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Manufacturing for Clean Heat in Scotland

Factsheet 2: Heat Network Distribution

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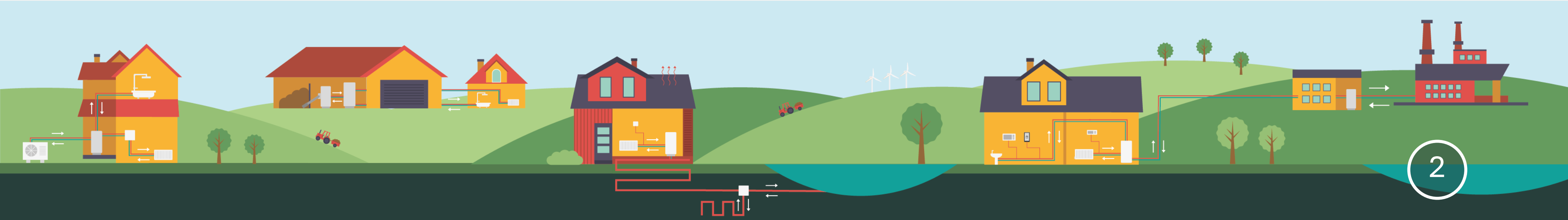
What is Clean Heat?

Clean heat refers to heat generation, distribution, and building energy efficiency technologies that provide heating and hot water with minimal environmental impact. Key technologies include heat pumps, heat networks, and direct electric systems, supported by measures to reduce heat demand and optimise usage through sensors, controls, and efficient design.

These factsheets aim to guide Scottish manufacturers to understand and enter the clean heat sector. Factsheet 2 focuses on key technologies used for Heat Network Distribution.

Factsheet 1	Factsheet 2	Factsheet 3	Factsheet 4	Factsheet 5	Factsheet 6
Heat Generation	Heat Network Distribution	Heat in Properties	Technology Enablers	Building Energy Efficiency	Energy Centre Construction
• Industrial Heat Pumps	• Pipework	• Radiators	• Control Panels	• Cladding	• Large Thermal Store
• Domestic Heat Pumps	• Circulation Pumps	• Underfloor Heating	• Thermostats	• Insulation	• Large Pumps
• Electrode Boilers	• Valves	• Infrared Panels	• Sensors and Meters	• Windows & Doors	• Structural Steel
• Electric Boilers	• Corrosion Control	• Hot Water Cylinders	• Actuators	• Ventilation Systems	• Electrical Switchgear
• Geothermal Drill Rigs	• Storage Buffers	• Storage Heaters	• Design Apps	• Offsite Manufacturing	• Cabling

Clean heat presents significant market opportunities for Scotland, UK and internationally. Clean heat is essential for all buildings to meet Scotland's 2045 net-zero target. This will be achieved via Local Heat and Energy Efficiency Strategies, regulations, and the proposed Heat in Buildings Act. Already, from April 2024, all new buildings must include clean heat systems. Existing buildings will require energy efficiency upgrades and clean heat retrofits and urban areas will see new heat networks (Heat Networks Act 2021).



Heat network distribution ensures efficient energy use, precise temperature control, and productivity in industrial operations.

Key heat network distribution components include:

- District Heat Pipework
- Circulation Pumps
- Valves
- Corrosion Control
- Storage Buffers

What is heat network distribution?

Heat network distribution uses a variety of components to transfer and manage the generated heat through insulated pipes, from a central heat centre to the end users in a domestic or industrial site.

Benefits of heat network distribution

- Pipework – essential to transport hot water or steam from the central heat source to various buildings and back. The quality and insulation of the pipes are crucial to minimise heat loss and maintain efficiency
- Pumps – to circulate the heated water or steam throughout the network. Ensuring that the heat reaches all parts of the network, and maintain the necessary pressure
- Valves – regulate the flow of water or steam within the network. Isolating sections for maintenance, control the flow rate, and ensure balanced distribution of heat
- Corrosion control – prevents significant damage to pipes, pumps, valves, and other components, avoiding leaks and failures
- Buffer Vessels – absorb excess heat during low demand periods and releasing it when demand increases. Stabilise the system and reduce the frequency of cycling

Pipes supply heat from a central source to consumers across a heat network.

A pre-insulated pipe:

Key Bill of Materials

1. Pipe
2. Insulation
3. Protective pipe

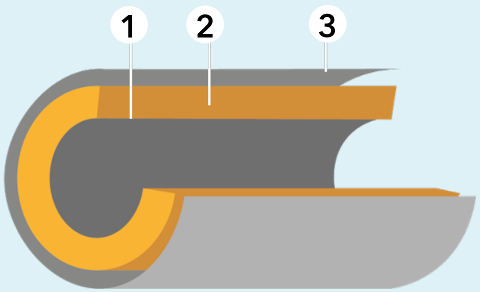


Diagram of pre-insulated pipe.

