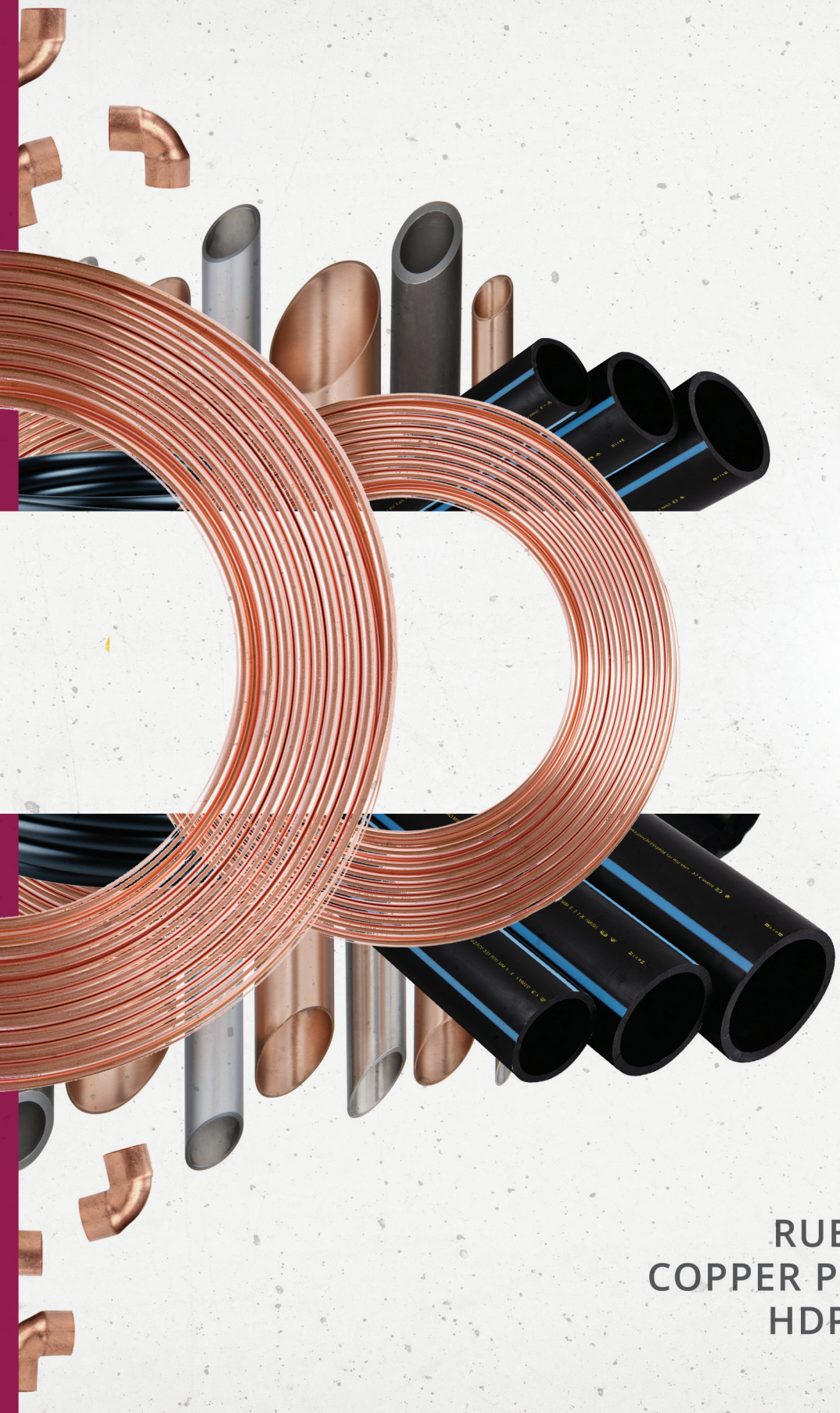


WELKONEK
MARKETING CORPORATION

RUBBER INSULATION
COPPER PIPING MATERIALS
HDPE PIPING SYSTEM

WWW.WELKONEK.COM

ABOUT WELKONEK

Welkonek Marketing Corporation is engaged in the distribution of Refrigeration, Rubber Insulation, Copper Piping Materials and HDPE Piping System.

Primarily, we supply to the HVAC, construction Industry. We work hand in hand with reputable Manufactures to ensure that we procure best quality copper materials to satisfy our customer needs.

We hold exclusive agency rights for various range of product and act as authorized distributor for manufacturers.

The goal of the management is to make the company one of the leading Refrigeration and Air-conditioning parts provider by supplying the highest quality standard of materials for its customer.

PRODUCT INFORMATION

Copper tubing is most often used for supply of hot and cold tap water, and as refrigerant line in HVAC systems. There are two basic types of copper tubing, soft copper and rigid copper. Copper tubing is joined using flare connection, compression connection, or solder.

ADVANTAGES OF COPPER TUBES

- Copper is lightweight
- Copper is formable
- Copper is easy to join
- Copper is safe
- Copper is dependable
- Copper is long-lasting
- Copper is 100% recyclable

TYPES OF COPPER TUBE

华鸿铜管集团 HUAHONG COPPER TUBE SMARTCO®

Soft / Pancake Coil

Soft (or ductile) copper tubing can be bent easily to travel around obstacles in the path of the tubing. While the work hardening of the drawing process used to size the tubing makes the copper hard or rigid, it is carefully annealed to make it soft again; it is therefore more expensive to produce than non-annealed, rigid copper tubing. It can be joined by any of the three methods used for rigid copper, and it is the only type of copper tubing suitable for flare connections. Soft copper is the most popular choice for refrigerant lines in split-system air conditioners and heat pumps.

SPECIFICATION

ASTM B280
AS/NZS 1571
EN 12735

Copper Alloy No.	C12200 CuDHP
Chemical Requirement	Cu+Ag min. 99.9% P 0.015-0.040%
Tolerances	As required by the standard
Cleanness	0.038g/m2
Origins	Made in korea / Made in China
H.S.CODE	7411.10.0000

FEATURES

- Highly efficient
- Durability
- Expansive applications
- Non-corrosive

MECHANICAL PROPERTIES

- Tensile strength: 205 Mpa/min
- Elongation: min 40%
- Hardness: 40-50 VPN
- Temper: Soft annealed (O60, R220)

Copper tubes are used mainly to transport refrigerant gas, liquids in refrigeration and air-conditioning units as well as heat exchangers.

STANDARD SIZE

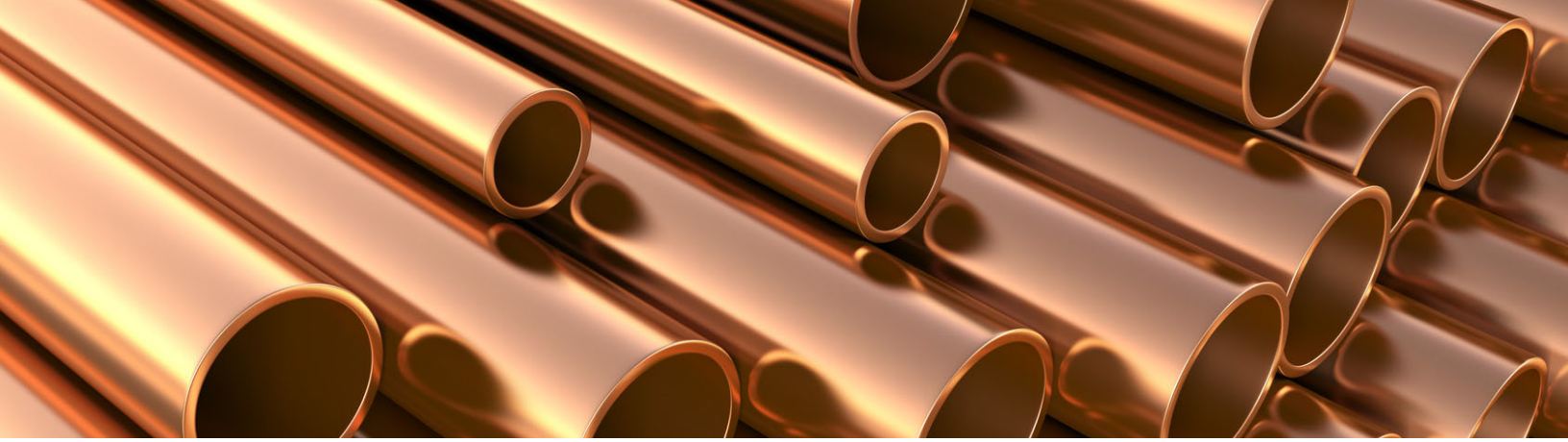
PANCAKE COILS

ACR Coil

CD		WT	LENGTH
INCH	MM	INCH	FT
1/4"	6.35	0.022, 0.028, 0.032	50ft
5/16"	7.94	0.022, 0.028, 0.032	50ft
3/8"	9.52	0.022, 0.028, 0.032	50ft
1/2"	12.7	0.022, 0.028, 0.032	50ft
5/8"	15.88	0.022, 0.028, 0.032	50ft
3/4"	19.05	0.022, 0.028, 0.032	50ft
7/8"	22.22	0.022, 0.028, 0.032	50ft
1-1/8"	28.58	0.022, 0.028, 0.032	50ft

* *Other sizes are available upon request*

Tube wall thickness will determine which refrigerant is suitable, depending upon temperature range.



