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Affected Publication: API Specification 20A, *Carbon Steel, Alloy Steel, Stainless Steel, and Nickel Base Alloy Castings for Use in the Petroleum and Natural Gas Industry*, First Edition, March 2012

ADDENDUM 2

(includes Addendum 1, October 2013)

Page 5, **Table 2** shall be replaced with the following:

Table 2—Qualification Casting Weld Repair Limitations

CSL	% Surface Area	% Wall Thickness
CSL-1	50 %	50 %
CSL-2	25 %	25 %
CSL-3	20 %	20 %
CSL-4	0 % ^a	0 % ^a
^a Weld repair not permitted.		

Page 8, **Table 3** shall be replaced with the following:

Table 3—Examination/Testing Requirements for Qualification

CSL	Section References									
	Chemistry	Mechanical	Micro-Structure	Visual	Dimensional	Hardness	Surface NDE	Volumetric NDE	Sacrificial Casting	Additional Testing
CSL-1	4.4.8	4.4.6	—	4.4.2	4.4.3	4.4.4	—	—	—	4.4.9.3 Group D
CSL-2	4.4.8	4.4.6	—	4.4.2	4.4.3	4.4.4	4.4.5.1 4.4.5.2	—	—	4.4.9.3 Group D
CSL-3	4.4.8	4.4.6	4.4.7	4.4.2	4.4.3	4.4.4	4.4.5.1 4.4.5.2	4.4.5.3	—	4.4.9.3 Group D
CSL-4	4.4.8	4.4.6	4.4.7	4.4.2	4.4.3	4.4.4	4.4.5.1 4.4.5.2	4.4.5.3	4.4.9.2	4.4.9.3 Group D

Page 10, **Section 4.4.6.1**, the first sentence shall be replaced with the following:

The mechanical tests required by this standard shall be performed on the qualification casting or its qualification test coupons representing the heat and heat treatment lot used in the manufacture of the casting.

Page 11, **Section 4.4.7** shall be replaced with the following:

4.4.7 Microstructure Examination

4.4.7.1 Prepare a micro-specimen from the grip end of one of the tensile specimens by making a transverse cut through the center of the grip end of one of the tensile specimens.

4.4.7.2 Provide a photomicrograph of the as-polished, un-etched specimen at 100X. For stainless steel and duplex steel, provide a photomicrograph taken at 400X or greater magnification. Results shall be documented.

4.4.7.3 Etch the specimen using the appropriate reagent. Provide a photomicrograph of the etched specimen at 100X showing the typical microstructure. For stainless steel and duplex steel, provide a photomicrograph taken at 400X or greater magnification showing the typical microstructure. Any unusual anomalies such as intermetallic and/or heavy precipitates or carbides in the grain boundaries, inhomogeneous structure or un-tempered structure, shall be reported. Results shall be documented.

4.4.7.4 For Group A, Group B, and Group C materials, steel cleanliness shall be determined in accordance with ASTM E45 using the sample from 4.4.7.2 and reported as shown in Table 4. Four (4) photomicrographs shall be taken at 100X magnification. A photomicrograph shall be taken of a representative field in each of the four quadrants shown in Figure 6. Results shall be documented as informational only.

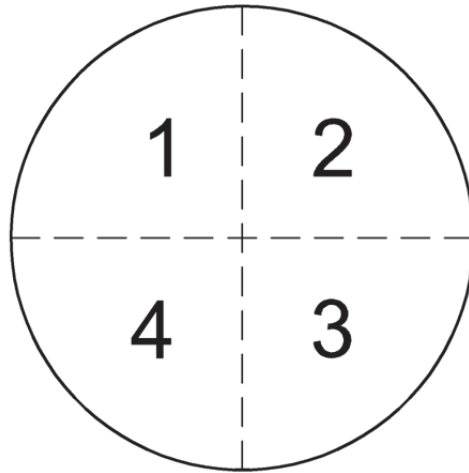
4.4.7.5 Grain size shall be determined in accordance with ASTM E112 for the sample following etching with a suitable reagent. Photomicrographs of grain size shall be taken. Results shall be documented and reported as informational only.

Page 11, **Table 4** shall be replaced with the following:

Table 4—Modified JK Inclusion Rating Limits

Inclusion Type	CSL-3 and CSL-4	
	Thin	Heavy
Type A sulfide	2.0	1.5
Type B alumina	2.0	1.5
Type C silicate	2.0	1.5
Type D oxide	Report	Report

Page 11, **Figure 6** shall be added:



Figure—6 Photomicrograph Locations

Page 13, **Section 4.4.9.3.3** shall be replaced with the following:

Duplex materials shall be impact tested in accordance with the method specified in ASTM A370 using the Charpy V-notch technique at $-50\text{ }^{\circ}\text{F}$ ($-46\text{ }^{\circ}\text{C}$).

Acceptance criteria shall be as follows:

- a) average of three specimens: 33 ft. lbs. (45 J) minimum;
- b) no single specimen less than 26 ft. lbs. (35 J).

Page 14, **Section 4.6 d)** shall be replaced with the following:

d) Test records: records of the examinations, mechanical testing, metallographic evaluations, as described in Section 4.

Page 21, **Table 10** shall be replaced with the following:

Table 10—Wall Thickness up to 2 inches, in Accordance with ASTM E446

Discontinuity Type	Category	Acceptable Comparative Plate	
		CSL-2 and CSL-3	CSL-4
Gas	A	A3	A2
Sand	B	B3	B3
Shrinkage, Type 1	C	CA2	2 (All types)
Shrinkage, Type 2	C	CB3	2 (All types)
Shrinkage, Type 3	C	CC3	2 (All types)
Shrinkage, Type 4	C	CD3	2 (All types)
Hot tears and cracks	D and E	None	None
Inserts (internal chills & metal chaplets)	F	None	None

Page 21, **Table 11** shall be replaced with the following:

Table 11—Wall Thicknesses from 2 inches to 4.5 inches, in Accordance with ASTM E186

Discontinuity Type	Category	Acceptable Comparative Plate	
		CSL-2 and CSL-3	CSL-4
Gas	A	A3	A2
Sand	B	B3	B2
Shrinkage, Type 1	C	CA3	2 (All types)
Shrinkage, Type 2	C	CB3	2 (All types)
Shrinkage, Type 3	C	CC3	2 (All types)
Crack	D	None	None
Hot tear	E	None	None
Inserts (internal chills & metal chaplets)	F	None	None

Page 21, **Table 12** shall be replaced with the following:

Table 12—Wall Thicknesses from 4.5 inches to 12 inches, in Accordance with ASTM E280

Discontinuity Type	Category	Acceptable Comparative Plate	
		CSL-2 and CSL-3	CSL-4
Gas	A	A3	A2
Sand	B	B3	B2
Shrinkage, Type 1	C	CA3	2 (All types)
Shrinkage, Type 2	C	CB3	2 (All types)
Shrinkage, Type 3	C	CC3	2 (All types)
Crack	D	None	None
Hot tear	E	None	None
Inserts (internal chills & metal chaplets)	F	None	None

Page 22, **Section 5.6.7.1** i) shall be replaced with the following:

i) Repair welding on duplex stainless steel is allowed provided that the ferrite content (volume fraction) is maintained between 35 % minimum and 65 % maximum as part of the WPS/PQR in either the as-welded or solution treated condition.

Page 24, **Section 5.9.1** shall be replaced with the following:

Each casting shall be marked with the following:

- casting supplier's name or mark;
- pattern number or part number;
- material grade;
- API 20A, CSL Number and Material Group;
- heat, heat treat lot or traceability number.