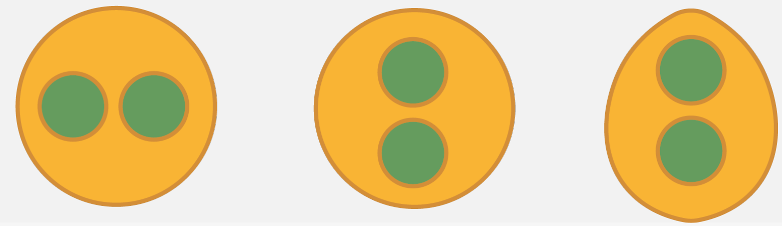


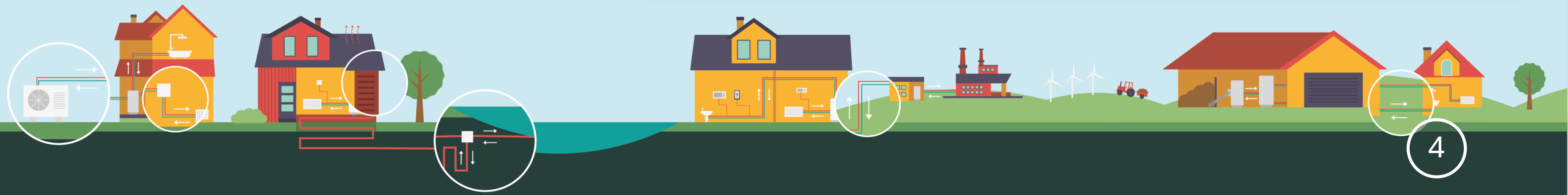
Diagram of twin pipes.

Pipework

Depending on the design of the network, there are various configurations of pipes to consider:

Single-pipe systems utilise one pipe to transport fluid in either direction. This system consists of two pipes: one for the delivery and another for return. This arrangement is the simplest and most cost-effective, however it is prone to significant heat losses.

Twin pipes house both the supply and return pipes within a single casing, with efficient insulation to decrease costs and minimise heat loss. Within this configuration, circular twin pipes can be positioned in three variants: horizontally, vertically, or in an egg-shaped form.



Pipes supply heat from a central source to consumers across a heat network.

Pipework

Piping needs to withstand external loadings, fluctuating water pressure and be capable of constant operation at elevated temperatures. If designed, manufactured and installed correctly, pipework can have a service lifetime of up to 50 years.

There are several factors that influence the size of pipework selected for a new system.

These include:

- Flow & return temperatures
- Route topology & scale
- Assessment of heat demand
- Acceptable losses
- Pump electricity consumption
- Pipe material/insulation/configuration choices

Subcomponents	Inner pipe, insulation, outer pipe			
Temperature Range	Metal	0 – 150 °C	Plastic	0 – 80 °C
Max. pressure	Metal	25 bar	Plastic	16 bar
Diameter	Inner pipe	25 – 1000 mm	Outer pipe	90 – 1200 mm
Length	Metal	12 m sections	Plastic	> 300 m coils
Standards	Heat Networks Code of Practice CP1.2 A Technical Guide to District Heating (BRE, 2014) BS EN 15632 – District heating pipes. Pre-insulated flexible pipe systems – Bonded plastic service pipes. Requirements & test methods			

*** The dimensions are approximate and can vary based on the specific requirements of the materials and the manufacturer's design standards.**

The typical manufacturing processes for the assembly of metal pipework.

Metal Pipework: Manufacturing Process

Rolling

Rolling:
Sheet steel is run through a line of rolling machines to make it into a pipe shape of the required thickness. This is a commonly used process.

→

Welding:
The seam is then welded to seal the pipe

→

Finishing:
The pipe undergoes various finishing processes which can include annealing, straightening, deburring and cutting.

Mandrel Milling

Mandrel Milling:
A solid round of metal (billet) is heated in a rotary hearth furnace and then pierced through the centre to form the pipe. The pierced billet is rolled by a mandrel mill to reduce the outside diameter and wall thickness, which is reheated and further reduced to specified dimensions and then cooled.

→

Finishing:
The pipes are cut to length, straightened and subjected to finishing, testing and inspection processes before shipment.

Insulation

Batch Assembly of Pipe Components:
The inner pipe and the casing are typically independently manufactured, then placed concentric to one another using spacers to maintain alignment. The insulator is then injected between the inner and outer pipes.

Pre-insulated pipes manufactured in batches, are typically shorter and made of metal.

The typical manufacturing processes for the assembly of plastic pipework.

Plastic Pipework: Manufacturing Process

Manufacturing Process

Extrusion:
In an extruder, plastic pellets are heated, melted and then extruded through a die-head. The extruder usually consists of a heating zone, a melting zone and a cooling zone to ensure the gradual heating and melting of the material, to avoid material degradation due to overheating.

