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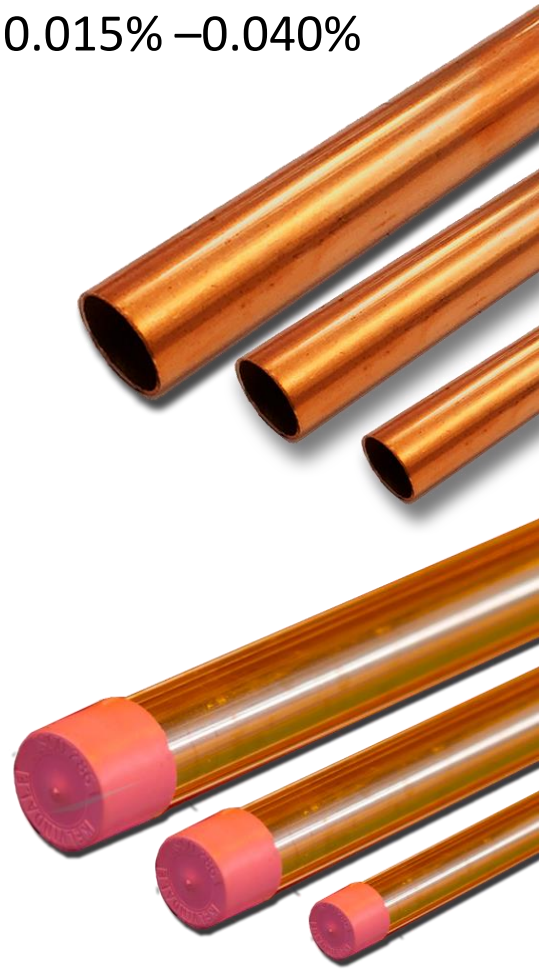
Proper Copper Tube

- **Quality copper tube starts with the highest quality copper**
- Copper tube is made from 99.90% pure copper & 0.015% –0.040% Phosphorus (offering advantages in brazing)
- Key factors in copper tube quality:

- Copper cathode grade (e.g. LME A Grade) used
- Level of scrap metal used
- Wall thickness
- Chemical composition
- Outside diameter
- Eccentricity
- Hardness
- Marking & Identification
- Cleanliness



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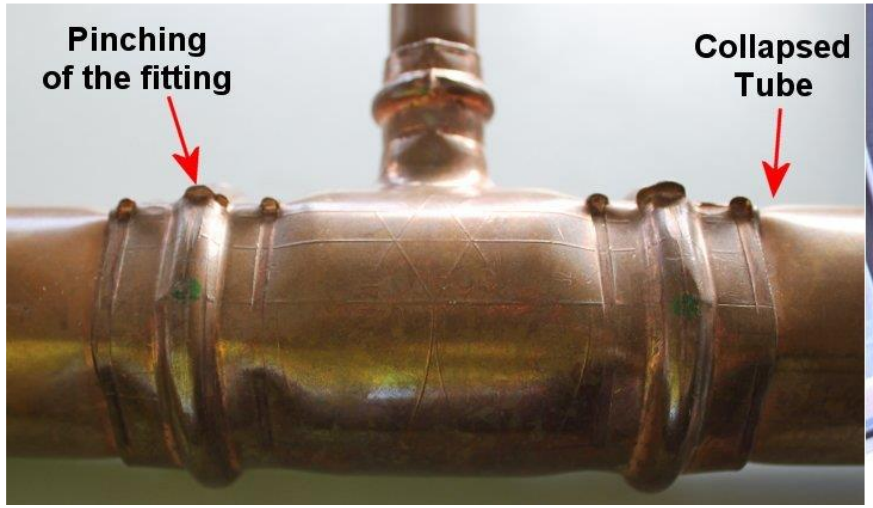
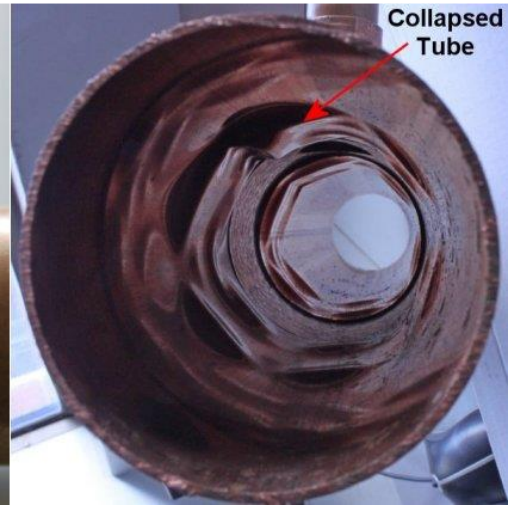
Proper Copper Tube

