



# EcoXS



**COPPER &  
COPPER IRON  
HIGH PRESSURE  
REFRIGERATION  
PIPING SYSTEM**

**SUITABLE FOR CO<sub>2</sub>  
TRANSCRITICAL  
REFRIGERATION  
SYSTEMS**

- 60 Bar Copper Tube
- 130 Bar Copper Iron Tube
- 130 Bar Copper Iron Fittings

[www.kembla.com.au](http://www.kembla.com.au)





**MM Kembla has been providing our customers with the highest quality and most reliable products and services for over 100 years. Established in 1916, MM Kembla is Australia's only copper tube manufacturer. Still operating from its original site at Port Kembla, NSW Australia, MM Kembla remains the most highly regarded supplier of copper products including tube, fittings and accessories.**

### **KEMBLA ECO XS**

**The high strength and high pressure Refrigeration Piping System from MM Kembla.**

The Kembla ECO XS high pressure refrigeration piping system offers a unique combination of *Extra Strength Copper* and *Copper Iron Alloy Tube and Fittings* capable of withstanding the high operating pressure requirements of today's evolving HVAC and Refrigeration industries, particularly in the use of CO<sub>2</sub> transcritical refrigeration systems.

The MM Kembla ECO XS suite of high pressure refrigeration tube and fittings delivers a unique solution comprised of only the highest quality products:

- Australian manufactured Kembla XS Copper Tube
- European manufactured Talos XS Copper Iron Tube
- European manufactured Sanha RefHP Fittings

### **KEMBLA XS COPPER TUBE**

Kembla XS Copper Tube is the only Australian manufactured tube that complies with both AS/NZS1571 and its strict cleanliness standards and incorporates KemCore™ technology to achieve concentric tube and uniform wall thickness to ensure 60 Bar (6,000kPa) safe working pressure is achieved as per AS4041 pressure piping requirements.

### **TALOS XS COPPER IRON TUBE**

Talos XS Copper Iron Tube is specifically developed and manufactured from high strength (CuFe2P) alloy to provide it with the extra strength needed to withstand operating pressures of up to 130 bar (13,000kPa).

### **SANHA REFHP FITTINGS**

Sanha RefHP fittings are the highest quality and optimal fittings for use with both 60 Bar and 130 Bar tube solutions. Rated to 130 Bar (13,000kPa) safe working pressure, RefHP fittings are manufactured from high strength (CuFe2P) systems and give you the strongest connection utilising tried and tested brazing methods.



**XS Copper Tube**



## GREEN REFRIGERATION

The increasing concern with the environmental impact of hydrofluorocarbon (HFC) refrigerants, and emergence of stringent environmental regulations have prompted a re-emergence of carbon dioxide (CO<sub>2</sub>) based refrigeration systems. CO<sub>2</sub> refrigerant is used as a working fluid in many climate control systems such as commercial refrigeration, residential air conditioning, hot water pumps and vending machines. The supermarket industry in particular has implemented an ecological and efficient store concept by successfully embracing advanced CO<sub>2</sub> refrigeration technologies developed by refrigeration system manufacturers.

## CO<sub>2</sub> AS A REFRIGERANT

CO<sub>2</sub> (R744) refrigerant is a natural refrigerant because it exists in the natural environment. Released from refrigeration systems in the atmosphere, it has a negligible effect to global warming unlike Chlorofluorocarbon (CFC), Hydrochlorofluorocarbon (HCFC), and Hydrofluorocarbon (HFC) refrigerants.

In addition to its low environmental impact, CO<sub>2</sub> is a viable solution for low-temperature refrigeration applications because it is non-ozone depleting, non-toxic, non-flammable, and has a high volumetric cooling capacity.

However due to its physical properties, CO<sub>2</sub> based refrigeration systems require much higher pressures compared to conventional systems. The higher operating pressure and broad temperature fluctuations require that all the system components, including piping need to be designed and manufactured accordingly.

The most common application for CO<sub>2</sub> refrigerants is in transcritical refrigeration systems.