During the heating and melting process, the plastic pellets become molten so they can be shaped through the die head to form the initial pipe profile. The die head typically has multiple extrusion holes, through which the molten plastic is extruded to form the initial pipe shape.

Cooling:
A cooling system cools and cures the extruded plastic to maintain the desired shape and size. These systems can include water showers, cold air blowers and cooling rollers.

Drawing and Cutting or Winding:
After cooling, the pipe enters the drawing equipment. This stretches the pipe to the desired length and helps to further shape it. Once the pipe reaches the desired size, it can be cut to the appropriate length and collected, ready for the subsequent processing stages, for long pipes, equipment winds the pipes into coils for transport and storage.

Insulation and Outer Pipe

Integrated Manufacture:
Pre-insulated pipes can be manufactured in rolls of up to several hundred meters, predominantly in a continuous process.

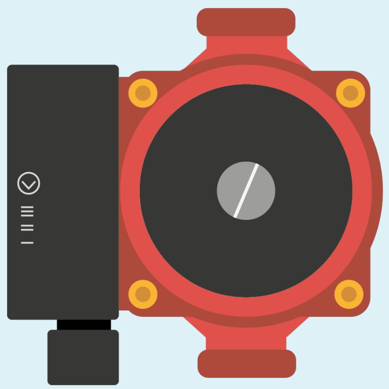
Insulation is poured into a moving casting mould and flows around the inner pipe whilst on a conveyor belt. The outer pipe is then extruded in place onto the insulation.

Main materials and characteristics used in pipework manufacturing.

Materials	Advantages	Disadvantages
Inner Pipe		
Steel	• Low cost • Suitable up to 120°C	• Susceptible to corrosion • Lack of flexibility
Copper	• Lightweight • Ductile & malleable	• Higher cost • Lack of flexibility
PEX	• Flexibility • Easy installation	• Sensitive to UV light • Not recyclable
CPVC	• Corrosion resistant • Flexibility	• Higher cost • Can become brittle
Insulation		
PUR Foam	• Excellent insulator • Corrosion resistant	• Rigid • Unsustainable
PET Foam	• Withstands high temperature • Low cost	• Low fire resistance • Sensitive to UV light
Outer Pipe (can be corrugated or smooth)		
LLDPE	• Flexibility • High impact strength	• Complicated manufacture
HDPE	• Flexibility • Sustainability	• Poorer weather resistance • Stress cracking sensitivity

Circulation pumps are an essential part of delivering heat across a network.

Circulation Pump:



Key Bill of Materials

1. Casing
2. Impeller
3. Shaft
4. Bearings
5. Electric motor

Diagram of circulation pump.

Subcomponents	Casing, impeller, shaft, bearing, electric motor
Temperature Range	-10 – 110 °C
System Pressure	6 - 16 bar
Max. Head	20 m
Max. Flow	5 – 100 m^3/h
Standards	Heat Networks UKCA/CE mark - Demonstrates that the pump meets the minimum legal safety, health, and environmental protection requirements to be placed on the market in the UK or any EU member state. ISO 14414 - Pump system energy assessment Ecopump and Europump initiatives

Heat Network Distribution: Circulation Pumps – Introduction and subcomponents

Circulation pumps are an essential part of delivering heat across a network.

Circulation Pumps

A circulating pump moves water around a heat network. These pumps ensure there is sufficient pressure in a circuit to meet possible demand.

As the water may need to be pushed through significant distances of piping before reaching its destination, the operational power, resistance to degradation and reliability of pumps are critical.

Pumps operate under a range of forces and need to be resistant to significant instantaneous forces and operational fatigue, so need to be designed for long lifecycles and regular maintenance to fulfil their system requirements.

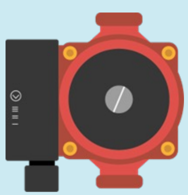
Materials	Advantages	Disadvantages
Stainless Steel	• Low maintenance • Durability • Corrosion resistant	• High cost • Difficult to weld • Susceptible to temperature fluctuations
Cast Iron	• Durability • Excellent machinability • Resistant to deformation	• High cost • Susceptible to rust
Aluminium	• Durability • Malleability • Recyclable	• High cost • Weaker than other materials
PES	• Corrosion resistant • Low mould shrinkage • High load/stress tolerance	• High cost • Low resistance to UV light • Processing requires high temperature & pressure

*** The dimensions are approximate and can vary based on the specific requirements of the materials and the manufacturer's design standards.**

The typical manufacturing processes for the assembly of a circulation pump.

Component Manufacture → Casing Manufacture → Subassembly → Final Assembly → Cleaning and Surface Treatment → Testing and Quality Control

Circulation Pump: Manufacturing Process



Circulation pump

Casting (Metal Components): The material is heated to approximately 1,500°C, when it becomes molten. It is then poured into a mould of the desired shape and left to cool.

