TECHNICAL SPECIFICATION
FOR
BRASS FITTINGS

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1.0 SCOPE

The scope of the tender will include manufacture/ supply, inspection/ testing/ marking/ packaging/ handling and despatch of Brass Fittings, meeting all the requirements as laid down in manufacturing standard BS 864 / EN 1254 Part 1.

The guideline as per BS 864 / EN 1254 Part 1 shall be followed until otherwise mentioned in this technical specification.

2.0 STANDARDS:

EN 1254 Part 1 - Copper and copper alloys. Plumbing fittings - Capillary fittings for soldering or brazing to copper tubes.

BS 864 - Capillary and compression tube fittings of copper and copper alloy.

BS EN 29453 - Soft solder alloys. Chemical compositions and forms.

3.0 MATERIAL

i. The material used for the manufacturer of Brass Capillary Fittings shall conform to EN 1254-1 (latest), Half Hard.
ii. Material used for the solder should conform to BS EN 29453 and should be lead free. Solder material shall be generally melting within the temperature range 180 ° C to 250 ° C.
iii. Threading on the Brass fittings shall be done as per BS 21.

4.0 DIMENSIONAL TOLERANCES

Dimensions tolerances of various types of brass capillary fittings (End feed fittings). shall be as per EN 1254 Part 1.

The tolerances at the end shall be as per EN 1254 Part I in nominal diameter which are as follows (Ref. table 2)

Nominal Diameter	Tolerance on the mean diameter with respect to the nominal diameter		Resulting Diametrical difference	
D	Outside Dia of male end (mm)	Inside Dia of socket (mm)	Max (mm)	Min (mm)
12 mm	+.0.04 -.0.05	+ 0.15 +0.06	0.20	0.02

The minimum wall thickness of a fitting shall be in accordance as given below
(Ref Table 3 of EN 1254-Part 1)

Nominal Dia mm, D	Minimum wall thickness (mm) Brass
12	1.1

END CONNECTION

End connection of the fitting must be capable of end feeding to the NPT x 12 mm. Internal solder ring type fitting is not acceptable.

5.0 THREADS

i) Fittings shall be threaded to dimensions & the tolerances as specified in BS:21 unless specified otherwise.
ii) Provisions for tightening shall be made on all straight fittings.
iii) All male & female threads are tapered.
iv) Chamfering: The outlet of the fittings shall have a chamfer, the chamfer shall have an included angle of 90° ± 5° for internal threads & 70° ± 10° for external threads.

6.0 CHEMICAL PROPERTIES

Chemical composition of Brass shall be as mentioned in EN 1254 PART I. Dezincification-resistant brass material CuZn36Pb2As or CW602N.

Cu 61.0-63.0 %
Pb 01.7-02.8 %
As 0.02 -0.15%
Remaining is zinc.

7.0 CARBON IN BORE

The internal surface of brass capillary fittings for soldering or brazing shall not contain any detrimental film nor present a carbon level high enough to allow the formation of such a film during installation. The maximum total carbon level on internal surfaces shall not exceed 1.0 mg/dm^2 when tested in accordance with the specification. This test shall be carried out as per clause no. 5.4 of EN 1254 -1.

8.0 RESISTANCE TO DEZINCIFICATION

The fittings shall be manufactured from alloys containing more than 10% Zinc. So, fittings shall be required to be resistant to dezincification. It shall be carried out as per Cl. 5.5 of EN 1254 -1.

9.0 STRESS CORROSION RESISTANCE TEST

A stress corrosion resistance is to be carried out as per method defined in ISO 6957 using test solution of pH 9.5 but without pickling.

10.0 FREEDOM FROM DEFECT

The fittings shall be free from internal fins, blow holes, skin defects etc. or other irregularities which might restrict the free flow of fluid, and shall be designed that resistance to the flow of fluid through the fittings is minimized.

11.0 HYDROSTATIC PRESSURE TEST

All fittings shall be leak tightness tested at 1.5x25 bars for a period of 15 minutes and no leakage is permitted. This test shall be performed on each size of the fittings.

12.0 PNEUMATIC PRESSURE TEST

All fittings shall be leak tested at 6 bars for a period of 10 seconds and no leakage is permitted.

13.0 MARKING

Each fitting shall be embossed with BPCL' s logo, manufacturers name and trademark BS 864 / EN 1254 Part – I and designation of fittings.