Hard / Rigid

Rigid copper is a popular choice for water lines, plumbing, gas, air conditioning refrigeration, Medial gas & General Engineering Application. It is joined using a sweat, roll grooved, compression or crimped/pressed connection. Rigid copper, rigid due to the work hardening of the drawing process, cannot be bent and must use elbow fittings to go around corners or around obstacles. If heated and allowed to cool in a process called annealing, rigid copper will become soft and can be bent/formed without cracking.

SPECIFICATION

ASTM B88
AS/NZS 1432
EN 1057

Copper Alloy No.	C12200 CuDHP
ChemicalRequirement	Cu+Ag min. 99.9% P 0.015-0.040%
Tolerances	As required by the standard
Origins	Made in Korea / Made in China
H.S.CODE	7411.10.0000

Typical uses includes

Type K underground residential, commercial and industrial uses.

Type L residential and commercial uses.

Type M above ground residential and light commerical uses.

Mechanical Properties

Tensile strength: 250 Mpa/min

Hardness: 100 VPN

Temper: Hard Drawn (H58. R290)

Packing: Straight tube in bundles and wrapped with plastic bag

HARD LENGTHS

Nominal	Actual size		TYPE L		TYPE M		Length
CD	CD		WT		WT		FT
Inch	Inch	mm	Inch	mm	Inch	mm	
1/4"	3/8"	9.52	0.030	0.76	-	-	20ft
3/8"	1/2"	12.7	0.035	0.89	0.025	0.64	20ft
1/2"	5/8"	15.88	0.040	1.02	0.28	0.71	20ft
5/8"	3/4"	19.05	0.042	1.07	-	-	20ft
3/4"	7/8"	22.22	0.045	1.14	0.032	0.81	20ft
1"	1-1/8"	28.58	0.050	1.27	0.035	0.89	20ft
1-1/4"	1-3/8"	34.93	0.055	1.40	0.042	1.07	20ft
1-1/2"	1-5/8"	41.28	0.060	1.52	0.049	1.24	20ft
2"	2-1/8"	53.98	0.070	1.78	0.058	1.47	20ft
2-1/2"	2-5/8"	66.68	0.080	2.03	0.065	1.65	20ft
3"	3-1/8"	79.38	0.090	2.29	0.072	1.83	20ft
3-1/2"	3-5/8"	92.08	0.0100	2.54	0.083	2.11	20ft
4"	4-1/8"	104.78	0.114	2.79	0.095	2.41	20ft
5"	5-1/8"	130.18	0.125	3.18	0.109	2.77	20ft
6"	6-1/8"	155.58	0.140	3.56	0.122	3.01	20ft

* *Other sizes are available upon request*

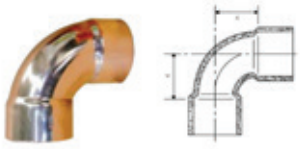
- Type M has an even thinner pipe wall section, and used in residential and commercial water supply and pressure applications. It usually has red colored printing.

- Type K and L are generally available in both hard drawn "sticks" and in rolls of soft annealed tubing, whereas type M is usually only available in hard drawn "sticks".

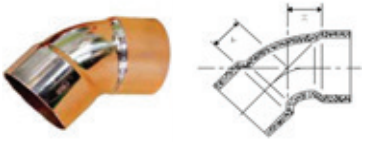
Copper Elbow

PSFITTING

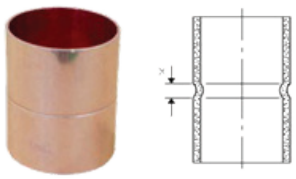
An elbow is install between two lengths of pipe (or tubing) to allow a change of direction, usually a 90° or 45° angle. A 90° elbow, also known as a "90 bend", "90 ell" or "quarter bend", attaches readily to plastic, copper, cast iron, steel, and lead, and is attached to rubber with stainless-steel clamps. Other available materials include silicone, rubber compounds, galvanized steel, and nylon. It used to connect hoses to valves, water pumps and deck drains. A 45° elbow, also known as a "45 bend" or "45 ell", is commonly used in water-supply facilities, food, chemical and electronic industrial pipeline networks, air-conditioning pipelines, agriculture and garden production, and solar-energy facility piping.



Nominal Size		X
A	B	
6	1/8	9
8	1/4	11
10	3/8	14
15	1/2	14
19	5/8	16
20	3/4	19.5
25	1	23
32	1 1/4	28
40	1 1/2	34
50	2	45
65	2 1/2	54
80	3	64
100	4	85
125	5	91
150	6	115
200	8	190
250	10	210

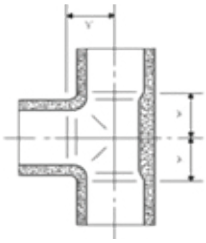


Nominal Size		X
A	B	
8	1/4	6
10	3/8	6.5
15	1/2	8
19	5/8	9
20	3/4	10
25	1	12
32	1 1/4	13
40	1 1/2	20
50	2	27
65	2 1/2	43
80	3	46
100	4	57
125	5	60
150	6	70
200	8	95
250	10	125

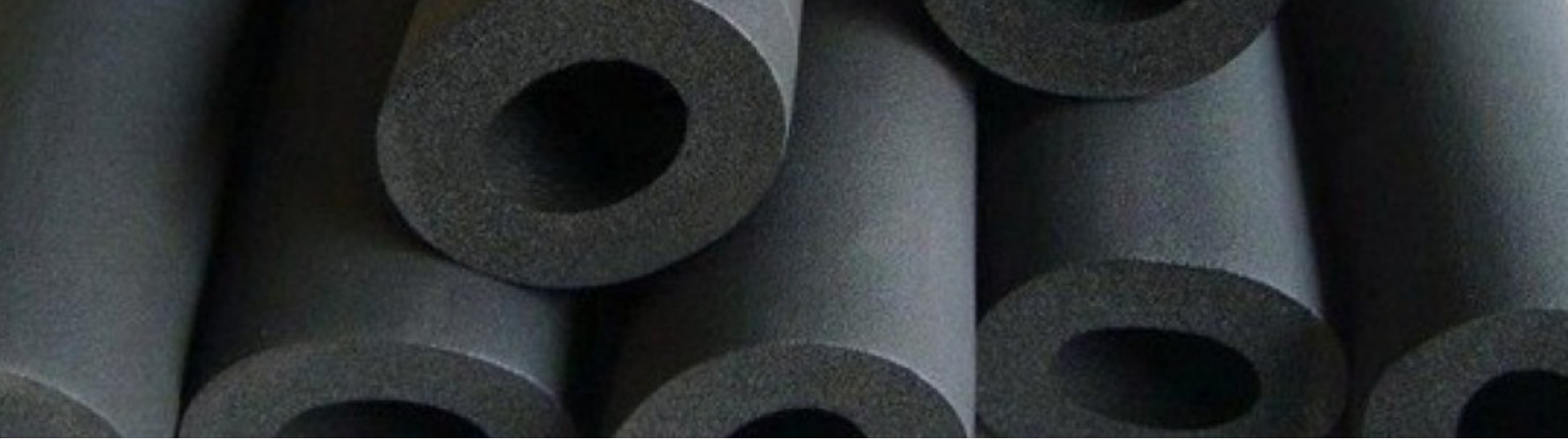


Nominal Size		X
A	B	
8	1/4	2.0
10	3/8	2.0
15	1/2	2.0
19	5/8	2.5
20	3/4	3.0
25	1	3.0
32	1 1/4	3.0
40	1 1/2	3.0

A Tee, the most common fitting, is used to combine (or divide) fluid flow. It is available with female thread sockets, solvent-weld sockets or opposed solvent-weld sockets and a female-threaded side outlet.



