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APPENDIX P – DoD CONTRACTS
MATERIAL IDENTIFICATION AND CONTROL

(January 2011)

I. GENERAL

A. The material identification and control requirements of this Appendix shall be implemented as part of the Supplier's inspection system for pressure-boundary parts as required by the purchase order. When drawings or other purchase documents require markings in accordance with NAVSEA 0948-045-7010 or NAVSEA 0948-LP-045-7010 the marking requirements of Part II.E. below will satisfy this requirement.

B. For pipe and tube and simple components such as fittings and flanges, the complete component shall be considered a pressure-boundary part. For complex assemblies, examples of pressure-boundary parts are shown in Section III. If there is doubt as to whether or not a part is a pressure-boundary part, the Purchaser shall be consulted.

C. Where the requirements of the purchase order and this Appendix, which forms a part of the purchase order, are at variance with other referenced specifications, the purchase order requirements shall apply.

II. REQUIREMENTS

A. All material used to produce pressure-boundary parts shall be verified prior to release for manufacture. After verification, all verified material shall be marked with a traceability code which provides for positive identification traceable to verification records; and thereafter, be stored separately from unverified material. For complex assemblies this marking shall be maintained up to the point of assembly. If, after assembly, the identification markings are obliterated or hidden, and cannot be re-established, the Supplier shall maintain assembly records which provide for traceability back to material test reports for pressure-boundary parts so affected.

B. When specified in the purchase order, the Supplier shall furnish test reports of the chemical and mechanical properties of each heat/lot of pressure-boundary parts furnished. Chemical reports shall include the elements required to be identified by the applicable material specification and/or the purchase order. Mechanical property reports shall include actual numerical values for the applicable properties listed in the material specification and/or the purchase order. Test reports furnished shall be correlated to the heat/lot number of the item represented and to the purchase order and item number. In the case of batch, continuous cast, or continuous pour processes, samples for reporting chemical and mechanical properties shall be taken no less than once in every eight hours of operation. In this case, traceability marking on both material and test reports shall relate to the production period represented by the test data.

C. Brazing and welding filler metals shall be verified to be the correct grade or type prior to consumption. Control of brazing and welding filter metal shall be maintained up to the point of consumption to ensure the correct grade/type is used.

D. Test report of pressure-boundary parts which are processed in such a way as to alter mechanical properties (e.g. forming, forging, heat treating), shall indicate properties after all such processing.

E. Unless specified otherwise in the purchase order or paragraph II.G. of this Appendix, each pressure-boundary part shall be marked with the following information:

1. Applicable heat or lot numbers, or of continuous cast process, a code which identifies the time period during which the piece was cast. These numbers shall provide traceability to the test reports required by paragraph II. B. above.

2. Identification marking required by the individual material specifications or otherwise specified in the purchase order.

3. Manufacturer's name or trademark.

F. Markings required by this Appendix or by any invoked specification may be established by any of the following methods, provided that the wall thickness of a pressure-boundary part is not reduced below the minimum specified:

1. Cast or forged integral with the part.

2. Impact die-stamping. Stamps shall be the round-bottom, low stress type (see Table I). Markings shall be applied only to low stress areas, flange rims, or integral pads or bosses. Tube or pipe shall not be marked by this method.

3. Vibro-etching. The tool shall be fitted with a carbide tip (or equivalent) with a minimum radius of 0.005 inches. Markings shall be between 0.003 and 0.010 inches in depth. Hardened materials (except fasteners and HY-80/HY-100) shall not be vibro-etched. Buffing may be required prior to etching rough cast surfaces. Not to be used on base materials of pressure boundary parts less than 1/8 inch thick.

4. Electrochemical etch. Electrolyte shall be compatible with the base metal.

5. Inks or paints compatible with the base metal may be used on pipe and tube only, unless otherwise stated by the applicable specification. The marking shall not rub off or efface through normal handling, exposure to the elements, shipment, and storage.

6. Electric arc pencils shall not be used for any marking application.

G. Permanent marking is not required for the items listed below. Such items shall be packaged or segregated and the package or container labeled with the required marking. In case of doubt as to whether the item should be marked, contact the Purchaser for determination before packaging and shipping.

