LTC
Installation
2021

Single/Twin Wall LTC
Insulated Flue System

For: Condensing
Pressure
Gas and light oil
Applications

Made in the UK.
100mm to 400mm
available

0333 456 8000
www.midtherm.co.uk

Midtherm
Flue Systems Ltd.

Contents

Product Testing

CE Mark – 2797-CPR-566560 UKCA Mark – 0086-CPR-781387

Test	Report Numbers	Products
BS EN 1856-1	BSRIA 59351/1 and 2	LTC Range SW and TW (Single wall tested to cover both SW and TW)
BS 476 Part 20	BRE - P108728-1000	TW-LTC has a 4 Hour fire rating for integrity

Regulatory / Guidance Documents

The designation of TW-LTC system chimney is in accordance with	EN 1856-1
The installed chimney shall be designated according to	EN 1443

In addition to the information in this document, please refer to regulatory and guidance documents to ensure that systems comply with relevant guidelines. A list of some relevant documents is available from the sales office.

1. Product installation instructions, other product information if available.
2. Appliance manufacturer's brochure, installation, operation and maintenance manual.
3. Building Regulations Document J – Heat producing appliances.
4. BS EN 1443 – Chimneys – General requirements.
5. BS EN 1856-1 – Chimneys – Requirements for metal chimneys – Part 1: System chimney products.
6. BS EN 1856-2 – Chimneys – Requirements for metal chimneys – Part 2: Metal liners and connecting flue pipes.
7. BS EN 15287 – Chimneys – Design, installation and commissioning of chimneys.
8. BS EN 13384 Parts 1, 2 and 3 – Chimneys – Thermal and flue dynamic calculation methods.
9. BS 5854 – Code of practice for flues and flue structures in buildings (G, O, SF: <45kW).
10. BS 7566 Parts 1, 2, 3 and 4 – Installation of factory-made chimneys to BS 4543 (G, O, SF).
11. BS 5440 Parts 1 and 2 – Installation and maintenance of flues and ventilation for gas appliances of rated input not exceeding 70kW net (1st, 2nd and 3rd family gases) (G,).
12. BS 6644 Specification for installation of gas-fired hot water boilers of rated inputs between 70kW (net) and 1.8MW (net) (2nd and 3rd family gases) (G,).
13. IGE/UP/10 - part 1 – Flued appliances. Installation of gas appliances in industrial and commercial premises.

LTC Product Types

SW-LTC - Single Wall Low Temperature Condensing
TW-LTC - Twin Wall Low Temperature Condensing

The range has laser seam welds down the length of components, elbows incorporate resistance seam welds. Tees are manually TIG welded.

Termination Heights

- Up to 60kW – Building Regulations Document J, (G, O, SF).
- Up to 150kW – BS 6644 (G,).
- Over 150kW – 1956 Clean Air Act Memorandum on Chimney Heights (Department of the Environment, (1981)), Environmental Protection Act 1990 Technical Guidance Note (Dispersion) D1 – Guidelines on discharge stack heights for polluting emissions, (G, O, SF).

Applications / Fuels / General

LTC has a Vm corrosion resistance classification and a 316L inner liner making it suitable for use in many industrial applications with equipment fired by gas, oil. LTC comes fitted with a seal making it suitable for use at lower temperatures with gas and light oil condensing appliances or under pressure (Installation instructions must be followed). Normal Maximum Continuous Operating Temperature is 250°C. This product doesn't contain any asbestos. COSHH Data sheets are available on request. LTC can be installed externally. LTC is not suitable for connection onto a solid fuel appliance.

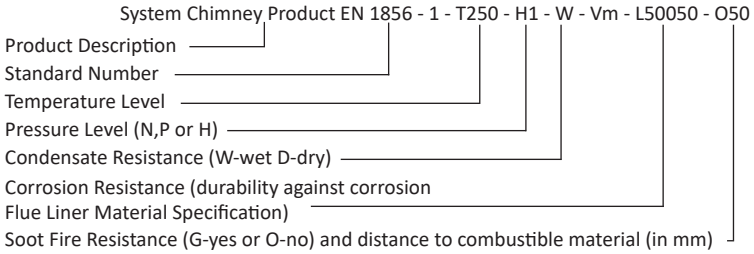
LTC Product and Installation Designations EN1856-1 and EN1443 Respectively

Temperature °C	Gas and Oil, dry or condensing applications with pressure:-	System Chimney product designations	Corresponding installation designations
250	5000Pa Positive	T250 **H1** W VmL50050 O50	T250 H1 W2 O50
400 (Seals must be removed)	Negative	T400 N1 D VmL50050 O70	T400 N1 D3 O70

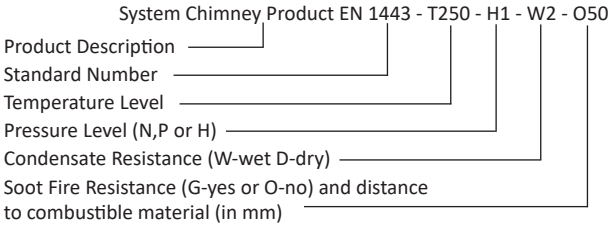
If in doubt please ask!

Technical Information

Product Designation System for system chimneys to EN 1856-1



Installation Designation System for system chimneys to EN 1443



LTC Product Data Material Specification

Material Specification	Material	Nominal Thickness (mm)	Minimum Thickness (mm)
Inner Lining	EN 1.4404 (316L)	0.5	0.45
Outer Casing for TW-LTC	EN 1.4301 (304)	0.5	0.45

The product thickness appears as a three figure number in the EN designation e.g. 0.5mm thick has a designation of 050.

TW-LTC Product Weights

	Diameter (mm)							
	100	130	150	180	200	250	300	350
Lengths 1000	5.77	6.15	7.23	8.14	9.35	11.48	13.67	15.76
Lengths 500	2.63	3.09	3.63	4.09	4.69	5.76	6.86	7.91
Lengths 300	1.59	1.87	2.19	2.47	2.83	3.47	4.14	4.77
Lengths 150	0.76	0.89	1.04	1.17	1.34	1.64	1.95	2.24
90°/87° Equal Tee	2.54	3.24	4.01	4.83	5.79	7.85	10.20	12.76
45° Tee	3.36	4.40	5.58	6.85	8.36	11.68	15.57	19.86
Tee Cap	0.55	0.60	0.65	0.80	0.88	1.08	1.28	1.48
Tee Cap with Drain	0.57	0.62	0.82	1.00	1.19	1.57	1.95	2.33
90°/87° Elbow	1.86	2.32	22.86	3.40	4.09	5.51	7.13	8.87
45°/42° Elbow	1.19	1.47	1.79	2.10	2.51	3.32	4.24	5.21
30° Elbow	1.08	1.31	1.58	1.83	2.16	2.81	3.53	4.27
15° Elbow	0.88	1.03	1.22	1.38	1.59	1.98	2.41	2.83
Adjustable Roof Plate	0.30	0.40	0.55	0.70	0.85	1.15	1.45	1.75
Flat Roof Plate	0.25	0.35	0.50	0.60	0.75	1.01	1.27	1.53
Cravat	0.11	0.12	0.13	0.14	0.15	0.18	0.23	0.28
Storm Collar	0.11	0.12	0.13	0.14	0.15	0.17	0.23	0.29
Rain Shield Cowl	1.00	1.20	1.45	1.80	1.95	2.68	3.28	3.88
Top Stub/Top Stub with Mesh	1.10	1.35	1.75	2.00	2.05	3.00	3.65	5.10
Split Clip Band	0.30	0.40	0.50	0.60	0.70	0.90	1.10	1.30
Wall Band	0.40	0.50	0.60	0.70	0.80	1.00	1.20	1.40
Appliance Connector/ TW-SW Adaptor	0.35	0.40	0.60	0.80	1.00	1.40	1.80	2.20
Fire Stop Spacer	0.50	0.60	0.75	0.90	1.05	1.35	1.65	1.95
Locking Bands	0.18	0.20	0.22	0.24	0.28	0.36	0.44	0.52

If in doubt please ask!

Thermal Resistance of TW-LTC Chimney

The Thermal Resistance figures below are based on the thermal conductivity of the different types of insulation at 200°C mean temperature and relate to the TW-LTC Product

Insulation Type	Mineral Wool	
Thickness	25mm	
Density	170kg/m³	80kg/m³
Thermal Conductivity at 200ºC Mean	0.068W/mK	0.066W/mK

Table showing thermal resistance in m²k/w of TW-LTC chimney for each diameter.

Internal Diameter	100	130	150	180	200	250	300	350
TW- LTC - Bulk 25mm -	0.37	0.34	0.38	0.35	0.38	0.30	0.40	0.40

Flow Resistance Factors of Chimney Lengths and Fittings TW & SW-LTC

The table below shows the surface roughness for lengths and the coefficient and resistance for fittings.

	Coefficient of Resistance								
Surface Roughness of lengths factor *r* (mm)	90/87 Tee	45 Tee	Capped 90/87 Tee	Capped 45 Tee	45/42 Elbow	30 Elbow	15 Elbow	90/87 Elbow	Dis-charge
0,001	1,2	0,3	2	0,5	0,3	0,2	0,1	0,6	1

Mechanical Resistance and Stability TW & SW-LTC

Compressive Strength

The recommended installation distance between load bearing supports is 6m. The following load bearing components will however take loads in excess of this and these are detailed in the table below: -

Where the building is to support the chimney, the building structure must be capable of supporting the load both vertically and laterally.

Telescopic base support, Intermediate wall support, support plate, support lengths, lengths, load in (m) of equal internal diameter product. (TW & SW-LTC)	Internal Diameter (mm)							
	100	130	150	180	200	250	300	350
Max Load, **A**	12m					8m		
Recommended Max Load, **B**	8m					6m		

Fittings

90º Tee 45º Tee Max Load (SW/TW-LTC)	Internal Diameter (mm)							
	100	130	150	180	200	250	300	350
	8m					6m		

Tensile Strength

It is not recommended that product be installed so that its tensile strength is tested however where there is no alternative the product has been tested with a 50kg load, therefore for the purpose of EN 1856-1 the tensile strength of the product is stated as 50/1.5kgs.
Also by riveting the product in accordance with these installation instructions (see "Forming Joints" section) the tensile strength is increased.

Supporting the flue

See Figure 1 and 2 for illustration of A to J dimensions
Lateral Strength

Loads in metres of equal internal diameter product (TW & SW-LTC)

Maximum distances exposed between types of supports	130 to 350mm ID inc.
A - Max Load	(See Previous Page)
B - Recommended Max Load	(See Previous Page)
C - Maximum vertical distance between lateral supports	4m
D - Recommended distance between lateral supports (Internally)	3m
E - Recommended distance between lateral supports (Externally)	3m
F - Recommended distance between lateral supports (Exposed installations e.g on masts)	2m
G - Maximum distance between non vertical supports	2m
H - Recommended distance between non vertical supports	1.5m
I - Maximum unsupported height above roof	2m
J - Recommended maximum unsupported height above roof*	1.5m

For TW-LTC structural locking bands may be used to provide additional stability. Above 1.5m and up to 3m a suitable guy wire kit or telescopic roof bracing kit should be used.
Above 3m alternative support arrangements may be required. Additional support may be required in areas that are exposed to high winds. TV and radio aerials must not be attached to the chimney. Riveting in accordance with installation instructions will also provide additional stability.
If the chimney is to be supported by a free-standing structure or windshield the construction of the support must comply with EN 13084-1.