- Achieving *certification* does not ensure *consistent quality*
- Manufactured (or sourced) tubes need to be tested according to a QMS: Process Controls, Monitoring, Materials, Tools and Maintenance





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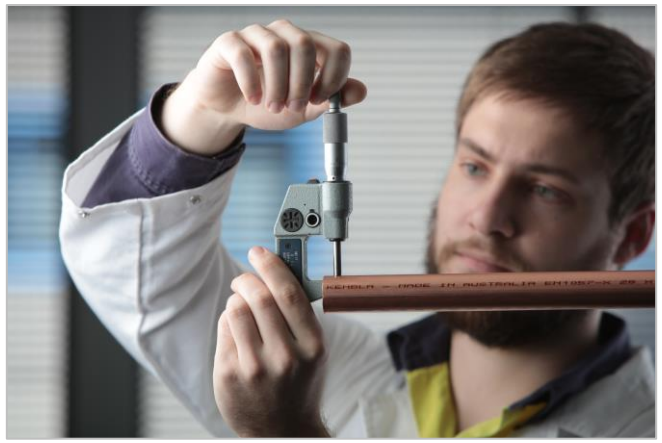
Market Quality Review

INTEGRATED PIPING SYSTEMS

“Copper Tube Ain’t Copper Tube”

- Rise of merchants importing direct leading to increased non-conforming product as merchants employ no quality control systems
- This is exposing installers, builders, developers, designers and merchants to increased risk and liability
- Testing performed by MM Kembla’s laboratory confirmed significant non-conformance of competing brands
- Testing of random samples found majority of them did not conform to Australian Standards:
  - Wall Thickness
  - Dimensions
  - Chemical Composition
  - Marking & Identification
  - Cleanliness requirements

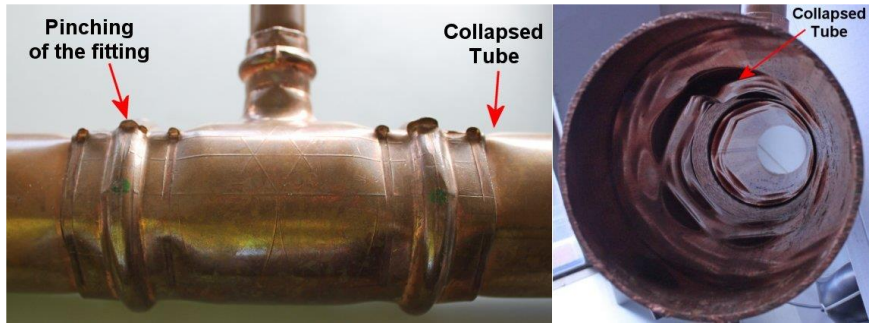


EXAMPLE: Collapse of the tube wall and significant pinching was visually evident as the cause of joint failure

- Minimum wall thickness of this sample was below AS1432 specifications:

Tube Size	Nominal Wall Thickness (mm)	Minimum Allowable Wall Thickness (mm)	Measured Minimum Wall Thickness (mm)	Measured Maximum Wall Thickness (mm)
AS 1432 DN 50 B	1.22	1.04	0.99	1.26
% Difference to Nominal		-14.8%	-18.9%	3.3%
Min-Max Variance				27.3%

- Significant variance in tube wall thickness results in unequal distribution of the press force of the pressing tool, reducing the tube structural integrity



