

ASTM A358/ASME SA358 STANDARD SPECIFICATION FOR ELECTRIC FUSION WELDED AUSTENITIC CHROMIUM NICKEL ALLOY STEEL PIPE FOR HIGH TEMPERATURE SERVICE¹

1. Scope

1.1 this specification² covers electric-fusion-welded austenitic chromium-nickel alloy steel pipe suitable for corrosive or high-temperature service, or both. (Although no restrictions are placed on the sizes of pipe which may be furnished under this specification, commercial practice is commonly limited to sizes not less than NPS 8).

Note 1 - The dimensionless designator NPS (nominal pipe size) has been substituted in this standard for such traditional terms as "nominal diameter," "size," and "nominal size."

1.2 This specification covers nineteen grades of alloy steel as indicated in Table 1. The selection of the proper alloy and requirements for heat treatment shall be at the discretion of the purchaser, dependent on the service conditions to be encountered.

1.3 Five classes of pipe are covered as follows:

1.3.1 class 1 - Pipe shall be double welded by processes employing filler metal in all passes and shall be completely radiographed.

1.3.2 Class 2 - Pipe shall be double welded by processes employing filler metal in all passes. No radiography is required.

1.3.3 Class 3 - Pipe shall be single welded by processes employing filler metal in all passes and shall be completely radiographed.

1.3.4 Class 4 - Same as Class 3 except that the weld pass exposed to the inside pipe surface may be made without the addition of filler metal(see 5.2.2.1 and 5.2.2.2).

1.3.5 Class 5 - Pipe shall be double welded by processes employing filler metal in all passes and shall be spot radiographed.

1.4 Supplementary requirements covering provisions ranging from additional testing to formalized procedures for manufacturing practice are provided. Supplementary Requirements S1 through S6 are included as options to be specified when desired.

1.5 The values stated in either inch-pound units or SI units are to be regarded separately as standard. Within the text, the SI units are shown in brackets. The values stated in each system are not exact equivalents; therefore, each system must be used independently of the other. Combining values from the two systems may result in non conformance with the specification. The inch-pound units shall apply unless the "M" designation of this specification is specified in the order.

Material Comparison Tables (ASTM, KS, JIS, DIN, BS, NF, UNI)

| ASTM Standard | UNS NO. | KOREA/JAPANES | | | GERMAN | | | | BRITISH | | | FRENCH | | | ITALIAN | | |
|---|---------|---------------------------|------------------|---------|-----------------|------------|-----------------|---------|------------|-----------|----------|----------------|-----------|---------|------------------|------------|---------|
| | | KS/JIS Symbol | KS/JIS Number | Remarks | DIN Type | DIN Number | Material Number | Remarks | B.S Number | B.S Grade | Remarks | AFNOR Type | NF Number | Remarks | UNI Type | UNI Number | Remarks |
| A 358 Electric-Fusion Welded Austenitic Cr-Ni Alloy Steel Pipe for High-Temperature Service | | | | | | | | | | | | | | | | | |
| Grade 304 | S30400 | STS 304TPY / SUS | D3588 / G3468 | | X5 CrNi 18 9 | 17440 | 1.4301 | (3b) | 3605 | 304S25 | LWHT(3b) | Z6 CN 18.09 | A36-209 | (3b) | X6 CrNi 18 10 | 8317 | (3b) |

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|-----------|--------|-----------------------------------|------------------|--|-----------------------|--------|-------------|------|--------|----------|-------------------|--------------|--|--------------------|------|----------|--|
| | | 310STPY | | | | | | | | | | | | | | | |
| Grade 310 | S31000 | STS 310STPY/ SUS 310STPY | D3588 / G3468 | | X 12 CrNi 25 21 | 1.4845 | WBL-470(3b) | | | (3) | | A36-209 | | X22 CrNi 25 20 | 6900 | (3b)(11) | |
| Grade 316 | S31600 | STS 316TPY / SUS 316TPY | D3588 / G3468 | | X5 CrNiMo 18 10 | 1.4401 | (3b) | 3605 | 316S26 | LWHT(3b) | Z6 CND 17.11 | A36-209 (3b) | | X6CrNiMo 17 12 | 8317 | (3b) | |
| Grade 321 | S32100 | STS 321TPY / SUS 321TPY | D3588 / G3468 | | X10 CrNiTi 18 9 | 1.4541 | (3b)(17) | 3605 | 321S22 | LWHT(3b) | Z6 CNT 18.10 | A36-209 (3b) | | X6 CrNiTi 18 10 | 8317 | (3b) | |
| Grade 347 | S34700 | STS 347TPY / SUS 347TPY | D3588 / G3468 | | X10 CrNiNb 18 9 | 1.4550 | (3b)(17) | 3605 | 347S17 | LWHT(3b) | Z6 CN Nb 18.10 | A36-209 (3b) | | X6 CrNiNb 18 10 | 8317 | (3b) | |

JIS Number and Corresponding Foreign Standards

| JIS | | | ASTM | | | DIN | | | ISO | | | Index Number |
|--------------------|-------|------|--------------------|-------|------|--------------------|-------|------|--------------------|-------|------|-----------------|
| Standard Number | Grade | Type | Standard Number | Grade | Type | Standard Number | Grade | Type | Standard Number | Grade | Type | |
| G3468 | | A409 | TP304 | SUS | | | | | 2604/5 | TW47 | SUS | C009 |
| 304TPY | SUS | A358 | 304 | SUS | | | | | | | | |
| SUS | | A409 | TP304L | SUS | | | | | 2604/5 | TW46 | SUS | |
| 304LTPY | SUS | A358 | 304L | SUS | | | | | | | | |
| SUS | | A358 | 309 | SUS | | | | | | | | |
| 309STPY | SUS | | | | | | | | | | | |
| SUS | | A358 | 309 | SUS | | | | | | | | |
| 310STPY | SUS | | | | | | | | | | | |
| SUS | | A409 | TP316 | SUS | | | | | 2604/5 | TW60 | SUS | |

