### 11.17 Ultrasonic Inspection of Centrifugally Cast Pipe

Listed below is applicable information regarding ultrasonic inspection of centrifugally cast pipe that is in accordance with this specification.

a) *Equipment*. Any equipment utilizing the ultrasonic principles and capable of continuous and uninterrupted inspection of the entire volume of the pipe may be used. Pipe ends within 4 in. (100 mm) may be inspected using hand-held ultrasonic equipment in accordance with Items b) and c) below. The equipment shall be of sufficient sensitivity to indicate defects and shall be checked as prescribed in 11.17 b).

b) *Reference Standard*. A reference standard having the same nominal diameter and thickness as the product being inspected shall be used to demonstrate the effectiveness of the inspection equipment and procedures at least once every working shift. The reference standard may be of any convenient length as determined by the manufacturer. It shall be scanned by the inspection unit in a manner simulating the inspection of the product. The reference standard shall contain a machined notch as specified in Figure 11.

   The notch shall be in the outer surface of the reference standard and parallel to the longitudinal axis of the pipe.

   By agreement between purchaser and manufacturer, another notch of identical depth, width, and length shall be located on either of the following:

   1) the inner surface of the reference standard and parallel to the axis of the pipe;

   2) in the outer surface of the reference standard and perpendicular to the axis of the pipe;

   3) in the inner surface of the reference standard and perpendicular to the axis of the pipe; or

   4) any combination thereof.

   The inspection equipment shall be adjusted to produce a well-defined indication when the reference standard is scanned by the inspection unit.

   Depth of notch shall be 10 % (±1.5 %) of the nominal wall thickness of the pipe being inspected, but not less than 0.012 in. (0.30 mm).

   By agreement between purchaser and manufacturer, the depth of the notch, $h$, shall be 5 % (+0.5 %, −0.75 %) of the nominal wall thickness of the pipe being inspected, but not less than 0.005 in. (0.13 mm).

   The length of the notch at full depth, $L$, shall be at least twice the width of the scanning head.

   NOTE The reference standard defined above is a convenient standard for calibration of nondestructive testing equipment. The dimensions of this specification should not be construed as the minimum size imperfection detectable by such equipment.

c) *Acceptance Limits*. Any imperfection that produces a signal greater than the signal received from the reference standard shall be considered a defect unless it can be demonstrated by the manufacturer that the imperfection does not exceed the provisions of 12.7. Pipe containing defects shall be given one of the dispositions as specified in 12.7.

## 12 Workmanship, Visual Inspection, and Repair of Defects

### 12.1 Inspection Notice

Where the inspector representing the purchaser desires to inspect this pipe or witness these tests, reasonable notice shall be given of the time at which the run is to be made.

## 12.2 Purchaser Inspection

When stated on the purchase order, the provisions of Annex G shall apply.

## 12.3 Workmanship

The manufacturer shall take all reasonable precautions to minimize damage to the pipe. Pipe containing defects listed below shall be rejected.

a) *Dents*. The pipe shall contain no dents greater than $^1/_4$ in. (6.35 mm), measured at the gap between the lowest point of the dent and a prolongation of the original contour of the pipe. The length of the dent in any direction shall not exceed one-half the pipe diameter. All cold-formed dents deeper than $^1/_8$ in. (3.18 mm) with a sharp bottom gouge shall be considered a defect. The gouge may be removed by grinding.

b) *Offset of Plate Edges*. For submerged arc and gas metal arc welded pipe with wall thicknesses 0.500 in. (12.7 mm) and less, the radial offset (misalignment) of plate edges in the weld seams shall not be greater than $^1/_{16}$ in. (1.59 mm). For submerged arc and gas metal arc welded pipe with wall thicknesses over 0.500 in. (12.7 mm), the radial offset shall not be greater than 0.125$t$ or $^1/_8$ in. (3.18 mm), whichever is smaller. For electric-welded pipe, the radial offset of plate edges plus flash trim shall be no greater than 0.060 in. (1.52 mm).

c) *Out-of-line Weld Bead in Submerged Arc and Gas Metal Arc Welded Pipe*. Out-of-line weld bead (off-seam weld) shall not be cause for rejection provided complete penetration and complete fusion have been achieved as indicated by nondestructive examination. When the electric-resistance welding process is used for tack welding, the subsequent submerged arc or gas metal arc weld shall eliminate all evidence of the tack weld.

d) *Height of Outside and Inside Weld Beads—Except ERW*. The weld head shall not extend above the prolongation of the original surface of the pipe more than the amount listed below in Table 22.