1. Non-metallic components

2. Material having cosmetic finishes (e.g., chrome-plated fixtures)

3. Material with a suitable marking surface of less than 3/8 of a square inch

4. Items of configuration or condition that precludes the use of permanent markings (e.g., hardened material and components with precision machined surfaces). The application of markings shall not affect the fit, form of function of an item.

5. Thin wall material which might be damaged by permanent masking.

III. EXAMPLES OF PRESSURE-BOUNDARY PARTS

1. PIPE AND TUBE

2. BODIES

In general, these are the parts of a component which are thought of as being the main pressure containing portion of the component, and which, in most cases, include the end connections for installation of the component into the piping system. Examples of this grouping are:

a. Valve bodies

b. Strainer bodies

c. Pipe fittings (flanges, elbows, tees, couplings, union assemblies, and separately furnished union-tail pieces, union-thread pieces, etc.)

d. Trap bodies (housings)

e. Cylinders

f. Orifice plates

3. COVERS

In general, these are the portions of components which act as pressure boundaries for the "bodies" listed above. Included in this grouping are:

a. Valve bonnets

b. Valve caps

c. Strainer caps

d. Plugs

e. Cylinder heads

f. Access covers

g. Oxygen and nitrogen valve cartridges

4. JOINT FASTENERS

Unless otherwise specified in the purchase order or applicable material specifications, only fasteners (bolts, nuts, studs, etc.) used to join two pressure-boundary parts must be controlled in accordance with the requirements of this Appendix.

5. EXTENSION PIECES

In general, these are branch systems, connecting to "bodies" and "covers" which are subject to piping system pressures and temperatures and in many cases, are furnished with end connections for installing into either main or branching system piping. Examples of this grouping are:

a. Blowdown or drain nipples (or pipe, including pipe fittings or flanges)

b. Union-tail pieces when part of component end connections (including flange union connections)

c. External connections (extensions of coils, bellows, etc.)

d. Pipe nipples used as body extensions for end connections

e. Separate bosses (attached to "bodies" or "covers" and providing connection for external piping)

f. Valve stems penetrating a pressure-boundary part

g. Thread pipe plugs penetrating a pressure-boundary part

6. MISCELLANEOUS

a. Welding and brazing filler metals

b. Union nuts (both bonnets and end-connection unions)

c. Metallic portions of flexible hose assemblies

d. Certain valve internal metallic parts (e.g. balls, disc, flappers, and poppets)

e. Submarine propulsion and through hull operating shafts

f. Instrumentation components and parts:

Instrument	**Level I Part**
Temperature	Thermowell (Welded and Flanged Base Bulb)
Flow	Meter Casing
Liquid Level	Tank penetration fitting
Pressure	Root valve of pressure instrumentation piping
Gage Column	Isolation valves
Gage Glass	Metallic pressure boundary parts

7. EXCLUSIONS

Certain parts are excluded from classification as pressure-boundary parts and therefore are not subject to the requirements of this Appendix unless otherwise specified in the purchase order or drawing. These examples include the following:

a. Packing glands (followers and retainers, integral flanges or separate)

b. Pressure seal rings, gaskets, o-rings, and similar sealing members used in conjunction with joining two pressure-boundary parts.

c. Internal parts of valves that are completely contained within the pressure boundary of the system such as discs, balls, seat rings, and bushings. An exception to this would be an internal piping system pressure containing part, such as coil or tube within a heat exchanger where the shell (or cylinder) maintains one piping system integrity and an internal coil or tube bank maintains the integrity of another piping system.

d. Silver braze flux

e. Flexible hose

f. Pumps, distilling plants, compressors, heat exchangers, oxygen generators, steam turbines, condensers, hydraulic accumulators and dehydrators.

TABLE I

DIMENSIONS FOR LOW STRESS DIE-STAMPS

CHARACTER SIZE	MINIMUM TIP RADIUS	IMPRESSION WIDTH FOR 0.010 INCH DEPTH
1/16 INCH	0.005 INCH	0.020 INCH
3/32	0.006	0.021
1/8	0.007	0.022
3/16	0.008	0.026
1/4	0.010	0.031
3/8	0.014	0.042
1/2	0.020	0.062