



Standard Specification for Seamless and Welded Carbon Steel Heat-Exchanger Tubes with Integral Fins¹

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1. Scope*

1.1 This specification covers external helical, integral finned, seamless or welded low-carbon steel tubes for use in tubular heat exchangers, surface condensers, evaporators, superheaters, and similar heat-transfer apparatus in unfinned end diameters up to 2 in. (50.8 mm), inclusive.

1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

2. Referenced Documents

2.1 ASTM Standards:²

A 179/A179M Specification for Seamless Cold-Drawn Low-Carbon Steel Heat-Exchanger and Condenser Tubes
A 214/A214M Specification for Electric-Resistance-Welded Carbon Steel Heat-Exchanger and Condenser Tubes

3. Ordering Information

3.1 The purchaser shall specify in the order the plain-tube specification and the alloy from which the finned tube is to be manufactured.

3.2 The purchaser shall specify in the order the diameter, wall thickness, and length of unfinned sections; root diameter and wall thickness of the finned section; number of fins per unit length; and the total tube length.

4. Material and Manufacture

4.1 The finned tubes shall be manufactured from plain tubes that conform to one of the following Specifications: A 179/A 179M and A 214/A 214M.

4.2 Any tests that are required in the plain-tube specifications that are performed on unfinned lengths of tube in accordance with this specification need not be performed on the plain tube.

4.3 The fins shall be produced by the cold forming of steel prime-surface tube. To comply with this specification, the fin and tube material must be homogeneous.

4.4 Finned tubes shall normally be furnished with unfinned ends, but may be furnished with finned ends if specified.

5. Heat Treatment

5.1 The tube after finning shall be supplied in either the *annealed* or *as-fabricated* condition, one of which shall be specified on the purchaser order.

5.2 The annealed condition is defined as having both the finned and unfinned portions of the tube conforming to the applicable heat-treatment requirements of the governing ASTM specification for the steel tube analysis involved.

5.3 The as-fabricated condition is defined as having the finned portions of the tube in the *as-finned* or cold-worked condition produced by the finning operation and the unfinned or plain tube portions of the finned tube in the as-fabricated condition suitable for rolling-in operations.

6. Chemical Composition

6.1 The steel shall conform to the chemical requirements prescribed in the governing plain-tube specification.

7. Tensile Requirements

7.1 The tube prior to the finning operation, or unfinned portions of the finned tube, shall conform to the requirements for tensile properties prescribed in the governing plain-tube specification.

8. Pressure Test

8.1 Each tube after finning shall be subjected to an internal air pressure of 250 psi (1.72 MPa) minimum for 5 s without showing evidence of leakage. Any evidence of leakage shall be cause for rejection. The test method used shall permit easy

¹ This specification is under the jurisdiction of ASTM Committee A01 on Steel, Stainless Steel, and Related Alloys and is the direct responsibility of Subcommittee A01.09 on Carbon Steel Tubular Products.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