**Table 22—Outside/Inside Weld Bead Height (Except ERW)**

| Wall Thickness | Maximum Height of Weld Bead |
|---|---|
| $^1/_2$ in. (12.70 mm) and under | $^1/_8$ in. (3.18 mm) |
| Over $^1/_2$ in. (12.70 mm) | $^3/_{16}$ in. (4.76 mm) |

Weld beads higher than permitted by the requirements of this paragraph may be ground to acceptance criteria at the option of the manufacturer.

The height of the weld bead shall in no case come below a prolongation of the surface of the pipe (outside or inside the weld head), except that contouring by grinding, otherwise covered in this specification, shall be permitted.

e) *Height of Flash of Electric-welded Pipe*. The outside flash of electric-welded pipe shall be trimmed to an essentially flush condition.

The inside flash of electric-welded pipe shall not extend above the prolongation of the original inside surface of the pipe more than 0.060 in. (1.52 mm).

f) *Trim of Inside Flash of Electric-welded Pipe*. Depth of groove is defined as the difference between the wall thickness measured approximately 1 in. (25.4 mm) from the weld line and the remaining wall under the

groove. The depth of groove resulting from removal of the internal flash of electric-welded pipe shall not be greater than the amount listed below in Table 23 for the various wall thicknesses.

g) *Grinding*. When surface conditioning by grinding is performed, it shall be done in a workmanlike manner.

**Table 23—Electric-Welded Pipe Inside Flash Trim**

| Wall Thickness | Maximum Depth of Trim |
|---|---|
| 0.150 in. (3.8 mm) and less | $0.10t$ |
| 0.151 in. (3.8 mm) to 0.301 in. (7.6 mm) | 0.015 in. (0.38 mm) |
| 0.301 in. (7.6 mm) and greater | $0.05t$ |

## 12.4 Visual Inspection

All finished pipe shall be visually examined and shall be free of defects as defined in 12.5. See 12.6 for repair of defects.

## 12.5 Defects

Listed below are requirements for defects in order to conform to this standard.

a) *Cracks and Leaks*. All cracks, sweats, and leaks shall be considered defects.

b) *Laminations and Inclusions*. Any lamination or inclusion extending into the face or bevel of the pipe and having a transverse dimension exceeding $^1/_4$ in. (6.35 mm) is considered a defect. Pipe containing such defects shall be cut back until no lamination or inclusion on the face of the bevel is greater than $^1/_4$ in. (6.35 mm). Any lamination in the body of the pipe that is both the following:

1) greater than or equal to $^3/_4$ in. (19.0 mm) in the minor dimension, and

2) greater than or equal to 12 in.$^2$ (7742 mm$^2$) in area is considered a defect.

Disposition of such defects shall be in accordance with API 5L. No specific inspection by the manufacturer is required unless the purchaser specifies special nondestructive inspection on the purchase order.

NOTE A lamination is defined as an internal metal separation creating layers generally parallel to the surface.

c) *Arc Burns*. Arc burns, defined as localized points of surface melting caused by arcing between electrode or ground and the pipe surface, shall be considered defects.

NOTE Contact marks, defined as intermittent marks adjacent to the weld line, resulting from the electrical contact between the electrodes supplying the welding current and the pipe surface, are not defects.

Pipe containing arc burns shall be given one of the following dispositions.

1) Arc burns may be removed by grinding, chipping, or machining. The resulting cavity shall be thoroughly cleaned and checked for complete removal of damaged material by etching with an appropriate reagent.

The cavity may be merged smoothly into the original contour of the pipe by grinding, provided the remaining wall thickness is within the specified limits.

2) The section of pipe containing the arc burn may be cut off within the limits of the requirements on length.

3) Rejected.

d) *Undercuts*. Undercutting on submerged arc or gas metal arc welded pipe is the reduction in thickness of the pipe wall adjacent to the weld where it is fused to the surface of the pipe. Undercutting can best be located and measured visually. Minor undercutting on either the inside or the outside of the pipe is permissible without repair or grinding. Minor undercutting is defined as follows.

1) Maximum depth of $^1/_{32}$ in. (0.79 mm) with a maximum length of one-half the wall thickness and not more than two such undercuts in any 1 ft (0.30 m) of the weld length.