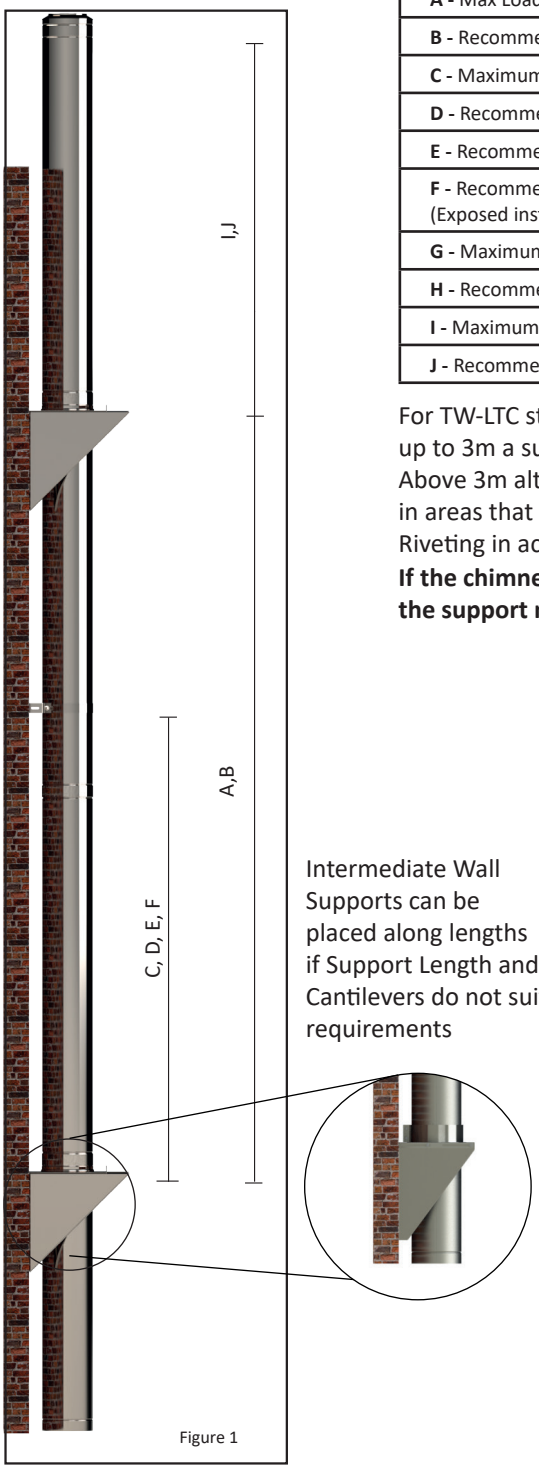


Figure 1

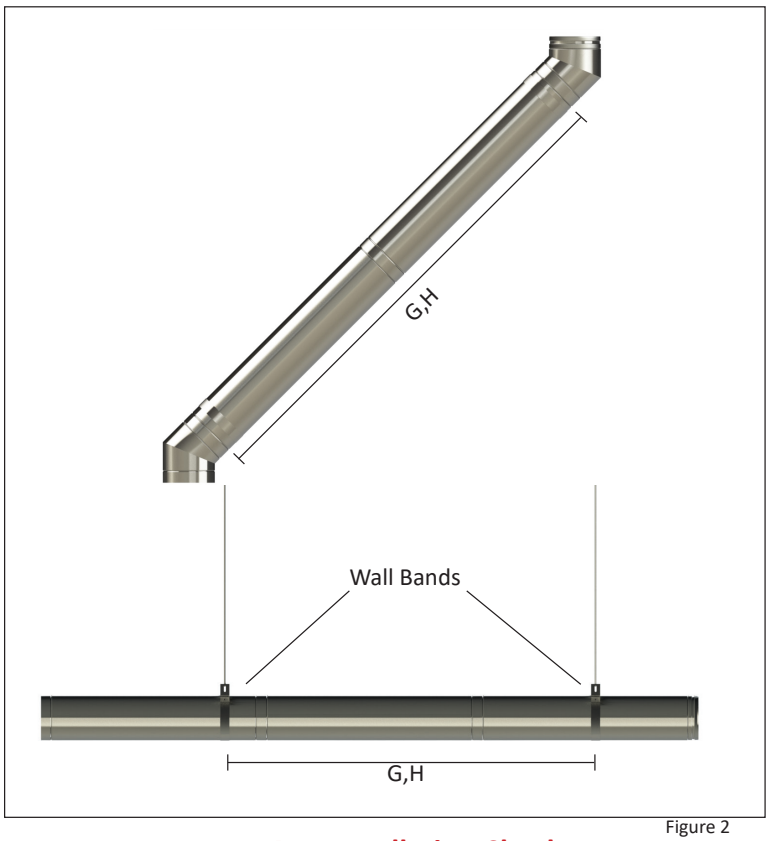


Figure 2

Handling and Storage

Products are to be stored in a suitable location (dry conditions on a level floor), and left in their packaging until immediately prior to installation. Products should be stored in a vertical position with the male end upwards. On cold hard floors, polythene or pallets should be located underneath stored items to avoid damp damaging the packaging.
If items are being delivered by transport other than that of Midtherm, special care should be taken to ensure that damage is not caused during transit.

Pre-Installation Checks

Check that all necessary instructions are on site with all the components. Check that the components are clean, dry and undamaged.
If items are to be powder coated, the powder coating company must be instructed to ensure that only the exterior of the product, when installed, should be coated. I.e. there should be no over spray on the connection joint externally and no spray on any internal / annulus areas. Over spray in these areas may compromise the pressure rating and could cause leaks, especially if the seal is affected. The maximum recommended temperature for powder coating is 200º C.

If in doubt please ask!

Installation Design

1. The chimney should be installed with a minimum of horizontal runs and offsets. A comprehensive drawing showing the order of installation of components should be available for the installation team. This is important to ensure quick installation time and negate the need for parts to be taken apart unnecessarily which could cause damage to the silicone seal. For oil fired appliances the distance between the bends should not exceed 20% of the vertical height of the chimney. CAD Blocks and drawing instructions are available, please contact sales. If the appliance is gas fired the distance between bends should not exceed half the vertical height of the chimney.

2. For minimum distance to combustible please refer to the table in the Test Arrangements section. Please note that distance to combustibles and fire stop and support plate requirements vary dependant upon whether the installation is SW/TW, enclosed, not enclosed, through combustible floors or non-combustible floors, temperature and the diameter of the product.

3. The chimney diameter should never be reduced to less than the diameter specified by the appliance manufacturer; in some cases this may involve an increase in diameter from the appliance spigot.

4. Ensure that adequate air is available for combustion. Refer to Building Regulations approved Document J.

5. Ensure chimney termination has adequate clearance from the roof of the building. Do not allow products of combustion to be discharged where they can enter an opening window or ventilation inlet.

6. It's good practice to install a minimum vertical riser of 600mm on to an appliance before fitting a bend. If connecting to a draught diverter, a vertical riser of at least 600mm must be installed immediately above the diverter, or as recommended by the appliance manufacturer.

7. The chimney should be adequately supported. A full range of support brackets are available. We recommend no more than 8m vertical rise between load bearing support brackets. Lateral support brackets should also be installed at 3m intervals or 2m if exposed (vertical riser), and 1.5m intervals (incline/ horizontal). For 400 mm Diameter and above additional supports may be required. The structure to which supports are to be fitted must be load bearing and adequate to take the weight of the products and any other loads imposed upon them.

8. Provisions for inspection/Cleaning must be made.

9. For Condensing applications, a fall MUST be maintained back to the appliance. Fully welded tees and elbows with inclined angles of 45/42° and 87° are available.

10. Joints within a floor or ceiling construction are prohibited.

11. Chimney components shall not be modified.

12. Chimneys penetrating walls shall be sleeved/shielded and weather proofed if though external walls.

13. Where required, lightning protection of the chimney shall be installed in accordance with EN 61024-1.

14. Fire stops spacers and ceiling supports must be installed as specified in these instructions.

15. Where there is a risk of combustibles being placed next to the chimney, the minimum distances to combustibles must always be maintained either by a permanent enclosure or shield.

16. Weather proofing where chimneys penetrate roofs shall be in accordance with these Installation Instructions.

17. The finished installation shall have a chimney plate.

18. On completion of the installation it should be commissioned in line with requirements of BS EN 15287 including a smoke test. Any fault must be rectified before the appliance is used.

19. Sufficient provisions must be made for draining condensate when required.

20. Installers must be competent to install for the particular application and also to handle the product.

21. The installation team must be instructed to check that seals are installed correctly at every joint.

22. SW-LTC should connect to TW-LTC as soon as possible along the system.

The above notes are an outline of only some of the aspects of good chimney installation practice. Building regulations and current design, Installation and maintenance standards must be complied with.

Condensate Drainage

Where condense is anticipated the flue route should allow for condense to either run back into the appliance, or a Tee + Tee Cap c/w Drain, should be installed at the base of the riser to allow condense to run from the chimney to a drain tube. For condensing appliances sufficient drains points must be installed at suitable intervals to correctly drain the anticipated condense levels of the appliance. Drain lengths and sump drain lengths are available to allow sufficient drainage throughout a system.

Openings

An opening into the chimney is necessary where it cannot be inspected through the appliance or where the chimney route includes offsets. This can be achieved via a Tee or an Inspection Length, depending upon the route from the appliance and the product range. Inspection lengths are available to order.

Lengths and fittings with pressure tight test points (socket and plug) can be made to order on request. Where required access shall be available so that the full length of the flue from the appliance adaptor to the chimney outlet can be cleaned and the chimney can be inspected. Openings must be located in areas where there is no risk from fire or explosion. Access must be provided where there is an offset of more than 30° or any other offset, which could not otherwise be inspected or cleaned. Cleaning access, draught regulation, appliance connection openings, etc. shall be separated by at least one internal diameter away from another, unless some other configuration has been tested.

Openings may be required for:
Cleaning and maintenance
Appliance performance testing
Draught control

Typical Installation

Clearance/Shielding

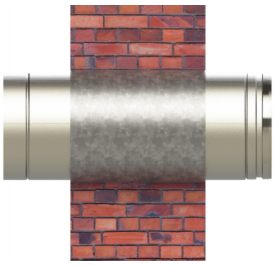
The installer should ensure that all electrical cabling, pipe work and any other obstructions are located so as not to disrupt the flue route. Any alterations that may be required to structural timbers, i.e. joists, should be carried out by a competent person to the relevant standard and allowing the specified minimum clearance from any combustible materials.

Floors

The minimum distance to combustible materials is 50mm for T250 applications and 70mm for T400 applications.

Walls

Where flues penetrate combustible walls the above distances to combustibles must be maintained using a wall sleeve. Through a cavity wall a sleeve should be used to contain any infill. The enclosure should be capped with a trim plate on either side of the wall and you should ensure a water tight seal on the external wall.



Other areas where contact with combustibles is a risk

Wherever there is a risk of combustibles falling or being placed against a chimney either an enclosure should be built or a shield installed around the chimney at the minimum distances stated above.

Commissioning, Operation and Maintenance

Once correctly installed the flue should be operated and maintained correctly.