***The Kembla ECO XS piping range provides a complete system solution for transcritical applications.***

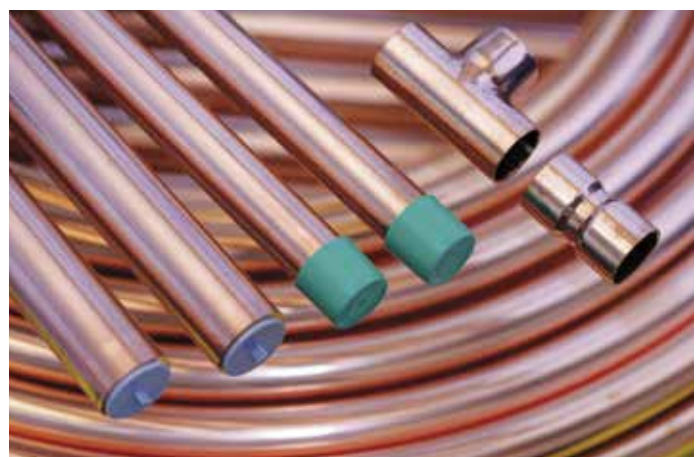
## KEMBLA ECO XS IN TRANSCRITICAL SYSTEMS

Unlike traditional subcritical refrigeration systems, transcritical systems operate above the critical point of the pressure-temperature curve. The critical point designates the conditions under which a liquid and its vapour can coexist. The area above this critical point is known as the "Fluid Region". A condition in the fluid region is often referred to as a gas condition, in transcritical systems this phase represents the "Gas Cooling" phase that is often referred to as the "Condensation Phase" in a traditional subcritical system.

For CO<sub>2</sub>, the critical point is at 31°C (88°F), which is lower than that of other commonly used refrigerants. A system using R744 operates in transcritical mode when the condensing temperature exceeds 31°C. At this point, no distinction can be made between the refrigerant as a fluid or a vapour. Due to this, the condenser acts as a gas cooler.

Transcritical CO<sub>2</sub> refrigeration systems require up to 37% less energy than a state-of-the-art R404A system and as a result provide significant energy efficiency savings when installed.

Due to the increased operating pressures of such systems, the Kembla ECO XS system utilises the highest quality manufacturing techniques and materials to produce a piping system optimised for use with transcritical CO<sub>2</sub> refrigeration systems.



## TECHNICAL SPECIFICATIONS

### Kembla XS 60 Bar Copper Tube

Manufactured in Australia, KEMBLA XS combines MM Kembla's extensive technical knowledge, stringent in house quality controls and over 100 years of experience to develop a high strength copper tube for high pressure refrigeration applications. Manufactured to AS/NZS 1571 and pressures as per AS 4041, it's ideally suited for applications with operational pressures up to 60 Bar.

## USAGE

- Air Conditioning
- Commercial Refrigeration Systems
- Industrial Refrigeration Systems
- Any refrigeration system using CO<sub>2</sub> / R744 up to 60 Bar



## FEATURES

- Available in 6m lengths in sizes 3/8" to 7/8"
- Made from Phosphorous Deoxidised Copper (Alloy C12200)
- Designed to meet safe working pressures of 60 Bar (6,000kPa)
- Utilises MM Kembla's unique KemCore Technology to provide uniform tube thickness for optimal piping performance under high pressures
- Optimised wall thickness design to ensure system longevity and performance as per AS 4041 pressure piping standard
- Compatible with Kembla ECO XS system fittings (Sanha RefHP fittings)
- Manufactured in Australia

## KEMCORE TECHNOLOGY™

Kembla's unique KEMCORE™ Technology ensures the final product is concentric with superior wall thickness control for long term tube performance.

## MATERIAL

Phosphorous Dexoxidised Copper (Alloy C 12200)

## SPECIFICATIONS

Dimensional Tolerances: AS/NZS 1571 AS4041  
 Internal Cleanliness: AS/NZS 1571 (<0.038g/m<sup>2</sup>)  
 Mechanical Properties: AS/NZS 1571  
 Form of Supply: 6m Lengths, External Green End Caps  
 Marking: e.g. KEMBLA XS AS/NZS 1571 & AS4041  
 HH - 12.70 X 0.97 – AUSTRALIA – Batch No.

## PRODUCT RANGE

### KEMBLA® XS 60 BAR COPPER TUBE (AS/ANS 1571 & AS 4041)

PRODUCT		ACTUAL TUBE SIZE					SAFE WORKING PRESSURE (kPa)
KEMBLA CODE	TEMPER	OD (inches)	OD (mm)	WALL THICKNESS (mm)	NOMINAL TUBE MASS (kg/length)	STRAIGHT LENGTHS	SERVICE TEMPERATURE @50°C
T62300	HD	3/8	9.52	0.81	1.19	6m	6,800
T62301	HH	1/2	12.7	0.97	1.92	6m	6,053
T62302	HH	5/8	15.88	1.21	2.97	6m	6,037
T62303	HH	3/4	19.05	1.45	4.30	6m	6,030
T62304	HD	7/8	22.22	1.69	5.85	6m	6,026

HD = Hard Drawn

HH = Half Hard / Bendable

## TECHNICAL SPECIFICATIONS

### Talos XS 130 Bar Copper Iron Tube

TALOS XS is specially designed and manufactured from extra strong copper iron alloy (CuFe2P) to satisfy the demand for the high pressures of the ever evolving HVAC-R industry where extra high pressures are required, particularly in CO<sub>2</sub> transcritical systems. Traditional installation methods ensure joining the system is fast and easy.