2) Maximum depth of $^1/_{64}$ in. (0.40 mm), any length.

Undercuts longer than one-half the wall thickness and $^1/_{64}$ to $^1/_{32}$ in. (0.40 to 0.79 mm) in depth, but not exceeding $12^1/_2$ % of the specified wall thickness, shall be removed by grinding. Undercuts greater in depth than $^1/_{32}$ in. (0.79 mm) shall be considered defects.

e) *Other Defects*. Any imperfection having a depth greater than $12^1/_2$ % of the specified wall thickness, measured from the surface of the pipe, shall be considered a defect.

f) *Disposition*. Pipe containing a defect shall be given one of the following dispositions.

1) The defect may be removed by grinding provided the remaining wall thickness is within specified limits.

2) Repaired in accordance with 12.6 through 12.9.

3) The section of pipe containing the defect may be cut off within the limits of the requirements on length.

4) Rejected.

## 12.6 Repair of Defects

Listed below are requirements for defects in order to conform to this standard.

a) *Seamless Pipe and Parent Metal of Welded Pipe*. Weld repairs are prohibited.

b) *Weld Seam of Welded Pipe*. Defects in the weld seam, except ERW pipe, may be repaired at the discretion of the manufacturer. Such repairs shall be in accordance with Table 24. The weld seam of electric-resistance welded pipe may be repaired only by agreement between the purchaser and manufacturer. Electric-resistance weld seam repairs shall be in accordance with Table 24.

**Table 24—Applicable Repair Procedure**

| Pipe Weld Seam | Section All Grades |
|---|---|
| Weld seam of submerged arc welded pipe | 12.7 |
| Weld seam of electric-resistance and induction-welded pipe | 12.8 |
| Weld seam of gas metal arc welded pipe | 12.9 |

c) *Heat-treated Pipe*. When heat-treated pipe has been repaired by welding, the need for and type of reheat treatment shall be, by agreement between the manufacturer and the purchaser, based on the effect of the repair on the microstructure and properties of the heat-treated pipe.

## 12.7 Procedure for Repair of Weld Seams of Submerged Arc Welded Pipe

Conformance is subject to approval of the purchaser's inspector. The repair of defects in the weld seam of submerged arc welded pipe shall conform to the following requirements.

a) The defect shall be completely removed and the cavity thoroughly cleaned.

b) The minimum length of a repair weld shall be 2 in. (50.8 mm). The repair weld shall be made by either semi-automatic or automatic submerged arc welding; by manual or semi-automatic or automatic gas metal arc (TIG or MIG) welding; or by manual shielded metal arc welding using suitable electrodes. The welding procedures and performance shall be qualified in accordance with Annex C. Shielding gas, containing hydrogen, shall not be used for duplex alloys.

c) Each length of repaired pipe shall be hydrostatically tested in accordance with Section 9.

## 12.8 Procedure for Repair of Weld Seams of Electric-weld and Induction-welded Pipe

Conformance to the repair procedure is subject to approval of the purchaser's inspector. Repair welding of the weld seam of electric-resistance welded pipe and induction welded pipe shall conform to the following requirements and shall include the weld zone which is defined for the purposes of repair as $^{1}/_{2}$ in. (12.7 mm) on either side of the fusion line.

a) The weld zone defect shall be removed completely by chipping and/or grinding and the resultant cavity shall be thoroughly cleaned.

b) The minimum length of repair weld shall be 2 in. (50.8 mm), and individual weld repairs shall be separated by at least 10 ft (3 mm).

c) The repair weld shall be made either by manual or semi-automatic submerged arc welding gas metal arc welding, or manual shielded metal arc welding using suitable electrodes. The metal temperature in the area to be repaired shall be a minimum of 50 °F (10 °C). The welding procedure and performance shall be qualified in accordance with Annex C.

d) When a repair weld is made through the full wall thickness, it shall include weld passes made from both the ID and the OD of the pipe. Starts and stops of the ID and OD repair welds shall not coincide.

e) The repair shall be ground to merge smoothly into the original contour of the pipe and shall have a maximum crown of 0.06 in. (1.52 mm).

f) Repair welds shall be inspected by either ultrasonic method in accordance with 11.15, except that the equipment need not be capable of continuous and uninterrupted operation, or by radiological methods in accordance with 11.4 through 11.14. The choice of these nondestructive testing methods shall be at the option of the manufacturer.

g) Repaired pipe shall be hydrostatically tested after repaired in accordance with Section 9.

