

Product Technical Submission: Install® Plus 235

BS EN10255/10217-2 Grade S/P 235 GT/GH Hot-finished Carbon Steel Tube.

Install® Plus 235 hot-finished, multi-standard tube has been specifically developed to satisfy a wide range of building, mechanical and industrial services pipework applications, pressures and temperatures.

Hot-Part-2 for uniform stress-free and consistent mechanical properties, improved service life and enhanced ductility compared to comparable commodity cold-formed alternatives.



1. Tata Steel

- Tata Steel is the UK's largest manufacturer of premium, high quality, carbon steel tubes.
- Our **Install® Plus 235** hot-finished (Hot-Part-2) is made at our manufacturing site in Corby, Northamptonshire, UK using steel strip, also made by Tata Steel in Port Talbot, South Wales, UK.
- As we manufacture both the steel and the tube, we can ensure full product traceability as well as control and consistency of steel and product properties and characteristics.
- Our hot-finished tubes are multi-standard and validated for elevated temperatures to help satisfy the widest range of pipework applications.

2. Hot-finished for proven benefits

- As our **Install® Plus 235** High Frequency Welded (HFW) tubes are hot-finished, they do not contain a Heat Affected Zone (HAZ), a highly stressed area of weakness adjacent to the weld line.
- They can therefore be more readily manipulated without the risk of failure, have improved weldability and pressure integrity and deliver improved performance and service life compared with cold-formed alternatives.

3. Multi-standard - making life easier

- By manufacturing and testing to the highest quality standards, we are able to provide a tube that covers the widest range of application and end-user requirements.
- Not only does **Install® Plus 235** meet the key BS EN10255 standard requirements (and that of the new draft prEN10255), it also covers those of BS EN10217-2:2019 Grade P235GH.
- This ensures a product that can be CE marked under the Construction Products Regulations (CPR) and is also harmonised with the Pressure Equipment Directive (PED).
- Specifying a BS EN10217-2 (Part 2) tube grade is the only way to technically ensure that a hot-finished GH (Get Hot) product is supplied, one that is also validated for above ambient / elevated temperature use.

4. Product statements – Install® Plus 235

- Is the perfect replacement for the old, and now withdrawn, BS1387, that is frequently, but incorrectly still specified.
- Uses a new stronger and more robust 235MPa steel in place of the old BS1387 195MPa grade.
- Is available in sizes 15nb (1/2") to 150nb (6") in both MEDIUM and HEAVY weight.

- Hot-finished for improved manipulation, installation, performance and service life benefits.
- Is multi-standard to satisfy a wider range of applications, including seamless substitution.
- Has a design temperature of: -20 to 300°C.
- Is available with: Plain, Screwed and Socketed, or Grooved end finishes.
- Can be supplied with: Red Painted (external), or Galvanised (internal and external) coatings. Self-coloured may be available upon request.

5. Servicing a wider range of applications

- **Install® Plus 235** has been specifically developed for use in a wide range of building and industrial services applications (please refer to our full technical literature for examples of typical applications).

6. Compliance statements

- **Install® Plus 235** is CE marked to CAT 3 (fuel, air, gas) & 4 (water) under the Construction Products Regulations (CPR), fully harmonised with the Pressure Equipment Directive (PED), and is technically compliant for use at high and elevated temperatures.

7. Product technical data

Size range

Thread size	Specified Outside Diameter			Thickness (mm)								
R (inch)	OD (mm)	NB	2.0	2.3	2.6	2.9	3.2	3.6	4.0	4.5	5.0	5.4
½	21.3	15			Medium		Heavy					
¾	26.9	20			Medium		Heavy					
1	33.7	25					Medium		Heavy			
1 ¼	42.4	32					Medium		Heavy			
1 ½	48.3	40					Medium		Heavy			
2	60.3	50						Medium		Heavy		
2 ½	76.1	65						Medium		Heavy		
3	88.9	80							Medium		Heavy	
4	114.3	100								Medium		Heavy
5	139.7	125									Medium	Heavy
6	165.1	150									Medium	Heavy