## USAGE

- Air Conditioning
- Commercial Refrigeration Systems
- Industrial Refrigeration Systems
- Any refrigeration system using CO<sub>2</sub> / R744 up to 130 Bar



## FEATURES

- Available in 5m lengths in sizes 3/8" to 1- 5/8"
- Made from extra strong copper iron alloy (CuFe2P)
- Designed to meet safe working pressures of 130 Bar (13,000kPa)
- Perfect for use in Transcritical CO<sub>2</sub> Refrigeration Systems
- Compatible with Kembla ECO XS system fittings (Sanha RefHP fittings)
- Optimised wall thickness and design to ensure system longevity
- Internal cleanliness of <0.038g/ m<sup>2</sup>
- Manufactured in Greece

## MATERIAL

Copper Iron Alloy (CuFe2P) with chemical composition according to EN12449 (CW107C) and UNS C19400

## SPECIFICATIONS

Dimensional Tolerances: EN12735-1  
 Internal Cleanliness: EN12735-1 (<0.038g/m<sup>2</sup>)  
 Mechanical Properties: EN12449, VdTÜV WB567  
 Form of Supply: 6m Lengths, Internal Grey End Caps  
 Marking: e.g. HALCOR TALOS-XS 9.52 x 0.65 (CuFe2P)  
 R300 130 Bar/1885 psi

## PRODUCT RANGE

### TALOS® XS 130 BAR COPPER IRON TUBE (EN12735-1)

PRODUCT		ACTUAL TUBE SIZE					SAFE WORKING PRESSURE (kPa)
KEMBLA CODE	TEMPER	OD (inches)	OD (mm)	WALL THICKNESS (mm)	NOMINAL TUBE MASS (kg/length)	STRAIGHT LENGTHS	SERVICE TEMPERATURE @150°C
T62314	R300 ANN	5/16	7.94	0.50	0.52	5m	13,000
T62305	R300 ANN	3/8	9.52	0.65	0.81	5m	13,000
T62306	R300 ANN	1/2	12.70	0.85	1.41	5m	13,000
T62307	R300 ANN	5/8	15.87	1.05	2.18	5m	13,000
T62308	R300 ANN	3/4	19.05	1.30	3.23	5m	13,000
T62309	R300 ANN	7/8	22.23	1.50	4.35	5m	13,000
T62310	R300 ANN	1 1/8	28.57	1.90	7.09	5m	13,000
T62311	R300 ANN	1 3/8	34.92	2.30	10.49	5m	13,000
T62312	R300 ANN	1 5/8	41.27	2.70	14.56	5m	13,000
T62313	R300 ANN	2 1/8	53.98	3.55	25.02	5m	13,000