Nominal Size		X	Y	Nominal Size		X	Y	Nominal Size		X	Y
A	B			A	B			A	B		
6 x 6	1/8 x 1/8	10	5	50 x 32	2 x 1 1/4	22	33	125 x 25	5 x 1	21	74
8 x 8	1/4 x 1/4	8	7	50 x 40	2 x 1 1/2	25	33	125 x 32	5 x 1 1/4	31	84
10 x 8	3/8 x 1/4	8.5	8.5	50 x 50	2 x 2	30	34	125 x 40	5 x 1 1/2	31	86
10 x 10	3/8 x 3/8	8.5	9	65 x 15	1 1/2 x 1/2	15.5	39	125 x 50	5 x 2	39.5	77
15 x 8	1/2 x 1/4	9.5	11	65 x 19	1 1/2 x 5/8	18	39	125 x 65	5 x 2 1/2	46.5	78
15 x 10	1/2 x 3/8	9.5	11	65 x 20	2 1/2 x 3/4	19.5	40	125 x 80	5 x 3	55.5	79
15 x 15	1/2 x 1/2	1	12	65 x 25	2 1/2 x 1	21.5	40	125 x 100	5 x 4	66	80
19 x 15	5/8 x 1/2	12.5	13	65 x 32	2 1/2 x 1 1/4	25	40	125 x 125	5 x 5/8	75.5	81
19 x 19	5/8 x 5/8	14	13	65 x 40	2 1/2 x 1 1/2	28	41	150 x 15	6 x 1/2	36	82
20 x 15	3/4 x 1/2	10.5	14	65 x 50	2 1/2 x 2	33.5	41	150 x 19	6 x 5/8	36	83
20 x 19	3/4 x 5/8	13	14	65 x 65	2 1/2 x 2 1/2	38	42	150 x 20	6 x 3/4	36	83
20 x 20	3/4 x 3/4	13.5	14	80 x 15	3 x 1/5	16.5	47	150 x 25	6 x 1	39	93
25 x 15	1 x 1/2	11	18	80 x 19	3 x 5/8	19	47	150 x 32	6 x 1 1/4	39	91
25 x 19	1 x 5/8	14	18	80 x 20	3 x 3/4	20.5	47	150 x 40	6 x 1 1/2	39	90
25 x 20	1 x 3/4	14	18	80 x 25	3 x 1/5	24	47	150 x 50	6 x 2	54.5	92
25 x 25	1 x 1	18.5	18	80 x 32	3 x 1 1/4	27.5	48	150 x 65	6 x 2 1/2	54.5	92
32 x 15	1 1/4 x 1/2	12	21	80 x 40	3 x 1/2	31	48	150 x 80	6 x 3	74	93
32 x 19	1 1/4 x 5/8	13.5	21	80 x 50	3 x 2	36	49	150 x 100	6 x 4	74	94
32 x 20	1 1/4 x 3/4	14.5	21	80 x 65	3 x 2 1/2	43	49	150 x 125	6 x 5	86.5	95
32 x 25	1 1/4 x 1	19	22	80 x 80	3 x 3	50.5	50	150 x 150	6 x 6	93.5	97
32 x 32	1 1/4 x 1 1/4	22.5	22	100 x 15	4 x 1/2	19	60	200 x 50	8 x 2	56	125
40 x 15	1 1/2 x 1/2	12.5	25	100 x 20	4 x 3/4	20	61	200 x 65	8 x 2 1/2	56	123
40 x 19	1 1/2 x 5/8	15.5	25	100 x 25	4 x 1/2	22.5	61	200 x 80	8 x 3	62	123
40 x 20	1 1/2 x 3/4	15.5	25	100 x 32	4 x 1 1/4	27	62	200 x 100	8 x 4	87.5	123
40 x 25	1 1/2 x 1	18	26	100 x 40	4 x 1 1/2	30	62	200 x 125	8 x 5	87.5	125
40 x 32	1 1/2 x 1 1/4	21.5	26	100 x 50	4 x 2	36	63	200 x 150	8 x 6	100	126
40 x 40	1 1/2 x 1 1/2	26	26	100 x 65	4 x 2 1/2	44	63	200 x 200	8 x 8	127.5	128
50 x 15	2 x 1/2	14.5	32	100 x 80	4 x 3	52	64	250 x 100	10 x 4	76	153
50 x 19	2 x 5/8	15.5	32	100 x 100	4 x 4	61.5	65	250 x 125	10 x 5	84	155
50 x 20	2 x 3/4	17.5	32	125 x 15	5 x 1/2	21	96	250 x 150	10 x 6	104	156
50 x 25	2 x 1	19.5	33	125 x 19	5 x 5/8	21	97	250 x 150	10 x 8	133	158
				125 x 20	5 x 3/4	21	75	250 x 250	10 x 10	161	161



AEROFOAM®-NBR
RUBBER INSULATION

Rubber Insulation

A flexible closed cell thermal insulation material for condensation control in air-conditioning, refrigeration and water installation. It is also suitable for reducing thermal losses in heating and plumbing systems. The combination of its technical properties – a low thermal conductivity and a high resistance to water vapor transmission- and its competitive price makes it a cost-effective energy-saving solution.

TECHNICAL DATA

Highly – Flexible, closed-cell insulation material with high water vapor diffusion resistance and low thermal conductivity.

Material: Elastomeric Foam based on synthetic rubber with density between 40-80 kg/m3.

Self-adhesive Coating: Pressure-sensitive adhesive coating on modified acrylate basis. Covered with polyethylene foil.

Applications: Insulation / protection for pipes, air ducts, vessels (incl. elbows, fittings, flanges etc.) of air-conditioning / refrigeration and process equipment to prevent condensation and save energy.

- Noise control properties
- Built-in water vapor barrier
- Very good thermal performance
- Very secure joints when the Aerofoam NBR glue is used
- Low VOC level; Low ODP & GWP values
- Very flexible foam insulation

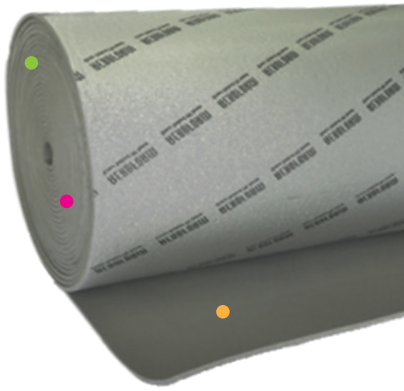
PROPERTY	VALUE/ ASSESMENT*	TESTED ACC. TO:
Temperature range **Max. line temperature** **Min. line temperature** *Our Customer Service Center should be consulted for applications with temperatures below - 50° C.*	+ 105° C (flat surface and tape +85° C) - 50° C (-200°C)	DIN EN 14706 : 2005 (E)
Thermal conductivity λ [W/(m·K)] at 24[°C] at 40[°C]	 0.033 0.034	 ASTM C518 : 2010 ASTM C518 : 2010
Water vapour diffusion resistance factor μ	>7300	BS EN 12086 : 1998
Water vapor permeance [perms]	0	ASTM E96
Water absorption [% by volume]	0.06	ASTM C209 : 1998
Reaction to fire 1. Building material class** 2. Practical fire behaviour	Class O Low flammability, self-extinguishing, does not drip, does not spread flames; Class1	 BS 476 Part 6 & 7 ASTM E84
Smoke and toxicity	Passed	IMO MSC 61(67)
Acoustic insulation	Reduction of structure-borne sound transmission; Insulation effect up to 28 dB(A)	DIN52219 DIN EN ISO 3822-1
Compression set	31.23% (for 25mm) 29.83% (for 32mm)	ASTM D3574
Resistance to fungi	Excellent	ASTM G21 : 2009
Resistance to bacteria	Excellent	ISO 22196 : 2007
Emission (VOC level)	< 6 μg/m²/hr	ASTM D5116
Chemical resistance	Very good	ASTM C871
Environment friendly Ozone resistance Ozone Depletion Potential Global Warming Potential CFC & HCFC, dust, fibres	 Excellent 0 <5 Free	
Storage life *Can be stored in dry, clean rooms at normal relative humidity (50% to 70%) and ambient temperature (0° C – 35° C)*	1 year for self-adhesive sheets/rolls, self-adhesive taps	

XLPE Insulation Solution

AEROFOAM® -XLPE
POLYOLEFIN INSULATION

XLPE is a close cell cross linked Polyolefin Foam mainly used as thermal insulation to protect against condensation heat loss and sound propagation. XLPE is reinforced with an alupet foil and has factory applied pressure sensitive self adhesive on the backside.

