



Standard Specification for Seamless and Welded Carbon, Ferritic, and Austenitic Alloy 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, alloy steel, and stainless 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:

A 179/A179M Specification for Seamless Cold-Drawn Low-Carbon Steel Heat-Exchanger and Condenser Tubes²

A 199/A199M Specification for Seamless Cold-Drawn Intermediate Alloy-Steel Heat-Exchanger and Condenser Tubes³

A 213/A213M Specification for Seamless Ferritic and Austenitic Alloy-Steel Boiler, Superheater, and Heat-Exchanger Tubes²

A 214/A214M Specification for Electric-Resistance-Welded Carbon Steel Heat-Exchanger and Condenser Tubes²

A 249/A249M Specification for Welded Austenitic Steel Boiler, Superheater, Heat-Exchanger, and Condenser Tubes²

A 334/A334M Specification for Seamless and Welded Carbon and Alloy-Steel Tubes for Low-Temperature Service²

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, A 199/A 199M, A 213/A 213M, A 214/A 214M, A 249/A 249M, and A 334/A 334M.

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 or alloy-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

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² *Annual Book of ASTM Standards*, Vol 01.01.

³ Discontinued; see 1995 *Annual Book of ASTM Standards*, Vol 01.01.