Key characteristics

Steel Name	C max	Mn max	P max	S max	Upper Yield Strength ReH min (MPa)	Tensile Strength Rm (MPa)	Elongation A min %
S235GT/P235GH	0.16	1.2	0.025	0.020	235	360 to 500	27

Tube weight (dry tube)

					Medium weight			Heavy weight					
OD		Nominal bore (NB)		Outside diameter (OD)		Wall thickness (T)		Weight per metre		Wall thickness (T)		Weight per metre	
						Plain end/ grooved tube		Screwed & socketed		Plain end/ grooved tube		Screwed & socketed	
mm	mm	inch	Max mm	Min mm	mm	kg/m	kg/m	mm	kg/m	kg/m	mm	kg/m	kg/m
21.3	15	1/2	21.8	21.0	2.6	1.2	1.2	3.2	1.4	1.5			
26.9	20	3/4	27.3	26.5	2.6	1.6	1.6	3.2	1.9	1.9			
33.7	25	1	34.2	33.3	3.2	2.4	2.4	4.0	3.0	3.0			
42.4	32	1 ¼	42.9	42.0	3.2	3.1	3.1	4.0	3.8	3.8			
48.3	40	1 ½	48.8	47.9	3.2	3.6	3.6	4.0	4.4	4.4			
60.3	50	2	60.8	59.7	3.6	3.0	5.1	4.5	6.2	6.3			
76.1	65	2 ½	76.6	75.3	3.6	6.4	6.5	4.5	7.9	8.1			
88.9	80	3	89.5	88.0	4.0	8.4	8.5	5.0	10.3	10.5			
114.3	100	4	115.0	113.1	4.5	12.2	12.5	5.4	14.5	14.8			
139.7	125	5	140.8	138.5	5.0	16.6	N/A*	5.4	17.9	N/A*			
165.1	150	6	166.5	163.9	5.0	19.8	N/A*	5.4	21.3	N/A*			

*We do not supply 5" and 6" screwed and socketed products.

Pressure integrity

Tube size			(A) Suggested maximum design (bar) for screwed and socketed joints Correctly made-up using suitable appropriate jointing compounds						(B) Suggested maximum design pressure (bar) for tube or full penetration butt-welded joints Butt-welded joints prepared in accordance with current best practice (based on S235GT/P235GH mechanical properties)								
			Water -20 up to 100°C		Compressed air		Steam to 220°C*		-20 to 60°C		100°C max		150°C max		300°C max		
OD		Nominal bore (NB)		Tube weight (M = Medium, H = Heavy)						Tube weight (M = Medium, H = Heavy)							
mm	mm	inch	M	H	M	H	M	H	M	H	M	H	M	H	M	H	
21.3	15	½	80	100	70	90	20	22	233	270	190	234	182	225	128	158	
26.9	20	¾	75	90	65	80	20	22	186	215	152	187	146	179	103	126	
33.7	25	1	70	85	60	75	20	22	172	215	149	186	143	179	101	126	
42.4	32	1 ¼	55	70	50	65	19	21	137	171	119	148	114	143	80	100	
48.3	40	1 ½	45	60	40	55	19	21	120	150	104	130	100	125	71	88	
60.3	50	2	40	55	35	50	17	19	109	136	94	118	91	113	64	80	
76.1	65	2 ½	35	45	30	40	17	19	86	108	75	93	72	90	51	63	
88.9	80	3	30	40	25	35	17	19	82	103	71	89	68	85	48	60	
114.3	100	4	25	35	20	30	15	17	72	86	62	75	60	72	42	51	
139.7	125	5	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	65	70	57	61	54	59	38	41	
165.1	150	6	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	55	60	48	52	46	50	32	35	

Pressure data for guidance only - actual pressures obtained will be a function of the joint used. S&S use may be restricted for some applications - please check.

*Please contact us to confirm other steam operating temperatures and pressures.

8. Internal weldbead removed

- All **Install® Plus 235** products above 25NB are fully trimmed, providing a clear, unrestricted tube bore.