- Very Good Sound Absorption Properties
- Easy to Apply on Duct As Sheet or Roll
- Easy to apply self-adhesive Rolls & Sheet



- Perfect Match to Outer Diameter of the Pipe
- Water Tight & Mechanical Resistant foil
- Built-in Water Vapor Barrier

Fire Rating And low Toxic Emission

XLPE is Class 0 RATED (BS 476 Parts 6&7) and achieved FSI/SDI of <25/50 (ASTM E84). XLPE passed the concentration limits of combustion gases (IMO MSC 61/67 1996, Annex 1, Part 2 and Achieved R=0.77 (BS 6853)

Zero Water Vapor Permeability and low water absorption rate

XLPE can be installed on ducts or pipes without any other additional water vapor barriers. The excellent protection against condensation ensures a long-term thermal efficiency of insulation.

Excellent Thermal Efficiency

XLPE has a low thermal conductivity of 0.035W/mk (ASTM C518), which guarantees a high thermal performance improvement of the installation. Excellent dimensional properties and 98% closed cell content stand for durable values of thermal efficiency.

Environment friendly foam

XLPE is a CFC and HCFC Free product and does not contain substances that contribute to the Ozone Depletion Potential (ODP) or to the Global Warming Potential (GWP). XLPE doesn't emit any loose fiber and has a very low emission level (VOC)

Cost Saving

XLPE requires a limited number of accessories (tape and glue); this facilitates a short installation time and low installation costs.

TECHNICAL DATA

Description: Flexible closed cell insulation material with high water vapor diffusion resistance and low thermal conductivity.

Material: Cross linked Polyolefin Foam with density of 25 ±3 Kg/m³ (foam core only) and charcoal grey color.

Self-adhesive coating: Pressure sensitive adhesive coating. Reinforced with permanently bonded alupet foil.

Applications: Insulation/protection for pipes, air ducts, vessles (incl, elbows, fittings, flanges, etc.) and process equipment to prevent condensation, save energy and block sound propagation.

Property	Value/Assessment	Testedacc. to:
Temperature range		
Max. line temperature	+105° C	DIN EN 14706: 2005 (E)
Min. line temperature	-80° C (-150° C)	ASTM C411
Our customer service center should be consulted for application with temperatures below -80° C.		
Thermal conductivity λ [W/(m·K)]		
at 23 [° C]	0.035	ASTM C518 : 2010
at 40 [° C]	0.037	
Water vapour diffusion resistance factor (μ)	54, 700	BS EB 12086 : 1997
Water vapour permeance [perms]	0	ASTM E96
Water absorption [Kg/m²]	0.05	BS EN 12087 : 1997
Reaction to fire	Class 0 FSI < 25 and SDI < 50	BS 476 Parts 6 & 7 ASTM E84
Smoke and toxicity		
1. Smoke toxicity levels	Passed	IMO MSC 61(67); A. 1, P. 2
2. Toxic smoke	R=0.77	BS 6853 : 1999
Sound absorption	α = 0.35 (25mm)	ISO 354
UV resistance	Excellent	ASTM G155
Resistance to corrosion	Excellent	ASTM B117
Compression set	35.77% (for 25 mm) 34.22% (for 32mm)	ASTM D3574
Resistance to fungi	Passed	ASTM G21 : 2009
Resistance to bacteria	Passed	ISO 22196 : 2007
Chemical resistance (Leachable ions)	Very low	ASTM C871
Emission (VOC level)	< 4 μg/m²/hr	ASTM D5116
Environment friendly		
Ozone resistance	Excellent	
Ozone Depletion Potential	0	
Global Warming Potential CFC & HCFC	< 5	
CFC & HCFC, dusr, fibres & asbestos	Free	
Storage Life		
Can be stored in dry, clean rooms at normal relative humidity (50% to 70%) and ambient temperature (0°C - 45°C).	1 year for self-adhesive sheets/rolls, self-adhesive tapes.	

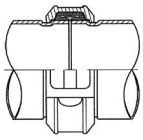
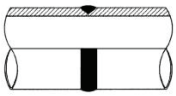
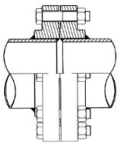
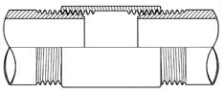
SHURJOINT®

Shurjoint Grooved Piping System

The Shurjoint grooved piping system is one of the most advanced, versatile, economical and reliable systems available today. After the pipe ends are grooved a gasket is stretched over the pipe ends. The coupling segments are then placed over the gasket and the bolts and nuts are fastened resulting in a secure and leak free joint.

A coupling can be installed 3–4 times faster than a comparable welded or brazed joint and there is no need for a flame or welding torch on the job site. A coupling can be installed by fastening a pair of bolts and nuts while using only a wrench or spanner, whereas a comparable flanged joint requires the fastening of many bolts and nuts with a pair of wrenches. The grooved system allows for easy material take-offs and unlike a threaded system, there is no need to allow for added pipe length for thread engagement. With the removal of just a few bolts one can easily access the system for cleaning, maintenance, changes and or system expansion.

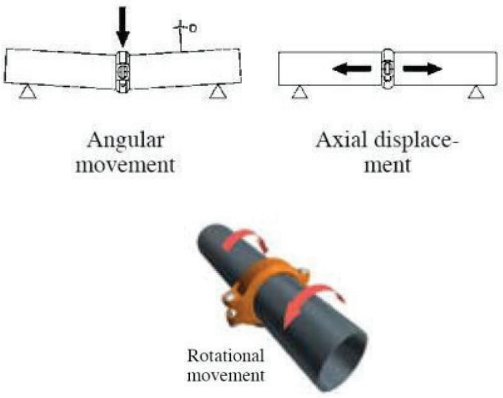
MAJOR PIPE JOINING METHODS - QUICK COMPARISON

System Type	Grroved	Welded	Flanged	Threaded
Joint Construction				
Pipe End Preparation	Roll-grooving. Fast and easy	Beveled Ends	Welding of flanges by qualified welders	Threading by skillful operators is required
Equipment Required	Roll-grooving machine 	Welding Equipment 	Welding Equipment 	Pipe threading machine 
Installation	Easy fastening of bolts & nuts using only a wrench or spanner	Welding tools and supplies required on the jobsite. A skillful and proper weld can be time consuming	A minimum of two wrenches or spanners required. Time consuming to tighten many bolts and nuts.	Pipe wrench required. As the pipe size increases so does the difficulty and force required for proper installation
Allowance For Axial Displacement And Deflection	Yes - Couplings can allow for both	No.	No.	No.
Required Space for Installation	Can be installed in small spaces	Adequate space is necessary for welding tools and welding around the entire O.D. of the pipe	Adequate space is required as the flange adapter O.D. is large and the wrenches require ample working space	Adequate space is required for turning the pipe wrench
Ease of Prefabrication	Very Easy	Difficult	Difficult	Difficult
Surface Corrosion Resistance	Easy - Anti-corrosive paint	Difficult – Hard to paint inside of the pipe after welding	Easy - Anti-corrosive paint	Easy to paint outside of the pipe after installation but the inside threads are vulnerable to corrosion
Quality Control	Product quality is easily controlled at the factory and/or job site. Installation can be visually checked	Quality of job site welding can be inconsistent. X-ray inspection may be required	Quality of job site welding can be inconsistent	Varies depending on skills of workers on the jobsite as all work is usually performed on site
Maintenance and/or Disassembly	Easy to dismantle and reinstall. System is flexible and forgiving	Very difficult and rigid, cutting and flame is required	Very difficult to dismantle and re-install due to limited space	Difficult due to thread engagement, thread corrosion, limited space needed for a union
Design and Cost Estimating	Easy take-offs and estimating. Most material can pre-fabricated	Labor is difficult to estimate as the individual skill levels of welders is a determining factor	Labor is difficult to estimate as the skill levels of welders and very accurate make-up is a determining factor	Labor is difficult to estimate because prefabrication is not possible all work is performed on the job site

RIGID OR FLEXIBLE?

