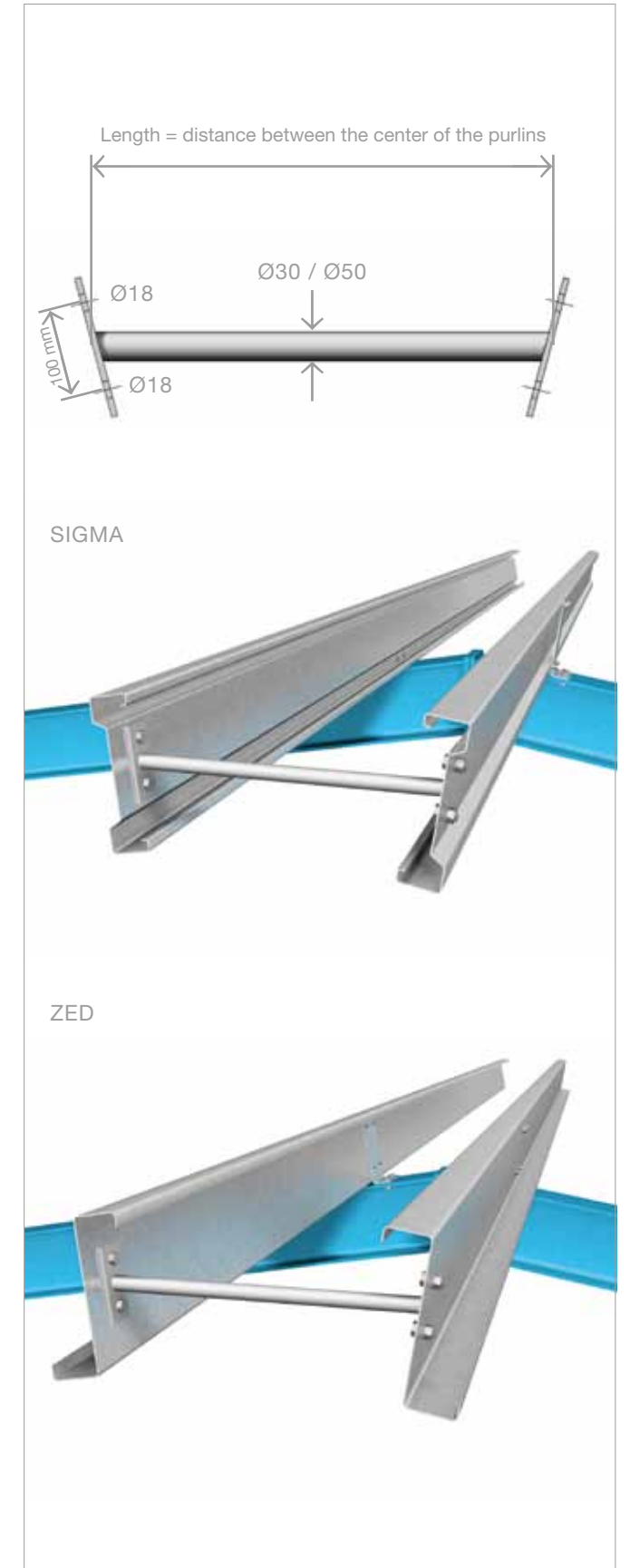




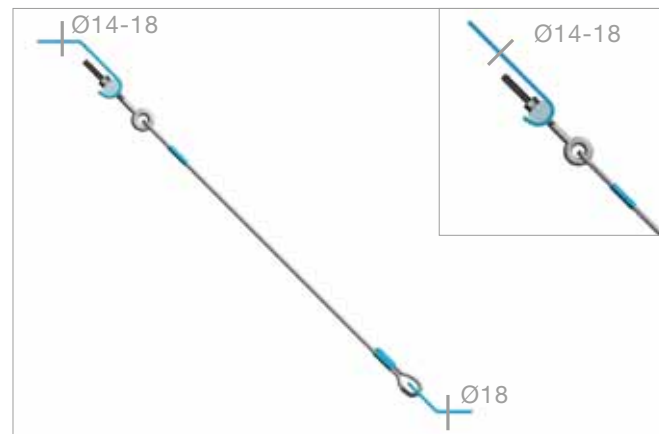
SADEF - LOCK® - APEX TIE



BOLT-ON - APEX TIE



SINGLE DIAGONAL TIE WIRE

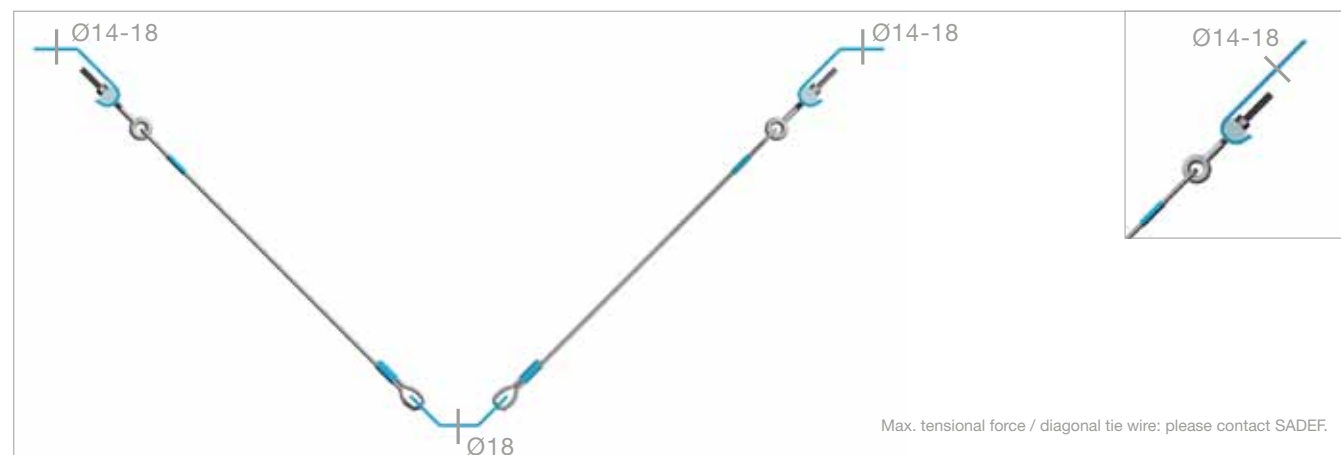


Tie wires are required for wide spans and/or for sheeting with no diaphragm action.

They prevent side rail deflection.

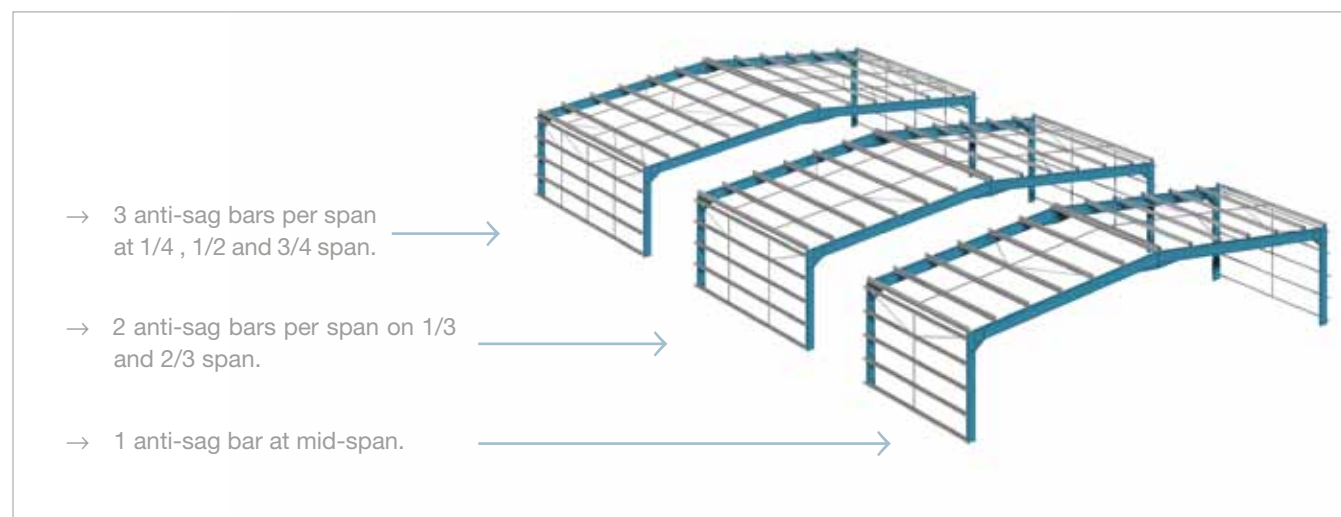
Please contact SADEF for prepiercing of additional holes for connection of diagonals to main structure.

DOUBLE DIAGONAL TIE WIRE

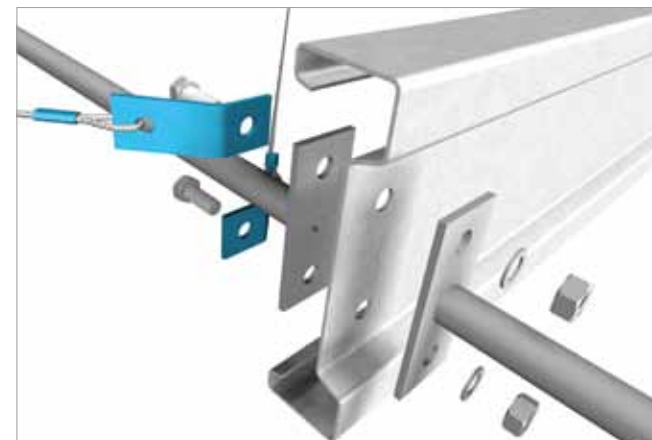


USE OF DIAGONAL TIE WIRES

Positioning of tie wires in function of the number of anti-sag bars.



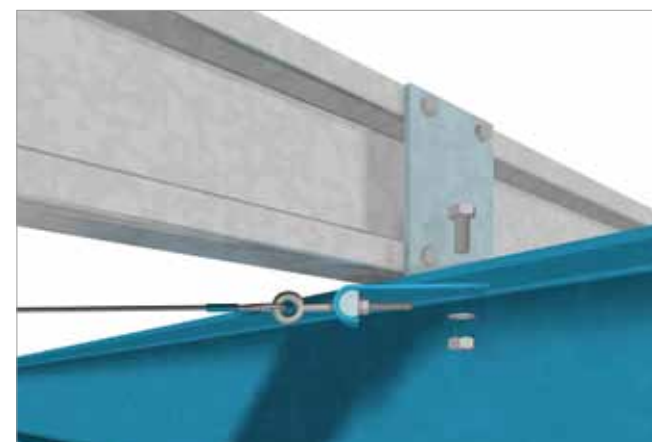
ASSEMBLY OF ACCESSORIES



Roof purlin + bolt-on anti-sag bar + single diagonal tie wire.



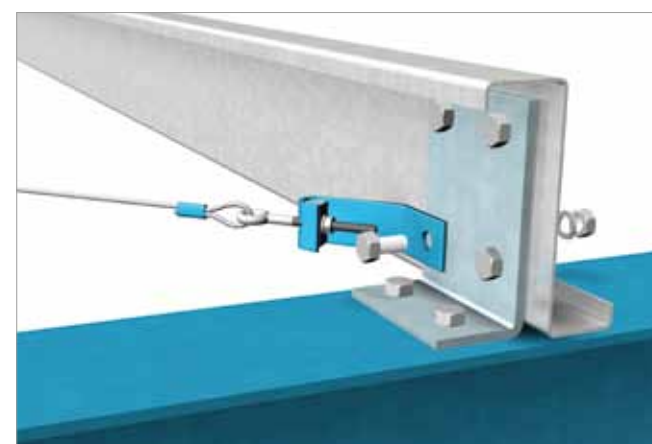
Construction roof purlin + SADEF-Lock® + double diagonal tie wire.



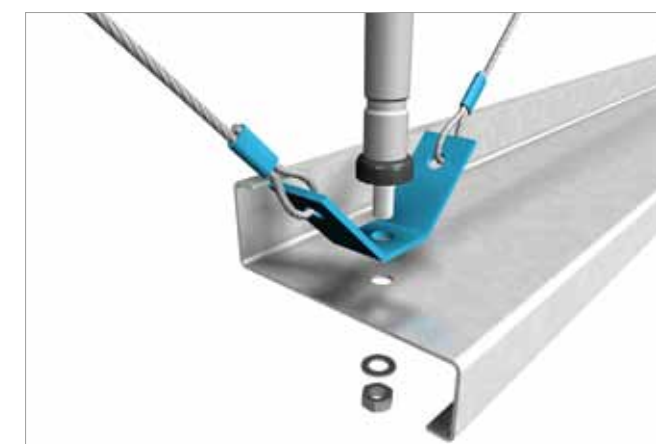
Fitting of diagonal tie to rafter. Using the cleat hole will avoid time consuming drilling of extra holes.*



Construction detail of side rail + cleat + diagonal tie wire.



Construction detail of the roof purlin + cleat + diagonal tie wire.



Construction detail of side rail + SADEF-Lock® + double diagonal tie wire.

*Where cleats are welded to the primary structure, ø 14 mm holes should be made in the beam upper flange (specially for Sigma 140 – 170 – 200). Contact SADEF for more information.



Use our fast quotation service “iPurlin” for detailed price quotations of your purlin and side rail projects through the internet.

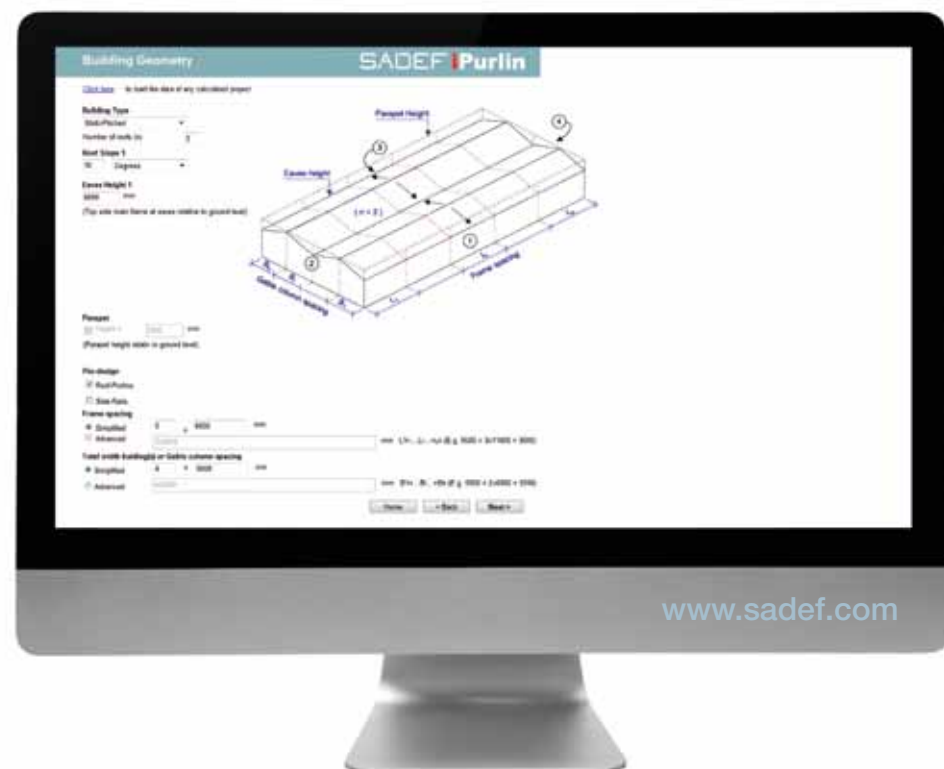
On our website www.sadeef.com, select “iDesign” first, then “iPurlin”.

Apply for your password to use this unique program.