## 12.9 Procedure for Repair of Weld Seam of Gas Metal Arc Welded Pipe

Conformance is subject to the approval of the purchaser's inspector. The repair of defects in the weld seam of gas metal arc welded pipe shall conform to the following requirements.

a) The defects shall be completely removed and the cavity thoroughly cleaned. The size of the cavity shall be sufficiently large [at least 2 in. (50.8 mm) in length] so as to permit multiple pass repairs wherein starts and stops of individual passes do not coincide.

b) The repair weld shall be made by suitable coated electrodes, semi-automatic or automatic gas metal arc welding. The welding procedure and operator performance shall be qualified in accordance with Annex C.

c) Each length of repaired pipe shall be hydrostatically tested in accordance with Section 9.

# 13 Marking and Surface Treatment

## 13.1 Marking—General

Pipe manufactured in conformance with this specification shall be marked by the manufacturer as specified hereinafter.

a) The required marking on pipe shall be as stipulated in 13.2.

b) Size, weight per foot, length, and hydrostatic test pressure markings shall be in USC units except that for pipe intended for use in countries utilizing the metric system; these markings shall be in metric units or both USC and metric units, if so specified on the purchase order. If not so specified, for pipe made and intended for use in countries utilizing the metric system, these markings may be given in metric units only, at the option of the manufacturer.

## 13.2 Location of Markings

The location and sequence of identification markings shall be as follows.

a) *1.900 in. OD and Smaller*. Die stamped on a metal tag fixed to the bundle, or may be printed on the straps or banding clips used to tie the bundle.

b) *Seamless pipe in All Other Sizes and Welded Pipe up to 16 in. OD*. Paint stencil on the outside surface starting at a point between 18 in. and 30 in. from the end of the pipe, and in the sequence shown below, except when agreed between the purchaser and the manufacturer some or all of the markings may be placed on the inside surface in a sequence convenient to the manufacturer.

c) *Welded Pipe 16 in. OD and Larger*. Paint stencil on the inside surface starting at a point no less than 6 in. from the end of the pipe in a sequence convenient to the manufacturer, unless otherwise specified by the purchaser.

## 13.3 Sequence of Markings

The sequence of markings shall be as follows.

a) Manufacturer's name or mark.

b) *Spec 5LC*. [8] "Spec 5LC" should be paint stenciled when the product is in complete compliance with this specification. Compatible standards products in compliance with multiple compatible standards may be stenciled with the name of each standard.

c) *Sizes*. The outside diameter in inches followed by the nominal wall thickness in inches.

[8] Users of this specification should note that there is no longer a requirement for marking a product with the API monogram. The American Petroleum Institute continues to license use of the monogram on products covered by this specification but it is administered by the staff of the Institute separately from the specification. The policy describing licensing and use of the monogram is contained in Annex A herein. No other use of the monogram is permitted.

d) *Weight per Foot*. For sizes $4^1/_2$ in. and larger, the tabulated weight in pounds per foot for plain-end pipe (Table 12), shall be paint stenciled.

e) *Grade*. The symbols to be used are as follows:

| | |
|---|---|
| Grade LC30-1812 | LC30-1812 |
| Grade LC52-1200 | LC52-1200 |
| Grade LC65-2205 | LC65-2205 |
| Grade LC65-2506 | LC65-2506 |
| Grade LC80-2507 | LC80-2507 |
| Grade LC30-2242 | LC30-2242 |

The symbols to use from grades not listed in Table 4 shall correspond to the designation described in NOTE "a" to Table 4.

f) *Process of Manufacture*. The symbols to be used are as follows:

| | |
|---|---|
| Seamless pipe | S |
| Welded pipe | E |
| Centrifugal cast pipe | C |

g) *Heat Treatment*. The symbols to be used are as follows:

| | |
|---|---|
| As-rolled | AR |
| Quench and tempered | HQ |
| Solution anneal | H |

h) *Test Pressure*. When the specified hydrostatic test pressure is higher than the tabulated pressure (Table 12), the test pressure in pounds per square inch, preceded by the word TESTED, shall be paint stenciled.

i) *Supplementary Requirement(s)*. See Annex B.

Example:

14 in. NPS 0.375 in. wall thickness, Grade LC30-1812, solution annealed, seamless shall be paint stenciled as follows:

ABCO SPEC 5LC 14 × 0.375
55.50 LC30-1812 SH

NOTE The weight per foot (55.50) is determined by applying the F factor, $F$ = 1.017, to 54.57 from Table 12.