→

Extrusion (Plastic Components): Raw material is heated until it melts, at which point it is pushed through a die-head. Once the material is pushed through the extruder it gets shaped into the desired form, which is maintained once it cools.

→

Processing: Machine and cutting tools are used to process the materials into the desired shape. The approaches include lathe turning, milling and CNC machining.

→

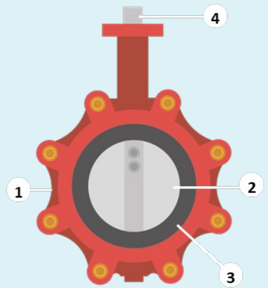
Finishing and Painting: Components are cleaned, polished, and painted to provide a protective finish, to prevent corrosion and enhance the longevity of the pump.

→

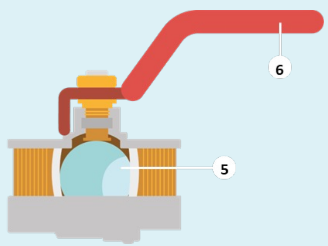
Assembly stages: Machined parts are assembled into subassemblies, such as the pump housing, impeller, shaft and rotor assembly

Valves control, regulate and direct the flow efficiently around a system, crucial for both residential and industrial heat networks.

Valves:



Butterfly Valve



Ball Valve

Key Bill of Materials

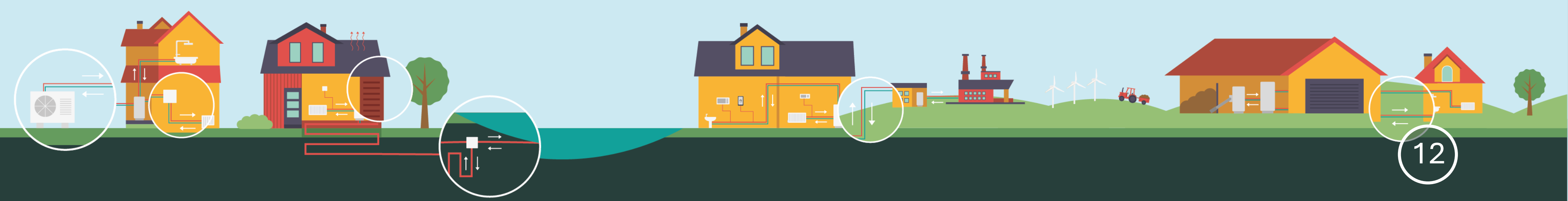
1. Casing
2. Disc
3. Seal
4. Stem
5. Ball
6. Handle

Valves

Ball Valve – Use 90-degree turn handles and a ball to control flow for easy on-off control.

Butterfly Valve - Compact design, many configurations and use a rotary motion valve.

Subcomponents	Body, Bonnet, Trim
Bore size	10 mm – 700 mm
Temperature	- 20 – 150 °C
Standards	Heat Networks Code of Practice CP1.2 A Technical Guide to District Heating (BRE, 2014) BS EN 15632 – District heating pipes. Pre-insulated flexible pipe systems – Bonded plastic service pipes. Requirements & test methods



Valves control, regulate and direct the flow efficiently around a system, crucial for both residential and industrial heat networks.

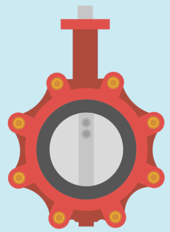
Materials	Advantages	Disadvantages
Stainless steel	• Low maintenance • Durability • Corrosion resistant	• High cost • Heavier • Lower thermal conductivity
Carbon steel	• Weldability • High tensile strength • Yield strength	• High cost • Increased brittleness • Limited formability
Alloy steels	• Enhance durability • Corrosion resistant • Versatility	• High cost • Limited machinability • Heavy
Aluminium	• Durability • Malleability	• High cost • Weaker than other materials
Brass	• Cost effective • Machinability • Corrosion resistant	• Lower tensile strength • Risk of dezincification
Bronze	• Resists metal fatigue • Corrosion resistant • Thermal conductivity	• High cost • Soft • Weaker than other metals
Cast iron	• Durability • Excellent machinability	• Heavy • Susceptible to rust
Ductile iron	• Superior strength • Flexibility	• Higher cost • Lower corrosion resistance

***The dimensions and weights are approximate and vary based on the specific requirements of valve and the manufacturer's design standards.**

The typical manufacturing processes for the assembly of a valve.

