

TATA STEEL



Urban Seam® Façade specification guide

Limited combustibility wall system suitable
for use on buildings over 18m tall



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1 INTRODUCTION

Following the Hackett Review, Part B of the Building Regulations was amended in August 2019. For buildings over 18m tall, Part B of the Building Regulations was revised to state:

Materials which become part of an external wall, or specified attachment, of a relevant building are of European Classification A2-s1,d0 or A1 , classified in accordance with BS EN 13501-1:2007=A1:2009.

A “relevant building” means a building with a storey (not including roof-top plant area or any storey consisting solely of plant rooms) at least 18 metres above ground level and which

- i. Contain one or more dwellings
- ii. Contains an institution; or
- iii. Contains a room for residential purposes (excluding any room in a hotel, hostel or boarding house)

Tata Steel has taken its non-combustible Urban Seam® cladding sheet and incorporated it into a façade system comprising products that are classified as A1 or A2-s1,d0 and therefore meet the requirement of the latest Building Regulations set out above.

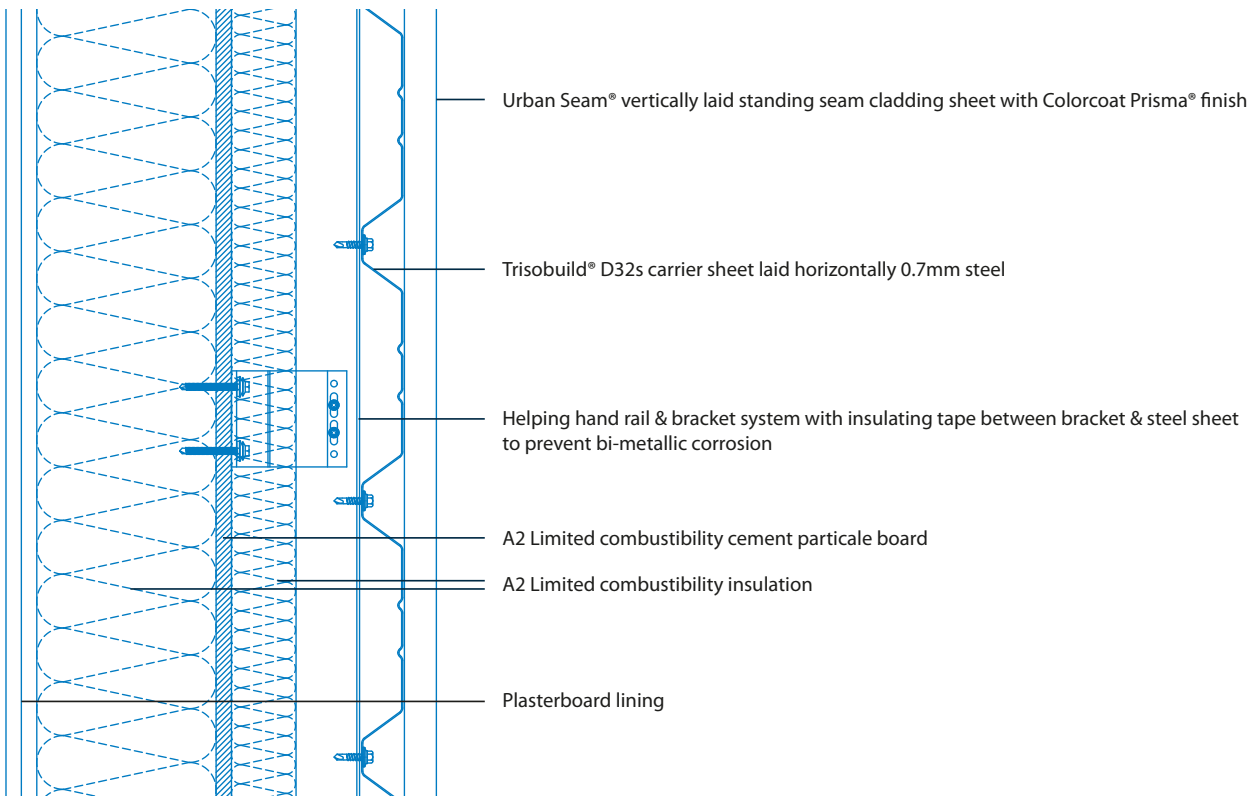
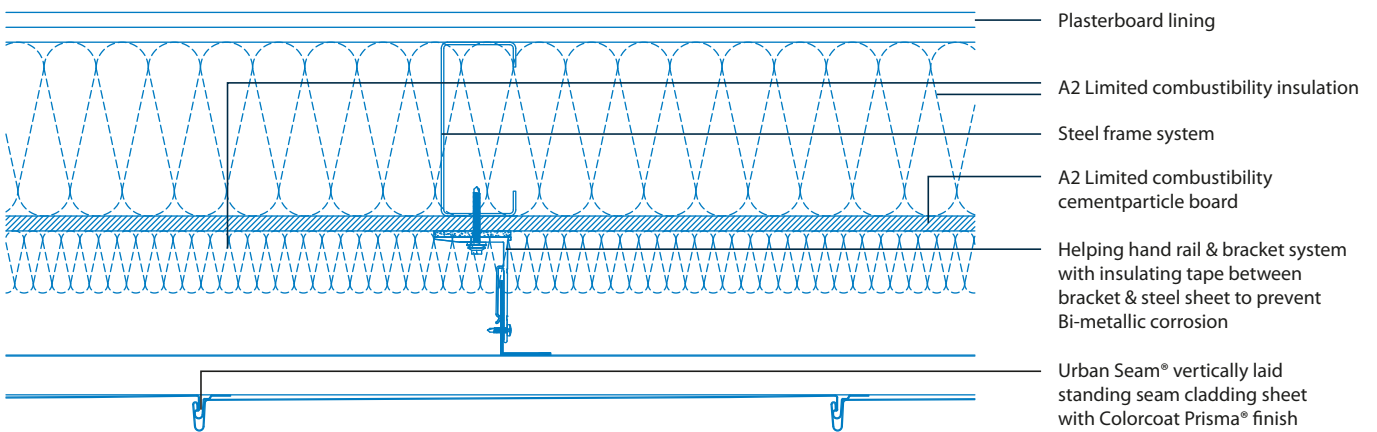
The system has been independently verified by full scale CWCT testing for wind resistance, water tightness and hard & soft body impacts.