1. Ensure that the appliance is running as efficiently as possible. An increase in fuel consumption, smoke in the building, evidence of sooting, difficulty in lighting, and staining around the appliance casing generally indicates a problem either with the appliance or a blockage in the system may have occurred.
2. Ensure that the appliance is maintained in accordance with its manufacturer's instructions.
3. Do not use cleaning chemicals on the flue.
4. Do not block or obstruct flue outlets or chimneys.
5. Do not cover an appliance.
6. Ensure that the appliance is run in accordance with the manufactures operating instructions. Failure to do so may result in increased acid levels in the condensate which may shorten the product life.
7. The following checks are to be carried out on commissioning and on a regular basis thereafter. (The frequency of inspections will be determined by your installer but will be annually as a minimum): -

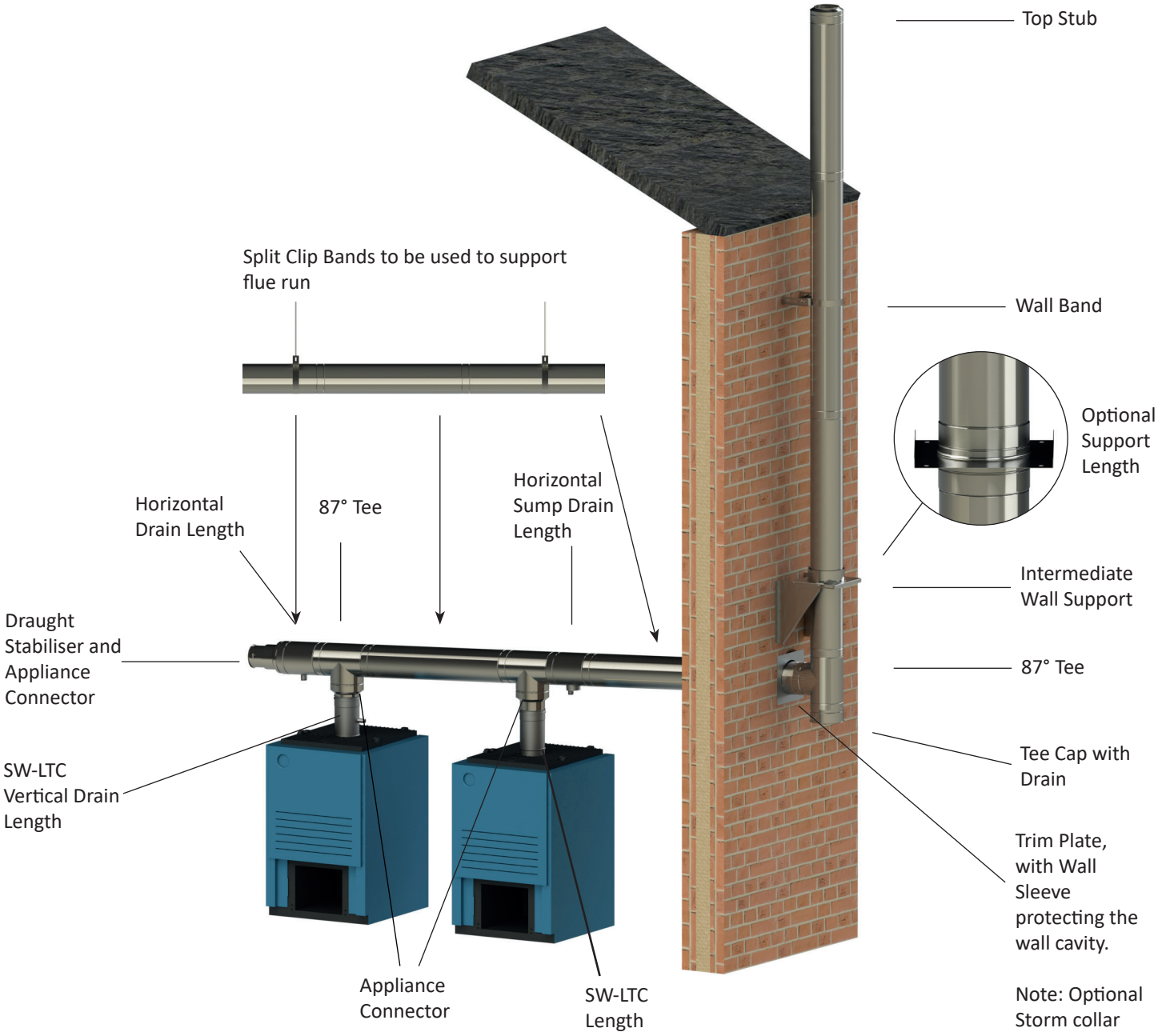
- Smoke test to ensure that the passageway is clear. When carrying out any smoke test / spillage test consideration should be given to the fans, draughts and combinations of the two which may affect the results of the test.
- Good visual inspection internally and externally to ensure that no damage has been caused to the system especially exposed sections which may be more susceptible to damage and corrosion.
- Check that terminations are free from blockage and that flashings still provide watertight seals.
- Check all components are still secure.
- Check that the quantity and positioning of drain points are sufficient to drain condense from the system. The system should allow for condense to drain back to the drain points and not to lie and evaporate which can increase acid attack on seals and joints.
- Check that sufficient supports and structural locking bands are in place and secure. Condensing applications may warrant more supports to ensure that joints especially on 3 degree runs are not under strain.
- Where pressure tests are required as part of the commissioning process, pressure test adaptors can be manufactured to order.

8. Inspection of the chimney is necessary to determine the frequency of sweeping inspection / cleaning required. More frequent maintenance may be required dependent upon the environment in which the plant is operated and the nature of the operation. Maintenance should be monitored on a regular basis and logged.
9. It is important that any personnel carrying out work or maintenance on appliances and flues are suitably qualified and competent to do so.

Recommend conducting pressure tests in line with IGEM/ UP/10 procedures as a part of the commissioning process for condensing and/or positive pressure applications.

If in doubt please ask!

Header and Riser system, passing through wall to external.



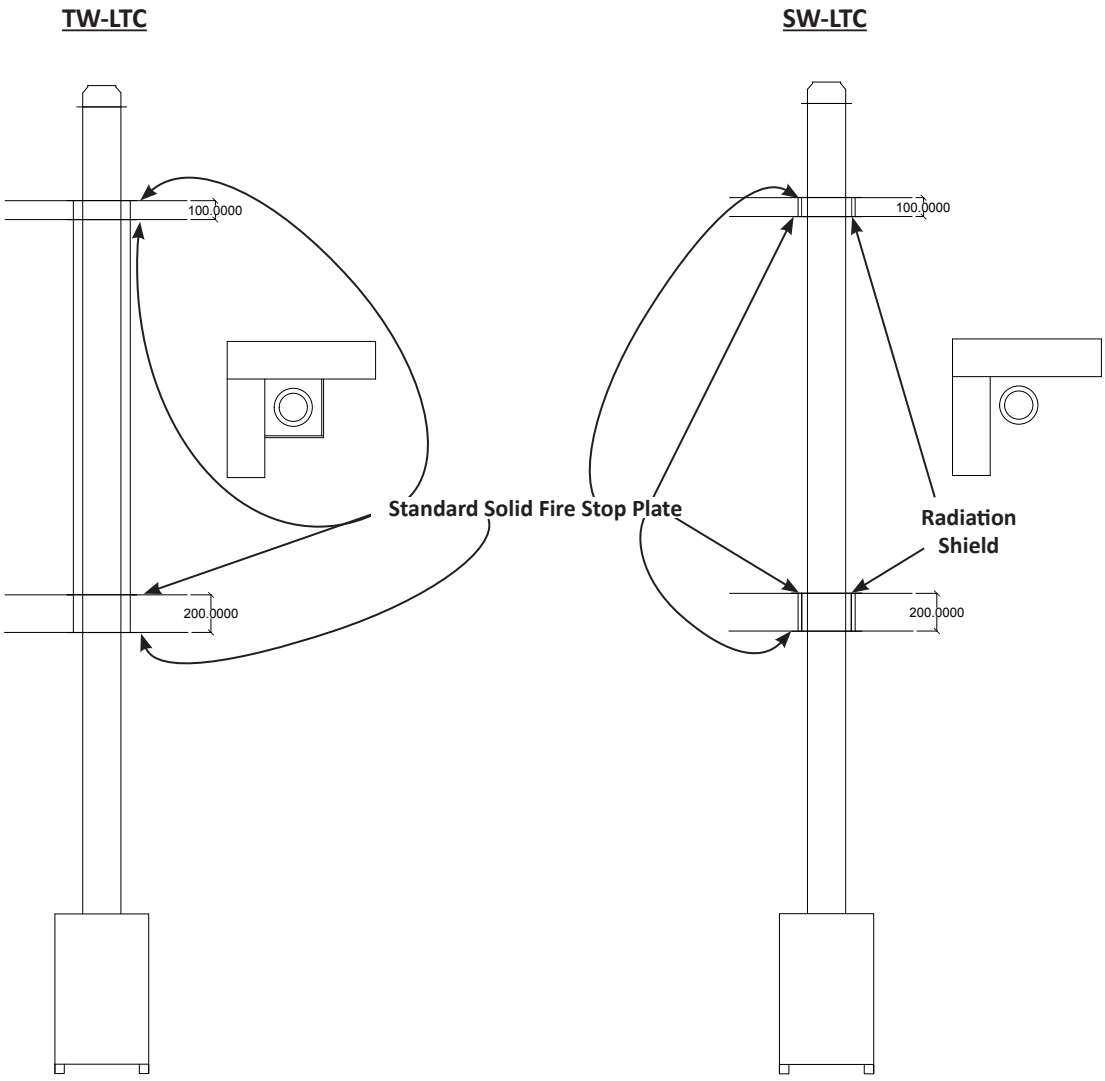
3 Degree Fall must be maintained.

Condensing appliances offer a positive pressure. Appliance manufacturers design & installation requirements must be considered to ensure that flue resistance and draught limits are not exceeded. Sizing must consider all modes of operation, e.g. one or all boilers firing or firing at different loads.

Resistance in header section and from boilers can be reduced by using 42°/30°/15° bends and by entering the header at 45° or through a booted tee.

Test Arrangements

T250 Test Arrangements

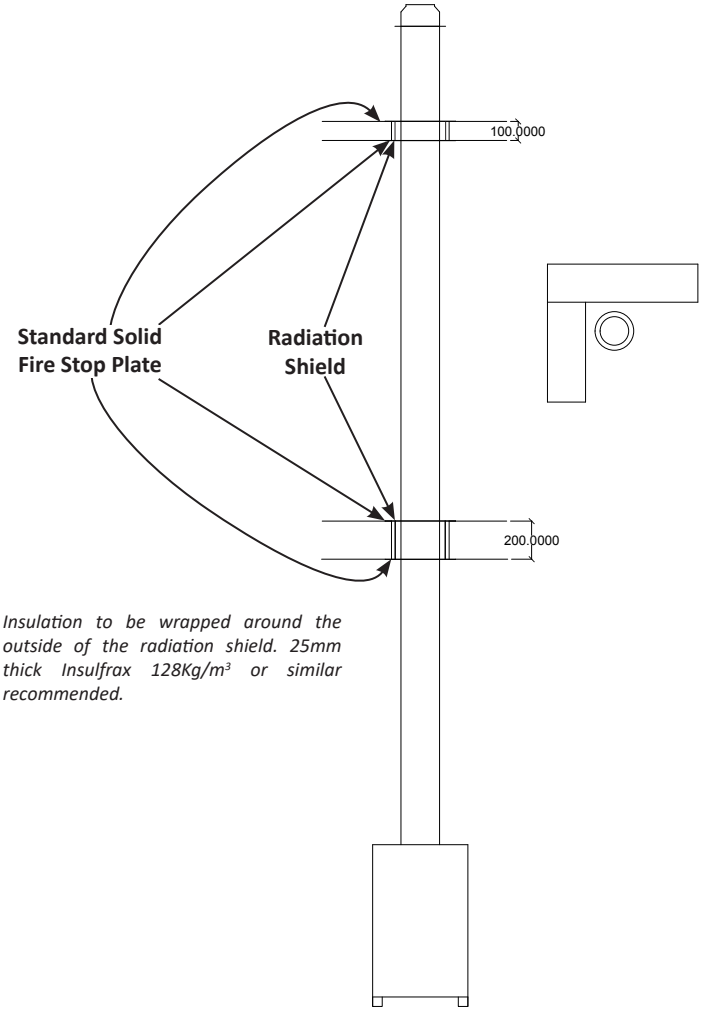


LTC TW and SW System Chimney use, combustion distance and fire stop plate type

Fuel	Operating Temperature °C	Soot fire resistance requirements	TW or SW	Floor Construction	Wall Construction	Distance to combustibles mm Flue ID ≤ 300mm	Fire stop/ Support plate type
Gas, Light oil (Kerosene)	T250	No (O)	SW	Combustible	Combustible Corner - Not enclosed	50 with Radiation shield	Solid
			TW	Combustible	Combustible Enclosed	50	Solid
			SW/ TW	Non-Combustible	Brick Chimney	N/A	Solid
Gas, Light oil (Kerosene)	T400 (Seals removed)	No (O)	SW	Combustible	Combustible Corner - Not enclosed	70 with Radiation shield and insulation	Solid
			TW	Combustible	Combustible Corner - Not enclosed	70 with Radiation shield and insulation	Solid
					Combustible - Enclosed	50	Ventilated
			SW/ TW	Non-Combustible	Brick Chimney	N/A	Solid

Note: The table above gives distance for the internal diameters of up to 300mm. For 350mm diameter flue refer to the table 'distance to combustibles multiplier' in this section.