Component Manufacture → Body Manufacture → Subassembly → Final Assembly → Cleaning and Surface Treatment → Testing and Quality Control

Valve: Manufacturing Process



Valve

Casting: The valve body is created using casting or forging methods

→

Machining: Precision machining, such as CNC, used to create intricate valve parts, including the orifice, stem and seat

→

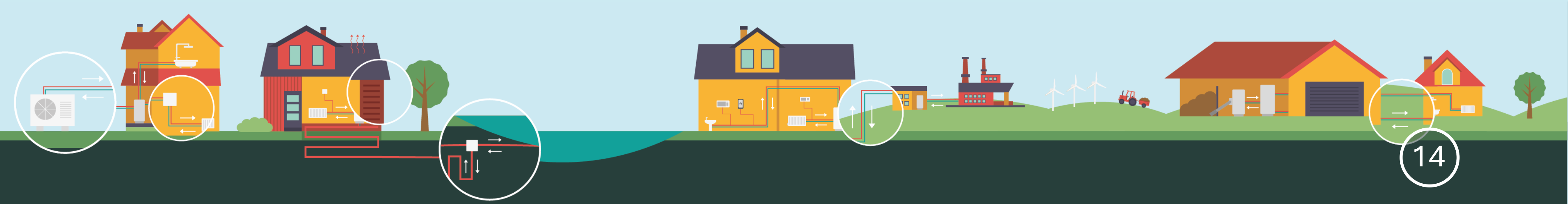
Assembly: Machined parts are assembled. This includes fitting the diaphragm, spring, and components that regulate the valves' operation

→

Cleaning and Surface Treatment: Valves are thoroughly cleaned. Electroplating or passivation may be applied to enhance corrosion resistance

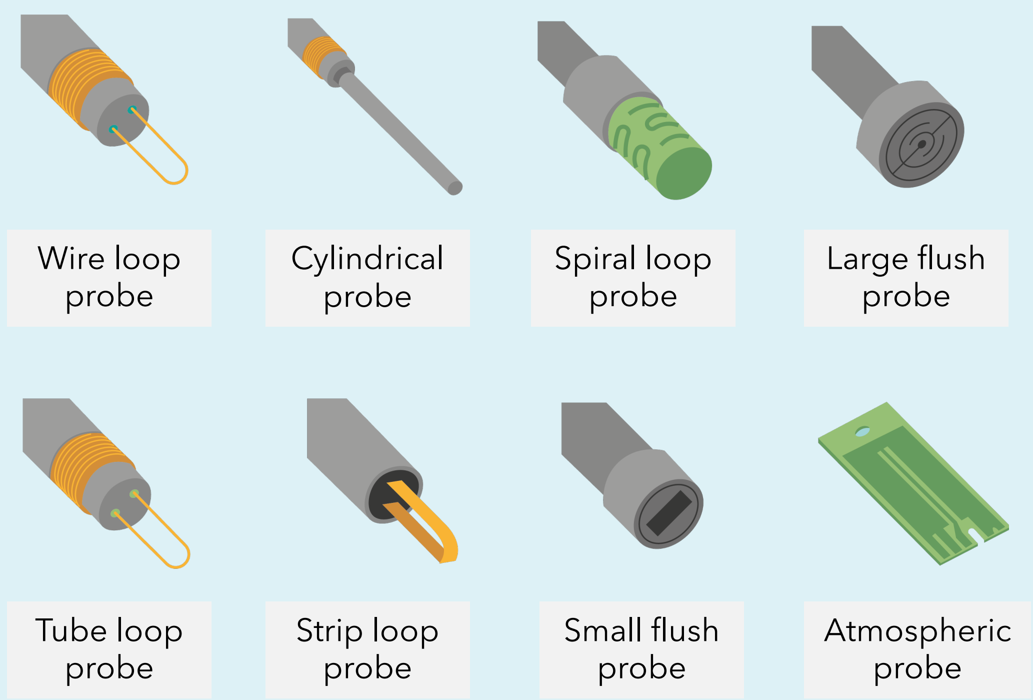
→

Testing: Valve tested for leaks, pressure tolerance, and operation. Calibr ation ensures valve opens and closes at correct pressure and temperature



Corrosion monitoring and control are vital to avoid the failure of a heat network due to corrosive degradation of infrastructure.

Corrosion Probes:



Electrical Resistance Methods

The electrical resistance (ER) technique is a continuous corrosion monitoring method for the total metal loss of any metallic equipment or structure. This technique measures a variety of corrosive activities, such as erosion or cavitation, making it very useful for application throughout a heat network.

Probe elements are available in a variety of geometric configurations, thicknesses, and alloy materials.

Different designs may also operate differently; either as fixed, retractable or retrievable probes.

Typically, the material of the probe is chosen to match the material of the component where the corrosion is being measured, to give an accurate reflection of the corrosive action taking place. These components are usually some form of steel, such as stainless and carbon steel.

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Corrosion monitoring and control are vital to avoid the failure of a heat network due to corrosive degradation of infrastructure.

Corrosion Control

Corrosion mitigation is typically underappreciated in the district heat sector. 15% of UK heat networks have suffered failures because of corrosion causing water quality issues.

There are various forms of corrosion control, which include careful installation, operations and maintenance of the network, corrosion coupons, linear polarisation and ultrasonic sensors. This factsheet focuses on the manufacture of electrical resistance probes due to the versatility of their application.