2 BUILD UP

Fully supported standing seam cladding systems are typically supported by and fixed back to continuous plywood or OSB backing board. In the Urban Seam® Façade system the combustible backing board has been replaced by a non-combustible profiled steel deck. The profiled steel deck is fixed back to a helping hand rail and bracket system which in turn is fixed back to a typical steel frame system.

All insulation, sheathing boards and plasterboard used must also be classified as A1 or A2-s1,d0.

Fig.1 Urban Seam® Façade build up



3 COMPONENTS

Outer sheet

Urban Seam® profile

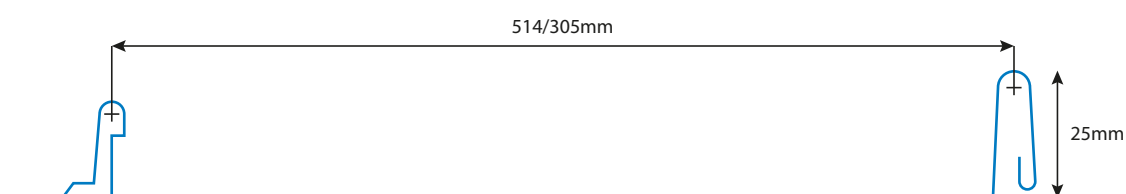
CE Marked to BS EN 14783:2013

Material: Colorcoat Prisma® with 0.7mm galvanised steel substrate (BBA Certificate available on our website www.tatasteelconstruction.com)

Cover widths: 305mm or 514mm

Sheet lengths: 1m to 12.5m

Fixed back to profiled steel backing sheet with fasteners at typically 180mm centres

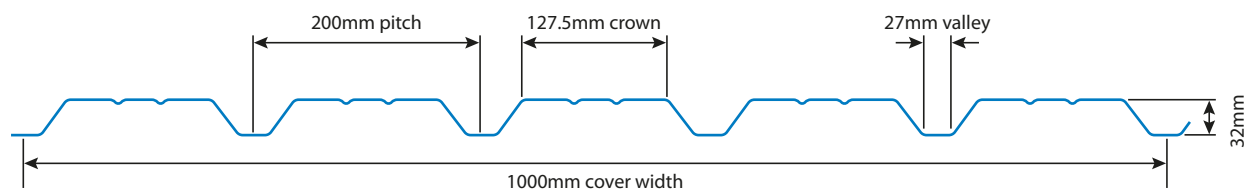


Decking profile

Trisobuild® D32s carrier

CE Marked to BS EN 1090-1

Supplier: Tata Steel



Material specification: Tata Steel 0.7mm Galvatite®, hot dip zinc coated steel EN 10326-S280+ZA80 substrate

Available Finishes:

- S280 + Z150 with a Colorcoat® PE 15 (15 micron polyester) white liner finish.
- S280 + Z275 plain galvanised finish.