Shurjoint grooved couplings are classified into two types, flexible and rigid. What are the differences? When and where should they be used? The following information is intended for system designers and installers to better understand the nature of the grooved piping systems. This will allow the designer and installer to make better use of the design features and advantages of grooved piping advantages of grooved piping components and systems.

Type	Angular Movement Deg.	Axial Displacement (mm)	Rotation after installation	Model Nos.
Flexible Coupling	≥ 1°	1.6 - 3.2	Yes	7705, 7706, 7707, SS-8, SS-8X
Angle-Pad Design	< 1°	< 1.6	No	7705, 7706, 7707, SS-8, SS-8X
T & G Design	< 1°	< 1.6	No	7705, 7706, 7707, SS-8, SS-8X
Bolt-Joint Design	< 0.3°	< 1.6	No	7705, 7706, 7707, SS-8, SS-8X



Note: 1) Angular movement of flexible couplings 8" and larger should be ≥ 0.5°
2) Axial displacement data based on roll-grooved pipe

RIGID COUPLING

The most popular and most widely used couplings today.

Shurjoint rigid couplings can be used in applications where you require a rigid joint similar to that of a traditional flanged, welded and or threaded connection. You need not worry about the snaking of the pipe on straight runs, as all Shurjoint rigid couplings utilize both a mechanical and frictional interlock design to provide rigidity. Rigid couplings eliminate or reduce undesired angular movement, axial displacement and rotation after installation as is required under normal service conditions. Rigid couplings are some of the most popular and most widely used today.

Shurjoint offers three different types of rigid couplings, the angle-pad design, the T&G (tongue and groove) design and the most recent innovation, the butt-joint design. The butt-joint design effectively eliminates the gap between pipe ends, offering increased rigidity.

#R20 Butt-joint Rigid Coupling

Angle-pad design

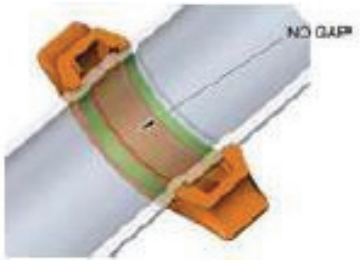
As the bolts are tightened, the angled bolt pads slide in opposite directions causing the couplings keys to tightly grip the pipe, while at the same time the pipe grooves are forced outward against the coupling keys.

T & G Design

The T&G (tongue & groove) mechanism provides a mechanical and frictional interlock resulting in a rigid joint which reduces undesired angular movement. Shurjoint precision casting techniques allow the coupling segments to meet metal-to-metal when installed on properly grooved pipe.

T & G Design

The unique butt-joint design eliminates the gap in between pipe ends, thus eliminating not only angular and rotational movement but also axial displacement under normal service conditions*. Fluid will not directly contact the gasket nor sit in the gasket pocket. The coupling segments will always come together forming metal-to-metal contact when properly installed.



*(*Pipes must be cut true and square to achieve a butt-joint.)*

FLEXIBLE COUPLING

Shurjoint flexible couplings allow for full design features in such applications as curved or deflected layouts and or when systems are exposed to outside forces beyond normal static conditions such as seismic events or where vibration and or noise attenuation are a concern. The ability to design in controlled flexibility is an advantageous feature when compared to traditional rigid joining methods such as threading, flanging and welding. When designing with flexible couplings you must allow for proper support to the system so as to eliminate undesired stress (see Anchoring, hanging and supports on data sheet #B-20).

There are several published standards and codes covering grooved piping components. These codes or standards may vary as to the definition or standard for flexible couplings. System designers should confirm which standard(s) and or code(s) are required for the system being designed and they should select the applicable coupling for the application. The NFPA 13 defines a flexible coupling as;

"a listed coupling or fitting that allows axial displacement, rotation, and at least 1 degree of angular movement of the pipe without inducing harm on the pipe. For pipe diameters of 8 in. and larger, the angular movement shall be permitted to be less than 1 degree but not less than 0.5 degrees."

(NFPA 13- 2007 3.5.4)

For sprinkler systems, NFPA 13 specifies the use of flexible couplings to protect the system against damage from earthquakes and sets some specific examples of how and where they should be used. Designers and installers should design their fire protection systems in compliance with this standard. See Typical Applications of Flexible Couplings on Shurjoint Data Sheet #B-19).

#7705 Flexible Coupling

Axial Displacement & angular Movement (Models 7705 & 7707)

Size		Axial Displacement †	Angular Movement † (Deflection)	
Nom. Size	Actual OD		Per Coupling	Per pip
in/mm	in/mm	in/mm	degress	in/ft
3/4 20	1.050 26.7	0.0625 1.6	3° - 23'	0.71 58
1 25	1.315 33.4	0.0625 1.6	2° - 45'	0.58 48
1 1/4 32	1.660 42.4	0.0625 1.6	2° - 10'	0.45 38
1 1/2 40	1.900 48.3	0.0625 1.6	1° - 54'	0.40 33
2 50	2.375 60.3	0.0625 1.6	1° - 31'	0.31 26
2 1/2 65	2.875 73.0	0.0625 1.6	1° - 15'	0.26 22
76.1 mm	3.000 76.1	0.0625 1.6	1° - 12'	0.25 21
3 80	3.500 88.9	0.0625 1.6	1° - 02'	0.21 18
101.6 mm	4.000 101.6	0.0625 1.6	0° - 54'	0.19 16
108.0 mm	4.250 108.0	0.1250 3.2	1° - 42'	0.36 30
4 100	4.500 114.3	0.1250 3.2	1° - 36'	0.34 28
127.0 mm	5.00 127.3	0.1250 3.2	1° - 27'	0.30 25
133.0 mm	5.250 133.0	0.1250 3.2	1° - 23'	0.29 24
133.0 mm	5.500	0.1250	1° - 18'	0.28

Size		Axial Displacement †	Angular Movement † (Deflection)	
Nom. Size	Actual OD		Per Coupling	Per pip
in/mm	in/mm	in/mm	degress	in/ft
159.0 mm	6.250 159.0	0.1250 3.2	1° - 09'	0.24 20
165.1 mm	6.500 165.1	0.1250 3.2	1° - 07'	0.24 20
6 150	6.625 168.3	0.1250 3.2	1° - 05'	0.23 19
8 200	8.625 219.1	0.1250 3.2	0° - 50'	0.18 15
10 250	10.750 273.0	0.1250 3.2	0° - 40'	0.15 12
12 300	12.750 323.9	0.1250 3.2	0° - 34'	0.12 10
200	8.516 216.3	0.1250 3.2	0° - 51'	0.06 4.5
250	10.528 267.4	0.1250 3.2	0° - 41'	0.05 4.0
300	12.539 318.5	0.1250 3.2	0° - 35'	0.12 10
14 350	14.000 355.6	0.1250 3.2	0° - 31'	0.06 4.5
16 400	16.000 406.4	0.1250 3.2	0° - 27'	0.05 4.0
18 450	18.000 457.0	0.1250 3.2	0° - 24'	0.04 3.5
20 500	20.000 508.0	0.1250 3.2	0° - 22'	0.04 3.0
22	22.000	0.1250	0° - 19'	0.04

Note: † Allowable Axial Displacement and Angular Movement (deflection) figures are for roll grooved standard steel pipe. Values for cut grooved pipe will be double that of roll grooved. These values are maximums; for design and installation purposes these figures should be reduced by: 50% for ¾" – 3½"; 25% for 4" and larger to compensate for jobsite conditions.
** Deflection or angular movement is the maximum value that a coupling allows under no internal pressure.