T400 Test Arrangement



Insulation to be wrapped around the outside of the radiation shield. 25mm thick Insulfrax 128Kg/m³ or similar recommended.

TW and SW Enclosure not allowed, Corner installation

70mm clearance to combustible

Radiation shield diameter

TW ID				100	130	150	180	200	250	300		350
TW OD				152	178	203	229	254	305	356		406
SW ID/OD	80	100	130	150	180	200		250	300		350	400
Distance to combustibles T250	50	50	50	50	50	50	50	50	50	50	75	75
Distance to combustibles T400	70	70	70	70	70	70	70	70	70	70	105	105
Radiation Shield Diameter	150	170	200	225	247	274	296	325	376	427	427	477

The radiation shield diameter is the same diameter for both T400 and T250 applications.

For T250 applications a radiation shield is only required for SW-LTC applications. The radiation shield diameters leave an air gap of approximately 35mm all around the flue.

See ancillaries price list for radiation shields.

Accidental Human Contact

Standard TW-LTC meets the accidental human contact requirements for T250 applications without the need for extra insulation or shielding. SW-LTC should not be used where there could be accidental human contact, i.e in a room separate to the appliance without a mesh shield.

The table opposite reflects the installations tested at BSRIA for SW and TW internal diameters up to and including 300mm ID. For larger diameters the distances to combustibles through the floor, walls and in the vicinity of other combustibles, should be increased as per the following generic table (Info from BS EN 1856-1 6.4 and 6.6). Therefore going through combustible floors in larger diameters will require specially manufactured firestop plates.

Distance to combustibles multiplier

Internal diameter mm	Distance to combustibles must be multiplied by a factor of
Up to and including 300mm	1 times
350, 400, 450mm	1.5 times
500, 550, 600mm	2 times
650mm +	4 times

Note: Non-combustible floors may require the added protection of a twin wall flue system. This should be determined considering the type of floor and the risk to the building by the contractor / installer.

Floor depth during testing is 200mm deep at first floor from room with appliance and 100mm deep for floors thereafter. For floor depths greater than these, TW product must be used with the appropriate fire stop and support components for the application.

Installation Instructions for Specific Components

Before starting an installation familiarize yourself with the following information which is applicable to many components in the range.

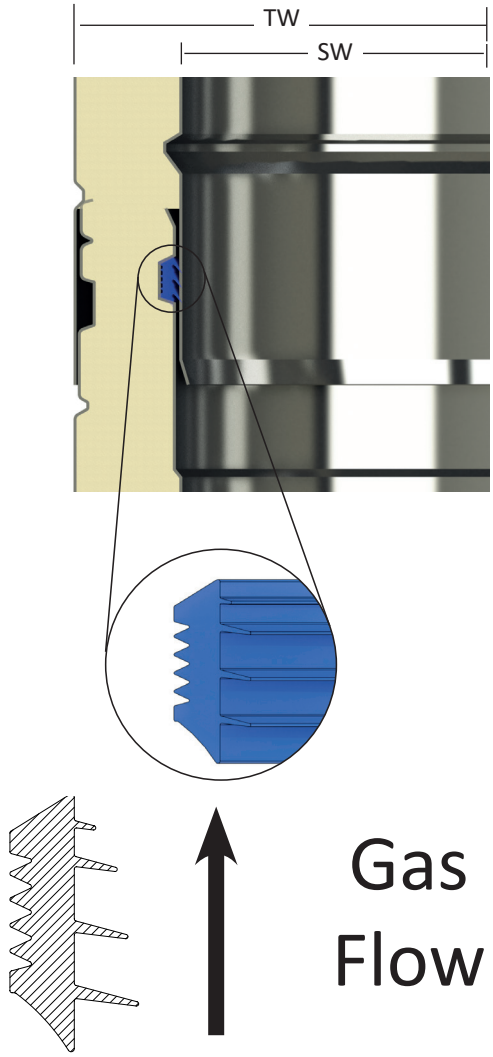
Health and Safety

When carrying out any installation/site work it is the Installer / Installation company's legal duty to ensure all Regulations made under the Health and Safety at Work Act 1974 are complied with including: - The Management of Health and Safety at Work Regulations, The Manual Handling Operation Regulations, The Workplace (Health, Safety and Welfare) Regulations, The Provision and Use of Work Equipment Regulations, The Personal Protective Equipment Regulations and The Control Of Substances Hazardous to Health Regulations.

This product does not contain asbestos. COSHH Data sheets are available on request. Stainless steel flue products may have sharp edges and suitable PPE may be required as per the installer/installation company's Risk Assessment. It is the responsibility of the installer/ installation company to determine any possible building, structural or asbestos risks on site prior to installation.

Forming Joints

The pressure and condensate rating can be achieved if the following instructions are adhered to. These are also required to ensure that the installation is safe and to ensure that risk of fire is not increased. **Do not modify components on site.** (Unless these installation instructions state otherwise.) Install products in order in the direction of the flue gases starting at the appliance.
Ensure that product is suitably supported. Use plumb lines, spirit level and tape measure to ensure that flue is installed at correct incline and to correct centre line dimensions. No JOIN CAN BE CONCEALED - Joins must be accessible for inspection. Relevant components are supplied with a locking band which must be fitted.



Silicone Seal

This must be installed in the inner lining joint when LTC is serving a positive pressure appliance up to 5,000Pa, they should also be installed when serving condensing appliances. The seals come pre-fitted. They should be removed for T400 applications.

For condensing appliances it is essential that a fall is always maintained. This product should not be installed on horizontal runs or where condense pools can form. (Should pools of condensate form they can be extremely corrosive and can shorten the service life of the product. Condensate pools evaporate leaving a corrosive residue, which when the pools forms the next time, means that the corrosive products are more concentrated than the previous time, and so on. If there is no alternative to a horizontal run we can offer our PS and PS Lite products.

Silicone seals are supplied fitted, however should one become dislodged please follow these instructions. The silicone Seal is pre-fitted into the groove provided in the female inner end of the flue. Also in the external groove on the inner of extension lengths. Check that each component with a female inner formed end has a seal fitted before installation, that the joint is clean, free from dust, grease, paint overs-pray, etc.

Should a seal become dislodged it is recommended that this is secured into place by silicone /adhesive sealant and allowed to cure prior to carrying out the chimney installation. This will ensure that the seal remains in place during the installation of the chimney.

Before applying the sealant, remove any previously applied sealant and ensure that the surface area is clean and dust free, a suitable primer should be used. The small fin should be positioned so that it is always the first fin to engage. I.e. pointing up in the direction of the flue gas flow when installed on the inside of the female inner end, pointing down into the flue gas flow on the outside of the liner of the extension length. Check the diagrams to the left to ensure that the seal is fitted in the correct orientation.

For items that have been manufactured to order urgently, which may not have had sufficient curing time, the installer must make a thorough inspection of the seal to ensure that it is suitable for installation or refit the seal.

The use of a suitable lubricant or soap solution to lubricate the Seal will make installation easier and help ensure that the Seal is not dislodged. Where lubricant has been used components can be gently eased apart in the short term until the lubricant has dried.

Where practical carry out visual inspections of the interior of the flue during the installation to ensure that all Seals are correctly seated.

Orientation of flue in relation to gas flow

Look for the gas flow labels as pictured, on products.
(Product pictured is SW-LTC)

To ensure that the product can achieve its designation requirements the TW and SW products should be installed in the orientation shown in the table below.

	TW		SW
Design Criteria	Inner Lining	Outer Casing	
Pointing upwards in the same direction as the flue gases	Female End	Male End	Female end
Pointing downwards allowing condense to flow back to the appliance	Male End	N/A	Male end
Pointing downwards to avoid rain water ingress at the joint	N/A	Female End	N/A*

*Not generally a requirement for single wall product for condensing appliances. However, if considered necessary for particular installations or for applications for T400 without seals inserted, a short changeover length with two male ends, and special terminal with a female form can be manufactured to order. We recommend that twin wall is installed externally whenever possible.

Rivets / Self Tappers

Prior to fitting the locking band, additional strength can be achieved if needed by using rivets on the outer casing of TW-LTC. If this is considered necessary due to the difficulty in providing supports or where wind load is expected on external runs, it should be carried out with stainless steel rivets at centres to suit the load, then concealed by the locking bands. Rivets should be S/S 1/8" 15mm long maximum. Self Tappers should be S/S.

CAUTION!! Care must be taken to ensure that the internal lining is not penetrated. The drill must therefore be set to ensure a maximum penetration of 15mm. After drilling carry out a visual inspection of the liner. SW-LTC should not be riveted.

Should riveting of SW product ever be considered necessary, the following must be considered by the designer/installer depending upon the site or application:

- Risk of fire
- Rain ingress
- Condense escape
- Condense collection leading to corrosion/leaks

Locking Bands

Fit the locking band over the joint of the two lengths. The locking band is supplied with an over centre clip. No joints can be concealed, joints must be accessible for inspection.

TW

The twin wall over centre clip incorporates a stainless steel nut and bolt which are securely fastened. Be careful not to over-tighten. If installed externally on a near horizontal run, the locking bands must be weatherproofed with silicone sealant at both ends.

SW

See the image above to ensure the locking band is fitted in the correct orientation.

Structural locking bands (TW)

Fit the structural locking band so that the internal swages sit in the internal swages on the outer casing of the product. Ensure nuts and bolts are securely fastened, be careful not to over-tighten and fully weatherproof on near horizontal runs.

Lengths

See current sales brochure for installed lengths.

Follow the "forming joints" section in these installation instructions.

Extension Lengths

Min - Max Installed Length Table

	TW		SW	
	Extension Length Type		Extension Length Type	
Component	75-350	75-150	75-350	75-150
Installed Length			60-315	60-115
1000mm	1030-1305	1030-1105	1000-1255	1000-1055
500mm	530-805	530-605	500-755	500-555
300mm	330-605	330-405	300-555	300-355
150mm	N/A	180-255	N/A	150-205

The Extension lengths come complete with a special locking band and provide adjustment as detailed in the table above. TW Sold fully insulated.

Design and Installation Requirements

- Minimum installation engagement = 75mm of the outer casing (TW-LTC); SW-LTC = 110mm.
- Follow the "forming joints" section.
- Ensure that the extension lengths are fully supported. They are not load bearing nor should they be installed under tension.
- When installing in the vertical runs locate extension lengths just beneath load bearing supports or termination.
- TW - Ensure that there are no hot spots by fully packing insulation.
- Do not install through floors and walls as the joints are not permitted and cannot be inspected.
- If installed externally on a near horizontal run, all of the locking bands must be weatherproofed with silicone sealant at both ends.
- Avoid having to retract product as scratching can occur.