Sheathing board

The sheathing board used on the outer face of the steel frame system must be of limited combustibility as defined in Part B of the Building Regulations for England & Wales.

The sheathing board will influence the fire resistance of the overall wall and the exact specification should be determined to suit the requirements of the project.

Insulation

1. Between Trisobuild® D32s carrier sheet and steel frame system
2. Within the steel frame system

Insulation must be of limited combustibility as defined in Part B of the Building Regulations for England & Wales

The exact U-value of the wall will be determined by the project specific build up but there are examples in section 4, showing typical U-values that can be achieved.

Plasterboard

Two layers of 12.5mm plasterboard with staggered joints are used on the internal face of the steel frame system.

Helping hand rail and bracket spacer system

Aluminium rail & bracket system
Fixed back to the steel frame system
Bracket depth (typically 120 - 200mm) to suit required insulation thickness.

Steel frame system

The steel frame system type and design will be project specific to suit structural, thermal, fire & acoustic requirements.

Fasteners

To comply with the our testing certification, the fasteners shown on the table below must be used.

Fasteners

Application	Manufacturer	Fastener code	Thickness of material being fixed to
Helping hand bracket to steel frame system (thru' sheathing board)	Ejot	LS 5.5x38 or LS 5.5x50	1.2 to 3.0mm
Trisobuild® D32s carrier sheet to steel rail	Ejot	JT3-3 5.5x25 S16	1.2 to 3.0mm
Trisobuild® D32s carrier sheet to aluminium rail	Ejot	JT3-3 5.5x25 S16	1.2 to 3.0mm
Urban Seam® to Trisobuild® D32s carrier sheet	Tata Steel	DS2 3.5x19	0.7mm

Specific pull out strengths are shown for each fastener type in Section 4 Performance.

4 PERFORMANCE

Structural

The overall structural performance of the system relies on the structural integrity of the individual components. The following gives the relevant structural performance of the individual components. We have also carried out independent full scale testing to CWCT and this is explained in detail later in this section.

Urban Seam®

Profile width (mm)	Allowable serviceability load (kN/m ²)	
	Suction	Imposed
305	2.4	2.4
514	1.6	2.4

Please note the 514mm wide Urban Seam® has been successfully been tested for a serviceability suction load of 2.4kN/m² but to limit deflection in the pan of the sheet we recommend it is only used for suction loads of up to 1.6kNm².

Trisobuild® 0.7mm D32s carrier sheet

Span Table - uniformly distributed loads (kN/m²)

	Span Condition	Span (m)						
		0.6	0.8	1.0	1.2	1.4	1.6	1.8
Imposed	Single	8.09	8.09	7.28	5.12	3.20	2.12	1.47
	Double	5.17	5.17	4.47	3.45	2.75	2.25	1.87
	Multi	6.08	6.08	5.27	4.08	3.27	2.68	2.25
Suction	Single	8.18	8.18	6.63	4.62	3.41	2.62	1.93
	Double	10.51	10.51	8.52	5.93	4.37	3.35	2.66
	Multi	12.75	12.75	10.34	7.19	5.30	4.06	3.22

Fastener pull out strengths

Rail and bracket spacer system to steel frame system (thru' sheathing board)

Manufacturer	Fastener code
Ejot	LS 5.5x38 or LS 5.5x50

Pull out strengths for LS 5.5x38 & LS 5.5x50 fasteners

Steel thickness (mm)	Ultimate pull out strength (kN)	Serviceability pull out strength (kN)
1.2	2.75	1.38
1.4	3.32	1.66
1.6	3.89	1.95
1.8	4.47	2.24
2.0	5.16	2.58
2.5	6.45	3.23
3.0	7.95	3.98

Serviceability pull out strengths include a safety factor 2

Trisobuild® D32s carrier sheet to rail and bracket spacer system

Manufacturer	Fastener code
Ejot	JT3-3 5.5x25 S16

Pull out strengths for JT3-3 5.5x25 S16 fasteners from steel

Steel thickness (mm)	Ultimate pull out strength (kN)	Serviceability pull out strength (kN)
1.2	2.75	1.38
1.4	3.32	1.66
1.6	3.89	1.95
1.8	4.47	2.24
2.0	4.62#	2.31#
2.5	4.62#	2.31#
3.0	4.62#	2.31#

Note: # = limited by pullover load of 15mm washer with 0.7mm steel sheet
Serviceability pull out strengths include a safety factor 2

