



TM

Wednesbury®



Streamline®
Copper Tube



仲賢行有限公司
CYH Limited





Copper - First Choice for Plumbing and Heating Systems



Durable

Copper has a long useful life. Being both corrosion resistant and mechanically strong copper can resist decay from internal attack and can withstand physical damage in service.



Lightweight

Thin-wall drawn copper tubes are convenient to distribute and offer excellent working pressure capabilities.



Malleable

Copper is convenient to manipulate at the manufacturing stage being suitable for casting, forging, extrusion and drawing. It is suitable for installation using brazed, soldered or mechanical connections.

Hygienic

Copper is antimicrobial - it naturally inhibits the growth of harmful pathogens including bacteria, mould, algae and fungi.



Recyclable

Copper waste can be efficiently recycled at the production stages and is 100% recoverable at the end of life of a building or system.

Streamline[®]
Copper Tube

Copper Tube manufacture at Bilston, UK

There has been a copper mill at the current site for over 70 years and Wednesbury (formerly known as Mueller Europe) is the only manufacturer of copper tube 100% produced in the UK. During this time the vast majority of output has been for plumbing and heating systems.

The site was acquired by Mueller Industries in 1997, since when US\$100million has been invested. The result is one of the most modern plants in the world shipping copper tube all around the world.

Production Process

Casting of Billets

Tens of thousands tonnes of copper are cast into billets at Bilston every year. The raw material is a combination of cathode (electrolytically pure to 99.90%) and a proportion of controlled scrap.



Extrusion

Billets are heated to 950 °C in a gas furnace and loaded into a 4,000 tonne press. An 80m long hollow shell is extruded under water as the basis for the drawing processes which follow.



Drawing

The shell proceeds through the plant in an automated basket handling system and follows a carefully controlled sequence of reduction processes through to the final dimensions and temper. A single billet yields over a kilometre of 15mm plumbing tube in a single length.



Finishing

The automatic finishing lines at Bilston complete the manufacturing process. Hard tube is straightened from the handling basket, whereas half-hard tube is annealed and given a final finishing draw. Finally the tube is eddy-current tested, plastic-coated if required, marked, cut to length and bundled. Tube to be supplied in the soft-coiled form is processed down a separate, dedicated finishing line.



Distribution

Finished tube is stored in the 3,043 sq m² warehouse for shipping in line with customer requirements.



Technical Data

Quality Standards

Wednesbury manufacture their copper tube to the exacting requirements of BS EN1057. The tube is rigorously tested, at regular intervals, by the British Standards Institution to ensure conformity. In recognition of the confidence in their product quality, Wednesbury have earned the right to stamp the Kitemark on their copper tubes.

They also hold the approvals for many European national and international standards, including China, Denmark, Finland, Ireland, Malaysia, Netherlands, Norway, Singapore and Sweden.

In addition, Wednesbury have achieved Registered Firm Status to ISO 9001:2008. This system ensures that all aspects of the company's activities meet the highest standard. Therefore customers buying from Mueller Europe can be sure they are buying a quality product, from a quality company.

Mechanical Properties

Seamless copper tube to the specification EN 1057 is produced at Wednesbury's Bilston factory and supplied in soft, half-hard and hard condition, offering a choice of mechanical properties to meet customer requirements. A softer tube offers improved malleability but lower ultimate strength. The different properties are achieved by a carefully controlled sequence of drawing and annealing cycles during production.

Environmental Standards

Wednesbury manufacture copper plumbing tube but they do it more efficiently. In addition to investing \$US100 million in 'state of the art' energy efficient production facilities, they have put systems and practices in place to reduce waste and minimise their impact on the environment. As a result, they are accredited with Environmental Management Approval to ISO 14001:2004. No other manufacturer supplying copper plumbing tube holds this approval.

CONDITION	MARKING per EN 1057	Outside Diameter range mm	Hardness HVS	Elongation Min %	Tensile Strength Rm Mpa Min
Soft	R 220	15mm to 28mm	40 to 70	40	220
1/2 Hard	R 250	15mm to 28mm	75 to 100	30	250
Hard	R 290	35mm to 159mm	min 100	3	290

Chemical Composition

The tube is manufactured from phosphorus deoxidised (non arsenical) copper alloy CW024A.

The melting point of copper is 1083°C and it has a density of 8.9 gm/cc.