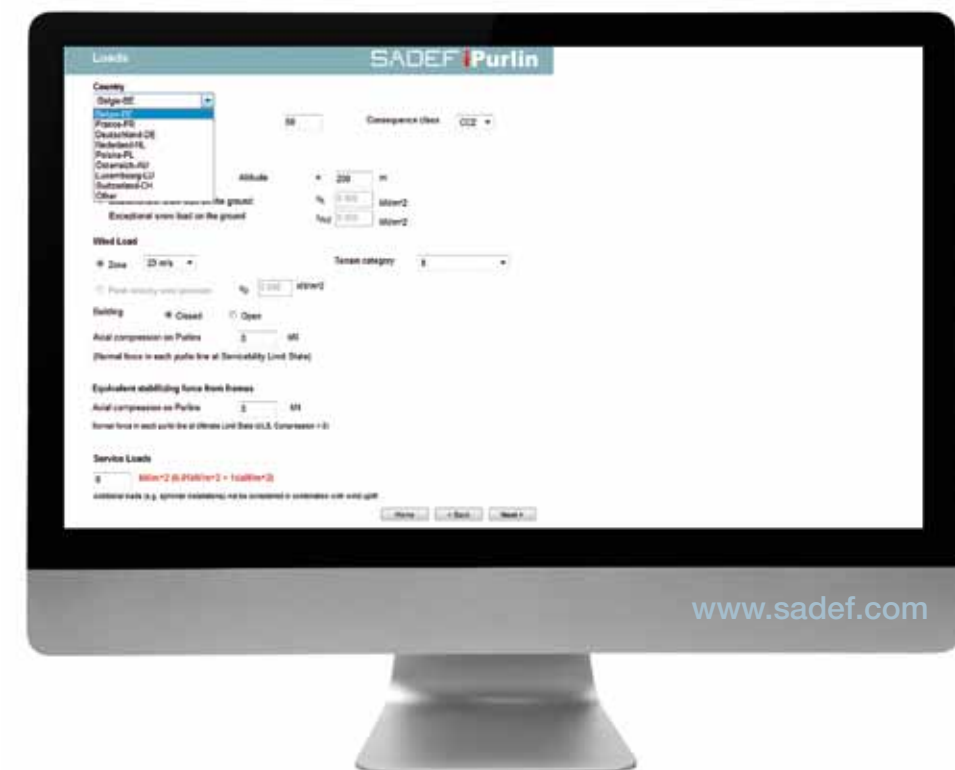
ADVANTAGES:

- User friendly
- Available in multiple languages including English, French, German and Dutch
- Your quotation in less than 5 minutes
- Variations quickly achievable
- 24/7 availability
- Quotations clearly laid-out
- National Annex to Eurocode if applicable implemented

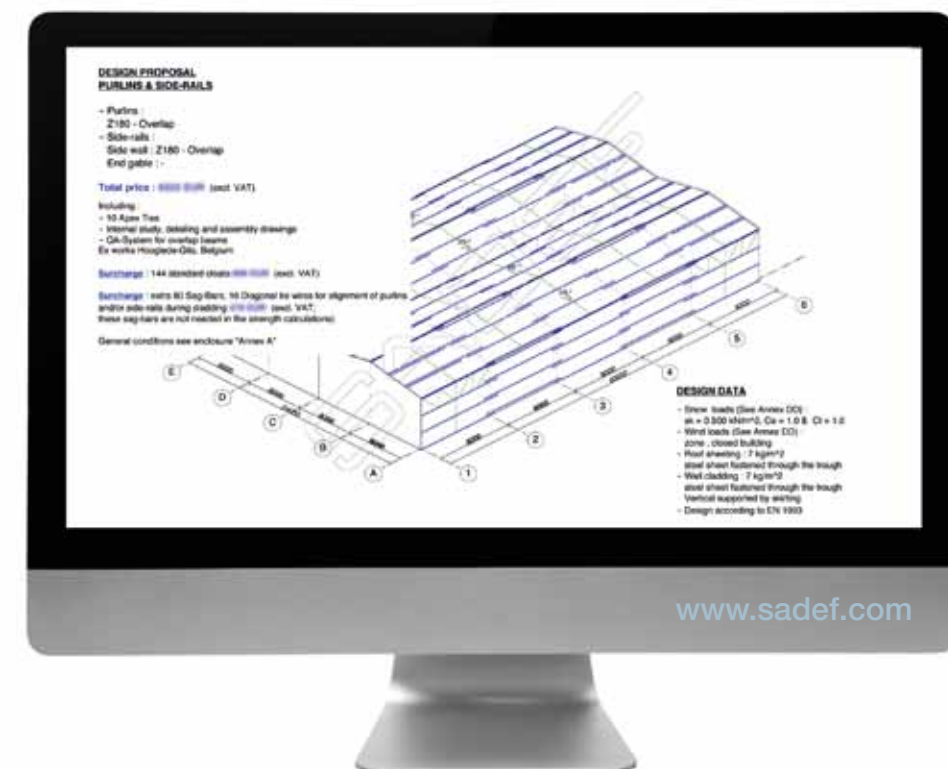
Step 1: INPUT OF GEOMETRY



Step 2: INPUT OF LOADS



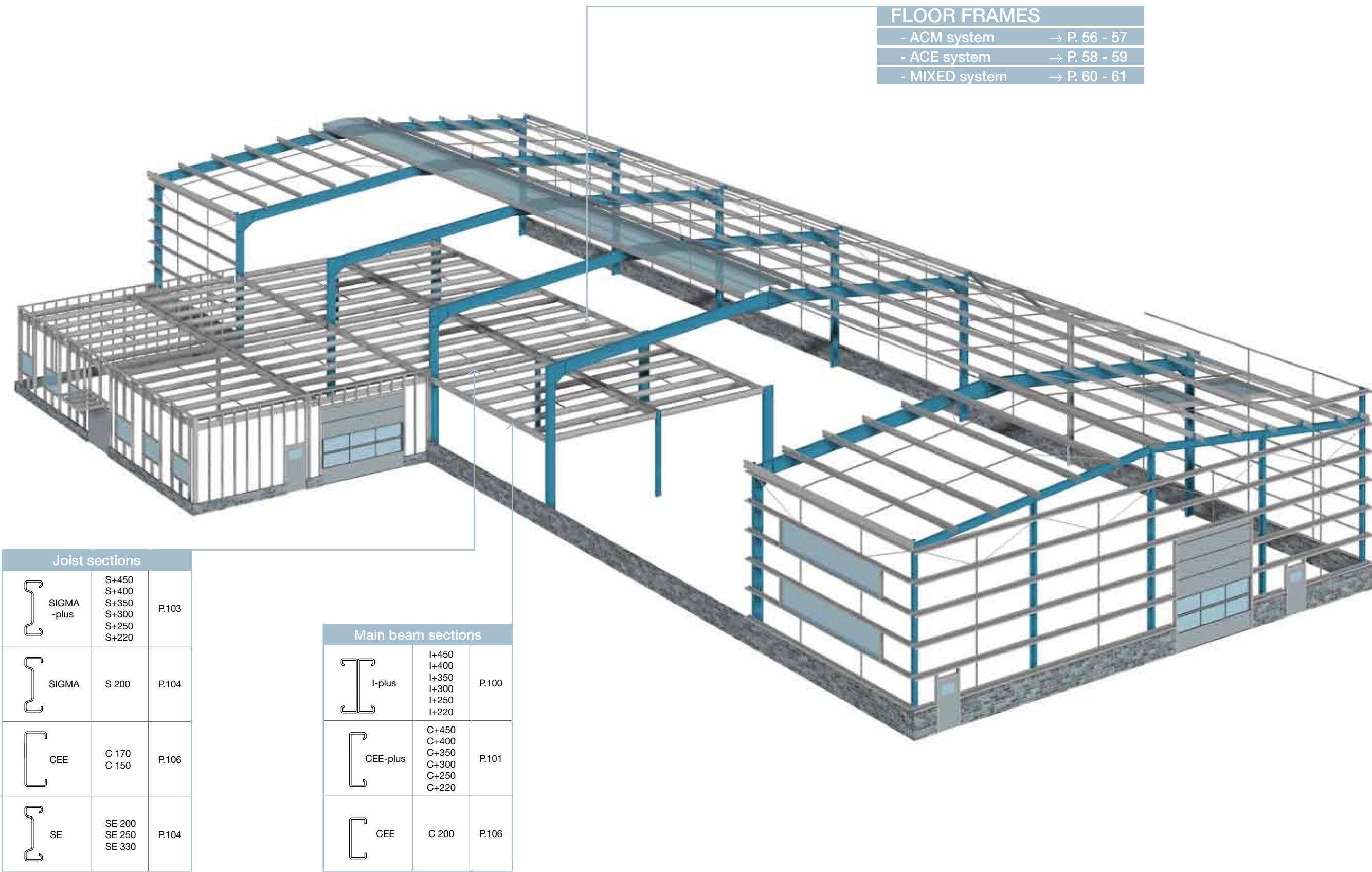
Step 3: OUTPUT - RESULT



For complex projects or a more detailed quotation, please feel free to contact SADEF Sales Dept.

FLOOR FRAMES

ACM SYSTEM	P. 56 - 57
ACE SYSTEM	P. 58 - 59
MIXED SYSTEM	P. 60 - 61
FLOOR COMPOSITION	P. 62 - 63







READY-TO-ASSEMBLE BUILDING COMPONENTS FOR FLOORING

A floor frame can be realised in an easy and competitive way by using SADEF-building profiles:

- Made by a unique production process
- Main features:
 - No cleats required
 - Bolting reduced by 50 %
 - Fast and cost effective assembly
 - Service holes integrated on request



AutoConnectMiddle STANDARD POSSIBILITIES									
MAIN BEAM				JOIST				ACM	
Section	A (mm)	B (mm)	Ø (mm)	Section	Notch	V (mm)	W (mm)	Type	P (mm)
C+450xt ₁	75	300	18	S+450xt ₂	Double	40	120	ACM200	225
				S+400xt ₂	Single			ACM200	200
				S+350xt ₂				ACM200	175
				S+300xt ₂				ACM150	150
				S+250xt ₂				ACM100	125
C+400xt ₁	75	250	18	S+400xt ₂	Double	40	110	ACM200	200
				S+350xt ₂	Single			ACM200	175
				S+300xt ₂				ACM150	150
				S+250xt ₂				ACM100	125
C+350xt ₁	75	200	18	S+350xt ₂	Double	35	100	ACM200	175
				S+300xt ₂	Single			ACM150	150
				S+250xt ₂				ACM100	125
				S+220xt ₂				ACM100	110
				S200xt ₂				ACM100	100
				C170xt ₂				ACM100	100
				C+300xt ₁	75			150	18
S+250xt ₂	Single	ACM100	125						
S+220xt ₂		ACM100	110						
S200xt ₂		ACM100	100						
C170xt ₂		ACM100	100						
C+250xt ₁	75	100	18	S+250xt ₂	Double	30*	80	ACM100	125
				S+220xt ₂	Single			ACM100	110
				S200xt ₂				ACM100	100
				C170xt ₂				ACM100	100
C+220xt ₁	55	110	14	S+220xt ₂	Double	30	80	ACM100	110
				S200xt ₂	Single			ACM100	100
				C170xt ₂				ACM100	100
C200xt ₁	55	90	14	S200xt ₂	Double	30	80	ACM100	100
				C170xt ₂	Single			ACM100	100

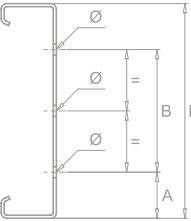
* For t₁ = 5mm: V = 35mm

PREPIERCING POSSIBILITIES

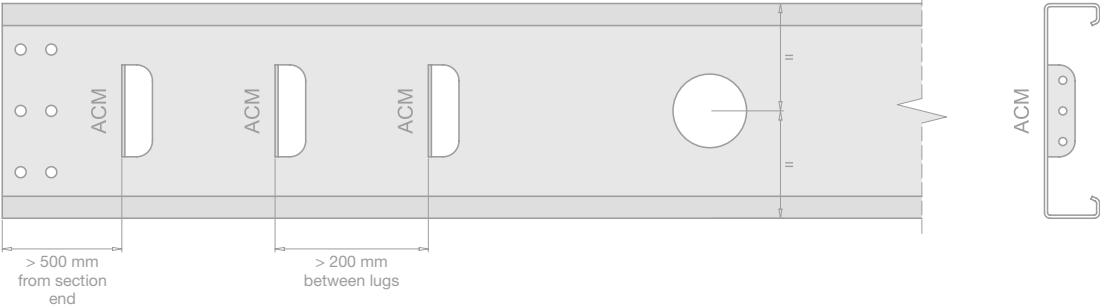
- Big size holes can be pierced in webs of beams and joists. See table:

Large perforations	
Section depth	Hole size
h ≥ 350	Ø150
250 ≤ h ≤ 300	Ø120
h ≤ 220	100x70

- Recommended perforations

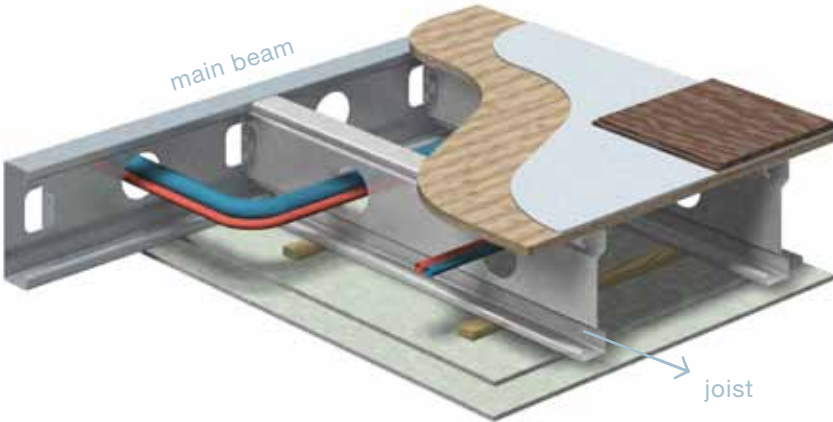


- Minimum distance between the lugs and minimum distance between lug and the end of the profile.



ACM - AutoConnectMiddle-SYSTEM

Floor frame with connections for SIGMA-joist integrated with main CEE-beam.



MAIN BEAM	JOIST	
	Smaller than main beam	Same depth as main beam
SADEF PATENTED	Joist length = L - (2xt ₁) - (2mm)	
	Single notch V*W	
	Double notches V*W	
	Joist length = L - (2xt ₁) - (2mm)	
ACM 200		
ACM 150		
ACM 100		

- Sections with AutoConnectEnd (ACE):
- $1.5\text{ mm} < t_2 < 4\text{ mm}$
 - AutoConnectEnd (and AutoNotch) to be identical at both ends.
 - Perforation of big holes in the web of the main beam and joist: See table at the bottom of p.56
 - Minimum length: 800 mm.
 - $F = 30\text{ mm}$.

ACE + AutoNotch (AN)						
MAIN BEAM		JOIST				
Section	Section	A (mm)	B (mm)	V (mm)	W1 (mm)	Ø (mm)
C+450xt ₁	C+350xt ₂	75	200	40	120	18
	C+300xt ₂		150			
	C+250xt ₂		100			
C+400xt ₁	C+350xt ₂	75	200	40	110	18
	C+300xt ₂		150			
	C+250xt ₂		100			
C+350xt ₁	C+300xt ₂	75	150	35	100	18
	C+250xt ₂		100			
	C+200xt ₂		60			
C+300xt ₁	C+250xt ₂	55	100	30*	90	18
	C+220xt ₂		110			14
	C 200xt ₂		90			
	C 170xt ₂		60			
C+250xt ₁	C+220xt ₂	55	110	30*	80	14
	C 200xt ₂		90			
	C 170xt ₂		60			
C+220xt ₁	C 200xt ₂	55	90	30	80	14
	C 170xt ₂		60			
C 200xt ₁	C 170xt ₂	55	60	30	80	14
	C 150xt ₂		40			

* only for beams where $t_1 \leq 4\text{ mm}$

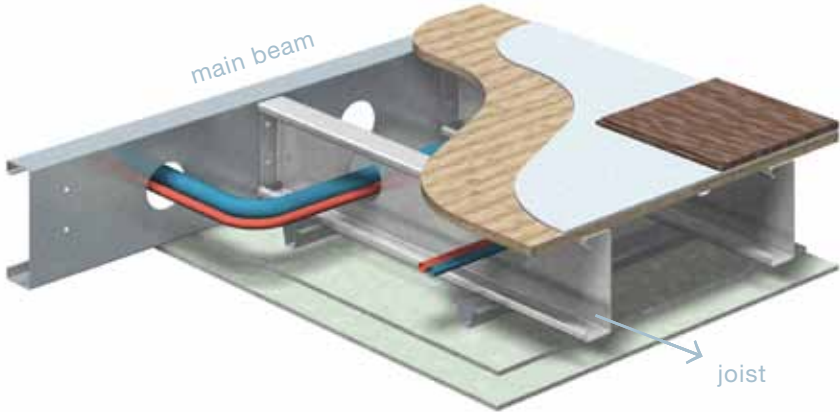
AutoConnectEnd (ACE)						
MAIN BEAM		JOIST				
Section	Section	A (mm)	B (mm)	V (mm)	W2 (mm)	Ø (mm)
$\geq \text{C+350xt}_1$	C+350xt ₂	50	250	5	$15+t_2$	18
$\geq \text{C+300xt}_1$	C+300xt ₂	50	200	5	$15+t_2$	18
$\geq \text{C+250xt}_1$	C+250xt ₂	50	150	5	$15+t_2$	18
$\geq \text{C+220xt}_1$	C+220xt ₂	50	120	5	$15+t_2$	14
$\geq \text{C+200xt}_1$	C+200xt ₂	50	100	5	$15+t_2$	14
$\geq \text{C+150xt}_1$	C+150xt ₂	45	60	5	$15+t_2$	14
$\geq \text{C200xt}_1$	C 200xt ₂	50	100	5	$15+t_2$	14
$\geq \text{C 170xt}_1$	C 170xt ₂	50	70	5	$15+t_2$	14
$\geq \text{C 150xt}_1$	C 150xt ₂	50	50	5	$15+t_2$	14
$\geq \text{C 100xt}_1$	C 100xt ₂	25	50	5	$15+t_2$	14

For additional information, prepiercing possibilities and minimum production batches: please contact SADEF.

ACE - AutoConnectEnd-SYSTEM

Floor system with integrated connection piece in the CEE-plus joists.

Both main beams and joists are CEE-profiles.



MAIN BEAM	JOIST
AutoConnectEnd (ACE) + AutoNotch (AN)	
AutoNotch (Notch with length W1), cut-out in top flange only. * Possibility of an additional hole for section depth > 200 mm. ** Optional : extra holes for beam to column connection.	
AutoConnectEnd (ACE)	
* Additional hole for section depth > 200 mm.	