SW

- Measure and mark up installed height ensuring min engagement can be achieved.
- Carefully install the extension length into the length/fitting below and push together. Take care, scratching can occur when retracting is necessary.
- Should it ever be necessary to cut down a SW extension length, ensure that the minimum engagement can be achieved and that the seal on the outside of the male end is relocated in the next groove with the small fin pointing downwards so that it is the first part of the seal to engage. See "Silicone Seal" section in these instructions.
- Check that the male end has not been deformed during the cutting process. If it is deformed it may not achieve the pressure rating.

SW Distances To Combustibles - additional notes for SW extension lengths

As the combustible distances table detailed in "Test Arrangements" section in these installation instructions for the **SW** product.

TW

- Measure and mark up installed height.
- Measure distance to bottom of outer ensuring that minimum engagement dimension can be achieved.
- Start carefully removing just enough insulation into a rubbish bag/box and keep packing it down into the annulus until the distance from the insulation to the bottom of the outer matches for the installed height. Pack down as much as possible uniformly and add in extra as required to ensure that there will be no gaps.
- Clean off all faces of the extension length, including the inside of the annulus where the joint will be made, ensuring that there is no dust / debris by the silicone seals and connection forms. This would otherwise compromise pressure and condensate designations.
- Carefully install the extension length into the length/fitting below and push together. If the extension has to be retracted to meet the dimensions then there could be gaps in the insulation and depending upon the product range and temperature application additional distance to combustible material may be required. (In this instance consider the length to be a single wall component with a shield and consult BS EN 15287 or guidance in addition to these instructions.) Take care, scratching can occur when retracting is necessary!
- The outer casing may be fixed at this point with rivets in accordance with these instructions.
- The special locking band must be fitted.
- Install the remaining components securing with locking bands ensuring that the extension length is not under load.
- Weatherproof locking bands if required.

TW Distances To Combustibles - additional notes for TW extension lengths

These notes should be consulted to ensure that risk of fire is eliminated at the point where extension lengths are installed. The risk of fire is dependent upon the method of installation of the component and whether it results in the component being fully insulated.

<table>
<tr><th>TW Distances to combustibles</th><th>Installation requirements for specific distance to combustibles to be possible</th></tr>
<tr><td rowspan="3">See the distance to combustible table in "Test Arrangements" section for TW product</td><td>If the product has been installed in order in the direction of the flue gases stating at the appliance, and</td></tr>
<tr><td>The installer has measured and removed only enough insulation to allow the extension length to be pushed down into place, and</td></tr>
<tr><td>The installer is confident that the component is insulated fully through its entire installed length.</td></tr>
<tr><td rowspan="2">See the distance to combustible table in "Test Arrangements" section for SW product</td><td>If the product is fitted between two fixed points e.g. push in and then pulled out into position to fill the gap, or</td></tr>
<tr><td>If the method of installation has not followed the above guidelines to ensure that the length is fully insulated through it's entire installed length.</td></tr>
<tr><td colspan="2">*Note - If the TW extension lengths are to be installed in an installation that includes a "Wall Construction" = "Combustible Enclosed" then the distance to combustibles is not covered for SW product and therefore a distance of 1.5 x Dia. should be maintained, but no less then 200mm. (BS EN 15287 allowing for a shielded SW product, i.e. TW product with possible air gaps)</td></tr>
</table>

Elbows

- Follow the forming joints instruction.
- Pay particular attention to ensuring that the orientation is correct with a spirit level and that components are suitably supported.
- LTC Brochures for SW and TW product give offset centreline dimensions and installed heights for combinations of elbows and standard lengths.
- Extension lengths can be used to achieve centreline requirements.
- Special elbows can be manufactured to order (please specify installed centreline dimensions with a sketch showing flue gas flow direction).

SW

TW



Adaptors

Connection Required	TW	SW
Appliance to LTC product	Appliance Connector	Any component with male end
SW-LTC to TW-LTC	Single-TW Adaptor	See TW range
TW-LTC to SW-LTC	Twin-SW Adaptor	See TW range
LTC to flex	TW-SW Adaptor + Flex adaptor	Flex adaptor - See Flex range*
Draught stabilizer to LTC	Appliance Connector	Tee body or branch male end

*Please specify "For connection from LTC to flex" when ordering

Appliance Connection

The OD of the inner liner of the appliance connectors and the OD of the inner liner of the SW product = the stated ID of the LTC (TW and SW) product. So for the 100mm diameter ID TW-LTC the OD of the tail of the appliance connector = 100mm. Check the spigot ID of the appliance to ensure that this will fit in. If the appliance spigot is 100mm + 1mm, the 100mm ID standard items will fit in. Special appliance connectors can be manufactured to order. Please supply a sketch showing ID or OD requirements and mark on the direction of flue gases.

Installation Method

- See also "Forming Joints" section in these Installation Instructions.
- Adaptors must be selected and fitted to ensure that condense can run back to the appliance.

When fitting to appliance or to flexible flue liner ensure that there is a suitable seal. Silicone sealant will be required when connecting to the flexible flue liner and may be required in other instances. Make the seal sufficient and allow a minimum of 24 hours for the seal to cure properly before running the appliance. Check specific silicone sealant application instructions.

Terminals

Terminals should be fitted to the top of the riser to terminate flue. (For single wall, for 200mm diameter and above, the last length of the system can be termination if suitable for the particular installation.) For diameters up to and including 180mm diameter a mesh top cowl is required for condensing appliances. For atmospheric appliance up to and including 180mm diameter, rain ingress should also be prevented to avoid flue gases cooling, which will reduce the performance of the system.

Application	100	130	150	180	200+
Gas condensing	Top stub with mesh Rain shield cowl Other terminal to stop leaf entry etc.				Top stub or any terminal (or last length of single wall systems can be treated as top stub without mesh).
Gas atmospheric	Rain shield cowl Other terminal to stop rain and leaf entry				Top stub or any terminal

Installation Method

- See also "Forming Joints" section in these Installation Instructions.
- Pay particular attention to ensuring that the locking band is secure.



Tee


45 Deg Tee


87 Deg Mod Tee

Tees

Our range of tees provide the following solutions for installations: -

- Connection in a modular header (Branch size different to body size)
- Connection at the base of the riser
- Cleaning / inspection access with tee caps
- A point to install draught stabilisers
- Drain points in horizontal or at the base of vertical runs with tee caps c/w drains
- Where system draught is on the limit for a diameter, a booted tee or 45 deg bend and 45 deg tee can sometimes give a suitable solution rather than having to increase the flue diameter as they give a smoother route for flue gasses to escape.
- Special mod tees can be made to order to suit individual header requirements

Tees Installation Method

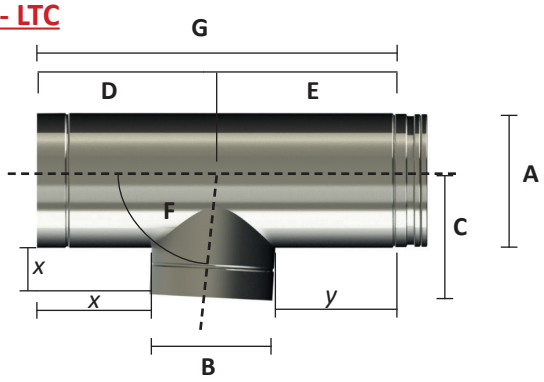
- See also "Forming Joints" section in these installation instructions.
- Assemble the route in order from the appliance to the termination. If this is not possible extension lengths will be required. Before assembling the tee component ensure that suitable and sufficient support is in place ready for connection.
- Position the tee ensuring that the male end of the inner liner is pointing down against the direction of the flue gases. (For TW the male end of the outer casing will be pointing in the same direction as flue gases. For SW the female end will be pointing in the same direction as the flue gases.)
- Fix locking bands securely in place on all joints.

Where tees are installed externally silicone sealant should be used around the point at which the branch intercepts the body of the tee. Locking bands should be sealed as detailed in the installation instructions. If installed externally on a near horizontal run, the locking bands must be weatherproofed with silicone sealant at both ends.

Special Mod Tee Design Requirements

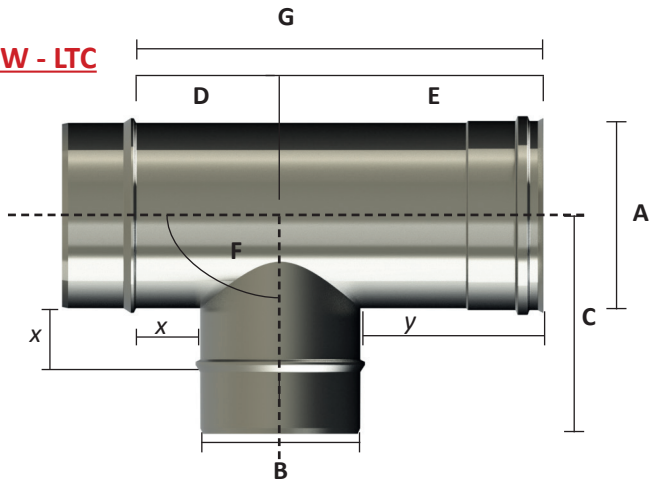
Please mark-up the sketch below with your specific requirements and email to sales.

TW - LTC



A - Body diameter
B - Branch diameter
C - Installed height / length of branch to centreline of body
D - Installed length / height from end to centreline of branch
E - Installed length / height from centreline of branch to end
F - Angle between centreline of branch to centreline of body
G - Overall installed height
Please note that the minimum dimensions to allow for the forms to be manufactured are: -
x = 75mm
y = 30mm

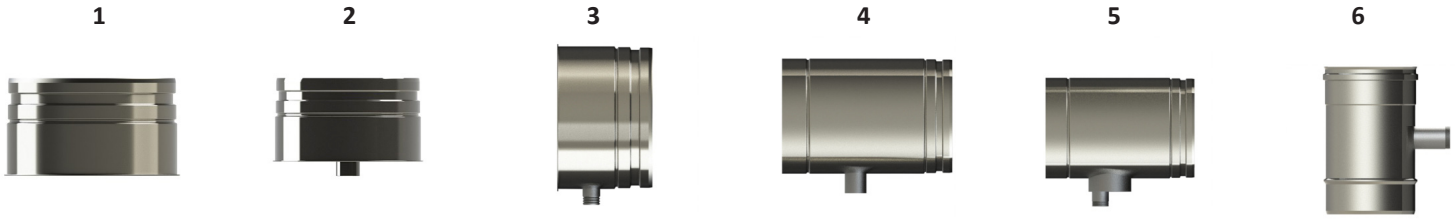
SW - LTC



A - Body diameter
B - Branch diameter
C - Installed height / length of branch to centreline of body
D - Installed length / height from end to centreline of branch
E - Installed length / height from centreline of branch to end
F - Angle between centreline of branch to centreline of body
G - Overall installed height
Please note that the minimum dimensions to allow for the forms to be manufactured are: -
x = 15mm
y = 75mm

Installation Instructions

Tee Caps and Drain components



	Component	Purpose	Availability SW	Availability TW
1	**Tee Cap**	To cap off where drainage is not required. To allow cleaning access.	✓	✓
2	**Tee Cap with Drain**	Fitted below a tee generally at the base of the riser to drain condense, condensation or rain water.	✓	✓
3	**Tee Cap with Side Drain**	Fitted at the lower bottom end of a header. Header including tee cap must be on a fall of 3 degrees.	✓	✓
4	**Horizontal Drain Length**	Fitted at intervals throughout all near horizontal runs. From the appliance fit after modular tees and after bends.	✓	✓
5	**Horizontal Sump Drain Length**	As drain length but provides a larger area (80mm diameter sump) for condensate to collect prior to draining.	✓	✓
6	**Vertical Drain Length**	Fitted directly off an appliance to reduce the condense allowed to drain back into the appliance.	✓	

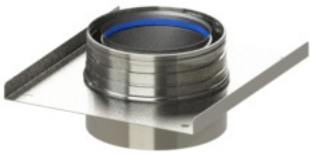
Condensing appliances generate large volumes of liquid with the flue gases and it is very important that the quantity of condense expected is calculated and sufficient drains allowed for. All drain points are 3/4" as standard 1" and above can be manufactured to order.