Dimensions

Data sheets are available, in the back flap of this brochure, providing details of the nominal diameters, wall thicknesses, safe working pressure and weights for the various tubes offered

Streamline[®]
Copper Tube

Copper Tube Applications

Copper tubes are used most often in

- Hot & cold water supply
- Waste water drainage
- Water filled heating systems with radiators or convectors
- Gas service for heating and cooking
- Oil service for heating

Copper tubes are also suitable for use commercially in

- Chilled water distribution and refrigeration
- Sprinkler systems for fire protection
- Air conditioning
- Steam
- Medical gases
- Pneumatics
- Hydraulics
- Waste water

In each case care should be taken to assess the environment and duty of the system in terms of pressure and temperature variations, possible chemical attack from the external conditions or the fluid carried.

Comprehensive details are provided in documentation and CDs by the Copper Development Association. For assistance contact your Wednesbury Export representative or follow the links available from www.wednesburytube.com

Installing Copper Tube

Bending half-hard Copper Tube – unlike hard-temper copper tubes, which are not meant to be bent, half-hard copper tubes can be bent with ease on bending machines or with internal springs.

Joining – copper tubes are suitable for connecting by means of capillary, compression or press fittings to EN 1254, silver brazing, bronze or autogenous welding.

Mueller Protec and Protec 2000: plastic coated copper tube

Wednesbury manufacture a range of plastic-coated copper tubes for use when copper tube is to be buried in a potentially aggressive environment. Building materials such as concrete and insulation materials can contain chemicals which are potentially corrosive to plain copper tube. Therefore, where copper tube is buried, it must be protected to ensure its longevity in service.

Protec

Protec is the brand name for copper tube with a plain polyethylene coating, which has been extruded tightly onto the outer surface of the copper tube. This coating protects the copper against aggressive environments and is colour coded to identify the service:

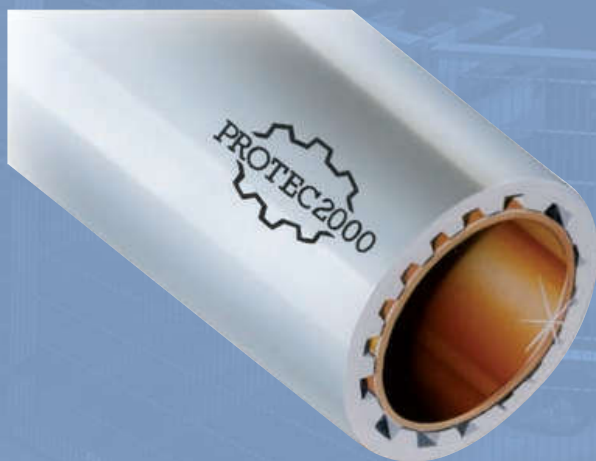
YELLOW OCHRE for GAS services

GREEN for POTABLE WATER

WHITE for CENTRAL HEATING

Protec 2000

Protec 2000 is the brand name for copper tube with a polyethylene coating, the inner surface of which is castellated to provide air gaps, which run the length of the tube. In addition to protecting the copper tube against external corrosion, the air gaps on Protec 2000 form a thermal barrier to reduce surface temperature, transmitted noise and condensation levels, together with a reduction in heat loss when buried. It is available in white only.



Installing Protec and Protec 2000

When joining plastic-coated copper tubes, make slits in the plastic and fold it back to reveal the copper. Protect both ends of the plastic by wrapping them with a damp cloth. Make the joint then return the plastic to its original position. Any breach in the plastics cover must be made good to ensure that the protective properties are maintained. Therefore, after making the joint, the last 25mm of intact plastic covering, either side of the joint, together with any bare copper tube (and fitting), should be carefully and completely spirally wrapped with a self-adhesive polyethylene or p.v.c. waterproof tape in order to ensure continuous protection.

Where Protec 2000 tubes are used, moisture should be prevented from entering the channels in the plastic coating where the plastic ends. The best way to do this is by the wrapping with self-adhesive plastic tape over the last 25mm of intact plastic covering, and at least a similar area of immediately adjacent bare copper pipe.

Protec and Protec 2000 copper tubes are available ex-stock in standard UK half-hard sizes to EN 1057. Other sizes, tempers and wall-thicknesses can be made to order.

Instead of using copper tubes bearing a protective plastic-coating, some installers prefer to protect copper tube by spirally wrapping the whole length with an impervious tape. However, this is a poorer substitute to installing Protec and Protec 2000 tubes, as it is impossible to guarantee that there will be no ingress of corrosive agents.