HDPE pipe KUPP PE PIPING SYSTEM

Welkonek Marketing Corporation is a sole distributor of KUPP Co., Ltd. (has been leading the Korean PE pipe industry and is now operating globally.) KUPP is a leading manufacturer of high-quality HDPE water and sewer pipe.

Characteristics

Chemical stability
No Corrosion against Acid, Alcaly, Salts. No propagation of germs(bacteria) inside of pipe

Sanitation
No impurities maintain the best purity of the contents for drinking water.

Flexibility
Smooth wall inside make free flowing to minimize "loss head".

Lightweight
1/7 weight comparing with steel pipe can make easy installation and handling.

Connecting
Many kind of connecting method (mechanical, fusion welding, E/F) can be ready for all eventualities in construction site.

Corrosion resistance
There is no corrosion or illumination by seawater, wetland and electricity.

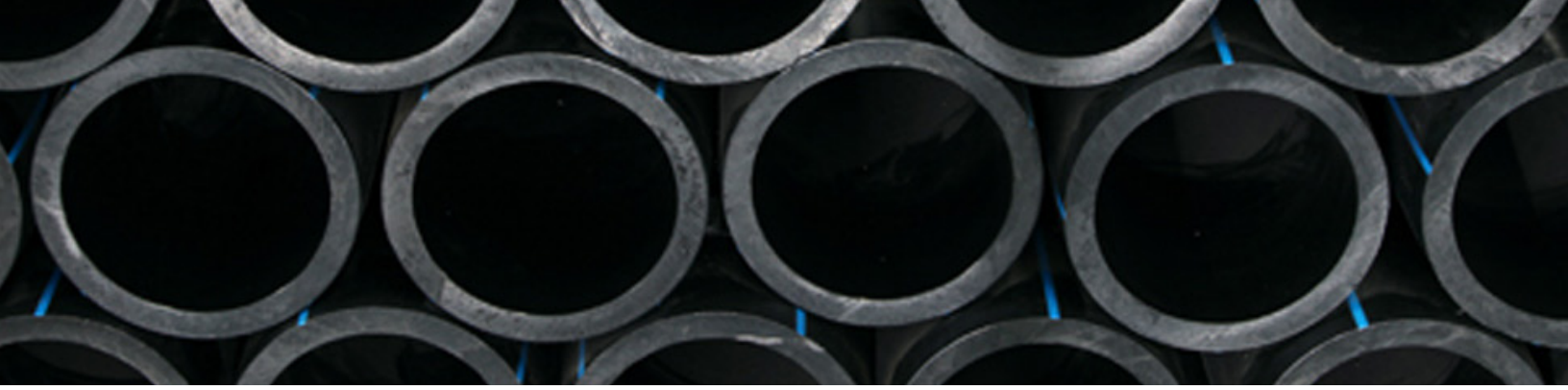
Shock resistance
This is general characteristic of PE. It has excellent resistance.

Cold hardiness
There is no changing characteristic until minus 80 Celsius. No frozen to burst.

Abrasive resistance
Great abrasive is suitable to use for slurry transfer pipeline or dredging pipes.

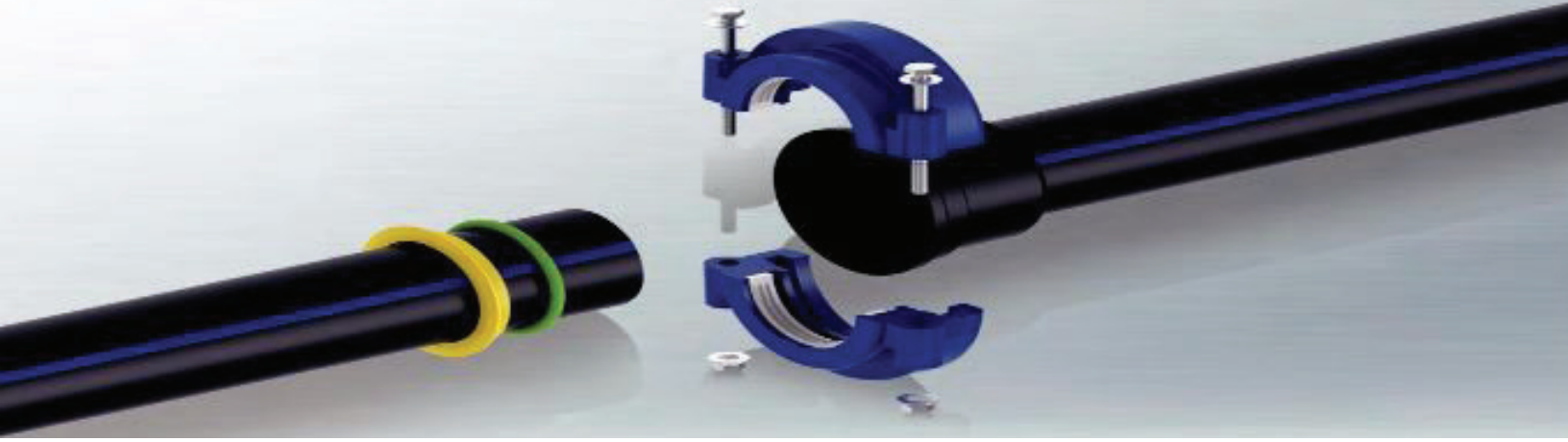
Economical
Low cost comparing with other material for maintenance and repairing.

Dimension	20 ~ 800mm (KS/ ISO
Pressure	0.6Mpa, 0.8MPa, 1.0MPa, 1.25MPa, 1.6MPa
Material	HDPE PE 100
Temperature	- 40°C ~ 40°C
Life	50 years
Connections	Compression / Butt Fusin / Electro Fusion
Approvals	KS M 3408-2 / KC
Standard	ISO 4427 and BS 6920



PE WATER PIPE

SDR 26 (PN 0.6)		SDR 11 (PN 1.6)		SDR 21 (PN 0.8)	
Nominal Size d_n (mm)	Wall Thickness e_n (mm)	Nominal Size d_n (mm)	Wall Thickness e_n (mm)	Nominal Size d_n (mm)	Wall Thickness e_n (mm)
110	4.2	20	2.3	63	4.7
125	4.8	25	2.3	75	5.6
160	6.2	32	3	90	6.7
180	6.9	40	3.7	110	8.1
200	7.7	50	4.6	125	9.2
225	8.6	63	5.8	160	11.8
250	9.6	75	6.8	180	13.3
280	10.7	90	8.2	200	14.7
315	12.1	110	10	225	16.6
355	13.6	125	11.4	250	18.4
400	15.3	160	14.6	280	20.6
450	17.2	180	16.4	315	23.2
500	19.1	200	18.4	355	26.1
560	21.4	250	20.5	400	29.4
630	24.1	280	22.7	450	33.1
710	27.2	315	25.4	500	36.8
800	30.6	355	28.6	630	46.3
900	34.4	400	32.2		
1000	38.2	450	36.3		
1200	46.3	500	40.9		
1400	53.9	560	50.8		
1600	61.6	630	57.2		



NIT Water Pipe

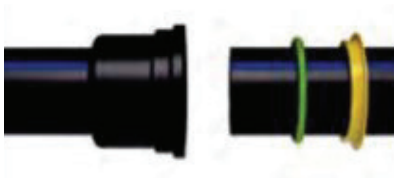
New integrated type of HDPE pipe, SPECIAL CONNECTION METHOD applied.

All fitting accessories supplied with the product as a set, an inclusion that allows SPEEDY & EFFICIENT INSTALLATION including MOVABLE HOLDER & CAP preventing pipe separation.

EASY INSTALLATION: No needs for additional fittings! The pipe supplied already integrated with the head. Very easy to connect the two covers with only bolts and nuts.

PREVENTION OF SEPERATION: The movable holder, which is made with engineering plastic than PE, holds the pipe firmly, preventing the pipes from deviating from its original shape due to expansion and contraction

WATER TIGHTNESS: The rubber O-rings guarantee a perfect tightness in the water pressure test.