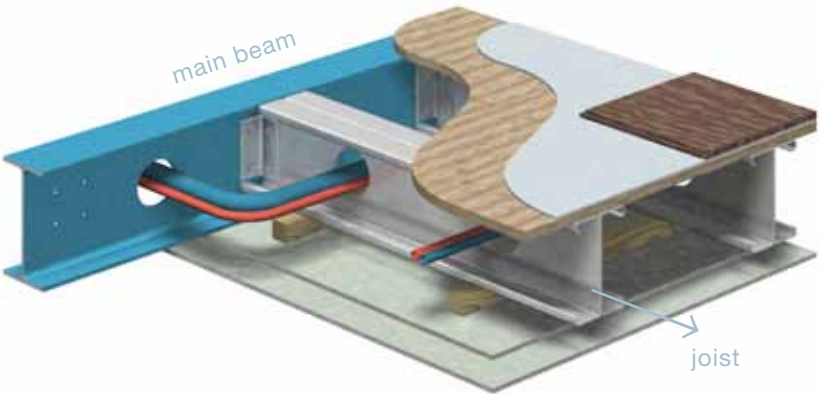
MAIN BEAM		JOIST							AutoNotch	
Section		S/SE 200	I+/S+220	I+/S+250	I+/S+300	I+/S+350	I+/S+400	I+/S+450	V (mm)	W (mm)
HEA/HEB 200		✓	-	-	-	-	-	-	35	120
HEA/HEB 220		✓	✓	-	-	-	-	-	35	120
HEA/HEB 240		✓	✓	-	-	-	-	-	35	125
HEA/HEB 260 → 280		✓	✓	✓	-	-	-	-	35	145
HEA/HEB 300		✓	✓	✓	✓	-	-	-	35	145
HEA/HEB 320 → 340		-	-	✓	✓	-	-	-	50	145
HEA/HEB 360		-	-	✓	✓	✓	-	-	50	145
HEA/HEB 400		-	-	✓	✓	✓	✓	-	50	145
HEA/HEB 450 → 700		-	-	✓	✓	✓	✓	✓	50	145
HEA/HEB 800 → 1000		-	-	✓	✓	✓	✓	✓	50	145
IPE 200		✓	-	-	-	-	-	-	35	55
IPE 220		✓	✓	-	-	-	-	-	35	55
IPE 240		✓	✓	-	-	-	-	-	35	65
IPE 270		✓	✓	✓	-	-	-	-	35	65
IPE 300 → 330		✓	✓	✓	✓	-	-	-	35	80
IPE 360		✓	✓	✓	✓	✓	-	-	35	90
IPE 400		✓	✓	✓	✓	✓	✓	-	35	90
IPE 450		✓	✓	✓	✓	✓	✓	✓	35	90
IPE 500 → 600		✓	✓	✓	✓	✓	✓	✓	35	105
UPN 200		✓	-	-	-	-	-	-	25	85
UPN 220 → 240		✓	✓	-	-	-	-	-	25	85
UPN 260		✓	✓	✓	-	-	-	-	25	85
UPN 280		✓	✓	✓	-	-	-	-	30	100
UPN 300 → 320		✓	✓	✓	✓	-	-	-	30	100
UPN 350 → 360		✓	✓	✓	✓	✓	-	-	30	100
UPN 400		✓	✓	✓	✓	✓	✓	-	35	100

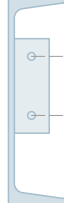
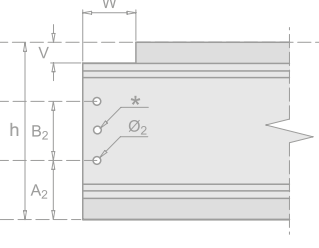
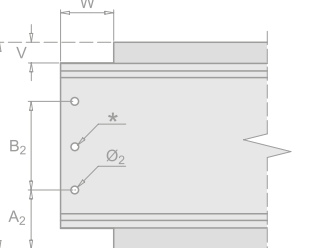
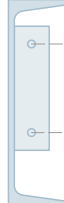
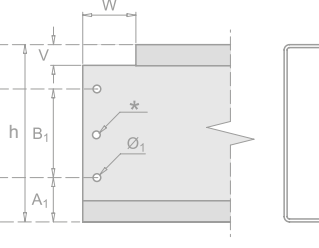
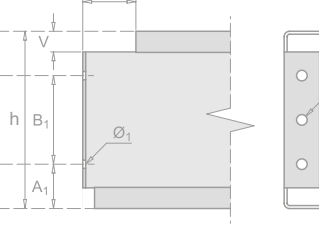
RECOMMENDED PERFORATION JOIST						
Section height h	A1 (mm)	B1 (mm)	Ø1 (mm)	A2 (mm)	B2 (mm)	Ø2 (mm)
450	75	300	18	125	200	18
400	75	250	18	125	150	18
350	75	200	18	100	150	18
330				115	100	18
300	75	150	18	100	100	18
250	75	100	18	100	50	18
220	55	110	14	75	70	14
200				75	50	14

Big size holes can be preperced in webs of main beams and joists: please turn to p. 56.

MIXED-SYSTEM

Floor framing consisting of hot rolled main beams and cold rolled side beams.

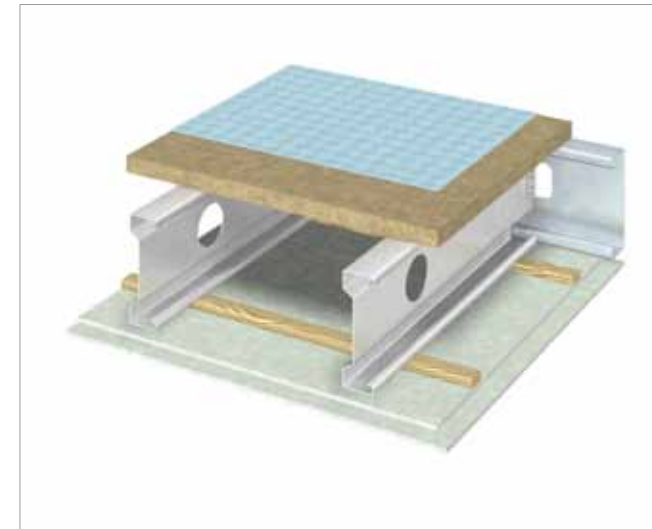


MAIN BEAM		JOIST	
Hot rolled		Smaller than main beam	Same depth as main beam
 UPN	 IPE HEA HEB		
		Single notch V*W	Double notches V*W
 UPN	 IPE HEA HEB		
		Single notch V*W	Single notch V*W
 UPN	 IPE HEA HEB		
		Single notch V*W	Single notch V*W

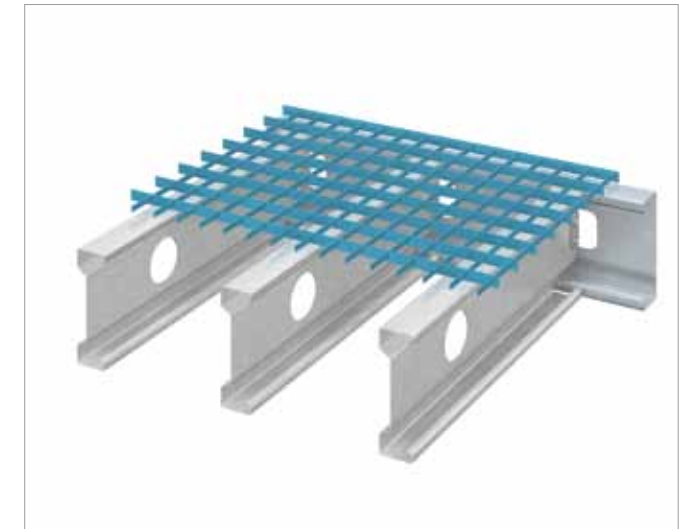
AutoNotches to be identical on both profile ends.
* Additional hole for section depth > 200 mm.



FLOOR MATERIALS FOR INDUSTRIAL BUILDINGS

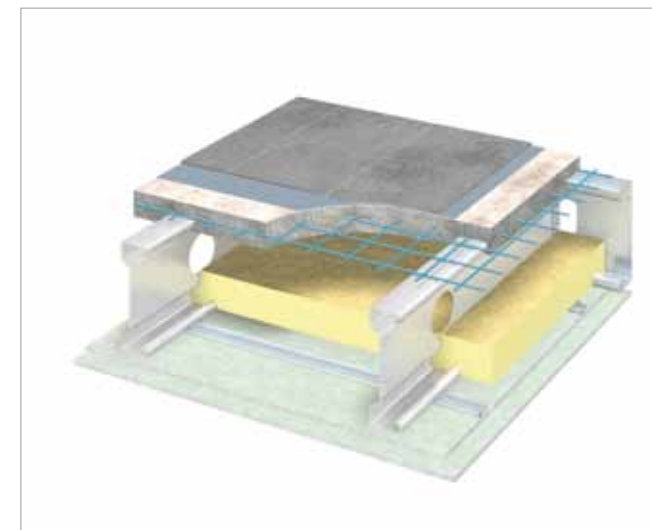


HD-Chipboard combined with fire resistant ceiling.

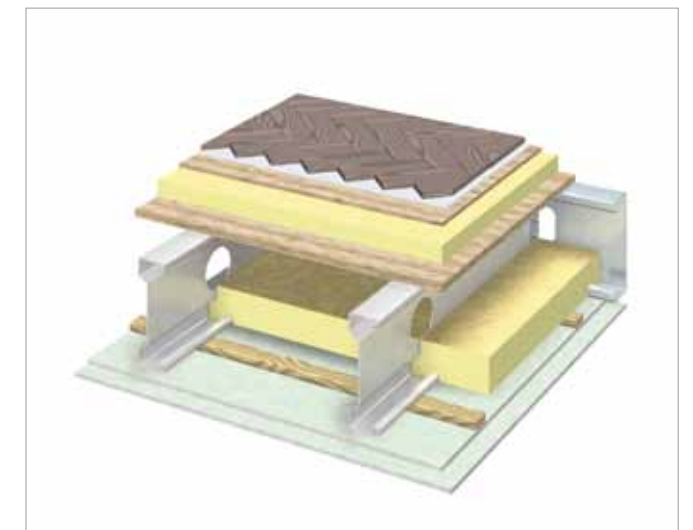


Steel gratings.

FLOOR MATERIALS FOR HOUSES AND OFFICES



Integrated concrete floor (see p. 78).



Floating floor for high acoustic performance in case of floor built up with light weight materials.

Maximum stability and strength will be achieved by screwing (or nailing...) at regular intervals of flooring material to upper flanges of beams and joists.

STEEL PROFILES FOR SOLAR PANELLING

- FLEXROOF™	P. 66 - 67
- FLEXPARK™	P. 68 - 69
- FLEXFIELD™	P. 70 - 71
- TAILOR-MADE ROOF TOP STRUCTURES	P. 72
- TAILOR-MADE GROUND STRUCTURES	P. 73

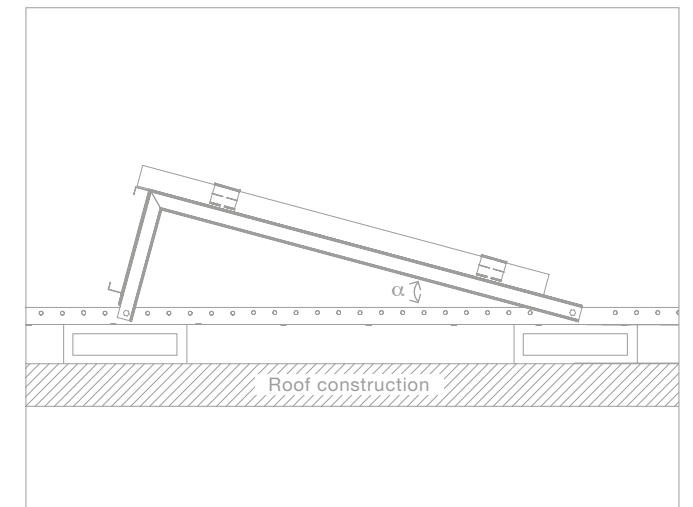


FLEXROOF™

The light weight Flexroof™ was developed for fitting solar panels on existing roofs.
A limited number of components will build a maximum of configurations.

Features:

- Ready-to-assemble concept
- Standard solutions
- Fast delivery
- Corrosion resisting HDG profiles
- User friendly design software
- Distribution through system partner



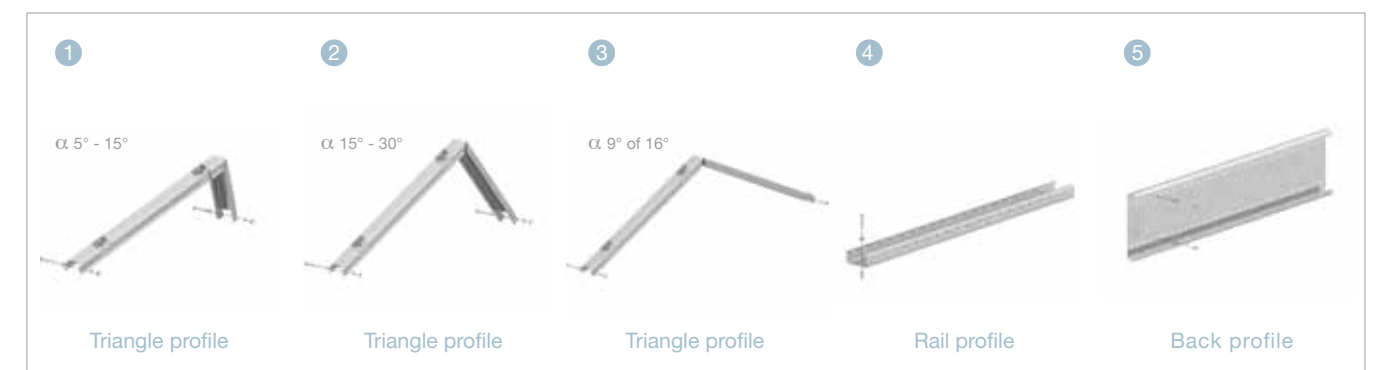
NORTH - SOUTH



EAST - WEST



STANDARD BUILDING COMPONENTS



For additional information: please contact SADEF.

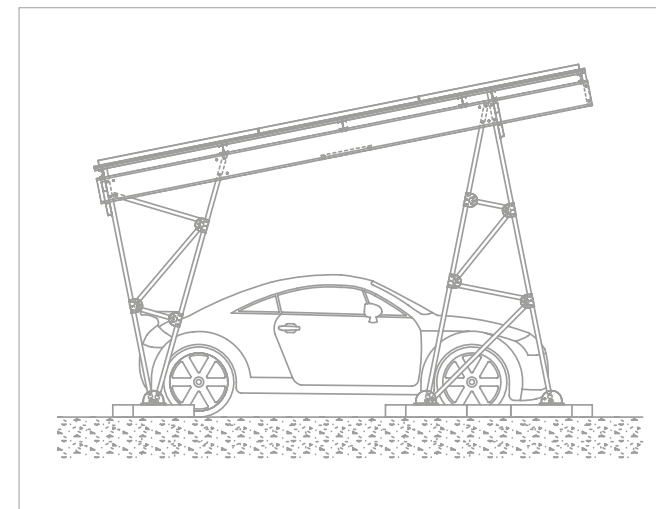


FLEXPARK™

Flexpark™ system was developed for private parking bays. Flexpark™ system allows a continuous expansion with single or double bay carports. A limited number of components will build a maximum of configurations.

Advantages:

- Ready-to-assemble concept
- Standard solutions
- Fast delivery
- Corrosion resisting HDG profiles
- Modular concept
- Distribution through system partner



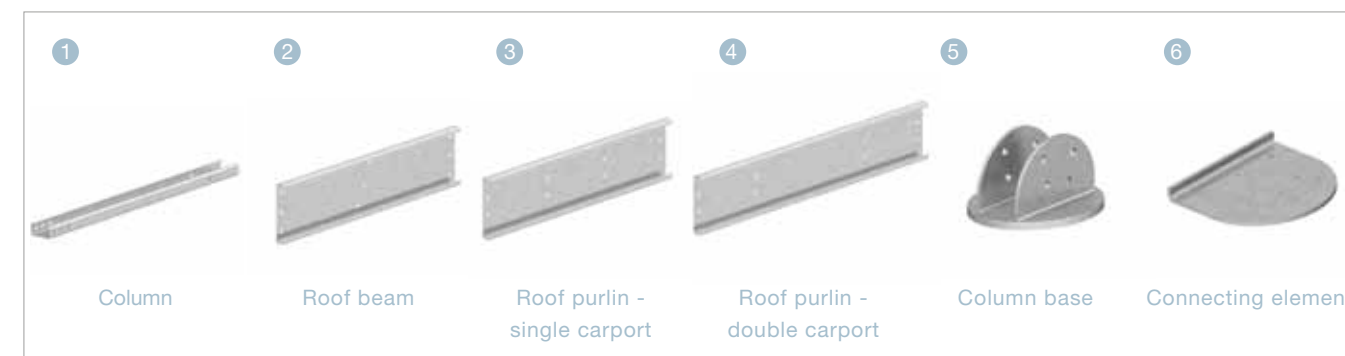
SINGLE CARPORT



DOUBLE CARPORT



STANDARD BUILDING COMPONENTS



For additional information: please contact SADEF.

