



## Challenge Title: Design and build of a manufacturing plant/system for a three-pipe nested copper product (“tube-in-tube”)

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**Challenge Owner:** An anonymous medium-sized manufacturing enterprise.

**Business Opportunity:** To design and build a manufacturing plant/system and develop the process to manufacture a three-pipe nested copper product (tube-in-tube).

**Solution Maturity:** The challenge owner is seeking a fully assembled manufacturing system, but plant designs will be accepted if accompanied with a proof of concept.

**Delivery Timelines:** Please note the timelines as listed below in the Phases section.

**Reward:** In return, the reward could be either a fixed fee for work done; or a royalty on sales of products manufactured through the new plant; or a minority share in the venture; or some combination of these negotiated between the parties.

### Challenge Statement

The business opportunity is to design and build a manufacturing plant/system and develop the process to manufacture a three-pipe nested copper product (“tube-in-tube”). The optimal outcome would be if a fully operational turnkey manufacturing plant can be acquired. This plant will be incorporated into existing infrastructure to optimise its output both in terms of production scale and product quality. In the event that a plant/system cannot be acquired, a credible plant design will suffice. The acceptance of such a design is conditional on an accompanying proof of concept. Any design submission should indicate the solution’s scalability and production capacity.



## Background

The challenge owner has come across a class of industrial applications which requires the use of approximately dimensioned nested pipes. The middle pipe is to be profiled in one of two ways, as presented in the section below. It is anticipated that the initial production capacity will be approximately 20 meters of nested piping per day, growing to about 500 meters per day over three to five years.

## Key Specifications

Considering the multiple industrial applications envisaged for the nested-pipe systems, the following minimum specifications have to be met:

- ❖ Focus on a manufacturing system and/or process for the manufacture of a three-pipe nested product made entirely from high-quality copper;
- ❖ The nested pipe shall consist of three parts: inner pipe, profiled pipe and outer pipe, as shown in Figure 1.
- ❖ The profiled pipe will be similar to either of the designs in Figures 2 and 3.

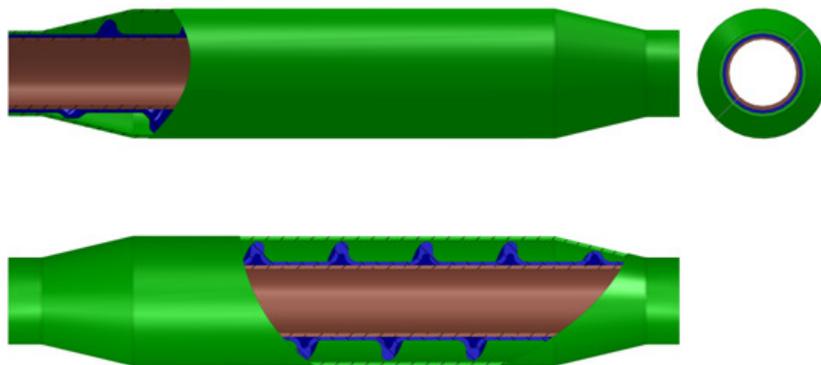


Figure 1: Nested Copper Pipes

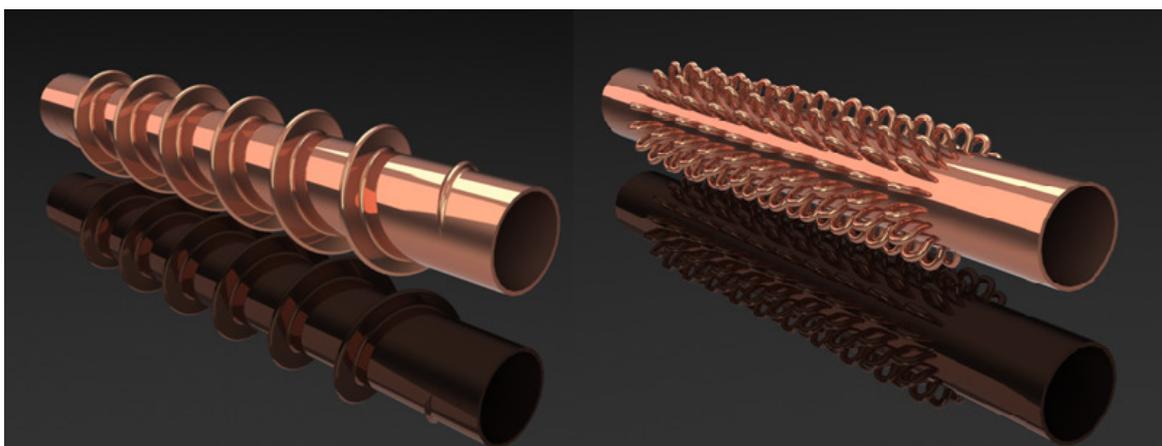
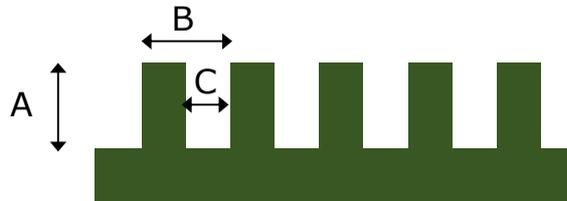


Figure 2: Spiral Rib Design

Figure 3: Wire Rib Design



- ❖ Regardless of the type of ribbing used the dimensions for the ribbing will follow these general parameters:



- The height A of the ribbing should be at least 6mm;
  - The rib thickness (B – C) of the ribbing should be 4mm or less;
  - The gap C between ribs should be about 10mm.
- ❖ With regards to the three tight-fitting concentric pipes, the inner pipe is a standard 22mm SABS Class 2 copper tube, whereas the profiled pipe must fit tightly on the inner pipe, and the third (outer) pipe can vary in diameter, depending on the specific application.

## Possible Approaches

All potential solutions that address the business opportunity, address or take account of the statements in the business challenge, comply with the key specifications above, that meet the criteria listed under evaluation criteria below, and that can be completed in the time frames as listed will be of interest.

## Phases

- ❖ Phase 1: Evaluation and a shortlist of respondents by end-June 2014
- ❖ Phase 2: EVALUATION of shortlisted submissions will be completed by end-August 2014
- ❖ Phase 3: PROTOTYPE DEVELOPMENT and TESTING by end-November 2014
- ❖ Phase 4: Commissioning of the fully functional plant manufactured by 1 March 2015

## Evaluation Criteria

The proposals received will be evaluated against the following criteria:

- ❖ Simplicity and ease of implementation;
- ❖ Potential for proprietary position;
- ❖ Respondents must be owners of IP or must state relationship with IP owner;
- ❖ Economic and scalable market potential;
- ❖ Cost-effectiveness of the solution;
- ❖ The respondent's capabilities and related experience including that of the team; and
- ❖ Must include references of at least two previous and current projects in the last three years

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