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Consequences of Non-Conformance

- **Wall thickness**
  - Lowers the burst pressure
  - Affects velocity of the system
  - Impacts on life span of the tube and system
- **Outside diameter**
  - Affects capillary action resulting in incomplete seals and weak join strength
  - Affects press-fit pull out strength
  - Difficulty bending tube
- **High Eccentricity**
  - Prevents effective press joints
  - Affects ability to bend tube
  - Major cause of tube collapse when using press fittings

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Consequences of Non-Conformance

- **Chemical composition**
  - Low phosphorous leads to cracking during brazing
  - High impurities affect workability of tube
- **Incorrect hardness**
  - Affects ease of use when bending/forming
  - Leads tube collapse when using press fittings
- **Tube cleanliness**
  - Assists against internal pitting corrosion
  - Can interfere with pumps and compressors
  - Can foul refrigerants or medical gas
- **Markings & Identification**
  - May affect traceability to manufacturer
  - May affect certification of an installation

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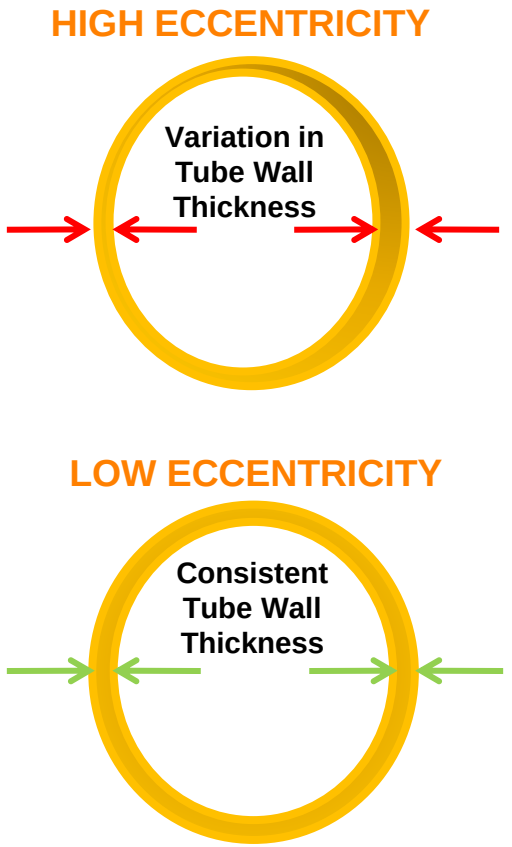
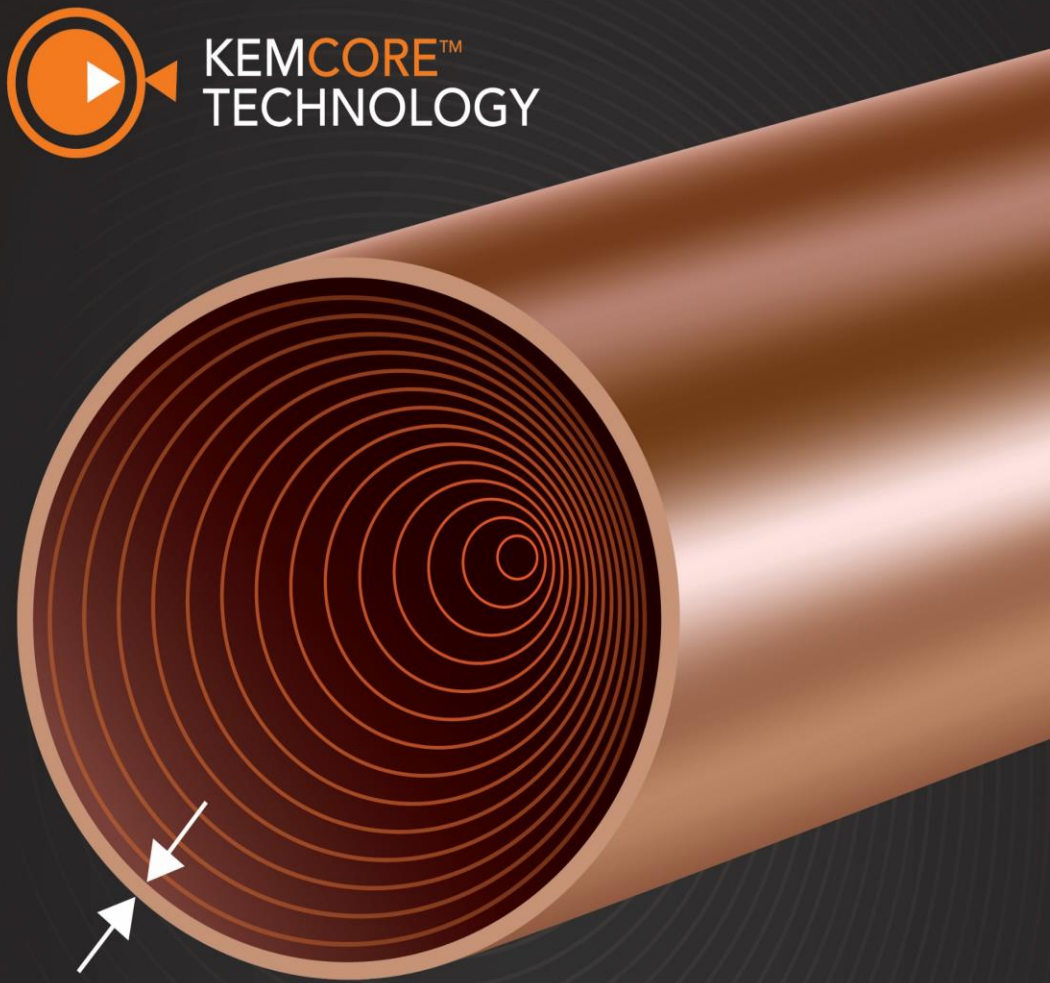
Tube Difference