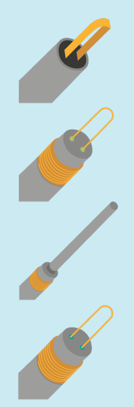
Materials	Usually some form of steel, such as stainless and carbon steel.
Thickness	1 – 50 mm
Length	400 – 1000 mm
Standards	BG29/2020 – Pre-commissioning cleaning of pipework BG50/2021- Water treatment for closed heating and cooling systems CIBSE CP1 - Heat networks: Code of Practice for the UK

*** The dimensions are approximate and can vary based on the specific requirements of the materials and the manufacturer's design standards.**

The typical manufacturing processes for the assembly of control corrosion probes and their fabrication.

Component Manufacture → Testing and Quality Assurance → Fabrication → Final Assembly

Corrosion Control: Manufacturing Process



Probes

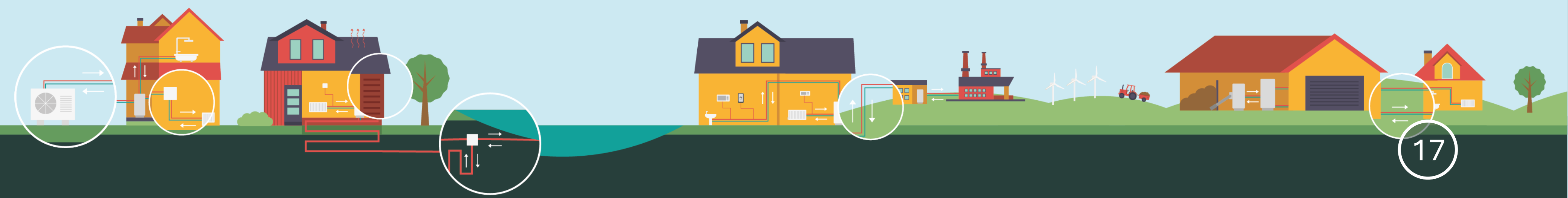
Design and Engineering: Understanding the requirements of the heat network, identifying any key areas of corrosion risk and determining the type and specifications of probes

→ **Component Procurement:** Sourcing high-quality components such as the wires, sensors and control units/necessary software from trusted suppliers.

→ **Testing and Quality Assurance:** The components received are inspected using dimensional and non-destructive methods, such as 3D scanning.

→ **Enclosure Fabrication:** The fabrication process can involve rolling, cutting, bending, and welding the metal to form the probe shape according to the design specifications.

→ **Component Installation:** Carefully positioning and mounting the internal components, according to the design requirements.



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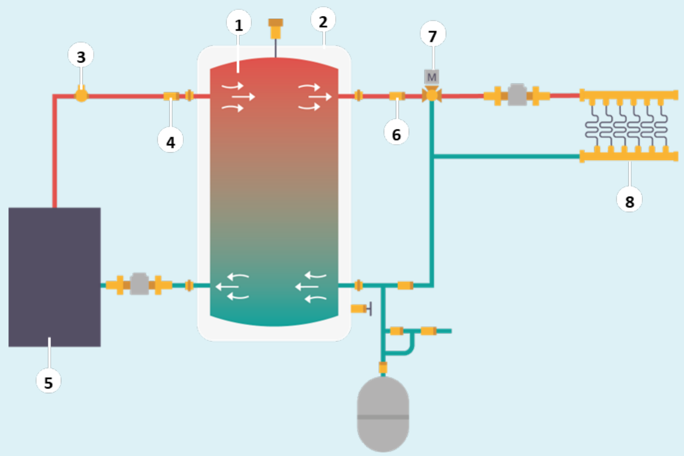
A storage buffer provides additional water volume or thermal inertia, stabilising temperature and enhancing system efficiency.

Buffer Vessel:



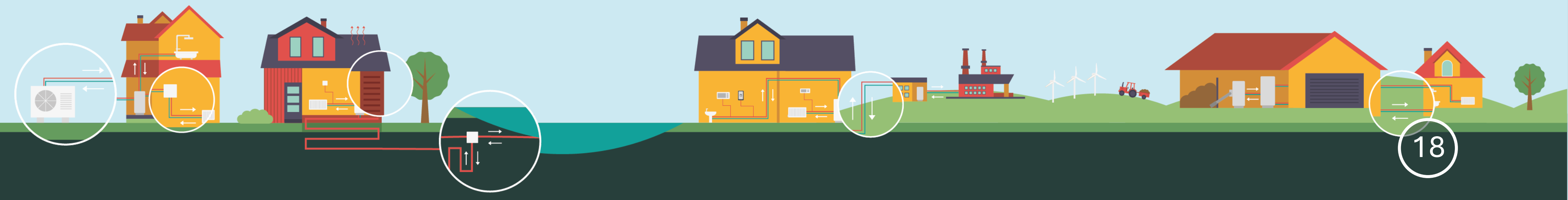
Key Bill of Materials

1. Tank
2. Insulation
3. Air separator
4. Swing check valve
5. Heat source
6. Spring loaded check valve
7. Mixing valve
8. Low temperature distribution system

Diagram of buffer vessel.

