

Submission by Zhejiang Hailiang Co., Ltd received 3 November 2022

I · Introduction of Standards Hailiang complies with in domestic sales and Australian sales of subject merchandise

1. Chinese national standards

In Chinese domestic market, the copper tubes under different types should comply with the following national standards:

- (1) GB/T 1527-2017 on drawn tube of copper and copper alloys; the GB/T 1527-2017 also directly refer to GB/T 16866-2006 on dimensions and tolerances of copper and copper alloy seamless tubes, which provides for the requirements on the tolerance of size and specifications, etc. of the tubes.
- (2) GB/T 17791-2017 on seamless copper and copper alloys tube for air conditioner and refrigeration equipment;
- (3) GB/T 18033-2017 on Seamless copper tubes for water and gas;

Meanwhile, for chemical composition of copper under each grade, GB/T5231-2012 is referred to by GB/T 1527-2017, GB/T 17791-2017, GB/T 18033-2017.

The copper tubes sold by Zhejiang Hailiang in domestic market should comply with the requirements set out in the standards above. This refutes the assertion made by the Australian industry that the Chinese standard is not mandatory. To confirm this point, in fact, the code “GB/T” means recommended standard under Chinese law, which ensure the following:

- (1) When referred to in laws, regulations or mandatory standards, it shall be mandatory;
- (2) When an enterprise expressly adopts the recommended standards, the standards are binding on the enterprises;
- (3) When the recommended standards are directly specified in a contract, or expressed on the package of the goods, it shall be binding between the parties to the transaction.

During the investigations and as verified by the ADC, Zhejiang Hailiang has provided sample domestic sales documentation, such as Attachment D-3(a) and D-3(b), which expressly stated that the quality requirement and technical standard shall be subject to relevant standards.

The copies of standards mentioned above are provided as Exhibits 1 through 5. For facilitating the ADC’s review, the context of provisions regarding chemical composition, grades, outside diameter, wall thickness, surface quality and cleanness has

been translated into English where necessary.

2. Australian standards

For subject products Zhejiang Hailiang sold to Australian markets, they are subject to the following standards:

- (1) AS 1572-1998 on copper and copper alloys - Seamless tubes for engineering purposes
- (2) AS/NZS 1571:1995 on copper-seamless tubes for air conditioning and refrigeration;
- (3) AS 1432—2004 on copper tubes for plumbing, gasfitting and drainage applications

These Australian standards have similar corresponding Chinese standards, see the explanation below.

II · Relationship and comparison between the Standards China and Australia

Based on the scope of application, specifications, etc., the correspondence between the above-mentioned standards are as follows:

CN Standard Code	Contents	Corresponding AS/NZS Standard Code	Contents
GB/T 1527-2017 and GB/T 16866-2006	Drawn tube of copper and copper alloys; dimensions and tolerances.	AS 1572-1998	Copper and copper alloys - Seamless tubes for engineering purposes
GB/T 17791-2017	Seamless copper and copper alloys tube for air conditioner and refrigeration equipment	AS/NZS 1571:1995	Copper-seamless tubes for air conditioning and refrigeration
GB/T 18033-2017	Seamless copper tubes for water and gas	AS 1432—2004	Copper tubes for plumbing, gasfitting and drainage applications

In addition, GB/T 5231-2012 set forth the standards for chemical composition applicable to the copper tubes subject to the Chinese national standards above.

III · Based on the comparison of the standards, the regulation on dimensions, tolerance, cleanness etc. between Chinese and Australian standards are similar or the same in general.

1. The requirement on chemical composition of copper tubes is the same between Chinese and Australian standards

As discussed previously, the GB/T 5231-2012 is applicable to tubes under each Chinese national standard regarding the chemical composition. The requirements on chemical composition are similar or the same between the Chinese and Australian Standards.

As shown below, according to the Table 1 to the GB/T 5231-2012, the requirements for minimum content for Cu+Ag for all grades are equal to or greater than 99.9%; for grades like TU00, TU0, TU1, etc., the requirements are even 99.97% or 99.99%. And regarding composition of phosphorus, for typical grade TP2 (C12200), the allowed range is 0.015% to 0.040%.