R300 ANN = Annealed condition as per EN 12735-1

# Sanha RefHP Copper Iron Fittings TO EN1254-1, EN1254-5

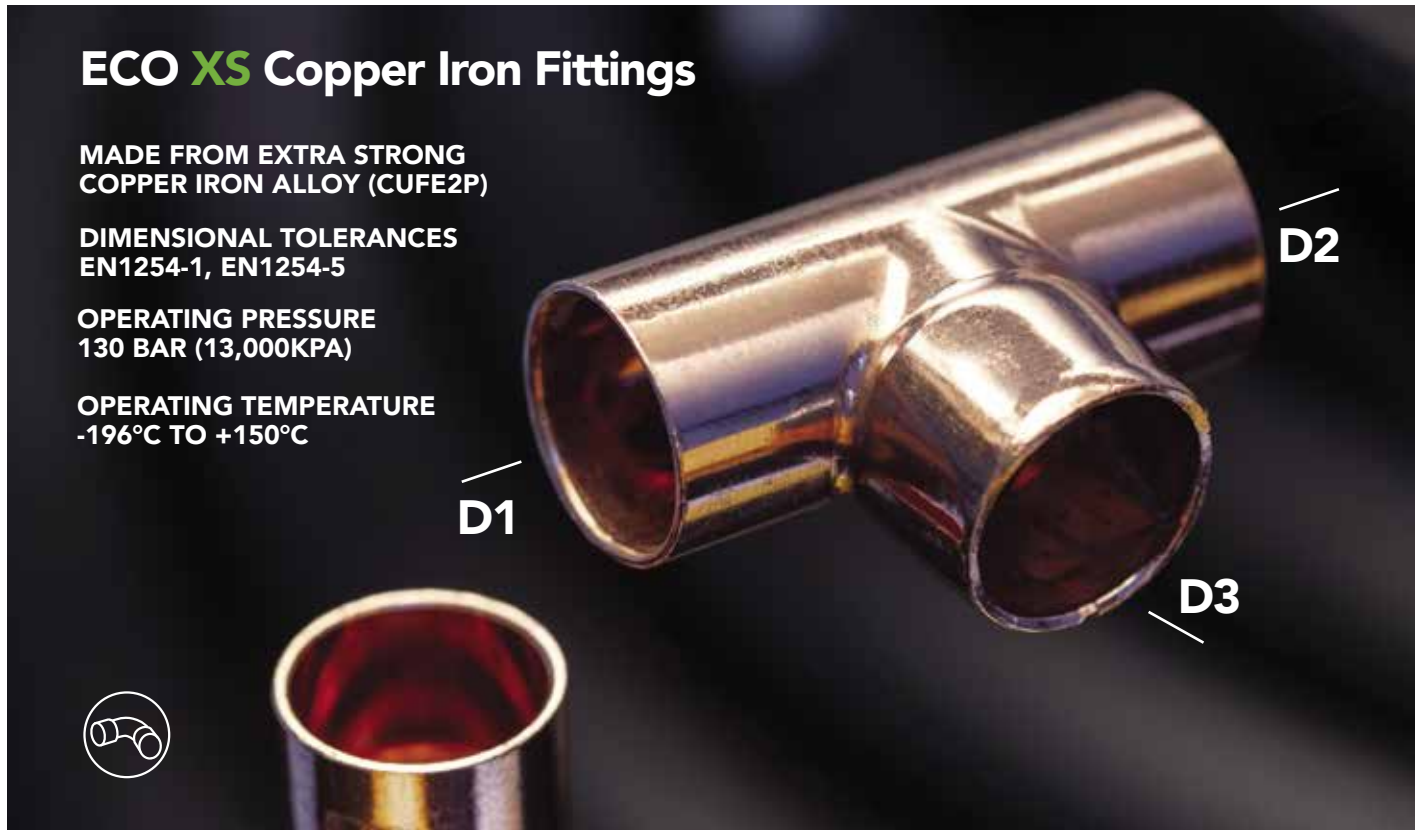
## TECHNICAL SPECIFICATIONS

### SANHA RefHP 130 Bar Copper Iron Fittings

The higher operating pressures of MM Kembla - ECO XS require higher performing fittings. Sanha RefHP combines German engineering and manufacturing with the ease of installation using proven installation processes. 50 years of experience and internal standards guarantee the fittings are a perfect fit.

## USAGE

- Air Conditioning
- Commercial Refrigeration Systems
- Industrial Refrigeration Systems
- Any refrigeration system using CO<sub>2</sub> / R744 up to 130 Bar



## ECO XS Copper Iron Fittings

MADE FROM EXTRA STRONG COPPER IRON ALLOY (CUFE2P)

DIMENSIONAL TOLERANCES EN1254-1, EN1254-5

OPERATING PRESSURE 130 BAR (13,000KPA)

OPERATING TEMPERATURE -196°C TO +150°C



## FEATURES

- Available in sizes 3/8" to 2-1/8"
- Made from extra strong copper iron alloy (CuFe2P)
- Designed to meet safe working pressures of 130 Bar (13,000kPa) even after brazing
- Stress corrosion resistant
- Suitable for use with Kembla XS 60 Bar and Talos XS 130 Bar Tube
- Manufactured in Germany

## INSTALLATION

- Fittings to be joined to Kembla XS Copper Tube & Talos XS Copper Iron Tube by silver brazing
- The use of 15% silver solder is recommended and a proprietary silver brazing flux (type FH10) is to be used
- Silver brazing shall be carried out by professional tradespersons using brazing principles and safety procedures in accordance with AS HB40 and relevant installation standards.