After inserting the pusher and rubber ring, insert the pipe up to marking and push the pusher into the pipe.

After inserting the pusher and rubber ring, insert the pipe up to marking and push the pusher into the pipe.

Complete the fitting by connecting the upper/lower cap with the body

Fittings

Compression Type of Jointing/Fittings

Give a professional finish to the job. Additional tools not required, just simply fit. Compact size allows for assembly in confined spaces. No need to restrain joints with 50 years lifetime guaranteed.

Butt Fusion Type of Jointing/Fittings

Offer leak-free connection, which outperform other competing materials in terms of reliability and longevity, not to mention the remarkable savings on the installation cost and life of the materials. This is the most widely-used type of fittings, also available in larger dimensions through custom-fabrication.

Electro Fusion Type of Jointing/Fittings

Are specifically designed for reliable, high performance pipe joining and long system life. The automated system has been proven most economical due to the low potential for operator error.

CERTIFICATE

METALS INDUSTRY RESEARCH AND DEVELOPMENT CENTER
Department of Science and Technology
Gen. Santos Ave., Bicutan, Taguig City, 1631 Philippines
Tel. Nos.: 837-0431 to 38 local 481 or 482 / Fax Nos.: 837-0430, 838-7878

ANALYSIS AND TESTING DIVISION

CERTIFICATE

WELKONEK MARKETING CORPORATION
#6 Ubay St., Brgy. Siena, Quezon City

Job Description	:	**BURST TEST**
Customer's Sample Description	:	Copper Tube
Date Received	:	30 May 2017
Date Tested	:	31 May 2017
Location of Testing	:	Mechanical Metallurgy Laboratory (MML)

TEST METHOD:

Test was conducted on as-received sample/s in accordance with Mechanical Metallurgy Laboratory Non-standard Testing Procedure Number 0129 Revision 0 (Burst Test of Metallic Materials and Products)

TEST RESULT/S:

Customer's Sample Designation	Brand: SmartCo Copper Tube
Outside Diameter, mm	19.08
Length, mm	646.00
Testing Pressure, MPa	21.00
Remarks	The fixture was pulled out from the sample upon reaching the recorded value of pressure

See attachment (Page 1)

Note: The results contained herein only relate to the item/s tested.

Witnessed on 31 May 2017 by:

Levi P. Dulay
Weikonek Marketing Corporation

EDWARD A. MALIT
SRS II

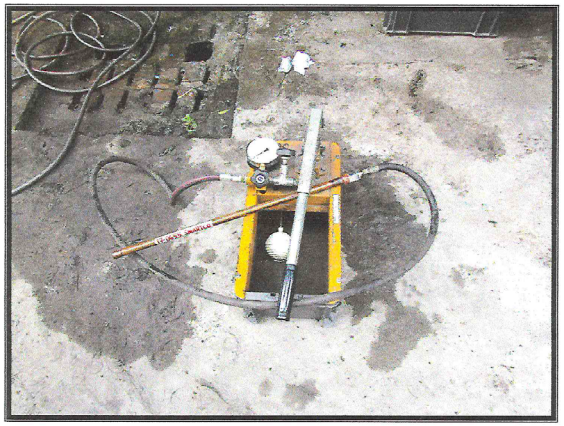
Noted by : **RIO S. PAGTALUNAN, Dr. Tech.**
Division Chief

Certificate No. : **MIRDC-052017-MML-0655**
Date : 31 May 2017

MIRDC
Metals Industry Research & Development Center
Department of Science and Technology

ANALYSIS AND TESTING DIVISION
PHYSICAL LABORATORIES SECTION
MIRDC Compound, General Santos Avenue,
Bicutan, Taguig, Metro Manila, Philippines 1631
Tel. Nos.: 837-0431 to 38 local 481 / 482
Fax Nos.: 837-0431 / 838-7878

ATTACHMENT



Test set-up for the Burst Test of Copper Tube (Brand: SmartCo)

Copper Tube (Brand: SmartCo), after the application of burst test

Certificate Number : MIRDC-052017-MML-0655

Prepared by : Jeffrey C. Obregon

CERTIFICATE

METALS INDUSTRY RESEARCH AND DEVELOPMENT CENTER
Department of Science and Technology
Gen. Santos Ave., Bicutan, Taguig City, 1631 Philippines
Tel. Nos.: 837-0431 to 38 local 481 or 482 / Fax Nos.: 837-0430, 838-7878

ANALYSIS AND TESTING DIVISION

CERTIFICATE

WELKONEK MARKETING CORPORATION
#6 Ubay St., Brgy. Siena, Quezon City

Job Description	:	**BURST TEST**
Customer's Sample Description	:	Copper Tube
Date Received	:	24 April 2017
Date Tested	:	27 April 2017
Location of Testing	:	Mechanical Metallurgy Laboratory (MML)

TEST METHOD:

Test was conducted on as-received sample/s in accordance with Mechanical Metallurgy Laboratory Non-standard Testing Procedure Number 0129 Revision 0 (Burst Test of Metallic Materials and Products)

TEST RESULT/S:

Customer's Sample Designation	5/8" Ø
Outside Diameter, mm	19.01
Length, mm	600
Testing Pressure, MPa	15.00
Remarks	The female adaptor expanded after the application of hydrostatic test pressure

See attachment (Page 1)

Note: The results contained herein only relate to the item/s tested.

EDWARD A. MALIT
SRS II

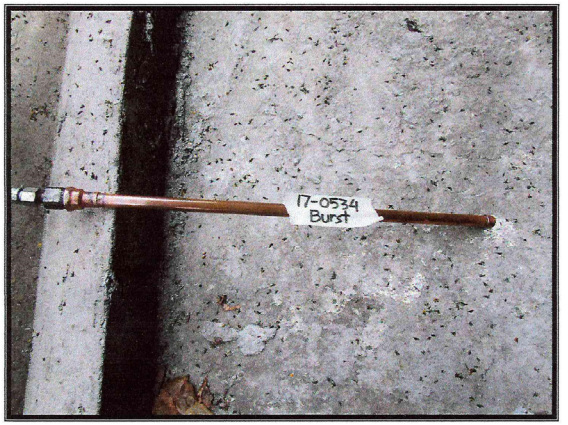
Noted by : **RIO S. PAGTALUNAN, Dr. Tech.**
Division Chief

Certificate No. : **MIRDC-042017-MML-0534B**
Date : 05 May 2017

MIRDC
Metals Industry Research & Development Center
Department of Science and Technology

ANALYSIS AND TESTING DIVISION
PHYSICAL LABORATORIES SECTION
MIRDC Compound, General Santos Avenue,
Bicutan, Taguig, Metro Manila, Philippines 1631
Tel. Nos.: 837-0431 to 38 local 481 / 482
Fax Nos.: 837-0431 / 838-7878