Table 1 Chemical Composition for Fabricated Copper

表 1 加工铜化学成分

分类 Type	代号 Code	牌号 Grade	Cu+Ag (Minimum)		化学成分质量分数/% Chemical elements/%												
			Cu+Ag (最小值)	P	Ag	Bi	Sn	As*	Fe	Ni	Pb	Sn	S	Zn	O		
Oxygen-free copper 无氧铜	C10100	TU00	99.99 ^a	0.000 3	0.002 5	0.000 1	0.000 1	0.000 5	0.001 0	0.001 0	0.000 5	0.000 2	0.001 5	0.000 1	0.000 5		
	T10130	TU0	99.97	0.002	—	0.001	0.002	0.002	0.004	0.002	0.003	0.002	0.004	0.003	0.001		
	T10150	TU1	99.97	0.002	—	0.001	0.002	0.002	0.004	0.002	0.003	0.002	0.004	0.003	0.002		
	T10180	TU2 ^c	99.95	0.002	—	0.001	0.002	0.002	0.004	0.002	0.004	0.002	0.004	0.003	0.003		
	C10200	TU3	99.95	—	—	—	—	—	—	—	—	—	—	—	0.001 0		
	T10350	TU00Ag0.05	99.99	0.002	0.05~0.08	0.000 3	0.000 5	0.000 4	0.002 5	0.000 6	0.000 6	0.000 7	—	0.000 5	0.000 5		
Silver Oxygen-free copper 银无氧铜	C10500	TUAg0.03	99.95	—	≥0.034	—	—	—	—	—	—	—	—	—	0.001 0		
	T10510	TUAg0.05	99.95	0.002	0.02~0.06	0.001	0.002	0.002	0.004	0.002	0.004	0.002	0.004	0.003	0.003		
	T10530	TUAg0.1	99.95	0.002	0.04~0.12	0.001	0.002	0.002	0.004	0.002	0.004	0.002	0.004	0.003	0.003		
	T10540	TUAg0.2	99.95	0.002	0.15~0.25	0.001	0.002	0.002	0.004	0.002	0.004	0.002	0.004	0.003	0.003		
	T10550	TUAg0.3	99.95	0.002	0.25~0.35	0.001	0.002	0.002	0.004	0.002	0.004	0.002	0.004	0.003	0.003		
	Silver Oxygen-free copper 银无氧铜	T10600	TUzr0.15	99.97 ^a	0.002	Zr: 0.11~0.21	0.001	0.002	0.002	0.004	0.002	0.003	0.002	0.004	0.003	0.002	
T10900		T1	99.95	0.001	—	0.001	0.002	0.002	0.005	0.002	0.003	0.002	0.005	0.005	0.02		
T11050		T2 ^{a,d}	99.90	—	—	0.001	0.002	0.002	0.005	—	0.005	—	0.005	—	—		
Pure copper 纯铜	T11090	T3	99.70	—	—	0.002	—	—	—	—	0.01	—	—	—	—		
	T11200	TAg0.1-0.01	99.5 ^a	0.004~0.012	0.08~0.12	—	—	—	0.05	—	—	—	—	—	0.05		
	T11210	TAg0.1	99.5 ^b	—	0.06~0.12	0.002	0.005	0.01	0.05	0.2	0.01	0.05	0.01	—	0.1		
silver copper 银铜	T11220	TAg0.15	99.5	—	0.10~0.20	0.002	0.005	0.01	0.05	0.2	0.01	0.05	0.01	—	0.1		
	C12000	TP1	99.90	0.004~0.012	—	—	—	—	—	—	—	—	—	—	—		
	C12200	TP2	99.9	0.015~0.040	—	—	—	—	—	—	—	—	—	—	—		
phosphorized copper 磷脱氧铜	T12210	TP3	99.9	0.01~0.025	—	—	—	—	—	—	—	—	—	—	0.01		
	T12400	TP4	99.90	0.040~0.065	—	—	—	—	—	—	—	—	—	—	0.002		

Screenshot of Table 1 of GB/T 5231-2012

Under Australian standards, the requirements are the same or similar. For example, under table 2.1 of AS1432-2004, for alloy designation C12200 of AS 2738, the minimum composition of copper (including silver) is 99.9% and the composition of phosphorus shall be within 0.015% and 0.040%. In this regard, the requirement under

the Chinese and Australian standard is the same.

**TABLE 2.1
CHEMICAL COMPOSITION**

Element	Composition %	
	Min.	Max.
Copper (including silver)	99.90	—
Phosphorus	0.015	0.040

Screenshot of Table 2.1 of AS1432-2004

2. The requirements on tolerance for outside diameter and wall thickness under the Chinese standards are the same with or even stricter than Australian standard

Regarding the dimension and tolerance, the requirements in Chinese and Australian standards are generally similar or the same.

(1) Outside diameter

As to the tolerance of outside diameter, the scope of tolerable deviation specified in the standards of China and Australia is basically within the similar range and for certain specification, the requirement under Chinese standards is even stricter.

Take tubes for air conditioner and refrigeration equipment as an example, Article 3.3.1 and Table 3 of GB/T 17791-2017 specified that, the tolerance of OD shall be within ± 0.05 mm to ± 0.08 mm, depending on the specified dimension.