Subcomponents	Tank, sparge, deflector plates, insulation, heat exchanger, buffer / expansion vessel, sensors, air separators, valves
Typical Capacity	100s – 1000s litres
Typical Pressure	1 – 30 bar
Standards	BS 5422:2023 - Thermal insulating materials for pipes, tanks, vessels, ductwork and equipment operating within the temperature range –40 °C to +700 °C. BS 853-1:1990+A3:2011 - Specification for vessels for use in heating systems. Calorifiers and storage vessels for central heating and hot water supply

*** The dimensions are approximate and can vary based on the specific requirements of the materials and the manufacturer's design standards.**



A storage buffer provides additional water volume or thermal inertia, stabilising temperature and enhancing system efficiency.

Storage Buffer Vessel

A typical storage buffer vessel has internal sparge pipes and deflector plates which prevent the flow bypassing the stored water.

Accurate sizing of the storage buffer tank is a critical part of the overall heat network distribution design, to ensure there is sufficient space to permit proper installation and any necessary maintenance. In addition, the integration and control of the buffer should be matched to the overall system.

Please note that large thermal stores are covered in Factsheet 6.

Materials	Advantages	Disadvantages
Mild Steel	• Low cost • Versatility • Durability	• Susceptible to corrosion • Lower strength • Limitation to heat treatment
Stainless Steel	• Low maintenance • Durability • Corrosion resistant	• High cost • Difficult to weld • Susceptible to temperature fluctuations
Galvanised Steel	• Durability • Longevity • Protection from contamination	• Heavier material • Difficult to weld
Fibreglass	• Dimensional stability • High strength	• Moisture issues • Susceptible to mould • Air exchange issues
Aluminium Cladding	• Lightweight • Malleability • High weight to strength ratio	• Susceptible to corrosion • Thermal conductivity • High cost

*** The dimensions are approximate and can vary based on the specific requirements of the materials and the manufacturer's design standards.**

The typical manufacturing processes for the assembly of storage buffers.

Component Procurement → Manufacture → Subassembly → Final Assembly → Cleaning & Surface Treatment → Testing and Quality Control

Storage Buffer: Manufacturing Process

Plate by Plate Assembly:

Assembling the tank's shells, bottoms, and roofs plate-by-plate. Shell and bottom assembly (welding) is carried out on the construction site.

The main factor determining the quality of the tank metal structures produced by this method, is strict provision of their shape and the set of technological decisions, preventing residual distortion of the metal frameworks while edging and transporting.

→

Coiling Method:

The shell, bottom and roof are brought to the site as coiled strip panels, for welding.

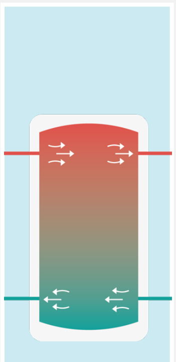
This method makes the tank installation period 3-4 times shorter by reducing the volume of welding procedures in the construction area whilst also providing high quality welded joints due to using two-side automatic welding.

Thermal stores can also be brought to site as a packaged unit, without the need to weld on site.

The typical manufacturing processes for the assembly of storage buffers.

Component Procurement → Manufacture → Subassembly → Final Assembly → Cleaning & Surface Treatment → Testing and Quality Control

Storage Buffer: Manufacturing Process



Storage Buffer

Enclosure Fabrication: This involves cutting, bending and welding the metal sheets to form the enclosure according to design specifications.

→ **Plate Rolling:** Plates are rolled to the required thickness and shape

→ **Welding:** Components welded to form the shell of the tank

→ **Cleaning and Surface Treatment:** Surfaces are treated to prevent corrosion, via sandblasting, priming and applying protective coat

→ **Assembly:** Shell, bottom and roof assembled as a pre-built structure or built on site as coiled strip panels or plate-by-plate

Summary of the key processes and equipment required for manufacturing heat network distribution components.

Process	Equipment/Facilities	Pipework	Large Pumps	Valves	Corrosion Control	Storage Buffers
Design and Prototyping	CAD Software, 3D Printers, CNC Machines	X	X	X	X	X
Casting, Milling, Drilling	Furnaces, CNC Machining, Drilling Machines		X	X		
Tube / Metal Forming and Bending	CNC Tube Benders, Roll Bending Machines, Stamping Presses, Wire Drawing	X			X	X
Manufacturing Facilities	Furnaces, CNC Machines, Mandrel Milling Equipment, Cutting Stripping and Assembling Machines, Injection Molding and Extrusion and Foaming Machines, Blowers and Fans	X	X	X	X	X
Welding, Brazing and Soldering	Welding Machines, Cutting Torches, and Fabrication Tools, Furnace	X	X			X
Painting Powder Coating and Plating	Spray Booths, Powder Spray Guns, Powder Feed System, Curing Ovens, Electroplating, Mixing and Dispensing Systems	X	X	X		X
Assembly Line	Conveyors, Robotic Systems, Assembly Machines	X	X	X	X	X
Testing and Quality Control	Inspection Tools, Testing Equipment	X	X	X	X	X
Calibration Facilities	Calibration Equipment, Testing Benches		X	X	X	X

Market size and growth.