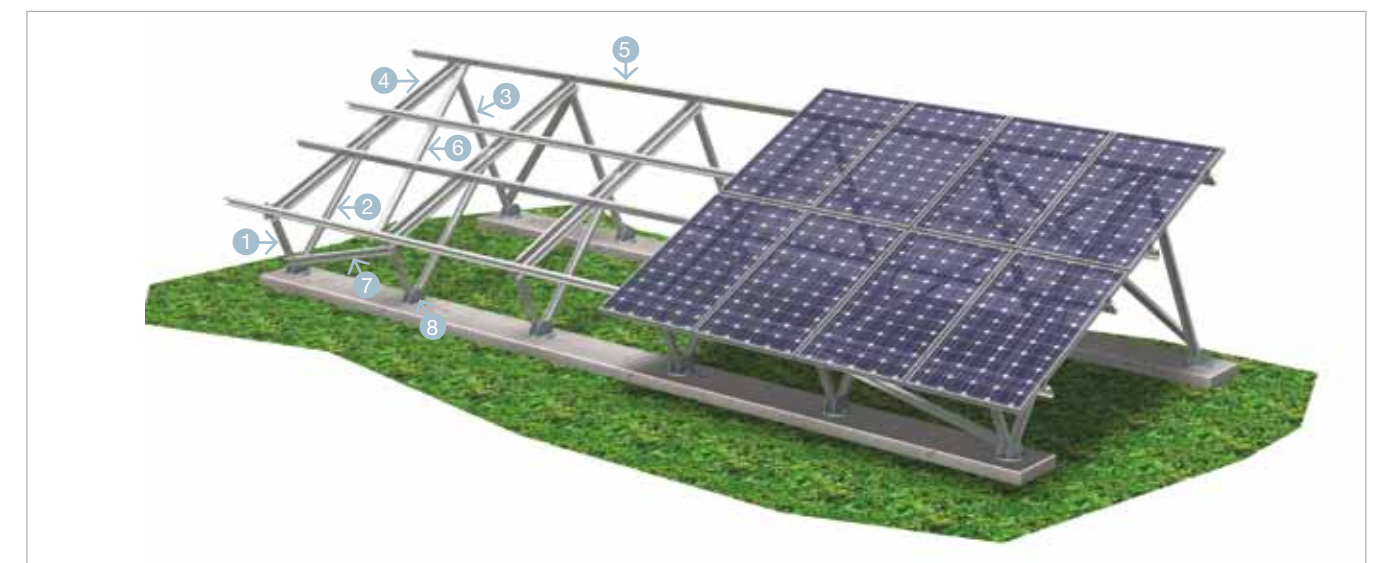
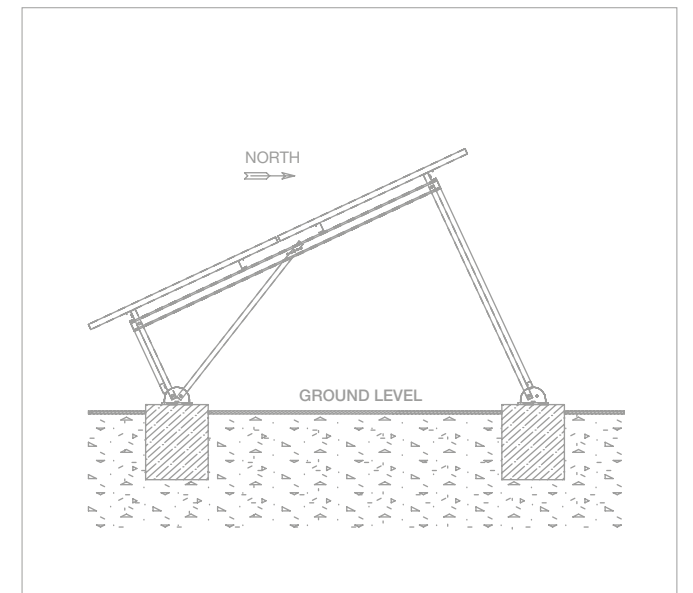


FLEXFIELD™

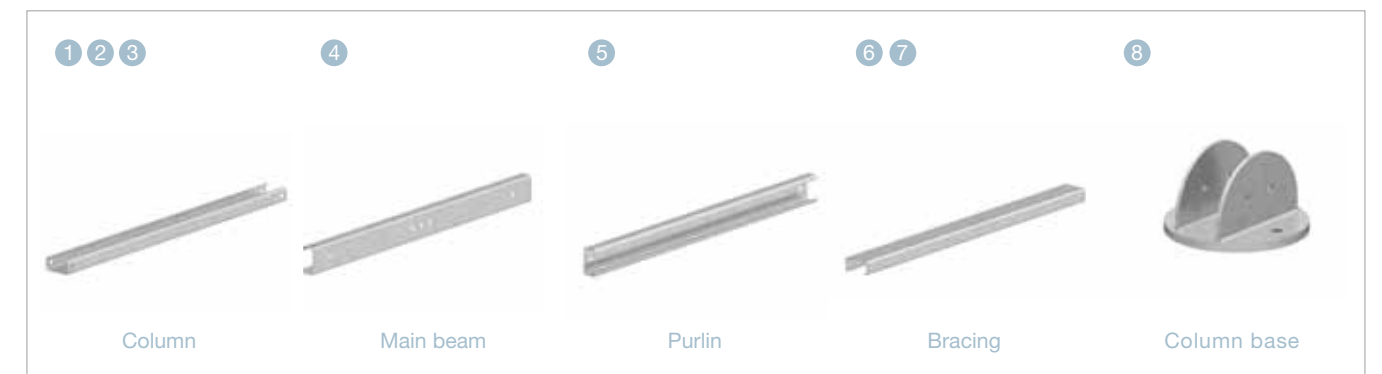
Our Flexfield™ is ideal for smaller solar panelling projects. A limited number of components will build a maximum of configurations.

Possibilities:

- Table length: 10, 18, 24 m
- Slope adjustable: 20°-25°-30°
- Modules in "portrait" disposition
- Modules size ca. 990 mm x 1650 mm
- Building site +/- 15%
- Building site orientation: E-W



STANDARD BUILDING COMPONENTS



For additional information: please contact SADEF.

ROOF TOP STRUCTURES

For every project, SADEF has the possibility to design and produce specific, tailor made, roof structures for solar panelling and to deliver just-in-time.

Advantages:

- Tailor-made concept
- Light weight
- User friendly
- Sustainable
- 100% recyclable

Ask for our specific Solar brochure.

AS SPREAD LOAD



BONDED TO ROOF



AS LINEAR SPREAD LOAD (resting on the support structure of the building)



FIXED TO SUBSTRUCTURE



PANNELLING FITTED TO ROOF



“RAMMED IN” TABLES



TABLES ON CONCRETE PADS



CANOPY STRUCTURES



CARPORTS



MISCELLANEOUS CONSTRUCTIONS

COMPONENTS FOR:

- 3D MODULAR	P. 76 - 77
- 2D MODULAR	P. 78 - 79
- LOAD BEARING WALLS	P. 80 - 83
- EXPORT-FRIENDLY TRUSSES	P. 84 - 85
- GABLE END STRUCTURES	P. 86 - 87
- INTERMEDIATE GABLE COLUMNS AND BRACING	P. 88 - 89
- SMOKE VENTS AND SKY LIGHTS	P. 90 - 91

TAILOR-MADE PROFILES	P. 94 - 95
SURFACE TREATMENT	P. 96 - 97

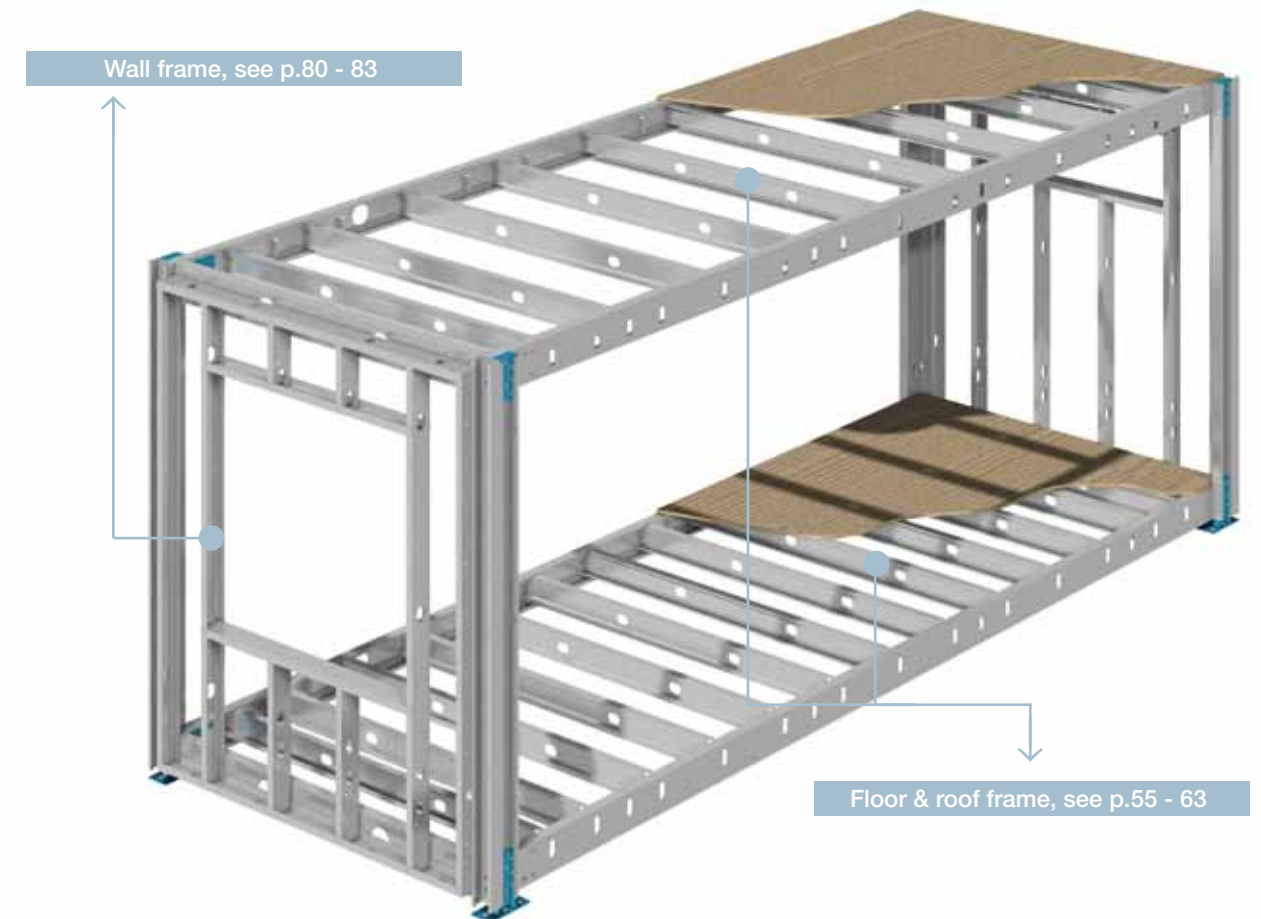


ADVANTAGES

Our 3D prefabricated modular frame is the better option when it comes to fast, weather independent and cost effective building.

Features:

- Optimised concept-solutions
- Weather independent building
- Load bearing frame suitable for any type of cladding
- Integrated service holes
- Well suited for "topping up" of existing buildings

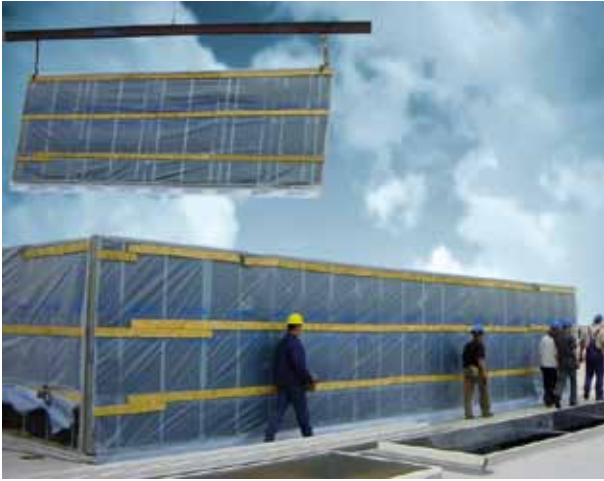


For additional information, prepiercing possibilities and minimum production batches: please contact SADEF.

2D ROOF ELEMENTS



2D WALL ELEMENTS



2D FLOOR ELEMENTS



Prefabricated modular 2D building elements are the better option when it comes to fast, weather independent and cost effective building.

Features:

- Fast building on site
- Independent of weather circumstances
- High standard and yet low cost production
- Consistent quality
- Compact transport
- No scrap on site

Wall profiles			
	CEE	C 150 C 100 C 80	P.106
	U	U 150 U 100 U 80	P.107
Wall frame, see p.80 - 83			

Floor and roof profiles			
	CEE-plus	C+450 C+400 C+350 C+300 C+250	P.101
	CEE	C 170	P.106
	SIGMA-plus	S+450 S+400 S+350 S+300 S+250	P.103
	SIGMA	S 200	P.104
Floor and roof frame, see p.55 - 63			

For additional information, prepiercing possibilities and minimum production batches: please contact SADEF.



Our wall framing elements are specially developed for external walling and for internal load bearing partition walls.

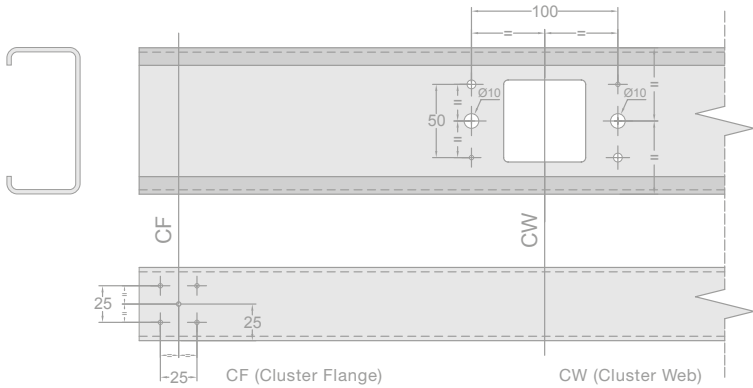
Standard piercing patterns CW (Cluster Web) and CF (Cluster Flange) for fast and safe assembly. Piercing at predetermined positions will result in pre-engineered components.

- Features:
- Applicable for vertical load bearing partitions and wind pressure loaded external walls.
 - Integration of service holes for transit pipelines

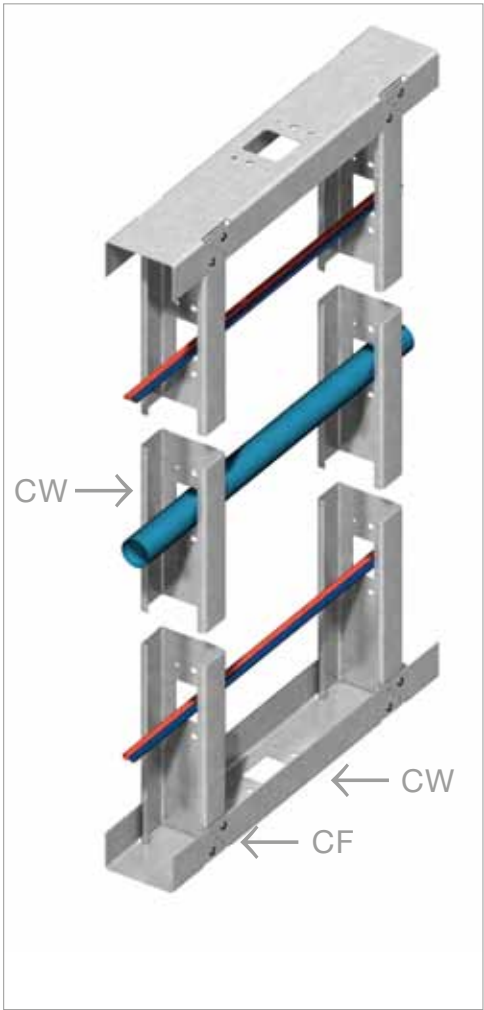
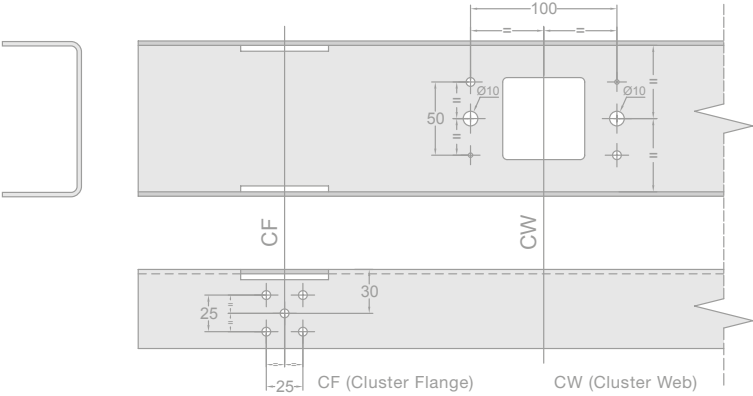
STUD PROFILE		
	CEE	C 150 C 100 C 80
		P.106

TRACK PROFILE		
	U	U 150 U 100 U 80
		P.107

STUD PROFILE



TRACK PROFILE



For additional information, prepiercing possibilities and minimum production batches: please contact SADEF.



CONTINUOUS WALL PROFILES



WALL ASSEMBLY

Wall frame consisting of CEE-studs and bottom U-channels can be placed. The CF (CLUSTER FLANGE) prepiercing in the bottom channel web ensures a perfect transfer of loads to the ground. Angle cut outs allow the stud to sit on the channel bottom.



For additional information, prepiercing possibilities and minimum production batches: please contact SADEF.