Installation Method

- See also "Forming Joints" section in these Installation Instructions.

Drainage Connection

1. Drainage pipes must be installed in accordance with industry standards including the following notes. Boiler manufacturer requirements must also be met:
2. Pipes should be plastic or UPVC pipe, rigid and supported.
3. Joints must be well sealed and pipework must have a continuous fall (minimum of 3º) down to the drain.
4. A U-trap is required on the flue condensation drainage to avoid combustion gases escaping.
5. If exposed/freezing possible then pipework should be increased to 30mm ID before going through the wall. The external pipe must also be suitably insulated to avoid boiler failure and/or leaks, and take the most vertical and shortest route to the discharge point.
6. Internal condensate drainage pipework must be a minimum of 19mm ID (typically 22mm OD) plastic pipe and this should fall at least 3º away from the boiler taking the shortest practicable route to the discharge point.
7. Access for cleaning and inspection must be provided.
8. An open tundish must be used to allow condensate to flow freely. This also allows the flow of condensate to be seen.



Support Lengths

The Support Length comes in one piece, which has a spigot top and bottom to allow connection of flue above and below the plate. The plate gives a standard 50mm distance to combustibles. For alternative clearance requirements, please specify when ordering, to ensure that the plates are suitable for your application. The distances to combustibles in the "Test Arrangements" section must be adhered to. The support length has a joint top and bottom and so must not be fitted through a floor.

Installation Method on suitable support frame

- Install the flue up to the point where the support length is to be fitted.
- Locate the support plate on the suitably constructed timber or metal frame.
- Securely fix the plate to the joist/timber frame with wood-screws, to other suitable fixings for other structures.
- Install the flue above the support length.
- The system must be suitably supported as per the "Supporting Flue" section in these installation instructions.
- Flue must be installed as per the "Forming Joints" section.

Cantilever Brackets

- The Cantilever Brackets come in pairs and give a standard 50mm distance to combustibles, with 75mm adjustment for 100mm diameter product, and 100mm adjustment for all other diameters.
- Ensure that the brick wall or other media is suitable to house a support bracket. Suitable bolts will be required to fix the bracket to the wall.

Installation Method with Cantilever Brackets

- Assemble the support plate and two side plates using the holes provided.
- Determine the location for the bracket.
- Use a plumb line and spirit level to ensure the correct location/orientation of the support length and cantilever brackets.
- Use the bracket as a template to mark where fixing holes need to be drilled.
- Adjust the location of the support length on the cantilever brackets to suit the centreline.
- With the bracket in position fix it securely to the wall starting at the bottom and working up. Start all fixings, then tighten.
- Install the flue as detailed in the "Support Length" installation method.

Draught Stabilisers

To allow optimum combustion performance with powered appliances, e.g. pressure jet, power gas, condensing, draught stabilisers should be used. They should also be used on headers serving one or more appliance. Consideration should also be given to the method of removing condense from systems to ensure that condense doesn't discharge from the draught stabiliser. **Draught stabilisers must be installed in the same room as the appliance(s).**

Components required for connection

SW-LTC & TW-LTC - The Draught Stabiliser will have a female connection piece fitted in the factory to fit to the SW pipe or the TW Appliance connector male ends. Which can then be secured with a SW-LTC locking band.

TW - Please order a "TW-LTC Appliance Connection for Draught Stabiliser".

The Draught Stabiliser will be expanded slightly to fit over the SW part/end of TW appliance connector. An optional PS-Lite cover band and cover ring can be ordered if desired.

Installation Method

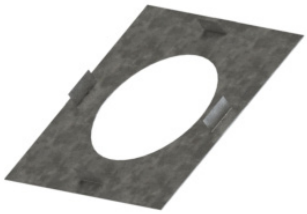
The stabiliser blade must be plumb at rest, and the pivot arm horizontal. A spirit level should be used to achieve this. Then locate the lead in spigot on the draught stabiliser into the connection component and fix securely. Fixing is by self tapping screws or, for PS "V" Band systems, a "V" band can be located and secured over the spun out flange of the stabiliser and that of the flue system.

Setting the Draught Stabiliser

The draught stabiliser should be set so as to allow sufficient draught for the appliance(s) to maintain efficient combustion. This is achieved by: -

- Sliding the outside weight closer toward the blade increases the resistance of the blade so that air is induced at an increased negative pressure setting.
- When sliding the weight further away from the blade, air is induced at a lower negative pressure in the stack.
- Secure the weight in the required position.

Fire Stopping Components



Please refer to the table in the "Test Arrangements" section to determine which type of fire stopping component you required for particular installations and applications.
The instructions for the "Solid" fire stopping requirements are detailed below and within these installation instructions. See also "Trim Plates" which should be installed as detailed below. And "4 Hour Fire Stop Arrangement" in these installation instructions.
The instructions for the "Ventilated" fire stop plates and ventilated support plates are detailed within a separate document called "HT-S installation instructions", and they must be adopted as and when required.

Fire Stop Plate (Solid)

Standard plate gives 50mm clearance to combustibles. For alternative clearance requirements please specify when ordering, to ensure that the plates are suitable for your particular application. Where the flue penetrates a floor or wall, building work may be required and should be carried out by a suitably qualified/competent person. The distances to combustibles in the "Test Arrangements" section must be adhered to.

For T400 O(xx) applications through a combustible floor and with a combustible enclosure, ventilated fire stops and support plates must be used. These are available from the HT-S product range.

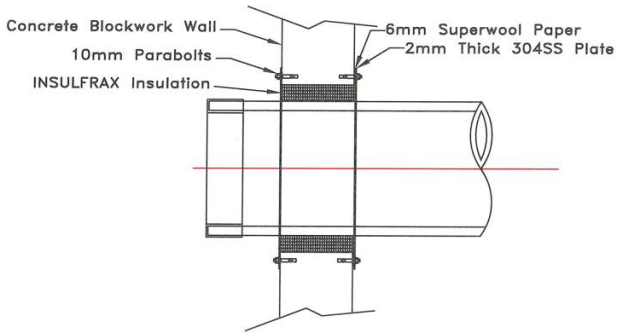
Installation Method

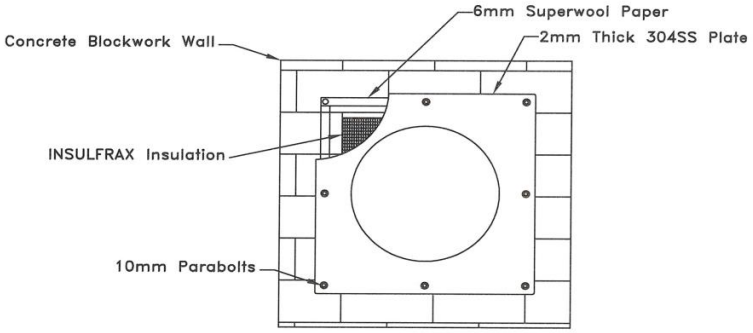
- Install the flue to about 250mm below the ceiling.
- Measure (using plumb line) where the centre line of the flue will be.
- Measure and cut the ceiling and floor above, and modify joist box section if required to ensure that distances to combustible materials can be maintained. Ensure that void is square.
- Fit the fire stop plate to the underside of the ceiling with suitable fixings for the structure. Tabs should be pointing upwards and no combustible material should be able to encroach on the minimum distance to combustibles. If trim plates are used as an alternative, the installer must ensure that the minimum distance requirements are met.
- Pass the flue down through the plate from the floor above, ensuring that it is central within the plate.
- Connect the flue.
- For T400 applications AND if required depending upon the application see "Test Arrangements" section, install a radiation shield and insulation as follows: -
- Install the radiation shield (this could be a wall sleeve cut to size to suit the depth of the floor). Radiation shields can be manufactured to order either as a one part (similar to a wall sleeve) or a two part telescoping type. See " Radiation Shield Diameters" table in "Test Arrangements" section.
- Fill the void between the outside of the radiation shield and the joist box section with INSULFRAX or SUPERWOOL insulation, with a density of 128kg/m^3
- Fit the next fire stop plate or support plate over the top of the flue and fix securely. If it is a support plate being fitted, see "Support Plate" installation detail also.
- The system must be suitably supported as per the "Supporting Flue" section in these installation instructions throughout.
- Flue must be installed as per the "Forming Joints" section.

4 Hour Fire Stop Arrangement

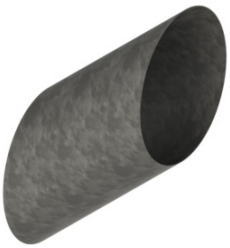
Where the specification calls for a 4 hour fire rated flue, TW-LTC and the 4 hour fire rated penetration seal kit should be used through floors and walls.

- Prepare the hole through the floor or wall ensuring that the structure is sound. The hole size should be the flue OD plus 25mm minimum to allow insulation to be successfully installed the void around the flue.
- Fit SUPERWOOL paper 25mm wide x 6mm thick strip (or similar specification fire seal) between the plate and the face of the wall (fire cement can be used to locate SUPERWOOL paper before fixing plate). This should form a continuous seal around the plate where it is fixed.
- The plates should be installed with suitable fixings for the structure to which it is being fixed, e.g. for concrete blockwork wall we would use M10 raw bolt fixings (Approx 65mm long). Fixings must be used as per the fixing manufacturer's instructions (this may be carried out using battery powered hand tools). Ensure that the bolt length is such that with bolts either side of the wall/floor, that they will not clash with each other on installation. This will be dependant upon the length of bolt and the thickness of the wall. If this is a concern then the fixing locations and fixing lengths should be considered.
- Ensure that supports are in place if going through a wall before fitting the flue in place.
- Install the flue through the first plate.
- Insulate the void with 128kg/m³ INSULFRAX or SUPERWOOL blanket.
- Offer up second plate to outside of furnace again with SUPERWOOL paper between the plate and face of the wall, fix plate.
- Seal around both plates and the flue with fire cement.
- For a through the floor construction and where a load bearing support is required, the uppermost plate can be ordered in thicker material with a support collar.
- The system must be suitably supported as per the "Supporting Flue" section in these installation instructions throughout.
- Flue must be installed as per the "Forming Joints" section.





Wall Sleeves



Generally used when going from internal to external through a wall. Provides shielding for the flue from falling debris and maintains the distance to combustible materials.
Where the flue penetrates a floor or wall, building work may be required and should be carried out by a suitably qualified/competent person. The distances to combustibles in the "Test Arrangements" section must be adhered to.

Non-Combustible wall installation method

- Measure the wall thickness and cut the wall sleeve to the required size.
- Fit the wall sleeve through the wall.
- Internally, fit a trim plate if desired.
- Install the flue through the wall.
- Externally weatherproof as detailed in the Flashings and Storm Collar installation sections.
- The system must be suitably supported as per the "Supporting Flue" section in these installation instructions throughout.
- Flue must be installed as per the "Forming Joints" section.

Combustible wall installation method

For T250 applications the installation method above can be used.

- For T400 applications the details in the "Test Arrangements" section must also be adopted.

Installation Instructions

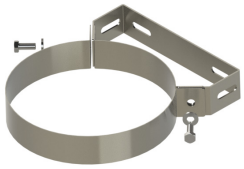
Split Clip Band

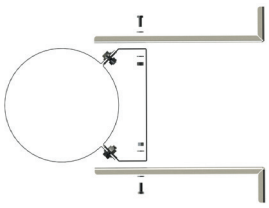
Used to provide horizontal suspension support and support where there is an incline.
Hole diameter = 11mm
Can be used with screwed rod fitted directly through hole, or with screwed rod / Uni-strut accessories.