Pull out strengths for JT3-3 5.5x25 S16 fasteners from 2.0mm aluminium

Steel thickness (mm)	Ultimate pull out strength (kN)	Serviceability pull out strength (kN)
2.0	1.153	0.577

Serviceability pull out strengths include a safety factor 2

Urban Seam® to Trisobuild® D32s carrier sheet

Manufacturer	Fastener code
Tata Steel	DS2 3.5x19

Pull out strengths for Trisobuild® DS2 3.5x19 fasteners from 0.7mm steel

Steel thickness (mm)	Ultimate pull out strength (kN)	Serviceability pull out strength (kN)
0.7	0.755 kN	0.378

Serviceability pull out strengths include a safety factor 2

Maximum recommended fixing centres for the Urban Seam® sheet based on serviceability pull out strength above

Panel width (mm)	Fixing centres (mm)	Maximum suction load (kN/m ²)
514	180	4.08
	240	3.06
	300	2.45
	360	2.04
305	180	6.88
	240	5.16
	300	4.13
	360	3.44

Serviceability pull out strengths include a safety factor 2

CWCT testing

In addition to reviewing the components individually, the complete Urban Seam® Façade system has been independently tested to CWCT standards for:

- Wind resistance - serviceability & safety
- Water tightness – dynamic pressure
- Impact resistance – soft & hard body

The large scale test set up comprised:

- A vertical helping hand rail and bracket system fixed through a sheathing board to vertical steel rails spaced at 600mm centres.
- Trisobuild® D32s carrier sheet fixed horizontally to the helping hand rails.
- Urban Seam® profile was fixed vertically to the Trisobuild® D32s profile.

The test included both 514mm and 305mm wide Urban Seam® sheets.



Wind resistance

The system was tested for: -

- Imposed loading
- Suction loading

During the test pressure was taken to an ultimate load of 3.6kN/m² for safety, giving a serviceability loading 2.4kN/m². Deflection was recorded during the test. At serviceability loads, short term deflection do not exceed L/200 with no residual deflection greater than 1mm.

Wind resistance test results

Sheet width (mm)	Wind resistance (kN/m ²)			
	Serviceability		Safety	
	Imposed	Suction	Imposed	Suction
305	2.4	2.4	3.6	3.6
514	2.4	2.4	3.6	3.6

Water tightness

The Urban Seam® Façade system was subjected to 600Pa of pressure from an aero engine while water was sprayed over the cladding system at 3.4 litres/m²/minute. No water penetrated the system.

Impact resistance

Hard and soft body impact tests were carried out classifying the system as shown below: -

Soft body impact test results

Impact energy (Nm)	Observations	Classification	
		Serviceability	Safety
		120	No damage
350	No damage	Class 1	Negligible risk
500	No damage	Class 1	Negligible risk

Hard body impact test results

Impact energy (Nm)	Observations	Classification	
		Serviceability	Safety
		3	Minor Indent
6	Minor Indent	Class 2	Negligible risk
10	Minor Indent	Class 3	Negligible risk

A full copy of the CWCT Test report is available on request.

Fire

The fire performance of the Urban Seam® Façade system is classified in terms of:

- Reaction to fire
- Fire resistance

Reaction to fire

Reaction to fire properties of a material describe how the material itself reacts in the case of fire. Reaction to fire tests are used to evaluate the contribution of a material to fire growth.

BS EN 13501-1: Fire classification of construction products and building elements, classifies products in 7 main categories based on their reaction to fire performance:

Class	Comments
A1	No contribution to a fire
A2	No significant contribution to fire growth
B	Very limited contribution to fire growth
C	Limited contribution to flashover
D	Contribution to flashover
E	Significant contribution to flashover
F	Not tested or incapable of achieving Class E

Building Height and Use

The Urban Seam® Façade system only uses components that are classified as A1 or A2-s1,d0 and therefore satisfies the requirements of the Building Regulations.

Distance from a relevant boundary

The external surface (i.e. outermost external material) of external walls should comply with the provisions of Table 10.1 of Part B of the Building Regulations. The provisions in Table 10.1 apply to each wall individually in relation to its proximity to the relevant boundary.