Degreased Copper Tubes

Wednesbury supply a range of copper tubes suitable for Oxygen and Medical Gas purposes. Please contact Wednesbury for details.





BLACK LABEL EN 1057

formerly BS2871 Part 1 Table X

INTRODUCTION

The British Standard EN 1057 (brand name Black Label) specifies the requirements for copper tube in straight lengths to half hard and hard temper. The tube is manufactured from phosphorus deoxidised (non arsenical) copper alloy CW024A. Tube complying to this table is suitable for hot and cold water services, gas services, sanitation and central heating. This tube when buried should be factory plastic coated.



Nominal dimensions temper and max working pressures

Nominal outside diameter Ø mm	Wall thickness mm	Temper	Maximum working pressure bar*
15	0,7	R-250 half-hard	58
22	0,9	"	51
28	0,9	"	40
35	1,2	R-290 hard	51
42	1,2	"	35
54	1,2	"	27
66,7	1,2	"	26
76,1	1,5	"	29
108	1,5	"	20
133	1,5	"	16
159	2,0	"	18
219	3,0	"	20
267	3,0	"	16

*maximum working pressure for liquids or gases with a temperature not exceeding 65°C.

Tolerance on outside diameter

Nominal outside diameter Ø mm		Tolerance on nominal diameter (mm)	
over	up to and including	Applicable to mean diameter	Applicable to any diameter ²⁾
		all tempers	R250 (half hard) temper
6 ¹⁾	18	±0,04	±0,09
18	28	±0,05	±0,10
28	54	±0,06	±0,11
54	76,1	±0,07	±0,15
76,1	88,9	±0,07	±0,20
88,9	108	±0,07	±0,30
108	159	±0,2	±0,40
159	267	±0,6	±1,5

¹⁾ Including 6mm

²⁾ Including deviation from circular form

Tolerance on wall thickness

Nominal outside diameter Ø mm	Tolerances wall thickness e ¹⁾	
	e < 1 mm %	e ≥ 1 mm %
< 18	±10	±13
≥ 18	±10	±15 ²⁾

¹⁾ Including deviation from concentricity

²⁾ ±10% for R250 (half hard) tubes of 35mm, 42mm and 54 mm diameter with a wall thickness of 1,2 mm

Note

Concentricity (uniformity of wall thickness) is controlled by tolerance on wall thickness.

Mechanical properties

Material temper		Nominal outside diameter Ø mm		Tensile Strength Rm MPa	Elongation A %	Hardness (indicative) HV5
EN 1173	Common term	min.	max.	min	min	VPN
R250	half hard	15	28	250	30	(75 - 100)
R290	hard	35	267	290	3	(min.100)

Note 1: Hardness figures in parentheses are not requirements of this standard but are given for guidance purposes only.

Note 2: MPa is equivalent to 1N/mm²

WEDNESBURY STREAMLINE



BLACK LABEL EN 1057

formerly BS2871 Part 1 Table X

APPROVAL

Black Label conforms to the requirements of the British Standards Institution and Wednesbury have earned the right to use the Kitemark as evidence of compliance of this tube to the British Standard EN 1057, and have Registered Firm Status to BS EN ISO 9001 : 2008 : FM 00452.

MARKING

Tube from 15mm to 159mm inclusive, is permanently die stamped 'STREAMLINE GB (Kitemark) EN 1057 Black Label Wednesbury and date of manufacture' at intervals of not more than 600mm. Sizes 219mm and 267mm are ink-marked only.

JOINTING

These tubes are suitable for connecting by means of capillary or compression fittings to BS EN 1254, silver brazing, bronze or

autogenous welding.

BENDING

Black Label tube can be bent with ease on bending machines, or with internal springs, provided they are of the correct size. Manufacturers of bending machines such as

Weights

Hilmor, Tubela, Consort, etc, are able to supply hand or free standing machines. Bending by spring is normally limited to a maximum size of 22mm diameter, but tight radii bends are not advised.