For pipe in sizes 1.900 in. OD and smaller, the identification markings specified in 13.2 shall be placed on the tag, strap, or clip used to tie the bundle.

### 13.4 Length

In addition to the identification markings stipulated in 13.1 and 13.2, the length shall be marked as follows.

a) For pipe in sizes larger than 1.900 in. OD, the length in feet and tenths of a foot, unless otherwise specified on the purchase order, as measured on the finished pipe shall be paint stenciled on the outside surface at a place convenient to the manufacturer, except by agreement between the purchaser and the manufacturer, the length marking may be placed inside the pipe at a convenient location.

b) For sizes 1.900 in. OD and smaller, the total length of pipe in the bundle in feet and tenths of a foot (or equivalent metric units), unless otherwise specified on the purchase order, shall be marked on the tag, band, or clip.

## 13.5 Die Stamping

Cold die stamping of all grades plate or pipe not subsequently heat treated, and all pipe with wall thickness of 0.156 in. and less is prohibited, except that by agreement between the purchaser and the manufacturer and when so specified on the purchase order, pipe or plate may be cold die stamped. The manufacturer at their option may hot die stamp [200 °F (93 °C) or higher] plate or pipe, or cold die stamp plate or pipe if it is subsequently heat treated. Cold die stamping shall be done with rounded or blunt dies. All die stamping shall be at least 1 in. (25 mm) from the weld for all grades. Etching or marking with a vibrograph are permitted in lieu of cold die stamping.

## 13.6 Surface Treatment

The corrosion resistant behavior of these alloys is adversely affected by poor surface condition. Therefore, scale spatter and annealing surface residues shall be removed by blasting or pickling, or a combination of both.

## 13.7 Pipe Processor Markings

Pipe heat treated by a processor other than the manufacturer shall be marked as stipulated in 13.1, 13.2, 13.3, 13.4, and 13.5. The processor shall remove any identity which is not indicative of the new condition of the product as a result of heat treating (i.e. prior grade identity, original pipe manufacturer's name or logo).

# Annex A
(informative)

# API Monogram Program
# Use of the API Monogram by Licensees

## A.1 Scope

### A.1.1 Applicability

This annex is normative (mandatory) for products supplied bearing the API Monogram and manufactured at a facility licensed by API; for all other instances it is not applicable.

### A.1.2 General

The API Monogram® is a registered certification mark owned by the American Petroleum Institute (API) and authorized for licensing by the API Board of Directors. Through the API Monogram Program, API licenses product manufacturers to apply the API Monogram to products which comply with product specifications and have been manufactured under a quality management system that meets the requirements of API Q1. API maintains a complete, searchable list of all Monogram licensees on the API Composite List website (www.api.org/compositelist).

The application of the API Monogram and license number on products constitutes a representation and warranty by the licensee to API and to purchasers of the products that, as of the date indicated, the products were manufactured under a quality management system conforming to the requirements of API Q1 and that the product conforms in every detail with the applicable standard(s) or product specification(s). API Monogram Program licenses are issued only after an on-site audit has verified that an organization has implemented and continually maintained a quality management system that meets the requirements of API Q1 and that the resulting products satisfy the requirements of the applicable API product specification(s) and/or standard(s). Although any manufacturer may claim that its products meet API product requirements without monogramming them, only manufacturers with a license from API can apply the API Monogram to their products.

Together with the requirements of the API Monogram license agreement, this annex establishes the requirements for those organizations who wish to voluntarily obtain an API license to provide API monogrammed products that satisfy the requirements of the applicable API product specification(s) and/or standard(s) and API Monogram Program requirements.

For information on becoming an API Monogram Licensee, please contact API, Certification Programs, 1220 L Street, NW, Washington, DC 20005 or call 202-682-8145 or by email at certification@api.org.

## A.2 Normative References

In addition to the referenced standards listed earlier in this document, this annex references the following standard:

API Specification Q1, *Specification for Quality Management System Requirements for Manufacturing Organizations for the Petroleum and Natural Gas Industry*

For Licensees under the Monogram Program, the latest version of this document shall be used. The requirements identified therein are mandatory.