Each packing containing fittings shall carry the following stamped or written in indelible ink.

a. Manufacturer's name or trademark.

b. Designation of fittings.

c. Month and year of manufacturing

14.0 INSPECTION / DOCUMENTS

i. Inspection shall be carried out as per design codes/standards, BPCL Technical Specification and Inspection Plan/ Vendor's detailed QAP duly approved by BPCL/BPCL's representative.

ii. BPCL representative or third-party inspection agency shall carry out random inspection during manufacturing/ final inspection.

iii. Vendor shall furnish all the material test certificates, proof of approval/ license from specified authority as per specified standard, if relevant, internal test/ inspection reports as per BPCL Technical Specification, at the time of final inspection of each supply lot of material.

iv. Even after third party inspection, BPCL reserves the right to select a sample of tube randomly from each manufacturing batch and have these independently tested. If the results of these tests fall outside the limits specified in BPCL Technical specification, then BPCL reserves the rights to reject all production supplied from the batch.

v. Vendor shall prepare and submit the detail drawings of required brass fitting for approval by BPCL /BPCL's representative before starting production.

vi. For any control test or examination required under the supervision of TPIA/BPCL/BPCL's representative, latter shall be informed in writing one (1) week in advance by vender about inspection date & place along with production schedule.

15.0 PACKAGING

Packing size to be mentioned to ensure uniformity in delivery conditions of the material being procured. Bidder shall submit the packaging details during QAP and also complied with at the time of delivery.

	QUALITY CONTROL TABLES - BRASS FITTING	D_SOR_2022 G11013 M063

SR. NO.	INSPECTION AND TESTING	QUANTUM OF CHECK	PROCEDURE	ACCEPTANCE CRITERIA AND CERTIFICATE	FORMAT OF RECORD	INSPECTION		
						Vendor	TPIA/CLIENT	REMARKS
1	Raw material Testing: (Chemical / Physical Requirement)	One in each heat	As per EN 12164	As per EN 12164 / PTS	MTC	P	W	Preferably witness by CA
2	Final product :							
2.1	Resistance to dezincification	One in each heat	As per EN 1254	As per EN 1254	TEST REPORT	P	W	
2.2	Stress corrosion resistance test	One in each heat	As per ISO 6957	As per ISO 6957 / PTS	TEST REPORT	P	W	
2.3	carbon in bore test	One in each heat	As per EN 1254	As per EN 1254 / PTS	TEST REPORT	P	W	
2.4	Hydrostatic pressure test	100%	As per EN 1254	Min 37.5 bar @ 15 min.	TEST REPORT	P	W	Preferably witness by CA
2.5	Pneumatic pressure test	100%	As per EN 1254	Min 6 bar @ 15seconds	TEST REPORT	P	W	
2.6	Visual inspection (Free from defects)	100%	As per EN 1254	As per EN 1254 / PTS	TEST REPORT	P	R	
2.7	Dimension tolerances (Min. length of engagement , OD , wall thk.)	100%	As per EN 1254	As per EN 1254 / PTS	TEST REPORT	P	RW	
2.8	Marking	100%	As per EN 1254	As per EN 1254		P	R	
3	Final Documentation		P.O. / PTS	P.O. / PTS	TEST REPORT	P	H	

LEGENDS: R - Review, W - Witness, H - Hold, P - Perform, TPIA - Third Party Inspection Agency, CA - Control Authority (Owner / Owner's representative), RW - Random witness

Notes: -

1 The above Testing and acceptance criteria are minimum requirements, however, manufacturer shall ensure that the product shall also comply to the additional requirements as per Particular Technical specifications(PTS)

2 The supplier shall submit their own detailed ITP prepared on the basis of above / Technical specification for approval of Owner/Owner's representative.

3 Owner/Owner representative shall review/approve all the documents related to ITP/Quality manuals/Drawings etc.submitted by supplier.

4 Contractor shall in coordination with Supplier/Sub vendor issue detailed Production and Inspection schedule indicating the dates and the locations to facilitate Owner/Owner's representative and TPIA to organize Inspection.

5 Special manufacturing procedures have to be specially approved or only previously approved procedures have to be used, in case of conflict between specifications more stringent condition shall be applicable.

6 Owner / Owner's representative including TPIA will have the right to inspect any activity of manufacturing at any time

7 All reference Codes/ Standards, Documents, P.O. Copies shall be arranged by vendor / supplier for reference of TPIA/GGL at the time of Inspection

8 At the time of delivery of material in stores, vendor will submit copy of all related document of inspection along with release note , despatch clearance note & MTC.