- We have a strong focus on controlling **tube eccentricity**
- Eccentricity is the degree of variation in tube wall thickness
- Strict process controls and tool maintenance prevents high eccentricity
- Requires monitoring of wall thickness during the entire tube drawing process from extrusion to drawing
- Low eccentricity even more critical when using **press fittings**: Equal distribution of press force requires consistent wall thickness to avoid tube collapse



- KemCore utilises inline technology (up to size DN50) to measure and control tube concentricity across the entire length of tube:
  - Providing superior wall thickness control and optimal weld/press conditions
  - Reduces variance in wall thickness which results in unequal distribution of force, reducing the tube structural integrity
- Proper copper tube must be optimised for use with press fittings – requiring additional control and consistency of dimensions under pressing force



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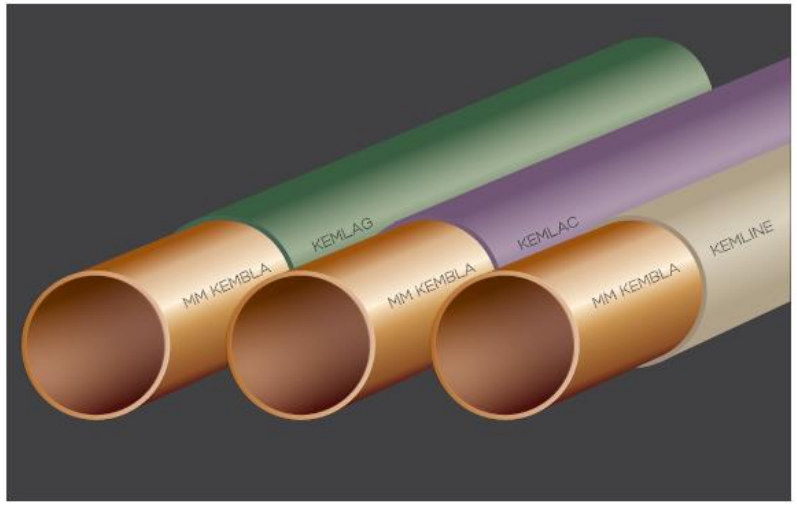
Kembla Copper Tube AS1432

with KemCore Technology

Selecting the right tube for the job:

- **Kembla AS 1432 tube available as:**
  - Kembla Hard Drawn straight lengths / Bendable Quality Straight lengths / Annealed coils / layer wound packs
  - **Kemlag Green** Pre-insulated copper in Green (for use when exposed to aggressive environments)
  - **Kemlag Lilac** Pre-insulated Copper in Lilac (for use with recycled water)
  - **Kemline** Pre-insulated Copper (for use in LP gas pipelines for vehicles to AS 1425)



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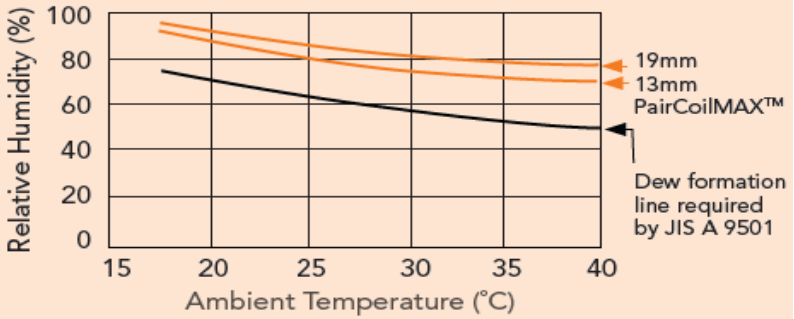
Proper PairCoil

- Insulation thickness to meet newly updated Australian thermal resistance (R-Value) requirements
- Fire retardant nitrile rubber insulated pair coil for air conditioning systems used in Class 2-9 buildings
- Suitable for applications ranging from -200˚ C to +116˚ C
- Meets BCA requirements and fire hazard properties in accordance with AS1530.3
- Closed cell nitrile rubber foam for improved energy efficiency, vapour barrier and condensation prevention
- Easy installation. No glue, tape or messy powder

INSULATION PROPERTIES

Material	Highly flexible 13mm and 19mm paired tubular closed cell elastomeric nitrile rubber foam
Thermal Conductivity	0.034 W/m.K at 23°C
Water Absorption	0.0029 g/100cm2
Vapour Barrier	≥10,000μ
Mildew Resistance	No fungal growth
Working Temperature	-200°C - +116°C Range

DEW POINT GRAPH



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Support Services

- **On Site Support**: MM Kembla representatives can provide installation inspections, product training and troubleshooting for your team at the project site
- **Technical Analysis:** We have a dedicated technical team and laboratory to offer Failure investigation, testing & certification services when you need them
- **National Customer Service Centre**
- **BIM Library**: MM Kembla now provides extensive BIM-MEP files/models for your Revit Library. This offers opportunities for significantly improving project efficiency through collaboration and the coordination of information and resources
- **Local Warehouses:** For urgent orders and local support
- **National Training Programme**

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Project Specific Warranty

MM Kembla Integrated Piping Systems are the combination of the highest quality system components manufactured and sourced by MM Kembla. To minimise the risk on your next project, you can request a project specific warranty. Just tell us what Kembla piping system components you are looking to use, and we can provide you a project specific warranty as well as our renowned technical and training support on your next project.

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Project Specific Insurance

As part of our project specific warranty, you will have peace of mind knowing MM Kembla integrated piping system components are backed and covered by Public and Product Liability Insurance with respect to personal injury and property damage.

"MM Kembla's Public and Product Liability Insurance covers the cost that MM Kembla may become legally liable to pay compensation for in the event of personal injury and property damage as a result of an occurrence and happening in connection with the failure of any components in an MM Kembla integrated piping system."

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Kembla Project Specific Warranty

The steps in this process are simple:

- Complete the warranty assessment form and submit to MM Kembla

- MM Kembla reviews details of the warranty assessment form

- Project specific Kembla system warranty provided

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To find out more:

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1800 804 631

INTEGRATED PIPING SYSTEMS