3.3.1 管材的外形尺寸及其允许偏差应符合表 3 和表 4 的规定。
 The dimension and tolerance of tubes shall comply with the requirement of Tables 3 and 4

表 3 管材的外径及其允许偏差
 Table 3 Outside Diameter of Tubes and Tolerance 单位为毫米 Unit: MM

尺寸范围 Specified OD	允许偏差 Tolerance
3.0~15	± 0.05
>15~20	± 0.06
>20~30	± 0.07
>30~54	± 0.08

注：当要求外径允许偏差全为(+)或全为(-)单向偏差时,其值为表中相应数值的 2 倍。

²
 Note: When the required difference for outside diameter is all positive (+) or negative (-), the tolerance is the double of the numerical value expressed in the table.

Screenshot of Table 3 of GB/T 17791-2017

In the corresponding AS/NZS 1571:1995, Article 8.2.1 and Table 2 specified that for

straight tubes, the scope of tolerance of OD are 0 to -0.08 mm, or -0.15/-0.30 mm for certain specified OD; and for coils, the scope of tolerance are from 0 to -0.13 mm, to -0.46 mm.

AS/NZS 1571:1995

6

TABLE 2
DIMENSIONAL TOLERANCES FOR OUTSIDE DIAMETER

Specified outside diameter	Tolerance*	
	millimetres	
	Straight lengths	Coils
>3.18 ≤12.70	+0, -0.08	+0, -0.13
>12.70 ≤19.05	+0, -0.08	+0, -0.20
>19.05 ≤25.40	+0, -0.08	+0, -0.31
>25.40 ≤31.75	+0, -0.08	+0, -0.38
>31.75 ≤50.80	+0, -0.08	+0, -0.46
>50.80 ≤101.60	+0, -0.15	—
>101.60 ≤155.58	+0, -0.30	—

* Allowable deviation of mean outside diameter.

Screenshot of Table 2 of AS/NZS 1571:1995

In sum, unlike the Chinese standard, the Australian standards does not allow positive deviation, i.e., the OD of the finished products is greater than the specified OD; while for certain sizes, the Chinese standard imposed stricter requirement on the negative deviation. For example, for tubes with OD of 16 mm, under GB/T 17791-2017, the tolerance is ± 0.06 , i.e., the scope of qualification is 15.94 mm to 16.06 mm; and under AS/NZS 1571:1995, the scope of qualification for straight tubes with OD of 15 mm is 15.92 mm to 16 mm.

In the comparison between GB/T 1527-2017 (with GB/T 16866-2006) and AS 1572-1998, as well as that between GB/T 18033-2017 and AS 1432—2004, the similar situation also applies. Thus, the differences in standards do not result in any “lower” requirement on outside diameter.

(2) Wall thickness

As to the wall thickness, Table 4 of GB/T 17791-2017 indicates that, depending on the specified OD or WT, the scope of tolerance is from ± 0.03 mm to ± 0.12 mm. For most sizes, the allowable deviation is around or within $\pm 10\%$.

Table 4 Wall Thickness of Tubes and Tolerance

Unit: MM
单位为毫米

表 4 管材的壁厚及其允许偏差

平均外径 Average outer diameter 尺寸范围 Scope of Sizes	壁厚 Wall thickness				
	0.25~0.4	>0.4~0.6	>0.6~0.8	>0.8~1.5	>1.5~2.5
允许偏差(±) Tolerance (±)					
3.0~15	±0.03	±0.04	±0.05	±0.06	±0.07
>15~20	±0.04	±0.05	±0.06	±0.07	±0.09
>20~30	—	±0.05	±0.07	±0.09	±0.10
>30~54	—	—	±0.09	±0.10	±0.12

注：当要求壁厚允许偏差全为(+)或全为(-)单向偏差时,其值为表中相应数值的2倍。

Note: When the required difference for wall thickness is all positive (+) or negative (-), the tolerance should be the double of the numerical value expressed in the table.

3.3.2 直管的不定尺长度为 400 mm~10 000 mm,管材的定尺或倍尺长度应在不定尺范围内,倍尺长

Screenshot of Table 4 of GB/T 17791-2017

According to Article 8.2.3 of AS/NZS 1571:1995, the thickness of tubes at any point shall not vary by more than ±10%, which is basically the same as the Chinese national standard.

8 DIMENSIONS AND TOLERANCES

8.1 General Tubes shall conform to the manufacturing tolerances specified in Clause 8.2.

8.2 Manufacturing tolerances

8.2.1 Mean outside diameter For tubes in all tempers either coiled or in straight lengths, the mean outside diameter shall not vary from the specified diameter by more than the tolerances specified in Table 2.

8.2.2 Out-of-roundness For tubes in the H temper supplied in straight lengths, the outside diameter at any point shall not vary from the mean diameter by more than 1%.

8.2.3 Thickness The thickness of tubes at any point shall not vary from the specified thickness by more than ±10%.

8.2.4 Length Tubes ordered to a specified length shall not vary from that length by more than the amount of tolerance specified in Table 3.