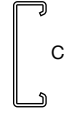


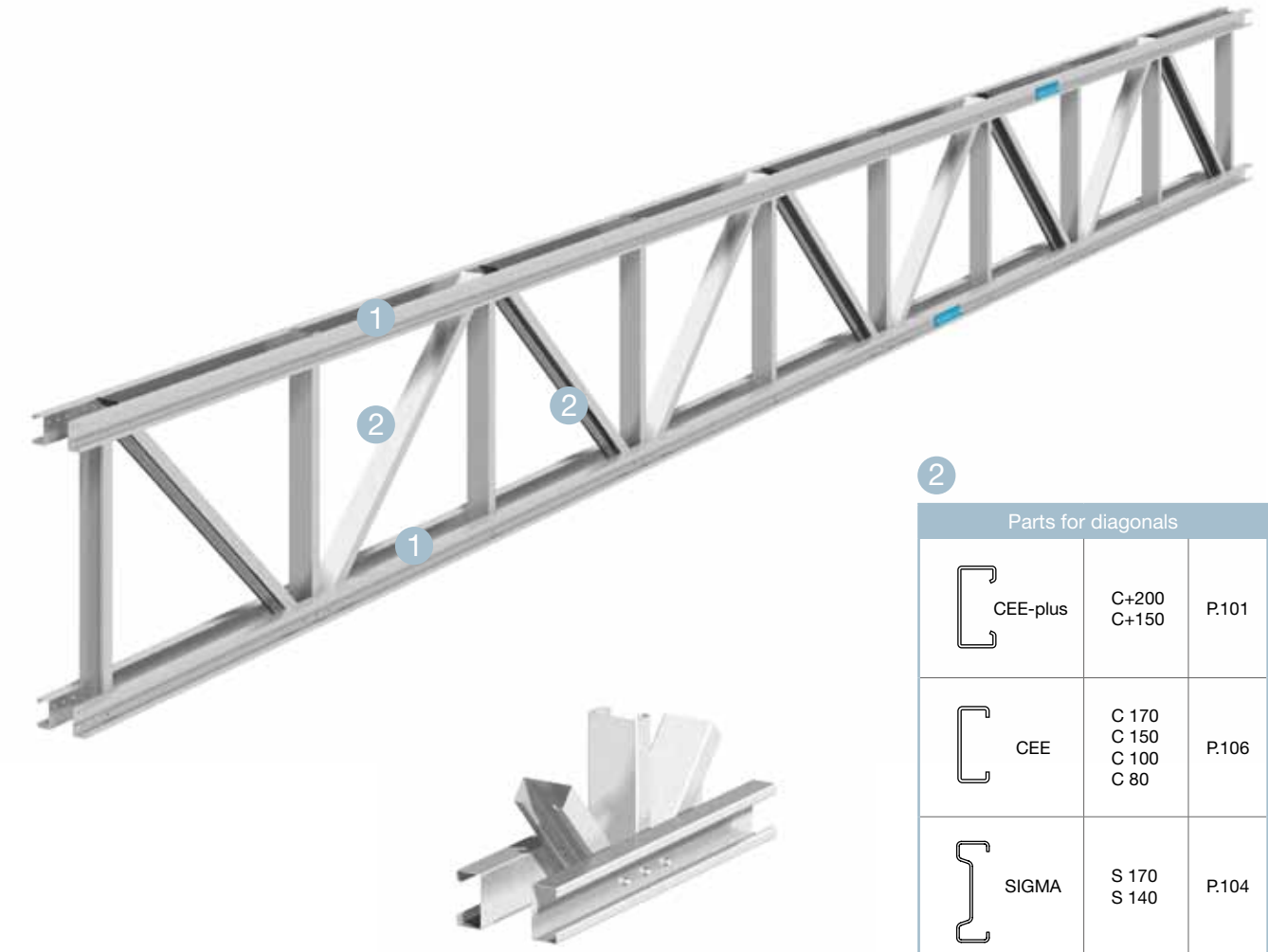
Trusses built by assembly of cold rollformed profiles are well suited for overseas building projects.

- Optimum use of material leading to cost-effective design
- Pregalvanised material
- Light weight
- Compact volume
- Kit of parts easy to assemble
- No skilled labour required
- Bolted connections – No welding
- Wide spans

Top and bottom beams consist of double CEE or CEE+ profiles. SIGMA, CEE or CEE+ profiles can be used as diagonals.

1

Parts for top and bottom beams		
	C+350 C+300 C+250 C+220 C+200 C+150	P.101
	C 200 C 170 C 150 C 100 C 100 C 80	P.106

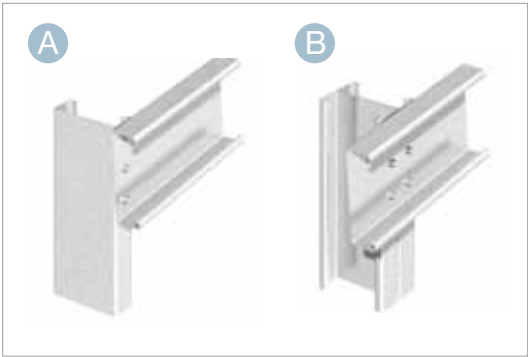


2

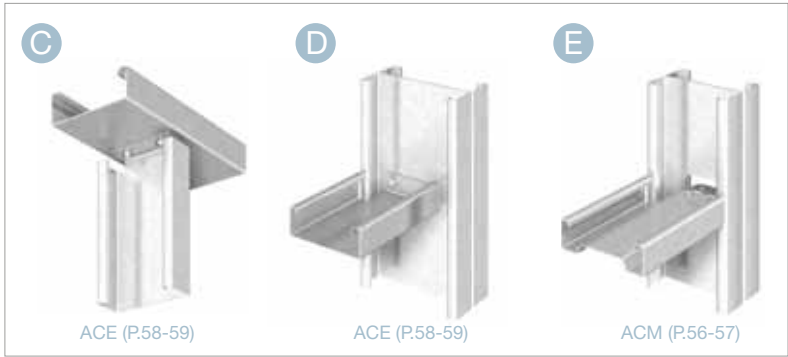
Parts for diagonals		
	C+200 C+150	P.101
	C 170 C 150 C 100 C 80	P.106
	S 170 S 140	P.104

For additional information, prepiercing possibilities and minimum production batches: please contact SADEF.

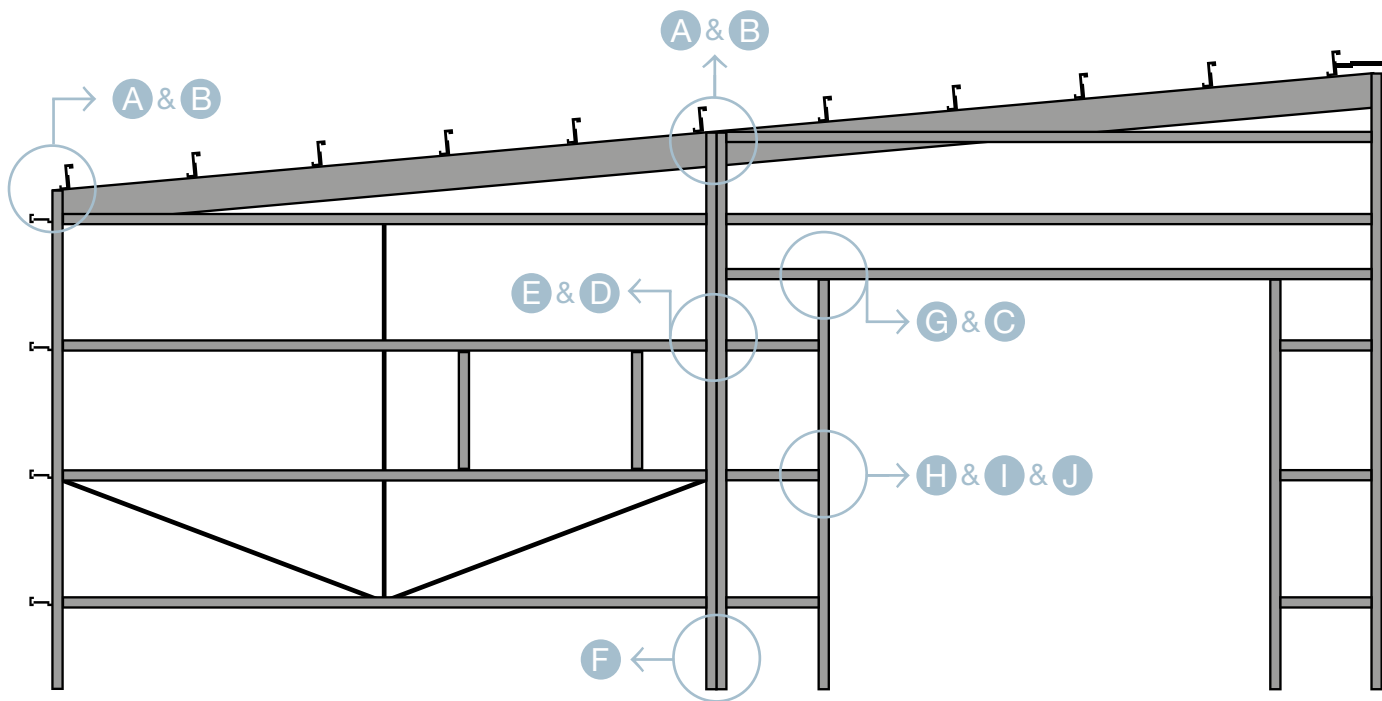
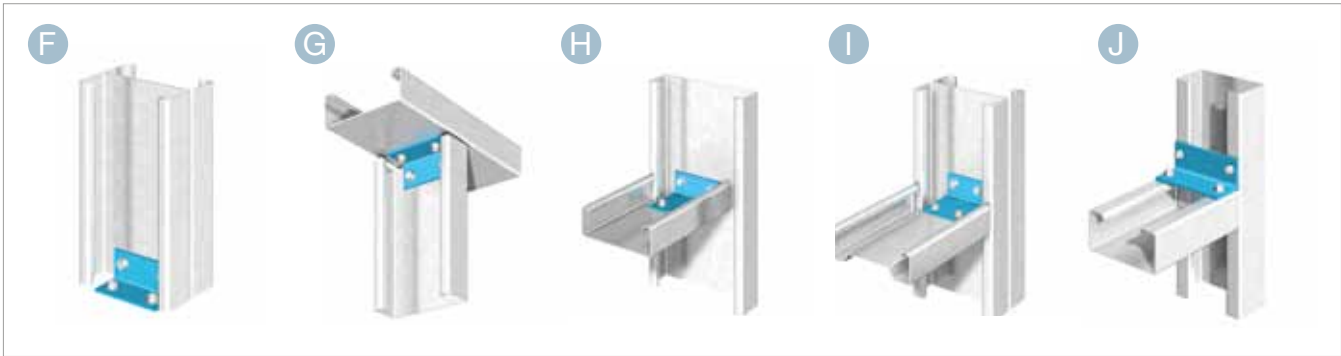
DIRECT CONNECTION



INTEGRATED CONNECTION



CLEATED CONNECTION

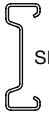


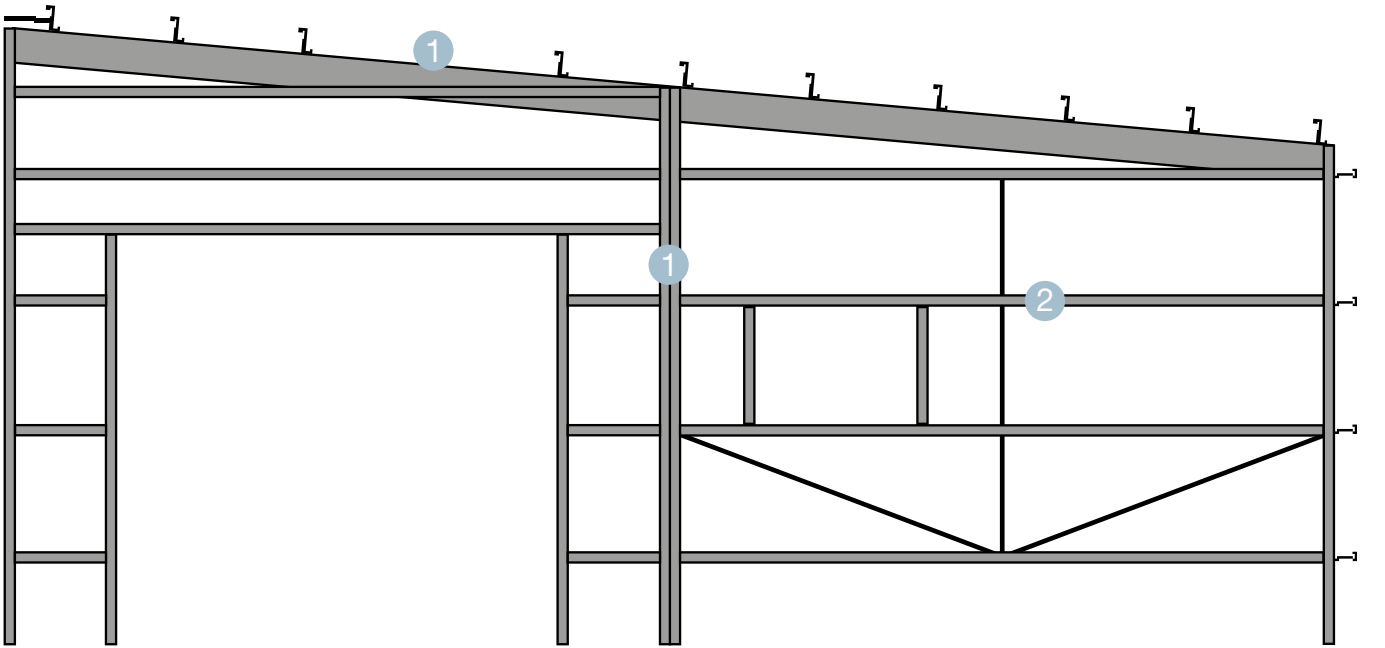
Gable end structures are easy to assemble using cold rollformed sections. They are ideally suited for repetitive construction projects.

- Features:
- Easy assembly
 - Light weight components
 - Bolted connection – no welding required
 - Galvanised profiles
 - Finish identical to cladding rails

1 Columns + Upper beam		
 CEE-plus	C+450	P.101
	C+400	
	C+400	
	C+350	
	C+300	
	C+250	
	C+220	
	C+200	
	C+150	

2

Side rails		
 ZED	Z 375 Z 350 Z 300 Z 250 Z 200 Z 180	P.105
 SIGMA-plus	S+350 S+300 S+250	P.103
 SIGMA	S 200 S 170 S 140	P.104
 CEE-(plus)	C+200 C+160 C+150 C 140	P.101



For additional information, prepiercing possibilities and minimum production batches: please contact SADEF.

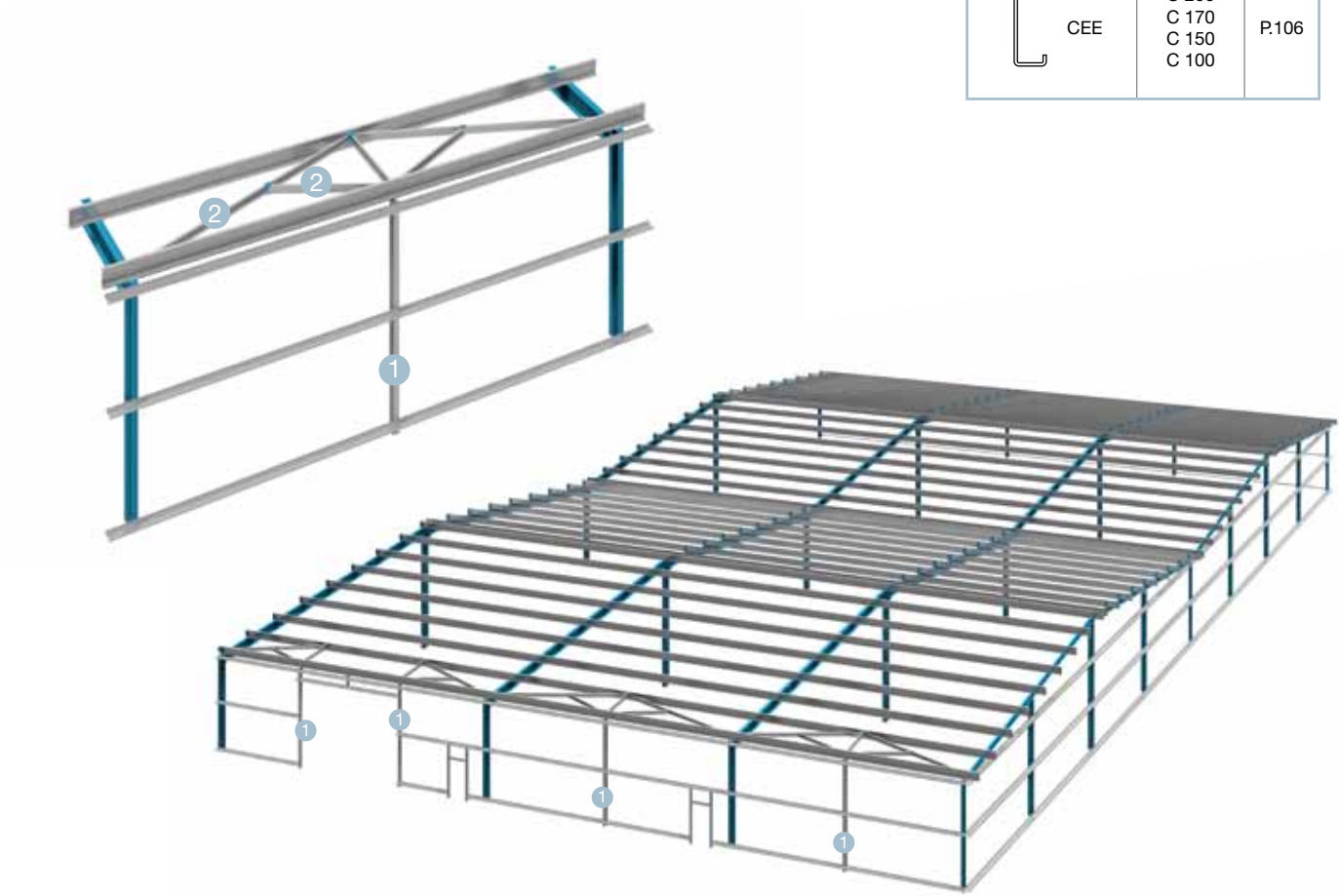


For large industrial buildings it may be advisable to widen the frame spacings to 10 - 18 m, which could then lead to additional columns being required in the long walls.

These can be supported on the foundation and fitted to the eaves beams. In these instances a horizontal bracing system placed between first and second roof purlin (as per sketch below) will transfer the horizontal wind loads to the portal frames.

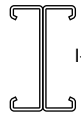
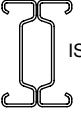
Columns and bracing diagonals are SADEF-sections featuring:

- Light weight
- Integrated connections → fewer components
- Finish identical to purlins and side rails

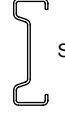


For additional information, prepiercing possibilities and minimum production batches: please contact SADEF.

