Designation: A802 – 95(Reapproved 2010)ε2

Standard Practice for Steel Castings, Surface Acceptance Standards, Visual Examination[1]

This standard is issued under the fixed designation A802; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the U.S. Department of Defense.

ε[1] NOTE—Footnote 2 was editorially corrected in June 2011.
ε[2] NOTE—Dual designation was removed in April 2015.

1. Scope

1.1 This practice covers the acceptance criteria for the surface inspection of steel castings by visual examination. Four levels of acceptance standards are provided.

1.2 Acceptance levels utilize Steel Castings Research and Trade Association (SCRATA)[2] graded reference comparators for the visual determination of surface texture, surface roughness, and surface discontinuities described as follows:

Acceptance levels

A—Surface Texture
B—Nonmetallic Inclusions
C—Gas Porosity
D—Solidification Discontinuities
E—Sand Expansion Discontinuities
F—Metal Inserts
G—Thermally Cut Surfaces
H—Mechanically Prepared Surfaces
J—Welded Surfaces

1.3 Descriptions of terms related to casting discontinuities are in Section 2.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Terminology

2.1 *Definitions of Terms Specific to This Standard:*

2.1.1 *expansion discontinuities:*

2.1.1.1 *veins, n*—raised, narrow, linear ridges that form upon cracking of the sand mold or core due to expansion of sand and the resulting mold or core stresses during filling of the mold with liquid steel.

2.1.1.2 *rat tails, n*—long, narrow, linear depressions or small steps occurring on a casting surface. Rat tails form as a result of sand expansion and minor buckling of the mold surface during filling of the mold with liquid metal.

2.1.1.3 *scab, n*—a raised, rough area on a casting that usually consists of a crust of metal covering a layer of sand. Sometimes, a scab consists of a raised, rough area of essentially solid metal on the surface of a casting.

2.1.2 *external chills:*

2.1.2.1 *external chills, n*—usually metal blocks, or graphite and carbon blocks, that are incorporated into the mold to locally increase the rate of heat removal during solidification. Brackets have the same purpose but represent an integral part of the casting. Brackets are produced by providing suitable cavities in the mold or core. External chills may produce flat spots and edges (raised areas or depressions) on the casting surface. Brackets merely change the casting appearance due to their presence. Brackets may be removed or allowed to remain on the casting.

2.1.2.2 *parting line and core print fins, n*—thin projections of excess metal at the parting plane between mold halves or core and mold. Causes are improper closing of the mold, insufficient weighting or clamping of the mold for pouring, or uneven pattern surfaces at the matching locations. Core print fins are usually caused by improper dimensions of core prints of the pattern or core box, by rough placement of cores in a soft mold, or by inadequately secured cores.

2.1.3 *fusion discontinuities:*

2.1.3.1 *wrinkles, n*—elongated, smooth depressions of the casting surface, frequently appearing in closely spaced groups. Wrinkles result from irregularities of the liquid metal flow in the mold cavity, frequently associated with low temperature, and are distinguished from the more severe phenomenon of laps, folds, or cold shuts where the casting surface is actually folded over.

[1] This practice is under the jurisdiction of ASTM Committee A01 on Steel, Stainless Steel and Related Alloysand is the direct responsibility of Subcommittee A01.18 on Castings.

Current edition approved Oct. 1, 2010. Published December 2010. Originally approved in 1982. Last previous edition approved in 2006 as A802/A802M – 95 (2006). DOI: 10.1520/A0802-95R10E02.

[2] Available from Castings Technology International, Advanced Manufacturing Park, Brunel Way, Rotherham, S60 5WG, South Yorkshire, England. http://www.castingstechnology.com.