## A.3 API Monogram Program: Licensee Responsibilities

### A.3.1 Monogram Program Requirements

For all organizations desiring to acquire and maintain a license to use the API Monogram, conformance with the following shall be required at all times:

a) quality management system requirements of API Q1;

b) API Monogram Program requirements of API Q1, Annex A;

c) requirements contained in the API product specification(s) to which the organization is licensed; and

d) requirements contained in the API Monogram Program License Agreement.

### A.3.2 Control of the Application and Removal of the API Monogram

Each licensee shall control the application and removal of the API Monogram in accordance with the following:

a) products that do not conform to API specified requirements shall not bear the API Monogram;

b) each licensee shall develop and maintain an API Monogram marking procedure that documents the marking/monogramming requirements specified by this annex and any applicable API product specification(s) and/or standard(s). The marking procedure shall:

   1) define the authority responsible for application and removal of the API Monogram and license number;

   2) define the method(s) used to apply the Monogram and license number;

   3) identify the location on the product where the API Monogram and license number are to be applied;

   4) require the application of the date of manufacture of the product in conjunction with the use of the API Monogram and license number;

   5) require that the date of manufacture, at a minimum, be two digits representing the month and two digits representing the year (e.g. 05-12 for May 2012) unless otherwise stipulated in the applicable API product specification(s) or standard(s); and

   6) define the application of all other required API product specification(s) and/or standard(s) marking requirements.

c) only an API licensee shall apply the API Monogram and its designated license number to API monogrammable products;

d) the API Monogram and license number, when issued, are site-specific and subsequently the API Monogram shall only be applied at that site specific licensed facility location; and

e) the API Monogram may be applied at any time appropriate during the production process but shall be removed in accordance with the licensee's API Monogram marking procedure if the product is subsequently found to be out of conformance with any of the requirements of the applicable API product specification(s) and/or standard(s) and API Monogram Program.

For certain manufacturing processes or types of products, alternative API Monogram marking procedures may be acceptable. Requirements for alternative API Monogram marking are detailed in the, *API Monogram*

*Program Alternative Marking of Products License Agreement*, available on the API Monogram Program website at http://www.api.org/alternative-marking.

### A.3.3 Design and Design Documentation

Each licensee and/or applicant for licensing shall maintain current design documentation as identified in API Q1 for all of the applicable products that fall under the scope of each Monogram license. The design document information shall provide objective evidence that the product design meets the requirements of the applicable and most current API product specification(s) and/or standard(s). The design documentation shall be made available during API audits of the facility.

In specific instances, the exclusion of design activities is allowed under the Monogram Program, as detailed in Advisory #6, available on API Monogram Program website at http://www.api.org/advisories.

### A.3.4 Manufacturing Capability

The API Monogram Program is designed to identify facilities that have demonstrated the ability to manufacture equipment that conforms to API specifications and/or standards. API may refuse initial licensing or suspend current licensing based on a facility's level of manufacturing capability. If API determines that an additional review is warranted, API may perform additional audits (at the organization's expense) of any subcontractors to ensure their conformance with the requirements of the applicable API product specification(s) and/or standard(s).

### A.3.5 Use of the API Monogram in Advertising

An API Monogram licensee shall not use the API Monogram and/or license number on letterheads, buildings or other structures, websites or in any advertising without an express statement of fact describing the scope of Licensee's authorization (license number and product specification). The Licensee should contact API for guidance on the use of the API Monogram other than on products.

## A.4 Product Marking Requirements

### A.4.1 General

These marking requirements shall apply only to those API Licensees wishing to mark applicable products in conjunction with the requirements of the API Monogram Program.

### A.4.2 Product Specification Identification

Manufacturers shall mark products as specified by the applicable API specifications or standards. Marking shall include reference to the applicable API specification and/or standard. Unless otherwise specified, reference to the API specifications and/or standards shall be, as a minimum, "API [Document Number]" (e.g. API 6A or API 600). Unless otherwise specified, when space allows, the marking may include use of "Spec" or "Std", as applicable (e.g. API Spec 6A or API Std 600).

### A.4.3 Units

Products shall be marked with units as specified in the API specification and/or standard. If not specified, equipment shall be marked with U.S. customary (USC) units. Use of dual units [USC units and metric (SI) units] may be acceptable, if such units are allowed by the applicable product specification and/or standard.

### A.4.4 Nameplates

Nameplates, when applicable, shall be made of a corrosion-resistant material unless otherwise specified by the API specification and/or standard. Nameplate shall be located as specified by the API specification and/or standard. If the location is not specified, then the licensee shall develop and maintain a procedure detailing