Screenshot of Article 8.2.3 of AS/NZS 1571:1995

In this regard, Zhejiang Hailiang submits that there is no significant difference between the regulations in the Chinese and Australian standards. The differences, if any, are consistent with the practice and reality of the industry, which will not result in significant difference in the product specification and quality between products subject to the Chinese or Australian standards. Zhejiang Hailiang further submits that, under the Chinese standard, there is no room for the so called “drawn thin” as the Chinese standard imposes even stricter requirement on negative deviation of wall thickness than the Australian standard. In any event, all costs, selling prices in domestic market and export to Australia were reported on kg basis according to the actual weight of the

products. Therefore, all the tolerances within the allowed scope under the standards have already been taken into account and reflected in costs and selling prices.

3. The requirement on capping cleanness under the Chinese standards are the same with or even stricter than Australian standard

For capping requirement of tubes for air conditioner and refrigeration equipment, both GB/T 17791-2017 and AS/NZS 1571:1995 provides that tubes shall be sealed by capping or other applicable method to ensure the cleanness. Article 6.2.1 of GB/T 17791-2017 requires that the coil tubes shall be filled with protective gas and sealed; and Article 5.3 requires that “Tubes shall be either capped, plugged, crimped or otherwise packaged in order to maintain internal cleanness under normal conditions of handling and storage”. In this regard the requirement on capping is similar.

In addition, both the Chinese and Australian standard provides for the requirement on surface quality of the copper tubes.

Regarding the tubes for plumbing market, both the Chinese and Australian market shall comply with the requirement that the surface shall be free from defects.

Regarding the tubes for air conditioner and refrigeration equipment, both the GB/T 17791-2017 and AS/NZS 1571:1995 provides for the requirement on cleanness of the internal surface.

Article 3.9 as well as Tables 11 and 12 of GB/T 17791-2017 stipulates the maximum allowed amount of various of residue and other contents. As a general requirement, the total amount of residue for tube with OD equal to or less than 15 mm shall be no greater than 25 mg/m²; and for tube with OD greater than 15 mm, the amount of residue shall not be greater than 38 mg/m².

For tubes for refrigerator, GB/T 17791-2017 stipulated that the maximum allowed amount of residue is 25 mg/m² and there are also requirements on amount of oil content, moisture, chloridion, and paraffin.

3.9 清洁度 Cleanness

Total amount of residue on internal surface of O60 or O50 tubes shall comply with requirement in Table 11

3.9.1 软化退火(O60)和轻退火(O50)的管材内表面残留物(总量)应符合表 11 的规定。拉拔硬(H80)、轻拉(H55)和表面硬化(O60-H)状态的管材内表面残留物(总量)由供需双方协商确定。

Total amount of residue on internal surface of H80, H55 or O60-H tubes is up to the negotiation between the supplier and purchaser.

表 11 内表面残留物(总量)

Table 11 Requirement on Residue on Internal Surface (Total)

外径/mm OD/mm	残留物(总量)/(mg/m ²) Total Residue/(mg/m ²)
≤15	≤25
>15	≤38

3.9.2 冰箱用铜管内表面残留物应符合表 12 的规定。

Total amount of residue on internal surface of tubes for refrigerator shall comply with requirement in Table 12

表 12 冰箱用铜管内表面残留物

Table 12 Requirement on Residue on Internal Surface of Tubes for Refrigerator

项目 Item	最大允许量/(mg/m ²) Maximum allowed amount/(mg/m ²)
Residue (Total) 残留物(总量)	25
Oil 油分	7
Moisture 水分	25
chloridion 氯离子(Cl ⁻)	0.2
paraffin 石蜡	0.5

注 1: 残留物(总量)包括可溶性和不溶性两类杂质,不包括水分。
注 2: 油分包括矿物油和非矿物油。

Note:

1. Total amount of residue includes soluble and insoluble residue and does not include moisture
2. Oil content includes mineral oil and non-mineral oil.

Screenshot of Article 3.9 of GB/T 17791-2017

In AS/NZS 1571:1995, Article 12 require the cleanness of tubes and the amount of residue shall not exceed 0.038g/m².

12 CLEANNESS The inside of a tube (supplied with ends sealed) when washed with trichloroethylene shall be sufficiently clean so that the residue after evaporation of the solvent does not exceed 0.038 g/m² of internal surface.

Screenshot of Article 12 of AS/NZS 1571:1995

The upper limit for residue is the same between Chinese and Australian standard is the same, i.e., 38 mg/m² (equivalent to 0.038 g/m²). While in Chinese standard, there are also stricter and more detailed requirement on the residue. For example, for tubes with OD greater than 15 mm, the allowed amount of residue is 25 mg/m².