1

Intermediate columns		
	I+450 I+400 I+350 I+300 I+250 I+220	P.100
	IS+450 IS+400 IS+350 IS+300 IS+250 IS+220	P.102

2

Diagonals		
	S 200 S 170 S 140	P.104
	C 200 C 170 C 150 C 100	P.106

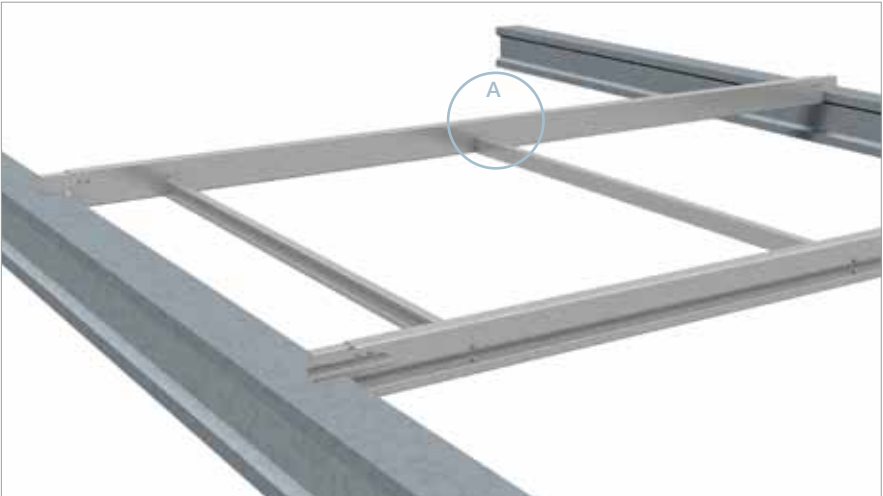


SMOKE VENTS AND SKY LIGHTS

Standard SADEF components will create easy to assemble and cost effective supporting structures for smoke vents and/or skylights.

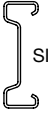
- Specific requirements for sprinkler systems can be taken into account.
- Very often these structures can be placed in a roof sheet corrugation.

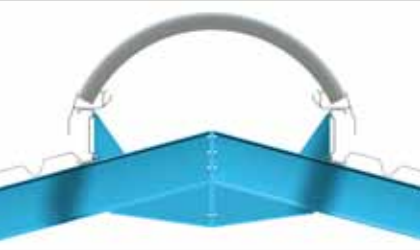
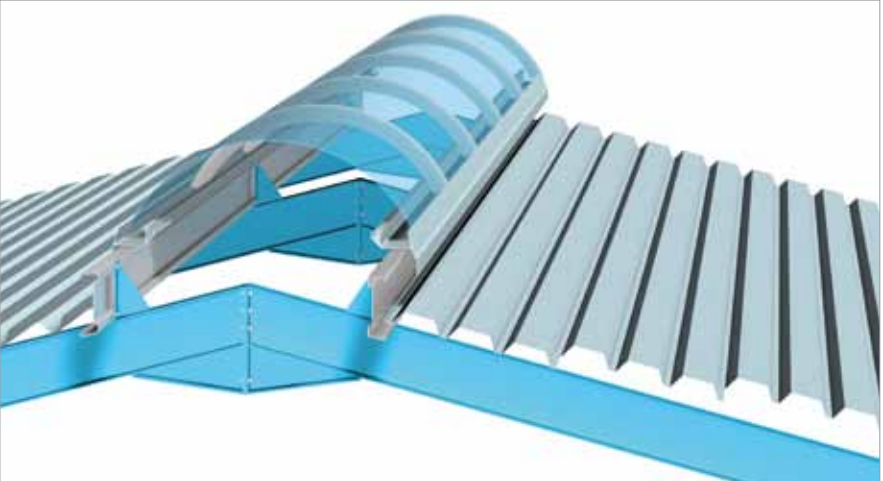
Components for smoke vents and sky lights		
 CEE	C 200 C 170 C 150 C 100	P.106



SKY LIGHTS

Skylights can be supported by SADEF profiles. Eaves beam sections fitted with their angled flange to the portal frame will create a flat base for supporting the skylight.

Components for sky lights		
 CEE-plus	C+450 C+400 C+350 C+300 C+250	P.101
 SIGMA-plus	S+450 S+400 S+350 S+300 S+250	P.103
 SE	SE 200 SE 250 SE 330	P.104



For additional information, prepiercing possibilities and minimum production batches: please contact SADEF.

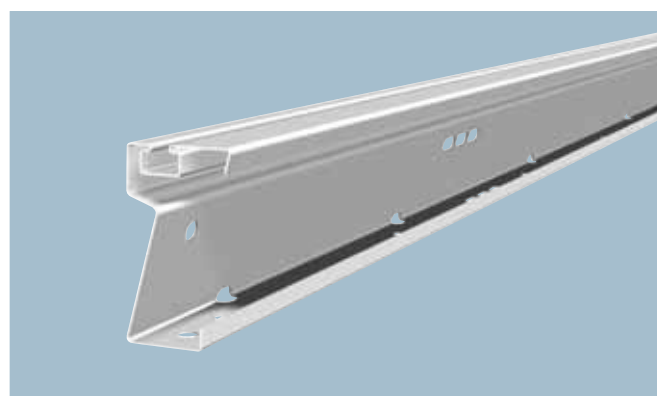
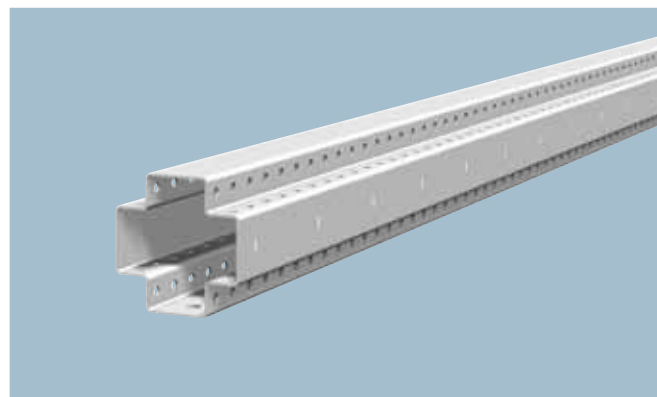
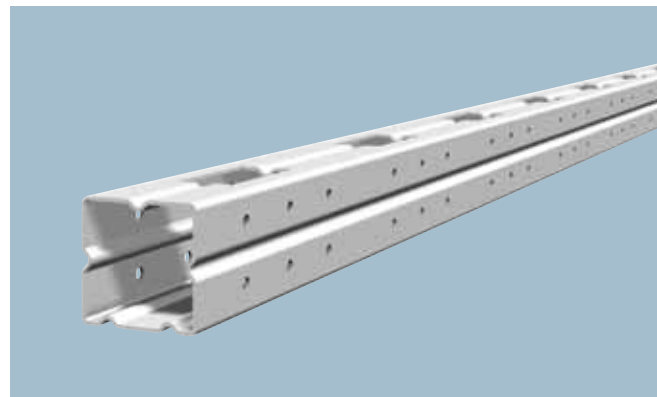


CUSTOM-MADE SECTIONS

SADEF is your best solution for any specific profile shape that may be required for your building project. Our know-how and experience in the field of cold rollforming are valuable assets in the design and optimising of your specific profile.

- 35 production Lines
- Open and closed profile shapes
- Steel thickness 0.4 → 11 mm
- Pre- and postpiercing of virtually any hole patterns, notches, inserts etc.
- Various steel grades and surface treatment
- Over 5000 profile shapes already designed and produced

IF YOU CAN DREAM IT, WE CAN MAKE IT

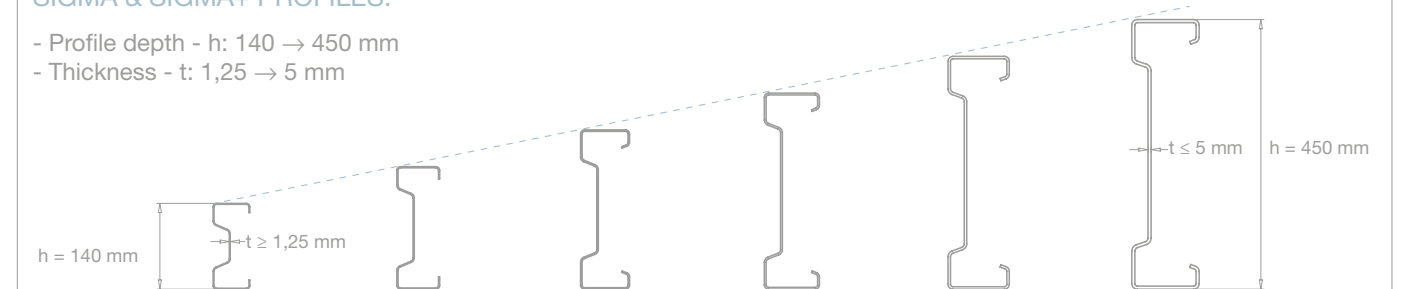


DIFFERENT DIMENSIONS OF SIGMA, ZED AND CEE-PROFILES

In large-scale and/or repetitive projects any building profile may be, in consultation with the client, developed within the following limitations:

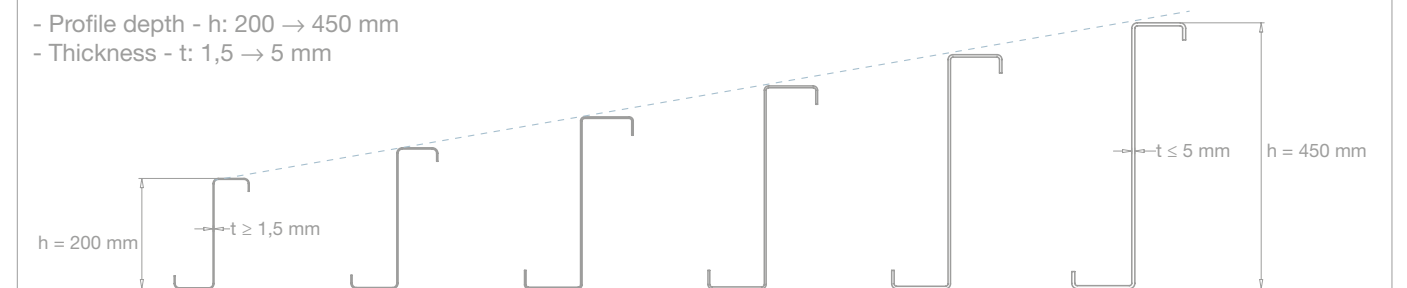
SIGMA & SIGMA+ PROFILES:

- Profile depth - h: 140 → 450 mm
- Thickness - t: 1,25 → 5 mm



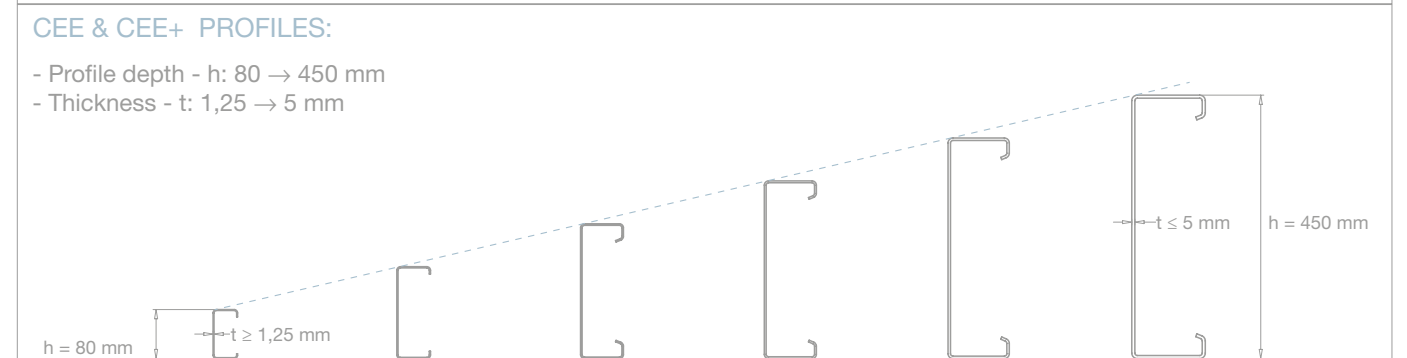
ZED PROFILES:

- Profile depth - h: 200 → 450 mm
- Thickness - t: 1,5 → 5 mm

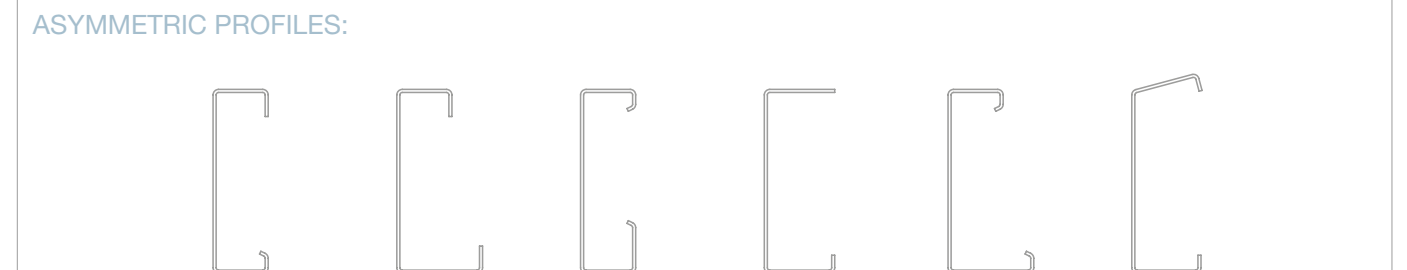


CEE & CEE+ PROFILES:

- Profile depth - h: 80 → 450 mm
- Thickness - t: 1,25 → 5 mm



ASYMMETRIC PROFILES:



For additional information, prepiercing possibilities and minimum production batches: please contact SADEF.

To protect steel against weather influences different surface treatments are possible.

PREGALVANISING (EN10.346)
(Continuous hot dip galvanised coil)

- Galvanised before rollforming
- Standard: Z275 (275 gr. zinc/m² - average 19 micron Zn coating)
- Alternative Zn-coatings up to Z1000 available on request (average 70 micron Zn coating)
- Coating of strip edges can be arranged if required



HOT DIP GALVANISING (EN-ISO 1461)

- After rollforming of pickled material profiles can be galvanised by dipping in zinc bath
- Please contact SADEF for more information.
- Minimum coating to EN-ISO 1461: see table below

Average minimum coating (EN-ISO 1461)	
Steel thickness	Mean coating thickness (minimum) µm
steel > 6 mm	85 µm
3 mm < steel ≤ 6 mm	70 µm
1,5 mm ≤ steel ≤ 3 mm	55 µm



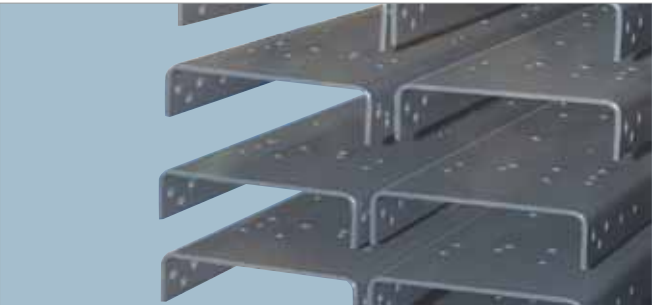
Lifetime
Lifetime of galvanized steel depends on the degree of corrosivity of the environment a.o. This is spread over 5 corrosivity degrees. (EN-ISO 12944-2)
With galvanized profiles the EN-ISO 12944-2 defines the annual zinc decrease as followed:

Atmospheric-corrosivity categories and examples of typical environments *			
Corrosivity category	Mass loss per unit surface/thickness loss (after first year of exposure)	Examples of typical environments in a temperate climate (informative only)	
	Zinc thickness loss µm	Exterior	Interior
C1 very low	≤ 0,1	-	Heated buildings with clean atmospheres e.g. offices, shops, schools, hotels.
C2 low	> 0,1 to 0,7	Atmospheres with low level of pollution. Mostly rural areas.	Unheated buildings where condensation may occur, e.g. depots, sport halls.
C3 medium	> 0,7 to 2,1	Urban and industrial atmospheres, moderate sulfur dioxide pollution. Coastal areas with low salinity.	Production rooms with high humidity and some air pollution, e.g. food-processing plants, laundries, breweries, dairies.
C4 high	> 2,1 to 4,2	Industrial areas and coastal areas with moderate salinity.	Chemical plants, swimming pools, coastal ship- and boatyards.
C5-I very high (Industrial)	> 4,2 to 8,4	Industrial areas with high humidity and aggressive atmosphere.	Building or areas with almost permanent condensation and with high pollution.
C5-M very high (Marine)	> 4,2 to 8,4	Coastal and offshore areas with high salinity.	Buildings or areas with almost permanent condensation and with high pollution.