ATTACHMENT



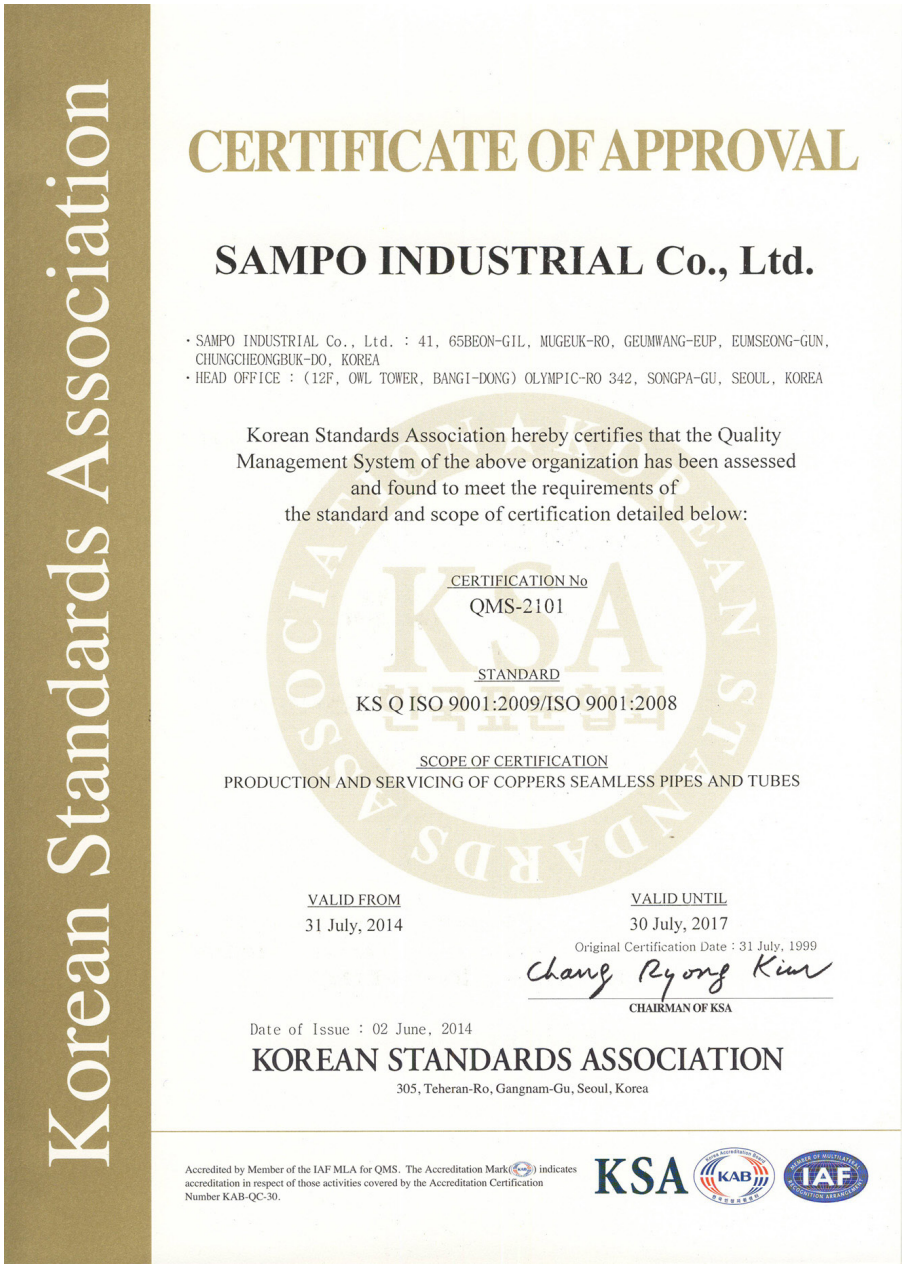
Test set-up for the Burst Test of Copper Tube: 5/8" Ø

Copper Tube: 5/8" Ø, after the application of hydrostatic test pressure

Certificate Number : MIRDC-042017-MML-0534B

Prepared by : Edward A. Malit

CERTIFICATE



Korean Standards Association

CERTIFICATE OF APPROVAL

SAMPO INDUSTRIAL Co., Ltd.

· SAMPO INDUSTRIAL Co., Ltd. : 41, 65BEON-GIL, MUGEUK-RO, GEUMWANG-EUP, EUMSEONG-GUN, CHUNGCHEONGBUK-DO, KOREA
· HEAD OFFICE : (12F, OWL TOWER, BANGI-DONG) OLYMPIC-RO 342, SONGPA-GU, SEOUL, KOREA

Korean Standards Association hereby certifies that the Quality Management System of the above organization has been assessed and found to meet the requirements of the standard and scope of certification detailed below:

CERTIFICATION No
QMS-2101

STANDARD
KS Q ISO 9001:2009/ISO 9001:2008

SCOPE OF CERTIFICATION
PRODUCTION AND SERVICING OF COPPERS SEAMLESS PIPES AND TUBES

VALID FROM
31 July, 2014

VALID UNTIL
30 July, 2017

Original Certification Date : 31 July, 1999

Chang Ryong Kim
CHAIRMAN OF KSA

Date of Issue : 02 June, 2014

KOREAN STANDARDS ASSOCIATION
305, Teheran-Ro, Gangnam-Gu, Seoul, Korea

Accredited by Member of the IAF MLA for QMS. The Accreditation Mark indicates accreditation in respect of those activities covered by the Accreditation Certification Number KAB-QC-30.

KSA KAB IAF

KSA

JIS

JIS MARK CERTIFICATE

Certification No. : KSCN15001

Foshan HuaHong Copper tube Co., Ltd.

No.9 Industrial Avenue East, Songgang Songxia Industrial Park, Nanhai District, Foshan city, Guangdong Province, China

Korean Standards Association hereby certifies the JIS Mark factory in accordance with the provision of Article 23 of the Japanese Industrial Standardization Law as follows

JIS NUMBER & TITLE
JIS H 3300 : Copper and copper alloy seamless pipes and tubes

GRADE OR TYPE
C1220

OTHERS

· Certificate Valid Date : 29 April, 2015 ~ 28 April, 2018
· Original Certification Date : 29 April, 2015
· Date of Issue : 29 April, 2015

Baek, Soo Hyun
CHAIRMAN OF KSA

KOREAN STANDARDS ASSOCIATION
305, Teheran-Ro, Gangnam-Gu, Seoul, Korea

CERTIFICATE

EWC

Certificate of Approval

Certificate No.: 5206QR3

Awarded to

Foshan HuaHong Copper Tube Co., Ltd

Industrial Avenue, Songxia Industrial Park, Songgang, Shishan Town,
Nanhai District, Foshan City, Guangdong Province

Organization Code: 760633986

Has established a Quality Management System which is in Accordance with the Requirements of the Standard (Exclude Clause 7.3):

GB/T19001-2008/ISO9001:2008

SCOPE OF CERTIFICATION

Production and Sale of Copper Product

(Copper Tube, Copper Rod, Copper Bus Bar)

Initial Certification Date: Feb. 27, 2006
Validity of Certification: Dec. 16, 2014 to Dec. 15, 2017
Issue Date: Dec. 16, 2014

The effectiveness of this Certificate shall be validated by periodic surveillance audit of EWC for maintenance. This Certificate will not be in force unless qualified identification is stuck thereunder by EWC within appropriate time limit

Dec. 2015 To Nov. 2016	Stuck	Dec. 2016 To Dec. 15, 2017	Stuck

Conditions on effectiveness of certificate see http://www.ewqcc.org
The information about this certificate can be found on the official website of Certification and Accreditation Administration of People's Republic of China (www.cnca.gov.cn)

EWC:

ANAB ACCREDITED 020102

IAF MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT

Ever Win Quality Certification Center EWC

Ever Win Quality Certification Center, No.4,Chegongzhuang St, Xicheng District, Beijing

Intertek

8431 Murphy Drive
Middleton, WI 53562

Telephone: +1 608 836 4400
Facsimile: +1 608 831 9279
www.intertek.com

Certificate of Compliance
No. CF 58829 09-15-09-02

This is to certify that the under mentioned manufacturer

SAMPO INDUSTRIAL CO, LTD.
2F Sampo Building
40-2 0gum-Dong, Songpa-Ku
Seoul, South Korea
Tel: 1 +82-2-405-8886; Fax: +82-2-571-5156

Is a Listed manufacturer or assembler of Product(s) specified below, under the Warnock Hersey (WH) label service.

Seamless Copper Air Conditioning/Refrigeration Tube:
Type ACR O60 (Coil), Annealed Sizes: 1/4", 5/16", 3/8", 1/2", 5/8".
Type ACR H58 Hard drawn, Sizes: 3/8", 1/2", 5/8", 3/4", 7/8", 1-1/8", 1-3/8", 1-5/8", 2-1/8", 2-5/8", 3-1/8", 3-5/8", 4-1/8"

Evaluated to the following:
ASTM-B280-08 Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service

Additional Information:
All required marking must be permanent, legible and visible after manufacture. Markings consist of the WHI Certification Mark and the Markings required by the relevant standard(s).

This certificate is only valid under Intertek/WHI Testing, Inspection, and Labeling Services. Only those products bearing the Warnock Hersey registered certification mark should be considered as being covered by Intertek / Warnock Hersey Certification and Surveillance Services.

Bob Davison
Certification Manager

Issued: 2009 September 15

Intertek Intertek Intertek Intertek Intertek Intertek Intertek

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