9. Coating data – Red Paint

- Install® Plus 235** can be supplied red painted. This coating has been specifically developed and provides significantly enhanced corrosion resistance and excellent robustness for better mechanical handling performance. It is also more environmentally friendly than our previous red paint offering.
- Tubes are shot-blasted prior to painting to provide an enhanced degree of adhesion. We have also conducted salt-spray and humidity tests to confirm corrosion resistance – REF TATA STEEL TUBES PRODUCT DATA SHEET TST73 for full details.

10. Coating data – galvanised:

- Install® Plus 235** can also be supplied galvanised. We employ a hot-dipped galvanised process to BS EN ISO1461. A typical average coating thickness for this process is >85 microns. REF TATA STEEL TUBES PRODUCT DATA SHEET TST60 for full details.

11. Fire ratings

- Install® Plus 235** is Class A1 fire rated and is therefore classified as non-combustible in a fire and does not have to undergo additional testing to demonstrate suitability and reaction to fire. REF TATA STEEL TUBES PRODUCT DATA SHEET TST67 for full details.

12. Life expectancy and warranty

- The lifespan of any carbon steel tube is dependent on a range of factors, including the specific service conditions, a satisfactory installation practice, a proper maintenance procedure and the use of appropriate corrosion protection, inhibitors or other suitable practices.
- Properly installed and protected **Install® Plus 235** can have a service life of +25 years. Service life of +40 years may be possible, depending on the application or the use of protective wraps, or other protection strategies.

- Tata Steel can advise on actual life expectancy if we fully understand the application and service conditions that our product will be exposed to. REF TATA STEEL TUBES PRODUCT DATA SHEET TST60 for full details.

13. Tube mechanical suitability

- Unlike some cold-formed tubes, **Install® Plus 235** hot finished tubes are suitable for threading, grooving, bending and flaring and are fully compatible with commercially available fittings.

14. Temperature range

- Install® Plus 235** is suitable for design temperatures from -20 to +300°C, and is supplied in accordance with BS EN10217-2, with guaranteed elevated temperature properties, in accordance with Part 2 Table 5, up to and including 300°C (only Part 2 Hot-finished Tubes can be validated to Table 5, alternative cold-formed tubes are tested for ambient only).

15. Weight and cost saving

- Our fully traceable 235MPa grade of steel also provides the opportunity for cost and weight savings through providing enhanced pressure containment by using a stronger medium weight instead of a traditional 195MPa heavy thickness.

16. Declaration of Performance (DOP) summary

- REF TATA STEEL TUBES PRODUCT DATA DOP for full details – available from our website, or by contacting us directly.

Declaration of Performance (according to Regulation EU No 305/2011)							
Unique ID code	TST InstallPlus235 Hot finished welded carbon steel tubes [Grade S195T / 1.0026]						
Harmonised standard	EN 10255:2004+A1:2007 - Non-Alloy steel tubes suitable for welding and threading - Technical delivery conditions (issued on the Official Journal of the European Union on 01/01/2010)						
Intended use	To be used in either intended use described in the harmonized standard (see table below). This product is supplied with a non-specific inspection document 2.2 (according to EN 10204).						
<table border="1"> <thead> <tr> <th>Intended use</th> <th>AVCP System</th> </tr> </thead> <tbody> <tr> <td>In installations for the transport/distribution/storage of gas/fuel intended for the supply of building heating/cooling systems, from the external storage reservoir or the last pressure reduction unit of the boiler/heater/cooler system(s) of the building(s)</td> <td>3</td> </tr> <tr> <td>In installations for the transport/disposal/storage of water, not intended for human consumption.</td> <td>4</td> </tr> </tbody> </table>		Intended use	AVCP System	In installations for the transport/distribution/storage of gas/fuel intended for the supply of building heating/cooling systems, from the external storage reservoir or the last pressure reduction unit of the boiler/heater/cooler system(s) of the building(s)	3	In installations for the transport/disposal/storage of water, not intended for human consumption.	4
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In installations for the transport/disposal/storage of water, not intended for human consumption.	4						
Manufacturer TATA STEEL UK LIMITED Notified body No. 0464 Centro de Apoio Tecnológico à Indústria Metalomecânica (CATIM) Rua dos Plátanos 197 4100 – 414 Porto, Portugal Tel +351/226 159 000 Email : catim@catim.pt Website : www.catim.pt							
Notified No. 0620 Kiwa N.V. Certificatie en Keuringen Sir Winston Churchillaan 273 Postbus 70 2280 AB RIJSWIJK The Netherlands Tel +31:70:41 44 400 Email : certif@kiwa.nl Website : www.kiwa.nl							