* Extract from EN-ISO 12944-2

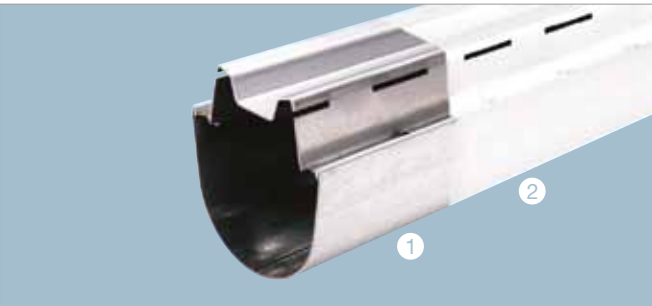
ELECTROSTATIC POWDERCOATING

- Applied after rollforming
- Process: pickled material + zinc phosphatation + powder coating
- Polyester, epoxy or PU-coating
- Electrostatic powder coating in any RAL-colour
- Colour and coating thickness to be specified



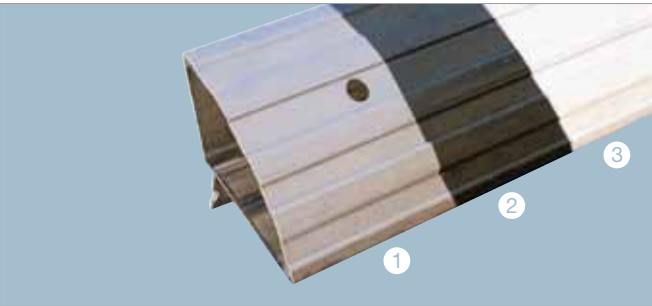
DUPLEX

- Applied after rollforming
- Coating process: pregalvanised (1) + powder coating (2)
- Polyester, epoxy or PU-coating
- Electrostatic powdercoating in any RAL-colour
- Colour and coating thickness to be specified
- Corrosion guarantee on request



DOUBLE DUPLEX

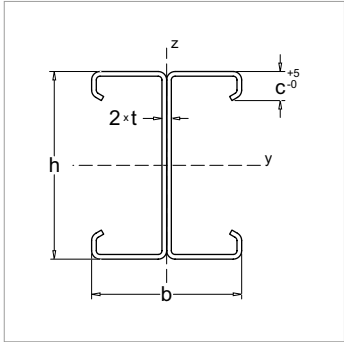
- Applied after rollforming
- Coating process: pregalvanised (1) + E-coat (2) + powder coating (3)
- Polyester, epoxy or PU-coating
- Electrostatic powdercoating in any RAL-colour
- Colour and coating thickness to be specified
- Corrosion guarantee on request



For further information on corrosion resistance, we refer to:
EN-ISO14713: Protection against corrosion of iron and steel structures. Zinc and aluminium coatings.
EN-ISO12944: Corrosion protection of steel structures by protective paint systems.
Specific requirements to be discussed case by case.

BUILDING SECTIONS RANGE

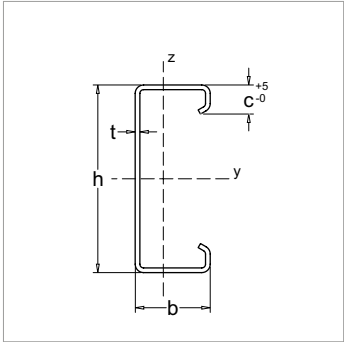
I-PLUS	P. 100
CEE-PLUS	P. 101
IS-PLUS	P. 102
SIGMA-PLUS	P. 103
SIGMA	P. 104
SE	P. 104
ZED	P. 105
CEE	P. 106
U	P. 107



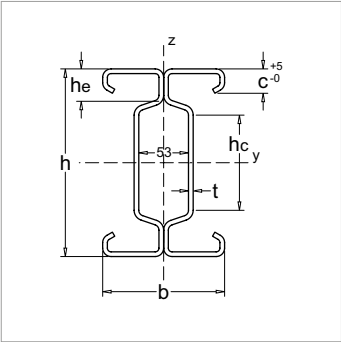
SECTION								GROSS CROSS SECTION PROPERTIES				
Section Type	Section name	h (mm)	b (mm)	c (mm)	t (mm)	G (kg/m)	A _{paint} (m²/m)	A (cm²)	I _y (cm⁴)	W _y (cm³)	I _z (cm⁴)	W _z (cm³)
I+450	I+450x5*	450	240	35	5,00	58,16	3,08	73,50	21127	949,5	1324,4	154,38
	I+450x4				4,00	47,04		59,32	17208	771,7	1101,4	127,90
	I+450x3				3,00	35,64		44,88	13142	588,0	859,2	99,42
	I+450x2,5				2,50	29,86		37,50	11032	493,0	728,7	84,18
	I+450x2				2,00	24,00		30,02	8870	396,0	591,7	68,20
I+400	I+400x4	400	220	35	4,00	42,64	2,80	53,78	12374	624,9	862,5	111,34
	I+400x3,5				3,50	37,52		47,30	10942	551,9	771,5	99,38
	I+400x3				3,00	32,34		40,74	9469	477,0	674,6	86,76
	I+400x2,5				2,50	27,10		34,06	7956	400,3	572,8	73,52
	I+400x2				2,00	21,80		27,28	6402	321,7	465,6	59,62
I+350	I+350x5*	350	200	30	5,00	46,26	2,44	58,44	10208	591,8	736,2	105,54
	I+350x4				4,00	37,54		47,34	8362	483,4	618,1	88,24
	I+350x3,5				3,50	33,06		41,70	7409	427,7	554,6	79,04
	I+350x3				3,00	28,54		35,94	6424	370,2	486,6	69,22
	I+350x2,5				2,50	23,94		30,08	5407	311,2	414,6	58,86
	I+350x2				2,00	19,28		24,12	4358	250,5	338,0	47,88
I+300	I+300x5*	300	180	30	5,00	40,76	2,10	51,50	6628	449,3	542,0	88,80
	I+300x4				4,00	31,18		39,32	4981	336,5	317,9	56,70
	I+300x3,5				3,50	27,52		34,70	4428	298,7	287,2	51,12
	I+300x3				3,00	23,78		29,96	3852	259,4	253,7	45,04
	I+300x2,5				2,50	19,98		25,12	3252	218,6	217,5	38,54
	I+300x2				2,00	16,12		20,18	2629	176,4	178,4	31,52
I+250	I+250x5*	250	160	30	5,00	35,26	1,84	44,56	3984	325,2	382,8	73,24
	I+250x4				4,00	28,04		35,36	3214	261,3	300,4	55,80
	I+250x3				3,00	21,42		27,00	2492	201,8	239,6	44,34
	I+250x2,5				2,50	18,02		22,66	2106	170,2	205,4	37,92
	I+250x2				2,00	14,54		18,22	1705	137,5	168,5	31,04
I+220	I+220x5*	220	160	30	5,00	32,90	1,74	41,58	2927	272,3	366,2	72,32
	I+220x4				4,00	26,14		32,98	2369	219,3	287,8	55,10
	I+220x3				3,00	20,02		25,22	1840	169,6	229,6	43,78
	I+220x2,5				2,50	16,84		21,18	1557	143,2	196,8	37,46
	I+220x2				2,00	13,60		17,04	1261	115,7	161,4	30,66
I+200	I+200x5*	200	200	43	5,00	36,86	1,96	46,58	2800	287,2	704,6	122,80
	I+200x4				4,00	29,96		37,78	2301	234,8	587,2	101,70
	I+200x3				3,00	22,80		28,74	1774	180,1	459,1	79,10
	I+200x2,5				2,50	19,14		24,08	1496	151,5	389,8	66,96
	I+200x2				2,00	15,42		19,32	1208	122,0	316,8	54,24
	I+200x1,5				1,50	11,64		14,46	909	91,6	239,6	40,84
I+160	I+160x3	160	182	43	3,00	20,08	1,72	25,30	980	125,0	337,4	67,82
	I+160x2,5		180		2,50	16,80		21,12	822	104,4	279,8	56,66
	I+160x2			40	2,00	13,34		16,72	664	84,0	222,0	44,16
I+150	I+150x4	150	180	43	4,00	25,56	1,68	32,24	1075	147,3	407,7	84,96
	I+150x3				3,00	19,52		24,60	835	113,5	320,3	66,30
	I+150x2,5				2,50	16,40		20,64	706	95,7	272,6	56,20
	I+150x2				2,00	13,22		16,58	571	77,2	222,0	45,60

I-plus profiles should be built from loose CEE-plus profiles by using bolts

Base material: S390 GD + pregalvanised Z275 (Following EN 10346)
* S350GD + pregalvanised Z275 (Following EN 10346)
Alternative grades or coating available on request



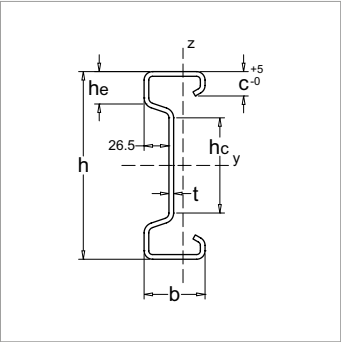
SECTION								GROSS CROSS SECTION PROPERTIES				
Section Type	Section name	h (mm)	b (mm)	c (mm)	t (mm)	G (kg/m)	A _{paint} (m²/m)	A (cm²)	I _y (cm⁴)	W _y (cm³)	I _z (cm⁴)	W _z (cm³)
C+450	C+450x5*	450	120	35	5,00	29,08	1,54	36,75	10563	474,8	662,2	77,19
	C+450x4				4,00	23,52		29,66	8604	385,8	550,7	63,95
	C+450x3				3,00	17,82		22,44	6571	294,0	429,6	49,71
	C+450x2,5				2,50	14,93		18,75	5516	246,5	364,4	42,09
	C+450x2				2,00	12,00		15,01	4435	198,0	295,8	34,10
C+400	C+400x4	400	110	35	4,00	21,32	1,40	26,89	6187	312,5	431,3	55,67
	C+400x3,5				3,50	18,76		23,65	5471	276,0	385,6	49,69
	C+400x3				3,00	16,17		20,37	4734	238,5	337,2	43,38
	C+400x2,5				2,50	13,55		17,03	3978	200,1	286,4	36,76
	C+400x2				2,00	10,90		13,64	3201	160,9	232,8	29,81
C+350	C+350x5*	350	100	30	5,00	23,13	1,22	29,22	5104	295,9	368,1	52,77
	C+350x4				4,00	18,77		23,67	4181	241,7	309,1	44,12
	C+350x3,5				3,50	16,53		20,85	3705	213,8	277,3	39,52
	C+350x3				3,00	14,27		17,97	3212	185,1	243,3	34,61
	C+350x2,5				2,50	11,97		15,04	2703	155,6	207,3	29,43
	C+350x2				2,00	9,64		12,06	2179	125,2	169,0	23,94
C+300	C+300x5*	300	90	30	5,00	20,38	1,05	25,75	3314	224,7	271,0	44,40
	C+300x4				4,00	15,59		19,66	2490	168,3	159,0	28,35
	C+300x3,5				3,50	13,76		17,35	2214	149,4	143,6	25,56
	C+300x3				3,00	11,89		14,98	1926	129,7	126,8	22,52
	C+300x2,5				2,50	9,99		12,56	1626	109,3	108,8	19,27
	C+300x2				2,00	8,06		10,09	1315	88,2	89,2	15,76
C+250	C+250x5*	250	80	30	5,00	17,63	0,92	22,28	1992	162,6	191,4	36,62
	C+250x4				4,00	14,02		17,68	1607	130,6	150,2	27,90
	C+250x3				3,00	10,71		13,50	1246	100,9	119,8	22,17
	C+250x2,5				2,50	9,01		11,33	1053	85,1	102,7	18,96
	C+250x2				2,00	7,27		9,11	852	68,7	84,2	15,52
C+220	C+220x5*	220	80	30	5,00	16,45	0,87	20,79	1464	136,2	183,1	36,16
	C+220x4				4,00	13,07		16,49	1184	109,7	143,9	27,55
	C+220x3				3,00	10,01		12,61	920	84,8	114,8	21,89
	C+220x2,5				2,50	8,42		10,59	778	71,6	98,4	18,73
	C+220x2				2,00	6,80		8,52	631	57,9	80,7	15,33
C+200	C+200x5*	200	100	43	5,00	18,43	0,98	23,29	1400	143,6	352,3	61,40
	C+200x4				4,00	14,98		18,89	1151	117,4	293,6	50,85
	C+200x3				3,00	11,40		14,37	887	90,1	229,6	39,55
	C+200x2,5				2,50	9,57		12,04	748	75,7	194,9	33,48
	C+200x2				2,00	7,71		9,66	604	61,0	158,4	27,12
	C+200x1,5				1,50	5,82		7,23	455	45,8	119,8	20,42
C+160	C+160x3	160	91	43	3,00	10,04	0,86	12,65	490	62,5	168,7	33,91
	C+160x2,5		90		2,50	8,40		10,56	411	52,2	139,9	28,33
	C+160x2			40	2,00	6,67		8,36	332	42,0	111,0	22,08
C+150	C+150x4	150	90	43	4,00	12,78	0,84	16,12	538	73,7	203,9	42,48
	C+150x3				3,00	9,76		12,30	417	56,8	160,2	33,15
	C+150x2,5				2,50	8,20		10,32	353	47,9	136,3	28,10
	C+150x2				2,00	6,61		8,29	286	38,6	111,0	22,80



SECTION										GROSS CROSS SECTION PROPERTIES				
Section Type	Section name	h (mm)	b (mm)	c (mm)	h _c (mm)	h _e (mm)	t (mm)	G (kg/m)	A _{paint} (m²/m)	A (cm²)	I _y (cm⁴)	W _y (cm³)	I _z (cm⁴)	W _z (cm³)
IS+450	IS+450x5*	450	220	35	280	70	5,00	58,78	3,06	74,36	20802	934,9	791,6	115,10
	IS+450x4						4,00	47,60		60,14	16970	761,0	665,6	95,90
	IS+450x3						3,00	36,10		45,54	12971	580,4	524,4	75,00
	IS+450x2,5						2,50	30,26		38,04	10885	486,5	446,7	63,66
	IS+450x2						2,00	24,34		30,46	8750	390,6	364,2	51,70
IS+400	IS+400x4	400	200	35	250	60	4,00	43,20	2,78	54,60	12199	616,1	497,2	81,68
	IS+400x3,5						3,50	38,04		48,06	10793	544,4	447,4	73,16
	IS+400x3						3,00	32,82		41,40	9343	470,8	393,7	64,08
	IS+400x2,5						2,50	27,50		34,60	7847	394,8	336,0	54,46
	IS+400x2						2,00	22,14		27,72	6313	317,2	274,5	44,28
IS+350	IS+350x5*	350	180	30	220	50	5,00	46,86	2,50	59,30	10042	582,1	393,2	74,60
	IS+350x4						4,00	38,10		48,14	8242	476,4	335,3	62,88
	IS+350x3,5						3,50	33,58		42,44	7307	421,8	303,1	56,54
	IS+350x3						3,00	29,00		36,60	6337	365,2	267,9	49,72
	IS+350x2,5						2,50	24,34		30,62	5332	306,9	229,7	42,42
	IS+350x2						2,00	19,60		24,56	4296	246,9	188,4	34,62
	IS+350x1,75						1,75	17,20		21,46	3763	216,1	166,1	30,42
IS+300	IS+300x5*	300	160	30	170	50	5,00	41,36	2,18	52,36	6465	438,3	285,9	63,32
	IS+300x4						4,00	33,00		41,70	5204	351,6	227,2	48,64
	IS+300x3,5						3,50	29,12		36,82	4625	312,0	206,4	43,90
	IS+300x3						3,00	25,18		31,80	4021	270,8	183,2	38,74
	IS+300x2,5						2,50	21,16		26,66	3392	228,0	157,7	33,18
	IS+300x2						2,00	17,08		21,40	2739	183,8	129,9	27,16
	IS+300x1,75						1,75	15,00		18,70	2401	161,0	114,6	23,88
	IS+300x1,5						1,50	12,90		16,00	2059	138,0	99,0	20,56
IS+250	IS+250x4	250	140	25	120	50	4,00	28,60	1,90	36,16	3097	251,8	161,4	40,88
	IS+250x3						3,00	21,88		27,66	2404	194,6	130,7	32,62
	IS+250x2,5						2,50	18,42		23,20	2032	164,2	112,7	27,96
	IS+250x2						2,00	14,88		18,66	1644	132,6	93,0	22,92
	IS+250x1,75						1,75	13,06		16,32	1442	116,2	82,2	20,16
	IS+250x1,5						1,50	11,24		13,96	1238	99,6	71,1	17,34
	IS+220x2						2,00	13,30	1,72	16,70	1156	106,2	64,8	17,88
IS+220	IS+220x1,75	220	130	20	120	36	1,75	11,70		14,60	1016	93,0	57,4	15,74
	IS+220x1,5						1,50	10,06		12,50	872	79,8	49,8	13,56
	IS+220x1,25						1,25	8,42		10,40	726	66,4	41,8	11,34

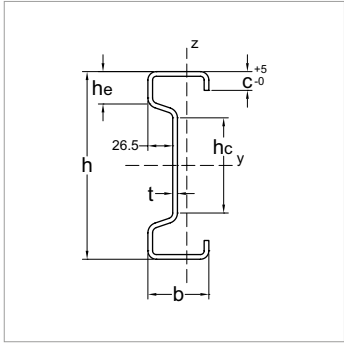
IS-plus profiles should be built from loose SIGMA-plus profiles by using bolts

Base material: S390 GD + pregalvanised Z275 (Following EN 10346)
* S350GD + pregalvanised Z275 (Following EN 10346)
Alternative grades or coating available on request