Table 10.1 Reaction to fire performance of external surface of walls

Building type	Building height	Less than 1000mm from the relevant boundary	1000mm or more from the relevant boundary
'Relevant buildings' as defined in regulation 7(4) (see paragraph 10.10)		Class A2-s1, d0 ⁽¹⁾ or better	Class A2-s1, d0 ⁽¹⁾ or better
Assembly and recreation	More than 18m	Class B-s3, d2 ⁽²⁾ or better	From ground level to 18m: class C-s3, d2 ⁽³⁾ or better From 18m in height and above: class B-s3, d2 ⁽²⁾ or better
	18m or less	Class B-s3, d2 ⁽²⁾ or better	Up to 10m above ground level: class C-s3, d2 ⁽³⁾ or better Up to 10m above a roof or any part of the building to which the public have access: class C-s3, d ⁽³⁾ or better ⁽⁴⁾ From 10m in height and above: no minimum performance
Any other building	More than 18m	Class B-s3, d2 ⁽²⁾ or better	From ground level to 18m: class C-s3, d2 ⁽³⁾ or better From 18m in height and above: class B-s3, d2 ⁽²⁾ or better
	18m or less	Class B-s3, d2 ⁽²⁾ or better	No provisions

Notes: In addition to the requirements within this table, buildings with a top occupied storey above 18m should also meet the provisions of paragraph 10.6.

In all cases, the advice in paragraph 10.4 should be followed.

1. The restrictions for these building apply to all the materials used in the external wall and specified attachments (see paragraphs 10.9 to 10.12 for further guidance).
2. Profiled or flat steel sheet at least 0.5mm thick with an organic coating of no more than 0.2mm thickness is also acceptable.
3. Timber cladding at least 9mm thick is also acceptable.
4. 10m is measured from the top surface of the roof.

The Urban Seam® Façade system uses Colorcoat Prisma® to form the outer sheet. Colorcoat Prisma® has a reaction to fire classification of A1 non-combustible and therefore satisfies all scenarios listed in table 10.1 above.

Fire resistance

Fire resistance is quoted in minutes and is a measure of one or more of the following:

- Integrity (E) - resistance to fire penetration
- Insulation (I) - resistance to the transfer of excessive heat

The extent of the fire resisting construction and standard of the fire resistance required will be set out in the relevant Building Regulations. A number of factors such as:-

- Building use
- Building size
- Proximity to a boundary

will determine the required level of fire resistance required.

Boundaries

At a boundary the required fire resistance of an external wall will in part depend on its distance from the relevant boundary

- External walls within 1000mm of the boundary require fire resistance from both sides
- External walls 1000mm or more from the boundary only require fire resistance from inside to outside.

The fire resistance of the system will be determined by the fire resistance of the steel frame system. By using different thicknesses and densities of insulation, and using different boards to clad the steel frame, each steel frame system supplier will have systems that can typically offer fire resistance from 30 minutes to 240 minutes.

Cavity barriers

Cavity barriers are used horizontally and vertically to restrict fire spread within cavity.

Horizontal cavity barriers

In ventilated cavities, open state horizontal cavity barriers are required. These allow air to flow past them but in the event of a fire, intumescent on the front of the cavity barrier expands to close the gap between the cavity barrier and the cladding panel. Horizontal cavity barriers are normally required at every compartment floor.

Vertical cavity barriers

Vertical cavity barriers are fitted tight to the back of the cladding panel and where necessary need to be cut to the fit the profile of the outer cladding panel. Building Regulations generally call for vertical cavity barriers at a maximum horizontal spacing of 20m while the National House-Building Council (NHBC) restrict the maximum spacing to 6m.

Thermal

Exact U-walls of the Urban Seam® Façade will be determined by the project specific build up but the 3 examples give typical U values that can be achieved. These should be used as guidance only.

Table title

Wall Build Up	Wall 1	Wall 2	Wall 3
Urban Seam®		0.7mm steel	
Trisobuild® D32s carrier sheet		0.7mm steel	
Vented cavity		50mm	
Insulation	60mm mineral wool	100mm mineral wool	160mm mineral wool
Sheathing board		12mm	
Insulation within steel frame		250mm mineral wool	
Lining		2 x 12.5mm plasterboard	
Finish		3mm Gypsum Plaster	
U-value (W/m²K)	0.21	0.18	0.15

5. DETAILS

The following details are available from Tata Steel in dwg and pdf format. A range of BIM Objects are also available.

Please visit www.tatasteelconstruction.com or contact the Colorcoat Urban® team on on +44 (0) 1244 892449 or E: colorcoaturban@tatasteel.com to request these details.

UCF-01-01	Bottom of Wall Option 1
UCF-02-01	External Corner Option 1
UCF-02-05	Internal Corner Option 1
UCF-03-02	Window Head Option 2
UCF-03-11	Window Cill Option 2
UCF-03-21	Window Reveal Option 2
UCF-09-01	Horizontal Joint Option 1

Other information available

Fastener Data Sheets

- EJOT LS 5.5
- EJOT JT3-3
- Colorcoat Urban® DS2 3.5x19

www.tatasteelconstruction.com

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