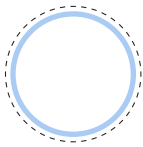
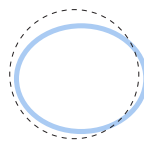
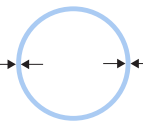
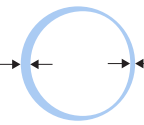
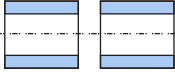
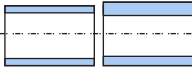


Essential characteristic	Performance	Harmonised technical specification	
Dimensional tolerances	In accordance with EN 10255:2004	EN 10255:2004 +A1:2007	
Reaction to Fire	Euroclass A1 (steel)		
Yield strength	Nominal thickness (mm)		Values Min (MPa)
	≤ 5.4		235 (a)
Durability	Durability is dependent on the method of protection and/or the type and thickness of the coating.		
(Leak) tightness gas & liquid	Yes		
Notes: (a) Declared performance is above the minimum allowed by the standard (195)			

Other characteristics	Performance	
Tensile strength	Nominal thickness (mm)	Values (MPa)
	≤ 5.4	min 320 max 520
Weldability	Nominal thickness (mm)	Composition (cast) max.
	≤ 5.4	C: 0.20, Mn: 1.40, P: 0.035, S: 0.030
Elongation (longitudinal)	Nominal thickness (mm)	Values min (%)
	≤ 5.4	20

 0464 (DN15 to DN25) 0620 (DN32 or higher)	
TATA STEEL UK LIMITED Registered in England No. 2280000 Registered office: 18 Grosvenor Place, London, SW1X 7HS, UK 13 TST InstallPlus235 Hot-finished welded carbon steel tubes [Grade S195T / 1.0026]	
EN 10255:2004 To be used in either intended use described in the harmonized standard (see DoP). This product is supplied with a non-specific inspection document 2.2 (according to EN 10204). Dimensional tolerances: Pass Reaction to fire: Euroclass A1 (steel) Yield strength (min.): 235 MPa (a) Durability: Yes (see DoP) (Leak) tightness gas & liquid: Yes Dangerous Substances: No Performance Determined	

17. An alternative to seamless tubes

- **Install® Plus 235** hot-finished (GH grade) has the same composition; steel grade designation and steel number as comparable hot-finished seamless products, and therefore may be considered as a cost effective alternative.
- **Install® Plus 235** is an ideal substitute for comparable hot-finished carbon steel seamless products, delivering real benefits, and providing the flexibility to service both welded and seamless market requirements.
- HFW (High Frequency Welded) tubes have a number of technical advantages over seamless, such as improved ovality, and more consistent wall thicknesses and length control, thereby delivering improved end matching and installation benefits.

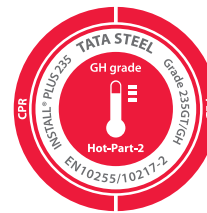
	Advantages of HFW Welded	Disadvantages of Seamless
Ovality	 Consistent roundness	 Out of roundness
Wall	 Consistent thickness	 Inconsistent thickness
End matching	 Consistent	 Inconsistent
Length tolerances	 Fixed length as standard (mm)	 Random length as standard (mm)

18. Technical support

- For any technical enquires or requests for further information, including **Install® Plus 235** technical brochures and training packages, please contact the Tubes Technical Helpline on **+44 (0) 1536 404561**

19. Additional information

- BIM (Building Information Modelling). For **Install® Plus 235** BIM models please scan the QR below.
- Our **Install® Plus 235** product brochure (Install Plus® 235 & Inline™ 265 Mini Guide – Ref TST186) provides confirmation of the information contained within this document. This can be downloaded from our website, please scan the QR below to get to our product landing page, which contains additional data and training animations. Alternatively, please contact our technical team for a copy.



www.tatasteelconstruction.com/hotvscold

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