## MATERIAL

Copper Iron Alloy (CuFe2P) with chemical composition according to EN12449 (CW107C) and UNS C19400

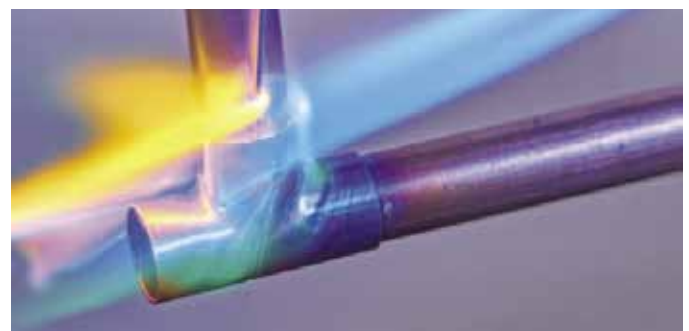
## SPECIFICATIONS

Dimensional Tolerances: EN1254-1, EN1254-5

Operating Pressure: 130 Bar

Operating Temperature: -196°C to +150°C

Form of Supply: Minimum Bag Quantities



# Sanha RefHP Copper Iron Fittings TO EN1254-1, EN1254-5

## PRODUCT RANGE

COPPER IRON FITTINGS				COPPER IRON FITTINGS				
	Code	Size (inch)	Quantity Bag		Code	Size (inch)	Quantity Bag	
<b>90° Elbow</b> Male/Female  	J62338	3/8	10	<b>Reducer</b> Male/Female  	J62413	1/2 x 3/8	10	
	J62339	1/2	10		J62414	5/8 x 3/8	10	
	J62340	5/8	10		J62415	5/8 x 1/2	10	
	J62341	3/4	10		J62416	3/4 x 3/8	10	
	J62342	7/8	10		J62417	3/4 x 1/2	10	
	J62343	1 1/8	5		J62418	3/4 x 5/8	10	
	J62344	1 3/8	2		J62419	7/8 x 3/8	10	
	J62345	1 5/8	2		J62420	7/8 x 1/2	10	
<b>90° Elbow</b> Female/Female  	J62329	3/8	10		J62421	7/8 x 5/8	10	
	J62330	1/2	10		J62422	7/8 x 3/4	10	
	J62331	5/8	10		J62423	1 1/8 x 1/2	5	
	J62332	3/4	10		J62424	1 1/8 x 5/8	5	
	J62333	7/8	10		J62425	1 1/8 x 3/4	5	
	J62334	1 1/8	5		J62426	1 1/8 x 7/8	5	
	J62335	1 3/8	2		J62427	1 3/8 x 1 1/8	2	
<b>45° Elbow</b> Male/Female  	J62356	3/8	10		<b>Equal Tee</b>  	J62365	3/8 x 3/8 x 3/8	10
	J62357	1/2	10			J62366	1/2 x 1/2 x 1/2	10
	J62358	5/8	10			J62367	5/8 x 5/8 x 5/8	10
	J62359	3/4	10	J62368		3/4 x 3/4 x 3/4	10	
	J62360	7/8	10	J62369		7/8 x 7/8 x 7/8	10	
	J62361	1 1/8	5	J62370		1 1/8 x 1 1/8 x 1 1/8	5	
	J62362	1 3/8	2	J62371		1 3/8 x 1 3/8 x 1 3/8	2	
J62363	1 5/8	2	J62372	1 5/8 x 1 5/8 x 1 5/8		2		
<b>45° Elbow</b> Female/Female  	J62347	3/8	10	<b>Reducing Tee</b>  		J62374*	1/2 x 3/8 x 3/8	10
	J62348	1/2	10			J62376*	1/2 x 1/2 x 3/8	10
	J62349	5/8	10		J62378*	5/8 x 1/2 x 1/2	10	
	J62350	3/4	10		J62380*	5/8 x 5/8 x 3/8	10	
	J62351	7/8	10		J62385*	3/4 x 3/4 x 5/8	10	
	J62352	1 1/8	5		J62392*	7/8 x 7/8 x 3/4	10	
	J62353	1 3/8	2		J62398*	1 1/8 x 1 1/8 x 7/8	5	
	J62354	1 5/8	2		J62404*	1 3/8 x 1 3/8 x 7/8	2	
<b>Coupling</b>  	J62320	3/8	10		<b>End Cap</b>  	J62411*	1 5/8 x 1 5/8 x 1 3/8	2
	J62321	1/2	10			J62460	3/8	10
	J62322	5/8	10	J62461		1/2	10	
	J62323	3/4	10	J62462		5/8	10	
	J62324	7/8	10	J62463		3/4	10	
	J62325*	1 1/8	5	J62464		7/8	10	
	J62326*	1 3/8	2	J62465		1 1/8	5	
J62327	1 5/8	2	J62466	1 3/8		2		
				J62467		1 5/8	2	

\* Available on request. Lead times apply.



**HIGH STRENGTH.  
HIGH PRESSURE.  
HIGH QUALITY.**



**KEMBLA ECO XS  
HIGH STRENGTH.  
ENERGY EFFICIENT.  
THE ONLY CHOICE  
WHEN USING CO<sub>2</sub>**

 **KEMBLA**

**ECO XS**

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