Size of Tube mm	No of Tubes per Handle Bundle	No of Tubes per Master Bundle	Bundles per tonne 5.8 m lengths	Kg per Metre
15	10	600	62	0,280
22	10	300	32	0,531
28	10	200	25	0,682
35	5	100	30	1,134
42	5	100	25	1,369
54	3	60	32	1,772
66,7	1	30	78	2,197
76,1	1	25	55	3,134
108	1	10	39	4,472
133	1	10	31	5,531
159	1	10	20	8,800
219	1	1		18,202
267	1	1		22,247

Based on theoretical weights

Lengths & Packaging

SPECIAL FINISHES	15	22	28	35	42	54	67	76	108		
Protec Green											
Protec White	•	•	•	•	•	•	•	•	•		
Protec 2000 White	•	•	•	•	•	•					
Chrome Plated											
Degreased											
Degreased Oxygen											
Degreased Medical											

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WHITE LABEL EN 1057

formerly BS2871 Part 1 Table Y

APPROVAL

White Label conforms to the requirements of the British Standards Institution and Wednesbury have earned the right to use the Kitemark as evidence of compliance of this tube to the British Standard EN 1057, and have Registered Firm Status to BS EN ISO 9001 : 2008 : FM 00452.

MARKING

Tube from 15mm to 108mm inclusive is permanently die stamped 'STREAMLINE GB (Kitemark) EN 1057 White Label Wednesbury and date of manufacture' at intervals of not more than 600mm.

JOINTING

These tubes are suitable for connecting by means of capillary or manipulative compression fitting to BS EN 1254, silver brazing, bronze or autogenous

welding. Prior to jointing, White Label tube in the annealed condition (coils), should be rerounded with a rerounding tool.

BENDING

White Label tube can be bent with ease on bending machines, or with bending springs, provided they are of the correct size. Manufacturers of bending

machines such as Hilmor, Tubela, Consort, etc, are able to supply hand or free standing machines. Bending by spring is normally limited to a maximum size of 22mm diameter, but tight bends are not advised.

Weight

Size of Tube mm	No of Tubes per Hand Bundle	No of Tubes per Master bundle	Bundles per tonne 5.8m lengths	Kg per Metre
15	10	300	44	0,391
22	10	150	25	0,698
28	10	100	19	0,899
35	5	50	12	1,405
42	5	50	20	1,699
54	3	30	20	2,908
66,7	1	20	47	3,617
76,1	1	20	41	4,151
108	1	-	23	7,383

Based on theoretical weights

Lengths & packaging

SPECIAL FINISHES	15	22	28	35	42	54								
Protec Yellow	•	•	•											
Protec White	•	•	•											
Degreased	•	•	•	•	•	•								
Degreased Oxygen	•	•	•	•	•	•								
Degreased Medical	•	•	•	•	•	•								

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WHITE LABEL EN 1057

formerly BS2871 Part 1 Table Y

INTRODUCTION

The British Standard EN 1057 : (brand name White Label), specifies the requirements for copper tube in straight lengths to half hard or hard temper or soft coils. The tube is manufactured from phosphorus deoxidised (non arsenical) copper alloy CW024A. Tube complying to this table is suitable for underground use for hot and cold water services, gas services, sanitation and central heating. White Label tube used underground or buried, should be plastic coated.



Nominal dimensions and max working pressure

Nominal outside diameter Ø mm	Wall thickness mm	Maximum working pressure (Bar)		
		R250 Half Hard	R290 Hard	R220 Annealed
15	1,0	87	-	67
22	1,2	69	-	57
28	1,2	55	-	42
35	1,5	-	64	-
42	1,5	-	53	-
54	2,0	-	55	-
66,7	2,0	-	45	-
76,1	2,0	-	39	-
108	2,5	-	34	-

Tolerance on outside diameter

Nominal outside diameter Ø mm		Tolerance on nominal diameter (mm)	
over	up to and including	Applicable to mean diameter	Applicable to any diameter ²⁾
		all tempers	R250 (half hard) temper
6 ¹⁾	18	±0,04	±0,09
18	28	±0,05	±0,10
28	54	±0,06	±0,11
54	76,1	±0,07	±0,15
76,1	88,9	±0,07	±0,20
88,9	108	±0,07	±0,30

¹⁾ Including 6mm

²⁾ Including deviation from circular form

Tolerance on wall thickness

Nominal outside diameter Ø mm	Tolerances wall thickness e ¹⁾	
	e < 1 mm %	e ≥ 1 mm %
<18	±10	±13
≥18	±10	±15 ²⁾

¹⁾ Including deviation from concentricity

²⁾ ±10% for R250 (half hard) tubes of 35mm, 42mm and 54 mm diameter with a wall thickness of 1,2 mm

Note

Concentricity (uniformity of wall thickness) is controlled by tolerance on wall thickness.