Installation Method

- Install the screwed rod support structure.
- Fit the split clip band around the flue.
- Fit the flue and connect the split clip band to the screwed rod support.
- Partially tighten bolts both sides, then fully tighten.
- The system must be suitably supported as per the "Supporting Flue" section in these installation instructions throughout.
- Flue must be installed as per the "Forming Joints" section.

Wall Bands





Wall Bands have three parts to them. As standard they provide the required 50mm clearance from the wall. Additional 'L' shaped brackets are available to provide additional adjustment, from 50-100m, 100-200mm and 150-300mm.

Wall band installation instructions

- Using a pencil or chalk line, mark a plumb vertical line centred on the proposed flue route.
- Remove the Band from the Wall Band Bracket
- The Brackets should be spaced approx. 2m to 3m (see 'supporting the flue' section) apart ensuring that they do not impede the fitting of the locking bands on the flue pipes. Use the bracket as a template to mark the fixing holes using the vertical line as a guide.
- Drill the structure to which the bracket will be fixed, then fix the bracket back part in place using suitable fixings. The slots are 10mm wide.
- Assemble the flue, re-fitting the bands as you go.
- If the 'L' shaped extension brackets are being used with the wall band, it is also possible to fit the wall band to the flue before fixing to the wall.
- Undo the bolts of the wall band and position around the flue.
- Assemble the wall band and 'L' shaped bracket which must face out with the fold on top (to allow rain to run off the bracket and not collect).
- Adjust to desired length and secure with the fixings supplied.
- Install the flue and then fix the bracket to the supporting structure with suitable fixings.

Telescopic Base Support

The telescopic base support will require a sound and level floor to which it can be bolted. Support plate is supplied with a spigot on top to connect to the flue and a single wall tee cap beneath. The product range requirements should be specified when ordering.

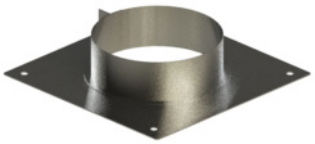
Installation Method

- Loosely assemble the length / tee on the base support for locating purposes.
- Move the base support into the correct position to house the flue system, mark out fixing points on the floor and then remove base support and drill suitable holes.
- Adjust the height to enable the length / tee to pick up the connection spigot, remove the length / tee. Then secure the adjustable sleeve in position using the holes provided.
- Re-assemble the length / tee and continue with the route.

385-585mm adjustable.

Support Plate

The Support Plate comes in one piece, which fits over the top of the flue and gives a standard 50mm distance to combustibles. For alternative clearance requirements, please specify when ordering, to ensure that the plates are suitable for your application. Where the flue penetrates a floor or wall, building work may be required and should be carried out by a suitably qualified/competent person. The distances to combustibles in the "Test Arrangements" section must be adhered to.



Installation Method

- Pass the support plate over the top of the flue.
- Locate the support plate over the joists (or suitably constructed timber or metal frame).
- Check that the support plate is central around the flue.
- Securely fix the plate to the joist/timber frame with wood-screws, to other suitable fixings for other structures.
- Use the holes in the support collar to mark out fixing points on the flue outer casing.
- Drill the outer casing of the flue to house stainless steel ½" Self-Tappers or rivets (⅛").
- Each hole in the support collar must be fixed to ensure that the support assembly is sufficient to carry the maximum loads.
- CAUTION!! Care must be taken to ensure that the internal lining is not penetrated. The drill must therefore be set to ensure a maximum penetration of 15mm. After drilling carry out a visual inspection of the inner liner.
- The system must be suitably supported as per the "Supporting Flue" section in these installation instructions throughout.
- Flue must be installed as per the "Forming Joints" section.

Intermediate Wall Support Plate

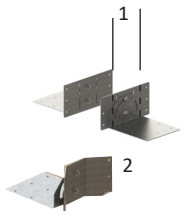
The Intermediate Wall Support Plate is supplied in 4 parts. The plate fits over the top of the flue and gives a standard 50mm distance to combustibles, with 75mm adjustment for 100mm diameter product, and 100mm adjustment for all other diameters when the plate is adjusted on the cantilever brackets.
Ensure that the brick wall or other media is suitable to house a support bracket. Suitable bolts will be required to fix the bracket to the wall.

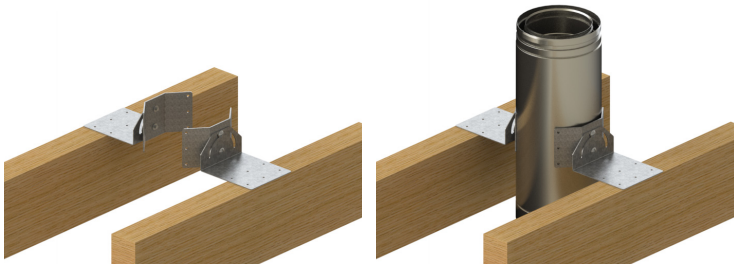
Installation Method

- Assemble the support plate and two side plates using the holes provided.
- Determine the best location for the bracket considering that the support collar is best situated just under the inverted swage before the male end of the flue. If this is not possible then the bracket can be located anywhere other than right on a joint.
- Use a plumb line and spirit level to ensure the correct location/orientation of the support plate and cantilever brackets.
- Use the bracket as a template to mark where fixing holes need to be drilled.
- Adjust the location of the support plate on the cantilever brackets to suit the centreline.
- With the bracket in position fix it securely to the wall starting at the bottom and working up. Start all fixings, then tighten.
- Pass the flue up, locate the collar along the length of the flue and mark out the fixing points.
- Remove the flue and carefully drill the outer casing of the flue to house stainless steel ½" Self-Tappers or rivets (⅛")
- **CAUTION!! Care must be taken to ensure that the internal lining is not penetrated. The drill must therefore be set to ensure a maximum penetration of 15mm. After drilling carry out a visual inspection of the inner liner.**
- Install the flue checking that it is central within the support plate.
- Each hole in the support collar must be fixed to ensure that the support assembly is sufficient to carry the maximum loads.
- The system must be suitably supported as per the "Supporting Flue" section in these installation instructions throughout.
- Flue must be installed as per the "Forming Joints" section.

Installation Instructions

Rafter Bracket Components





Rafter brackets are to be installed so that the minimum clearance distances to the nearest combustible material are maintained. See "Test Arrangements" section for distances. Additional joist boxing or uni-strut support should be used to provide suitable support for the brackets as and when required.

Universal Rafter Support Bracket

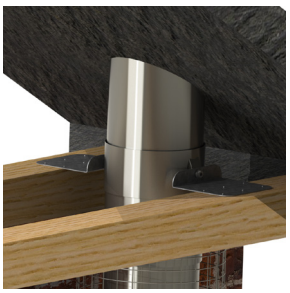
Sold in 4 parts to be assembled on site.

Installation Method

- Bend down the line slots on both sides of the flat parts (1). The bends need to be sufficient so that this part makes three contact points with the outer casing of the flue (2).
- Use the nuts and bolts to fix the two parts together.
- Temporarily assemble the flue components in order to determine the fixing points on the flue, ensuring that the combustibles clearances are maintained (temporary support may be required).
- Locate the rafter support bracket on top of the joist/box section. Mark out the points where holes need to be drilled in the outer casing.
- Remove the flue and carefully drill the outer casing of the flue to house stainless steel ½" Self-Tappers or rivets (⅛")
- **CAUTION!! Care must be taken to ensure that the internal lining is not penetrated. The drill must therefore be set to ensure a maximum penetration of 15mm. After drilling carry out a visual inspection of the inner liner.**
- After drilling carry out a visual inspection of the inner liner.
- Relocate the flue between the brackets and fix the brackets on either side to the outer casing. See "Rivets and Self Tappers" in "Forming Joints" section.
- Secure the brackets to the timbers using 6 off 3mm wood screws (not supplied). (Or other suitable fixings depending upon support structure.)
- The system must be suitably supported as per the "Supporting Flue" section in these installation instructions throughout.
- Flue must be installed as per the "Forming Joints" section.

Heavy Duty Rafter Support Bracket

A clamp band with two fixing brackets.



Installation Method

- Assemble the clamp band and two fixing brackets ensuring that there is a washer either side of the fixing bracket. Tighten the nylock nuts fully. When tightened the brackets will still be able to rotate.
- Install the flue in position including the piece to which the bracket will be fitted.
- Ensure that the minimum distances to combustibles are maintained.
- Put the Heavy Duty Rafter Support Bracket over the flue component and locate (not fix yet) it on the rafters.
- Use the holes in the support collar to mark out fixing points on the flue outer casing.
- Remove the flue and carefully drill the outer casing of the flue to house stainless steel ½" Self-Tappers or rivets (⅛").
- **CAUTION!! Care must be taken to ensure that the internal lining is not penetrated. The drill must therefore be set to ensure a maximum penetration of 15mm. After drilling carry out a visual inspection of the inner liner.**
- After drilling carry out a visual inspection of the inner liner.
- Tighten up the clamp around the flue using the fixings provided. Ensure that these are tightened evenly and sufficiently to take the load.
- Each hole in the support collar must be fixed to ensure that the support assembly is sufficient to carry the maximum loads.
- Now fix the Heavy Duty Rafter Support Bracket to the to the timbers using 6 off 3mm wood screws (not supplied). (Or other suitable fixings depending upon support structure.)
- The system must be suitably supported as per the "Supporting Flue" section in these installation instructions throughout.
- Flue must be installed as per the "Forming Joints" section.

Guy Wire Bracket

See also 'Lateral Strength'. To install guy wires you shall need a guy wire bracket and a guy wire kit. The kit contains 30m of cable which will be more than sufficient for each installation.

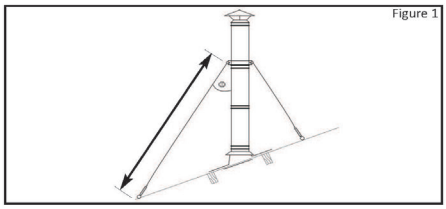


Figure 1

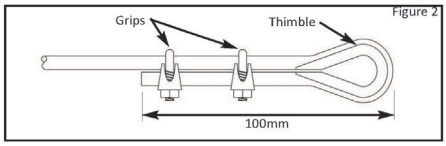


Figure 2

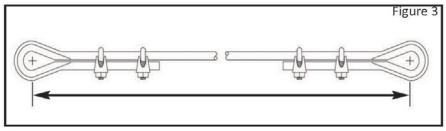


Figure 3

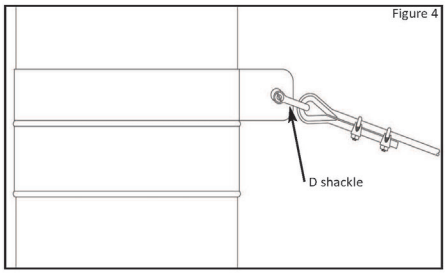


Figure 4

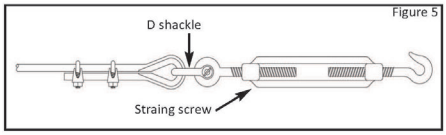


Figure 5

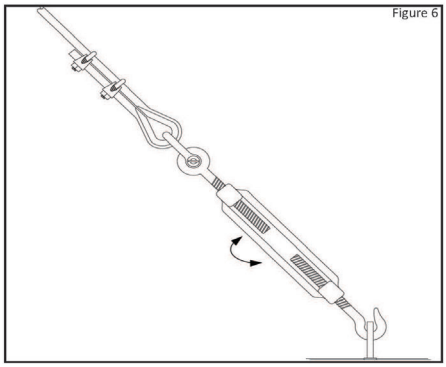


Figure 6

Installation Method

- Clamp the Guy Wire bracket around the flue above a swage.
- Make sure the structure to which the guy wires are to be fixed is structurally sound. Fix 3 anchor points (not provided) to this structure at a suitable distance from the flue. please note the guys must be fitted so that their angle from vertical (Φ) is more than 30° (figure 1).
- Measure the distance from the bracket to the anchor points (figure 1) cut the steel cable to the lengths measured).
- Assemble the cable. Pass the cable over the thimble and clamp together with 2 grips. You need to have about 100mm of overlap from the end of the thimble to the end of the cable (figure 2). Repeat this process for the other end of the cable.
- The distance from the centre to centre of the thimbles should be the distance measured minus about 200mm (figure 3).
- Bolt one D shackle to one end of the cable through the thimble and then bolt it to one of the eyelets on the guy wire bracket (figure 4).
- Bolt another D shackle to the other end of the cable through the thimble and then attach it to the eyelet end of a straining screw (figure 5). The straining screw should be unscrewed 2/3 out to allow for the adjustment later on in the installation procedure.
- Attach the hook end of the straining screw to the corresponding anchor point.
- Repeat the process for the other two sides.
- Once all three guy wire cables are installed tighten the strainers evenly to remove any slack in the cables (figure 6).
- Be careful not to over tighten the guys.