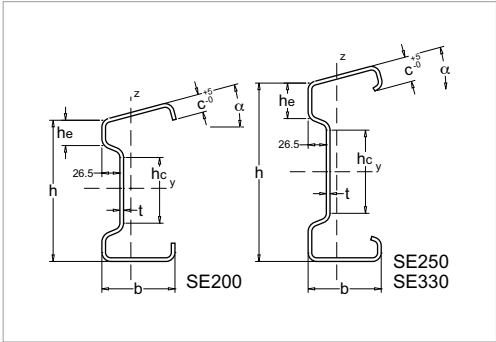


SECTION										GROSS CROSS SECTION PROPERTIES				
Section Type	Section name	h (mm)	b (mm)	c (mm)	h _c (mm)	h _e (mm)	t (mm)	G (kg/m)	A _{paint} (m²/m)	A (cm²)	I _y (cm⁴)	W _y (cm³)	I _z (cm⁴)	W _z (cm³)
S+450	S+450x5*	450	110	35	280	70	5,00	29,39	1,53	37,18	10401	467,5	395,8	57,55
	S+450x4						4,00	23,80		30,07	8485	380,5	332,8	47,95
	S+450x3						3,00	18,05		22,77	6486	290,2	262,2	37,50
	S+450x2,5						2,50	15,13		19,02	5443	243,3	223,4	31,83
	S+450x2						2,00	12,17		15,23	4375	195,3	182,1	25,85
S+400	S+400x4	400	100	35	250	60	4,00	21,60	1,39	27,30	6099	308,1	248,6	40,84
	S+400x3,5						3,50	19,02		24,03	5397	272,2	223,7	36,58
	S+400x3						3,00	16,41		20,70	4672	235,4	196,8	32,04
	S+400x2,5						2,50	13,75		17,30	3924	197,4	168,0	27,23
	S+400x2						2,00	11,07		13,86	3156	158,6	137,3	22,14
S+350	S+350x5*	350	90	30	220	50	5,00	23,43	1,25	29,65	5021	291,1	196,6	37,30
	S+350x4						4,00	19,05		24,07	4121	238,2	167,6	31,44
	S+350x3,5						3,50	16,79		21,22	3653	210,9	151,6	28,27
	S+350x3						3,00	14,50		18,30	3169	182,6	134,0	24,86
	S+350x2,5						2,50	12,17		15,31	2666	153,4	114,9	21,21
	S+350x2						2,00	9,80		12,28	2148	123,5	94,2	17,31
	S+350x1,75						1,75	8,60		10,73	1881	108,0	83,1	15,21
S+300	S+300x5*	300	80	30	170	50	5,00	20,68	1,09	26,18	3232	219,1	143,0	31,66
	S+300x4						4,00	16,50		20,85	2602	175,8	113,6	24,32
	S+300x3,5						3,50	14,56		18,41	2313	156,0	103,2	21,95
	S+300x3						3,00	12,59		15,90	2011	135,4	91,6	19,37
	S+300x2,5						2,50	10,58		13,33	1696	114,0	78,9	16,59
	S+300x2						2,00	8,54		10,70	1369	91,9	65,0	13,58
	S+300x1,75						1,75	7,50		9,35	1200	80,5	57,3	11,94
	S+300x1,5						1,50	6,45		8,00	1030	69,0	49,5	10,28
S+250	S+250x4	250	70	25	120	50	4,00	14,30	0,95	18,08	1548	125,9	80,7	20,44
	S+250x3						3,00	10,94		13,83	1202	97,3	65,3	16,31
	S+250x2,5						2,50	9,21		11,60	1016	82,1	56,4	13,98
	S+250x2						2,00	7,44		9,33	822	66,3	46,5	11,46
	S+250x1,75						1,75	6,53		8,16	721	58,1	41,1	10,08
	S+250x1,5						1,50	5,62		6,98	619	49,8	35,5	8,67
	S+220x2						2,00	6,65	0,86	8,35	578	53,1	32,4	8,94
S+220	S+220x1,75	220	65	20	120	36	1,75	5,85		7,30	508	46,5	28,7	7,87
	S+220x1,5						1,50	5,03		6,25	436	39,9	24,9	6,78
	S+220x1,25						1,25	4,21		5,20	363	33,2	20,9	5,67

Effective section properties: on demand
Detailed perforation possibilities, see p. 29 & 56 - 61



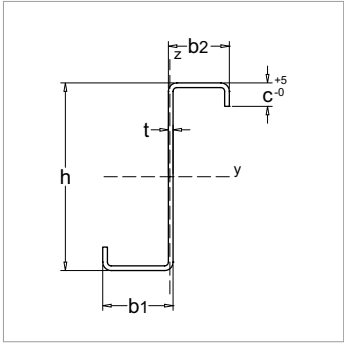
SECTION										GROSS CROSS SECTION PROPERTIES				
Section Type	Section name	h (mm)	b (mm)	c (mm)	hc (mm)	he (mm)	t (mm)	G (kg/m)	A _{paint} (m ² /m)	A (cm ²)	I _y (cm ⁴)	W _y (cm ³)	I _z (cm ⁴)	W _z (cm ³)
S 200	S 200x4	200	65	20	100	36	4,00	11,57	0,78	14,64	814,7	83,13	49,22	13,51
	S 200x3						3,00	8,85		11,19	633,3	64,29	40,02	10,76
	S 200x2,5						2,50	7,45		9,38	535,3	54,21	34,55	9,20
	S 200x2						2,00	6,01		7,53	433,2	43,76	28,53	7,52
	S 200x1,75						1,75	5,28		6,59	380,4	38,37	25,28	6,63
	S 200x1,5						1,50	4,54		5,64	326,8	32,93	21,92	5,72
	S 200x1,25						1,25	3,80		4,69	272,5	27,42	18,45	4,79
S 170	S 170x4	170	60	15	70	36	4,00	10,00	0,68	12,66	502,4	60,53	35,91	10,53
	S 170x3						3,00	7,67		9,71	392,9	47,06	29,43	8,44
	S 170x2,5						2,50	6,46		8,15	333,1	39,77	25,50	7,24
	S 170x2						2,00	5,22		6,55	270,3	32,18	21,12	5,93
	S 170x1,75						1,75	4,59		5,74	237,6	28,24	18,74	5,24
	S 170x1,5						1,50	3,96		4,94	204,3	24,25	16,27	4,52
	S 170x1,25						1,25	3,31		4,10	170,6	20,22	13,71	3,79
S 140	S 140x4	140	60	15	40	34	4,00	9,05	0,62	11,47	313,5	46,11	34,92	10,21
	S 140x3						3,00	6,97		8,82	246,3	35,91	28,69	8,21
	S 140x2,5						2,50	5,88		7,41	209,2	30,43	24,89	7,05
	S 140x2						2,00	4,75		5,96	170,1	24,66	20,64	5,79
	S 140x1,75						1,75	4,18		5,22	149,7	21,65	18,32	5,11
	S 140x1,5						1,50	3,60		4,48	128,7	18,61	15,92	4,42
	S 140x1,25						1,25	3,02		3,72	107,7	15,52	13,42	3,71



SECTION										GROSS CROSS SECTION PROPERTIES				
Section Type	Section name	h (mm)	b (mm)	c (mm)	hc (mm)	he (mm)	t (mm)	G (kg/m)	A _{paint} (m ² /m)	A (cm ²)	I _y (cm ⁴)	W _y (cm ³)	I _z (cm ⁴)	W _z (cm ³)
SE 330	SE 330x3	330	100	30	200	50	3,0	14,50	1,24	18,30	2906	177,8	176,4	29,10
SE 250	SE 250x2,5	250	100	30	120	50	2,5	10,60	1,08	13,34	1262	102,0	148,6	25,03
SE 200	SE 200x2	200	100	25	100	36	2,0	7,27	0,93	9,10	579	58,5	94,0	15,54

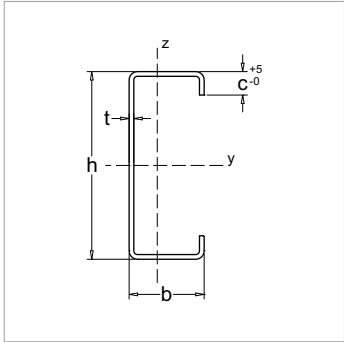
Section properties for $\alpha = 0^\circ$
Other values for α , zie p. 33

Base material: S390 GD +pregalvanised Z275 (Following EN 10346)
* S350GD + pregalvanised Z275 (Following EN 10346)
Alternative grades or coating available on request



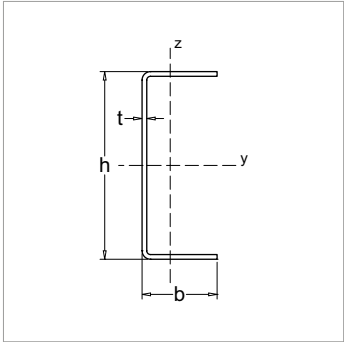
SECTION									GROSS CROSS SECTION PROPERTIES				
Section Type	Section name	h (mm)	b ₁ (mm)	b ₂ (mm)	c (mm)	t (mm)	G (kg/m)	A _{paint} (m ² /m)	A (cm ²)	I _y (cm ⁴)	W _y (cm ³)	I _z (cm ⁴)	W _z (cm ³)
Z 375	Z 375x5*	379	103	88	28	5,00	23,11	1,2	29,20	5766	300,7	421,8	44,33
	Z 375x4	377	96	88	30	4,00	18,54		23,38	4597	243,2	330,5	36,53
	Z 375x3	376	95	87		3,00	13,99		17,61	3478	184,0	253,1	27,97
	Z 375x2,5	375	94	86		2,50	11,66		14,66	2897	153,0	209,5	23,29
	Z 375x2	375	94	86		2,00	9,38		11,73	2325	123,0	170,9	18,90
	Z 350x4	352	96	88	30	4,00	17,75	1,15	22,39	3895	220,7	330,5	36,55
Z 350	Z 350x3,5	351	95	87		3,50	15,56		19,61	3415	193,5	288,2	32,05
	Z 350x3	351	95	87		3,00	13,40		16,87	2947	167,0	253,0	27,99
	Z 350x2,5	350	94	86		2,50	11,18		14,04	2455	139,1	209,5	23,30
	Z 350x2	350	94	86		2,00	8,98		11,24	1971	111,7	170,9	18,91
Z 300	Z 300x5*	304	103	88	30	5,00	20,32	1,04	25,68	3421	222,4	437,7	46,21
	Z 300x4	302	96	88		4,00	16,18		20,41	2698	178,3	330,4	36,61
	Z 300x3,5	301	95	87		3,50	14,18		17,88	2365	156,3	288,1	32,10
	Z 300x3	301	95	87		3,00	12,22		15,39	2043	135,0	253,0	28,03
	Z 300x2,5	300	94	86		2,50	10,20		12,81	1702	112,5	209,5	23,34
	Z 300x2	300	94	86		2,00	8,20		10,26	1366	90,3	170,9	18,94
	Z 300x1,75	300	94	86		1,75	7,19		8,96	1193	78,9	150,6	16,65
Z 250	Z 250x4	253	79	70	22	4,00	12,93	0,84	16,39	1482	116,4	155,9	21,32
	Z 250x3,5	253	78,5	69,5		3,50	11,46		14,45	1319	103,7	139,0	19,11
	Z 250x3	252	78	69		3,00	9,77		12,33	1117	87,9	119,0	16,28
	Z 250x2,5	251	78	68		2,50	8,16		10,25	927	72,9	99,9	13,61
	Z 250x2	250	77	67		2,00	6,53		8,16	734	57,8	78,9	10,82
	Z 250x1,75	250	77	67		1,75	5,73		7,14	645	50,7	69,7	9,53
	Z 250x1,5	251	77	67		1,50	4,95		6,13	560	43,9	60,9	8,28
Z 200	Z 200x4	204	73	63	21	4,00	11,04	0,71	13,92	836	81,3	120,1	17,99
	Z 200x3	203	72	62		3,00	8,30		10,48	631	61,4	91,7	13,74
	Z 200x2,5	203	72	61		2,50	6,96		8,75	529	51,2	77,0	11,49
	Z 200x2	202	71	60		2,00	5,56		6,96	419	40,6	60,7	9,13
	Z 200x1,75	202	70	59		1,75	4,86		6,06	364	35,3	51,6	7,85
	Z 200x1,5	202	70	59		1,50	4,18		5,19	313	30,3	44,7	6,78
	Z 180x2,5	182	66	60	21	2,50	6,38	0,66	8,02	392	42,8	65,5	10,54
Z 180	Z 180x2	181	65	59		2,00	5,10		6,38	310	34,0	51,6	8,37
	Z 180x1,75	180	65	59		1,75	4,47		5,57	269	29,6	45,7	7,39
	Z 180x1,5	180	65	59		1,50	3,85		4,77	231	25,4	39,6	6,38
	Z 180x1,25	180	65	59		1,25	3,22		3,97	193	21,2	33,3	5,35

Effective section properties: on demand
Detailed perforation possibilities, see p. 21,29 & 33



SECTION								GROSS CROSS SECTION PROPERTIES				
Section Type	Section name	h (mm)	b (mm)	c (mm)	t (mm)	G (kg/m)	A _{paint} (m ² /m)	A (cm ²)	I _y (cm ⁴)	W _y (cm ³)	I _z (cm ⁴)	W _z (cm ³)
C 200	C 200x4	200	80	25	4,00	11,91	0,79	15,03	908,6	92,72	125,33	23,64
	C 200x3,5				3,50	10,52		13,26	808,6	82,31	112,72	21,18
	C 200x3				3,00	9,09		11,45	704,1	71,48	99,16	18,56
	C 200x2,5				2,50	7,64		9,60	595,0	60,25	84,90	15,78
	C 200x2				2,00	6,16		7,71	481,4	48,63	69,16	12,84
	C 200x1,5				1,50	4,66		5,78	363,2	36,59	52,65	9,73
C 170	C 170x3	170	60	15	3,00	6,97	0,62	8,79	374,3	44,82	37,22	8,87
	C 170x2,5				2,50	5,87		7,39	317,9	37,96	32,16	7,63
	C 170x2				2,00	4,75		5,95	258,5	30,77	26,57	6,27
	C 170x1,75				1,75	4,17		5,21	227,3	27,02	23,54	5,54
	C 170x1,5				1,50	3,60		4,47	195,7	23,23	20,41	4,79
	C 170x1,25				1,25	3,01		3,72	163,5	19,38	17,18	4,02
C 150	C 150x2,5	150	50	12	2,50	4,97	0,52	6,26	204,5	27,73	17,80	5,01
	C 150x2				2,00	4,02		5,05	166,9	22,55	14,83	4,15
	C 150x1,75				1,75	3,54		4,42	147,0	19,83	13,19	3,68
	C 150x1,5				1,50	3,05		3,79	126,7	17,07	11,48	3,19
	C 150x1,25				1,25	2,56		3,16	106,1	14,26	9,69	2,68
C 140	C 140x4	140	90	32	4,00	11,10	0,72	14,00	440,1	64,72	163,06	31,21
	C 140x3			28	3,00	8,29		10,44	338,4	49,40	121,44	22,55
	C 140x2,5			26	2,50	6,89		8,67	284,7	41,40	100,51	18,38
	C 140x2			26	2,00	5,56		6,97	230,8	33,45	81,99	14,94
C 100	C 100x2,5	100	50	12	2,50	3,99	0,42	5,04	78,8	16,16	15,60	4,79
	C 100x2				2,00	3,24		4,07	64,6	13,19	13,00	3,96
	C 100x1,75				1,75	2,85		3,57	57,0	11,61	11,50	3,51
	C 100x1,5				1,50	2,46		3,06	49,3	10,01	10,07	3,05
	C 100x1,25				1,25	2,07		2,55	41,3	8,37	8,50	2,52
	C 100x1				1,00	1,67		2,04	33,2	6,71	6,88	2,07
C 80	C 80x2,5	80	40	12	2,50	3,20	0,35	4,04	39,5	10,20	8,20	3,26
	C 80x2				2,00	2,61		3,28	32,6	8,37	6,90	2,72
	C 80x1,5				1,50	1,99		2,48	25,1	6,38	5,38	2,10
	C 80x1,25				1,25	1,68		2,07	21,1	5,35	4,57	1,78
	C 80x1				1,00	1,35		1,65	17,0	4,30	3,71	1,43

Base material: S390 GD + pregalvanised Z275 (Following EN 10346)
Alternative grades or coating available on request



SECTION							GROSS CROSS SECTION PROPERTIES				
Section Type	Section name	h (mm)	b (mm)	t (mm)	G (kg/m)	A _{paint} (m ² /m)	A (cm ²)	I _y (cm ⁴)	W _y (cm ³)	I _z (cm ⁴)	W _z (cm ³)
U 150	U 150x2,5	156	54	2,50	4,98	0,52	6,25	220	28,65	16,58	3,96
	U 150x2	155	55	2,00	4,02		5,03	177	23,19	14,08	3,30
	U 150x1.75			1,75	3,53		4,40	156	20,32	12,37	2,89
	U 150x1.5	154	56	1,50	3,05		3,78	133	17,50	11,16	2,56
	U 150x1.25			1,25	2,55		3,14	111	14,57	9,31	2,14
U 100	U 100x2,5	106	54	2,50	4,00	0,42	5,02	89	17,20	14,74	3,77
	U 100x2	105	55	2,00	3,24		4,05	72	13,92	12,50	3,14
	U 100x1,75			1,75	2,84		3,55	63	12,22	10,99	2,75
	U 100x1,5	104	56	1,50	2,46		3,05	54	10,51	9,90	2,44
	U 100x1,25			1,25	2,07		2,56	46	8,88	8,67	2,10
U 80	U 80x2	85	45	2,00	2,61	0,35	3,27	37	9,05	6,72	2,08
	U 80x1,5		44	1,50	1,95		2,42	28	6,71	4,79	1,50

Effective cross section properties: on demand
Detailed perforation possibilities, see pag. 35, 56-61, 81

HEADQUARTER:

BELGIUM

Bruggesteeweg 60
8830 Hooglede-Gits, Belgium
T. +32 51/26 12 11
F. +32 51/26 13 01
bouw@sadef.com

REPRESENTATIVE OFFICES:

THE NETHERLANDS

W. Witsenplein 4
2596 BK Den Haag,
The Netherlands
T. +31 70/324 28 02
F. +32 51/26 16 13
bouwnl@sadef.com

FRANCE

188 Grande Rue Charles de Gaulle
CS 30001
94736 Nogent sur Marne cedex, France
T. +33 1/43 24 60 11
F. +33 1/43 24 60 01
batimentfrance@sadef.com

GERMANY

Franz-Tilgner-Straße 10
50354 Hürth, Germany
T. +49 22 33/20 11 48
F. +49 22 33/20 28 85
bauprofile@sadef.com

SPAIN

C. Galileo, 303-305 4a
08028 Barcelona, Spain
T. +34 93/394 44 60
F. +34 93/439 89 27
sades@sadef.com