Mechanical properties

Material temper		Nominal outside diameter Ø mm		Tensile Strength Rm MPa	Elongation A %	Hardness (indicative) HV5 VPN
EN 1173	Common term	min.	max.	min	min	
R220	annealed	15	28	220	40	(40 - 70)
R250	half-hard	15	28	250	30	(75 - 100)
R290	hard	35	108	290	3	(min.100)

Note 1: Hardness figures in parentheses are not requirements of this standard but are given for guidance purposes only.

Note 2: MPa is equivalent to 1N/mm²



PROTEC COPPER TUBE EN 1057

INTRODUCTION

PROTEC is a brand name for Wednesbury Polyethylene coated copper tube. The copper tube coated with Polyethylene is to British Standard EN 1057.

This Standard specifies the requirements for copper tubes in straight lengths to half hard, hard temper or coils in the annealed condition.

The tube is manufactured from phosphorus deoxidised (non arsenical) copper alloy CW024A and the plastic to BS 3412. Tube complying to these tables is suitable for hot and cold water services, gas services, sanitation and central heating. These plastic coated tubes will withstand temperatures up to 95°C (203°F) with occasional peaks up to 110°C (230°F). The plastic is tightly extruded on to the copper tube in a seamless and continuous run, it is durable and more effective than some other methods of protection against environments which may be aggressive to the copper tube.



The plastic coatings are applied in various colours to identify its use in service. Blue and green for water, yellow ochre for gas and white for central heating.

APPROVAL

Wednesbury tube EN1057 conforms to the requirements of the British Standards Institution and has earned the right to use the Kitemark as evidence of compliance of these tubes to the British Standard BS EN 1057 and have Registered Firm status to BS EN ISO 9001 : 2008 : FM 00452.

MARKING

Tube from 15mm to 108mm inclusive is marked 'Wednesbury STREAMLINE GB (Kitemark) EN 1057' at intervals of 1000mm. The copper tube is permanently die marked every 600mm in a similar manner together with the date of manufacture, to the relevant Label.

SPECIAL FINISHES	15	22	28	35	42	54	67	76	108	
Protec Green										
Protec Yellow										
Protec White	•	•	•	•	•	•	•	•	•	



PROTEC COPPER TUBE EN 1057

JOINTING

These tubes are suitable for connecting by means of capillary or compression fitting to BS EN 1254, silver brazing, bronze or autogenous welding. When jointing, cut the plastic and fold back (see photograph), make joint and return the plastic to its original position, cover split plastic and joint with an impervious plastic tape to give continuous protection.

BENDING

With the exception of hard temper, Protec tube can be bent with ease on bending machines or with internal springs. These machines must be specific for bending plastic coated copper tube which have special size formers to account for the increased diameter. Manufacturers of bending machines such as Hilmor, Tubela, Consort etc, are able to supply hand or free standing machines of this type. Bending by spring is normally limited to a maximum size of 22mm diameter. Internal springs are available for tube up to this size but tight radii bends are not advised.

Dimensions

Size of tube mm	Nominal Diameter Plastic mm	Nominal Thickness Plastic mm
15	17.00	1.00
22	24.00	1.00
28	30.00	1.00
35	38.00	1.50
42	45.00	1.50
54	57.00	1.50
67	71.00	2.00
76	80.00	2.00
108	112.00	2.00



Fold back to reveal copper.



Be sure not to aim the blowtorch directly at the plastic



When the joint is complete and cool, fold back the plastic coat and wrap the joint to give continuity of protection.

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PROTEC 2000 COPPER TUBE EN 1057

INTRODUCTION

Protec 2000 is a brand name for Wednesbury Polyethylene coated copper tube, the inner surface of which is castellated to provide air gaps which run the length of the tube. These gaps trap air which forms a thermal barrier to reduce surface temperature, transmitted noise and condensation levels, together with a reduction of heat loss when buried.

The copper tube coated with Polyethylene is to EN 1057. This standard specifies the requirements for copper tubes in straight length to half hard, hard temper or coils in the annealed condition.

The tube is manufactured from phosphorus deoxidised (non arsenical) copper alloy CW024A and the plastic to BS 3412. Tube complying to these tables is suitable for hot and cold water services, gas services, sanitation and central heating. These tubes when plastic coated, will withstand temperatures of up to 95°C (203°F) with occasional peaks of up to 110°C (230°F). The plastic is tightly extruded on to the copper tube in a seamless



and continuous run. It is durable and more effective than some other methods of protection against environments which may be aggressive to the copper tube.