Note

The guy wire kit is suitable for use up to 3 meters from roof level above 3 meters alternative support may be required. Additional support may be required in areas that are exposed to high winds.
The guy wire kit safe working load is 100 kilos per wire.

Telescopic Flue Bracing Kit

Telescopic poles adjust to right length and fit back to roof. Each pole adjusts from 1.9m - 3.4m. Kit includes: 2 x telescopic poles made from galvanised mild steel or 3 x poles for 250mm diameter and above; 2 x roof brackets; support ring; fixings to assemble these components.

Installation Method

- Clamp the support ring around the flue preferably above a locking band.
- Each hole in the support ring must be fixed to ensure that the support assembly is sufficient to take the maximum loads.
- CAUTION!! Care must be taken to ensure that the internal lining is not penetrated. The drill must therefore be set to ensure a maximum penetration of 15mm. After drilling carry out a visual inspection of the inner liner.
- Make sure that the structure to which the braces are to be secured to is structurally sound.
- Locate the anchor points and fix the anchor brackets with suitable fixings for the structure.
- Fit the telescopic poles to the bracket around the flue using the fixings provided.
- Telescope the poles to the anchor points and secure with the fixings provided.
- Secure the telescopic poles in position.
- Replace any roof tiles ensuring that the roof is weatherproofed at the anchor points.
- The system must be suitably supported as per the "Supporting Flue" section in these installation instructions throughout.
- Flue must be installed as per the "Forming Joints" section.

Flashings

Selecting Flashings

Flashing Type	Storm Collar Required	Vertical Terminations					Horizontal Terminations	
		Slate Tiled	Pan Tiles	Conservatory (Polycarb)		Profile Roof	Corrugated cladding poor quality uneven surface	Wall in good condition
				Flat	Profiled			
Aluminium Roof Plate	Y	✓	✗	✓	✗	✗	✗	✗
Lead Slate	Y	✓	✓	✓	✓	✓	✗	✗
Sillicone Flexible Flashing	Optional	✗	✗	✓	✓	✓	✓	✓
AL base silicone flexible	Optional	✓	✗	✓	✗	✗	✗	✗
Lead base silicone flexible	Optional	✓	✓	✓	✓	✓	✗	✗
Trim plate	Y	✗	✗	✗	✗	✗	✗	✓

The flashing table above shows how flashings can be selected for typical roof types.

Aluminium, lead and flexible pipe flashings are available and the external chimney casing temperature and the type of roof surface should be considered when choosing the appropriate flashing. In general the HT-S Aluminium flashing plates will be suitable. For flat or nearly flat roofs the flat flashing plate should be used. The adjustable flashing plate should be used for roof pitches from 5° to 45°. Flashing plates can be made to order for pitches outside this range.

Locate the chimney route so that it will penetrate the ceiling through the joists and rafters where this is possible. Otherwise it may be necessary to seek the advice of a structural engineer. Approval from a structural engineer would be required for example if you were to cut through a rafter on a trussed rafter roof, or cut through a purlin or ridge timber on either roof system. Any alterations must be carried out by a competent person.

Inside preparation

- Determine the centre point where the chimney will penetrate the ceiling. This point should be clear of electric cables and water pipes etc.
- Drill a small hole with a masonry bit and mark the spot with a small length of dowel or a pencil to aid locating the penetration point from outside.
- Take internal measurements that can be used externally to help locate the drilled hole.

Outside preparation

From the measurements roughly locate the drilled hole externally.

Pitched roofs

- Number (if preferred) and then remove and set aside sufficient tiles from the penetration point to allow the flashing to be fixed. More tiles need to removed from the top and sides so that they can be fitted back over the top of the roof plate, (the bottom of the roof plate will fit over tiles to allow the rain to run off).
- Check that sufficient tiles have been removed by placing the flashing in place and in line with the hole drilled earlier.
- Mark out a circle or ellipse in the roof liner using the hole in the roof plate as a template.
- Extend this if required to ensure that the minimum distance to combustibles is maintained.
- Pass the chimney through the roof lining and check that the distance to combustibles is maintained all around.
- Pass the roof plate over the chimney.
- Fix the roof plate across the joists and fix with 30mm wood-screws and washers.
- Then replace the tiles, over the top of the roof plate on the top and sides. Trim tiles as required to give the desired finish.
- Seal as required with suitable sealant for the application.

For flat roofs (with a pitch of up to approximately 10 degrees)

We recommend that specialist contractors should be employed to waterproof around the flashing as there are many different types of flat roofing materials on the market, all with unique properties. Weatherproofing should also be taken to the top of the cone on the roof plate (excluding Aquarius flashings), so that where it meets the top of the flashing, it is protected by the storm collar.

General Installations

- Use the roof plate as a template to mark out a circle which is then to be cut out and removed. Check that the distance to combustibles is maintained.
- Cut back in segments.
- Lift back the segments and fit the roof plate over the flue and fix to the battens.
- Re-fit the segments forming a weatherproof dressing.
- Apply more waterproofing material as required.

For bitumen roof tiles

- Use the roof plate as a template to mark out a circle which is then to be cut out and removed.
- Check that the distance to combustibles is maintained.
- Then ease up the tile sections around the hole at the sides and top of the hole sufficient to allow the roof plate to fit underneath them, removing the nails as you go.
- The bottom part of the roof plate must sit over the tiles.
- Check that the roof plate will fit into the desired location so that the flue can be installed and connected up successfully after the flashing is in place.
- Turn the flashing upside down and apply, generously, a suitable roof sealant at a distance 1-2" away from the outside edge of the flashing plate.
- Carefully slide the top edge of the flashing underneath the tiles at the top and sides.
- Secure with suitable fixings.
- Weatherproof between the tiles and the flashing.

Final Weatherproofing

After the roof plate is fixed and sealed at the roof, a storm collar must be fitted to weather proof the gap between Aluminium and Lead flashings. A storm collar is optional with the Aquarius flashings. See the 'Storm Collar' section.

Solution for conservatory roofs

Always seek advice from the conservatory manufacturer and use the correct non-combustible replacement panel, as failure to do this could render the owners warranty on their conservatory, void. Ensure that the chimney has a load bearing support either above, below, or as it penetrates the roof.

Roof preparation

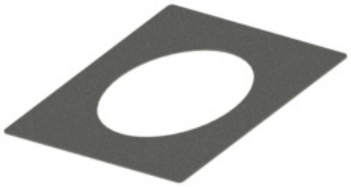
Glass - Conservatory companies offer replacement panels in non-combustible material with pre-cut holes. Hole = Flue OD + 50mm minimum. Check with the manufacturer on clearance requirements.

Polycarbonate - Use the inside of the roof plate as a template to mark a cutting line. Cut the hole.

Flashing installation

Fit the flue component through the roof, then fit the flashing over the top of the flue. Fix the roof plate using suitable fixings or silicone sealant (such as glazing sealant). If using sealant only then even pressure can be applied around the flashing using a wooden template and weights. See the 'Storm Collar' installation instruction.

Trim Plate



Circular discs or square plates with a hole to suit the flue OD. Also available for pitched roofs. Split trim plates will offer a tight fit around the TW & SW flue. One piece ones will offer a tight fit around TW flue. Standard parts give a 75mm trim all around the flue. Other designs and standard parts for larger diameters are manufactured to order.

Installation Method

- If being installed as a fire stop plate, install as per the "Fire Stop Plate" installation detail in these instructions.
- If being installed for an installation going through a wall to external see the "Storm Collars - Wall Penetration installations" section.

Installation Instructions

Storm Collars

Cravat Type

Washer Type

Supplied flat, pull round flue into conical shape and nuts and bolts are provided to secure, supplied in two or three pieces in larger diameters. Normally sold as 100mm wide collar.

Roof penetration installation

To install: with a flashing plate (aluminium, lead, aquarius).

- Ensure the area where the storm collar will be weatherproofed is clean and dry and free from contamination or damp.
- After the roof plate is fixed a storm collar is then positioned into place on the outer casing of the chimney directly above the flashing plate.
- Waterproof silicone based sealant (suitable for use in operating temperature of up to 180º) should be used to seal the collar.
- To seal with silicone cover both faces of the fold on the cravat before clamping and bolting. Fully silicone around the circumference of the storm collar at the point of contact with the outer casing of the flue.
- Washer type is a thinner collar (60mm wide) for use in restricted spaces.
- Sufficient curing time should be allowed before exposing siliconed areas to the elements.

Wall penetration installation

To install: with a trim plate.

- Ensure that the surface is free from dust, damp, or loose masonry work.
- Install flue components and wall sleeve through wall.
- Fit a trim plate to the wall using suitable screws or adhesive, and then silicone around the perimeter between the plate and wall.
- Fit the storm collar as detailed above.
- Finally silicone seal around the circumference of the storm collar at its contact point with the trim plate.


IMPORTANT SAFETY INFORMATION
This label must not be removed or covered

Midtherm Flue Systems Ltd.

Product Type: System Chimney ☐ Metal Liner ☐
Product Name: _____
Installation Designation: EN 1443 - T_____-_____-_____-_____-_____
Example: EN 1443 - T450-N1-D3-G50
Suitable for condensing appliances: Yes ☐ No ☐
Distance to combustibles in mm: _____
Nominal Size: 130 ☐ 150 ☐ 180 ☐ 200 ☐ 250 ☐ 300 ☐ 350 ☐ Other:_____mm

Product Type: Connecting Flue Pipe ☐
Product Name: _____
Installation Designation: EN 1443 - T_____-_____-_____-_____-_____
Example: EN 1443 - T450-N1-D3-G600
Suitable for condensing appliances: Yes ☐ No ☐
Distance to combustibles in mm: _____
Nominal Size: 100 ☐ 130 ☐ 150 ☐ 180 ☐ 200 ☐ Other:_____mm

Property Address: _____
Post code: _____
The Hearth & Chimney Installed in the: _____
Are suitable for: _____
Installers Company Name: _____
Installed by: _____ Installed on: _____
Address and Telephone No: _____
Other Information: _____

Tel: 0333 456 8000
www.midtherm.co.uk

5052147024970

Data Plate

The plate should be permanently and indelibly marked and fixed in a visible position. The plate must not be covered or removed. Possible locations are by the cleaning/inspection access or the side of the appliance.

Guidance on completing the "Installation Designation"

Example installation Designation:

LTC on gas/oil fired appliance for positive pressure applications with silicone seal.	EN 1443 - T250 - H1 - W1 - O50
LTC on gas/oil fired appliance with out silicone seal.	EN 1443 - T400 - N1- D3 - O70

The "Installation Designation" shall reflect the lower limits of the products installed.

Notes

The Midtherm Family

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