Market Size and Outlook

Both the UK and Scottish Governments are supportive of the further development of district heating. The Committee for Climate Change forecasts that 20% of heating demand in the UK could be met by district heating by 2050.

In Scotland, heat networks provide hot water to 28,000 homes to meet 1.1% of heat demand. By 2035, the Scottish Government has the ambition to reach 7TWh meeting 9.5% of demand.

The UK district heating industry had a value of over £1.15 billion in 2023. Globally, district heating is expected to grow by 5.2% per year for the next decade.

Pipework

- The Heat Networks Industry Council estimates a £60bn investment is required, alongside 30,000 jobs, to meet the UK's 20% ambition.
- The length of insulated pipework in the UK is currently estimated at 1,800km – with considerable growth potential - GB gas infrastructure is around 282,000km.

Circulation Pumps

- The UK pump manufacturing industry had revenues of £2.3 billion in 2023, a 7.6% increase. Whilst manufacture of pumps is a mature industry, the heat network sector provides a growth opportunity.

Valves

- The UK tap and valve manufacturing industry market was £1.2 billion in 2024. Whilst the manufacture of valves is a mature industry, the heat network sector provides a growth opportunity.

Corrosion Control

- The global corrosion monitoring market was worth £270 million in 2023. This market is expected to experience a 9.3% compound annual growth rate from 2024 to 2029.
- As industries mature, regulatory compliance becomes more comprehensive, which supports the adoption of advanced corrosion monitoring technologies.

Buffer Vessels

- At a global level, this market is expected to experience a 7.8% compound annual growth rate from 2024 to 2031.

Support available and competitor analysis.

Scotland

- The Heat Network Support Unit provides funding, information and signposting to support district heat networks in Scotland
- The Scottish Government's Heat Network Fund is a capital fund to support low or zero emission district heat networks.
- The Scotland Heat Map shows demand for domestic and non-domestic buildings.
- Scottish Local Authorities have a Local Heat and Energy Efficiency Strategy (LHEES) and LHEES Officers with a local view clean heat system plans.

UK

The Heat Network Exchange database connects companies with suppliers, bringing together organisations that design, build, operate, and maintain heat networks.

England and Wales

The Department for Energy Security and Net Zero provides guidance and support for heat network projects. Heat networks - GOV.UK

- The Heat Network Investment Project (HNIP) provides funding to support the deployment.
- The Green Heat Network Fund (GHNF) offers grants to support the development of low-carbon heat networks.

Competitor Analysis

Insulated pipes: CPV Ltd (UK), Isoplus and Logstor (Denmark) (owned by Kingspan), Powerpipe (Sweden). TrentENERGY and ThermaMech are specialist suppliers (UK)

Pumps: Carrier, Aermec, AVT Pump (UK), Grundfos Pumps (Denmark), Danfoss (Denmark)

Valves: Danfoss (Denmark)

Corrosion control: RCSL Corrosion Monitoring, BAC Corrosion Control, Teledyne Cormon (all UK)

Storage buffers: Kingspan Environmental (N. Ireland), Flexiheat (UK)

Scottish Enterprise can support you to explore growth in clean heat.

Clean Heat Market Opportunities

Clean heat will play a crucial role in meeting Scotland's net zero targets. There is a huge growth potential for Scottish businesses too.

- For general enquiries, and to access our Clean Heat team, please contact us
- For specialist advice on manufacturing and productivity, contact the Scottish Manufacturing Advisory Service (SMAS)
- For information on domestic and international markets contact our Market Research service
- If you are based in the Highlands and Islands, or the south of Scotland, please contact Highlands and Islands Enterprise or South of Scotland Enterprise respectively.

Newsletter

Please complete this subscription form if you would like to receive an occasional newsletter from Scottish Enterprise on market opportunities relating to clean heat.

Subscribe here

Further Reading

- Economic Value of Clean Heat in Scotland (2024)
- Heat Pumps and Heat Networks Assemblies and Key Component Analysis (2022)
- Cost Analysis of a Typical 4th and 5th Generation Heat Network (2024)
- Analysis of potential for Scotland to be leader in 5th Generation Heating and Cooling Networks | Scottish Enterprise

External Support Services in Scotland

- National Manufacturing Institute Scotland (NMIS) world-leading manufacturing facilities for collaborative R&D projects
- Built Environment - Smarter Transformation (BE-ST) innovation and expertise for projects / materials for the built environment