APPROVAL

Wednesbury Tube EN1057 conforms to the requirements of the British Standards Institution and has earned the right to use the Kitemark as evidence of compliance of these tubes to the British Standard EN 1057 and have Registered Firm status to BS EN ISO 9001 : 2008 : FM 00452.

MARKING

Tube from 15mm to 28mm inclusive is permanently marked 'Wednesbury STREAMLINE GB (Kitemark) EN 1057' at intervals of 1000mm. The copper tube is prominently die marked in a similar manner together with the date of manufacture, to the relevant Label.

FINISHES	15	22	28	35	42	54					
Protec 2000 White	•	•	•	•	•	•					



PROTEC 2000 COPPER TUBE EN 1057

JOINTING

These tubes are suitable for connecting by means of capillary or compression fittings to BS EN 1254, silver brazing, bronze or autogenous welding. When jointing cut the plastic and fold back (see photograph), make joint and return the plastic to its original position, cover split plastic and joint with an impervious plastic tape to give continuous protection.

BENDING

Protec 2000 annealed tube can be bent with ease, on bending machines or with internal springs. Bending machines are available with formers designed to accommodate the increased diameter for Protec 2000 from Hilmor, tubela, Consort and Rothenburger etc. These

Dimensions

Size of tube mm	Nominal Diameter Plastic mm	Nominal Thickness Plastic mm
15	17.5	1.25 (+/- 0.15)
22	24.4	1.1 (+/- 0.15)
28	30.4	1.2 (+/- 0.15)
35	37.6	1.3 (+/- 0.15)
42	44.6	1.3 (+/- 0.15)
54	56.7	1.35 (+/- 0.15)

use with soft temper copper tube. If in doubt, refer to the bending machine manufacturer.

Manufacturers of bending machines are able to supply hand or free standing machines of this type. Bending by spring is normally limited to a maximum size of 22mm diameter.

for tube up to this size but tight radii bends are not advised.



Fold back to reveal copper.

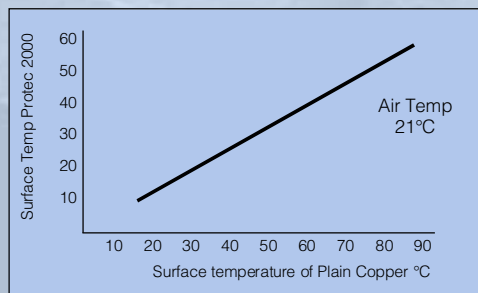


Be sure not to aim the blowtorch directly at the plastic

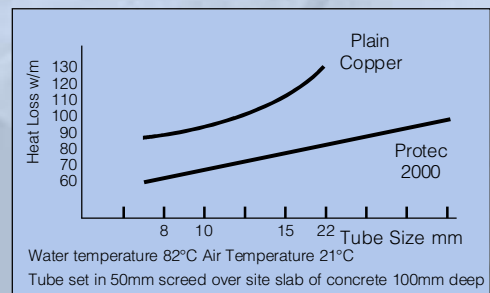


When the joint is complete and cool, fold back the plastic coat and wrap the joint to give continuity of protection.

The graph below indicates the lower surface temperatures of Protec 2000 measured against bare copper in air



The graph below indicates the reduction in heat loss which can be achieved by using Protec 2000



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Marking, Identification & Ordering

Wednesbury copper tubes are marked with the brand name 'Wednesbury Streamline', tube diameter and nominal wall thickness, relevant standard reference and code representing date of manufacture.

When ordering it is important to clearly specify the following and take note of the declared packaging or bundling specification.

- a) Tube type and relevant standard
- b) Outside diameter and nominal wall thickness
- c) Condition
- d) Form & length
- e) Quantity required

Example 1

- a) Copper tube to EN 1057 Black Label Plain
- b) Dia 15mm x 0.7mm wall
- c) R250 HALF HARD
- d) Straight lengths of 5.8m each
- e) 11,600 metres

Example 2

- a) Copper tube to EN 1057 White Label Yellow Protec
- b) Dia 22mm x 1.2mm wall
- c) R220 SOFT
- d) Coils of 20m each
- e) 10,000 metres



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