

Expanding a Standard

Y14.8 for the dimensioning and tolerancing of castings and forgings is extended to molded parts. *By Donald E. Day*

ASME has expanded the scope of its standard for the dimensioning and tolerancing of casting and forging technologies. Since most of the principles apply equally well to molded parts, the standard, Y14.8, has been renamed “Castings, Forgings, and Molded Parts.” The standard includes recommendations for the uniform description of features that are unique to cast, forged, and molded parts, and for their inclusion on engineering drawings and related documents.

New symbols for drawings and a section on CAD model requirements have also been added to the new version of the standard, which was issued late last year and replaces Y14.8M-1996.

Although the engineering drawing must capture the design intent of the part, it is essential that the drawing also account for the unavoidable variations caused by the manufacturing process. In castings, forgings, and molded parts variations usually include such characteristics as die closure, mismatch, draft, parting lines, flash, and ejector marks. The 2009 revision of the Y14.8 standard provides symbols as well as tolerancing methods to clearly define the allowable variation in these characteristics.

Parting lines result where die segments meet. The location of parting lines on cast, forged, and molded parts is very important. A new parting line symbol may be placed on the appropriate drawing views to clearly indicate parting line locations. Once the parting lines are defined, the tolerancing of die closure, mismatch, match draft, flash, and draft may be clearly defined on the drawing.

Where a tolerance applies in a die segment other than the one that creates the datum features, additional tolerance is usually required. The new symbols for **all around** and **all over this side of parting line** provide a symbolic means to clearly specify these tolerances.

The **all around this side of parting line** symbol is view dependent and applies to a shape seen in its true profile on one side of a parting line. Where a tolerance or note applies to all surfaces/features created by a single die segment the **all over this side of parting line** symbol may be applied.

Draft angle is required on many cast, forged, or molded surfaces. A general note such as “Draft adds material” may be used to define the draft allowance. How draft affects the limits of size and other dimensions and tolerances is clearly explained. Where there is a need to specify draft or override a general draft note, the new

symbols for **plus draft**, **minus draft**, and **draft included** may be applied. To help explain where a dimension and tolerance apply, the term “mold line” is defined. Several figures have been added to the standard to clearly explain the meaning of these symbols and terms.

The new CAD model section illustrates how to represent the solid model of a part in order to clearly show mold lines, draft, etc. Using profile of a surface to control part surfaces is shown. Also wall thickness is defined. The Standard illustrates how wall thickness may be used as a refinement of a general profile of a surface tolerance.

The section on datum referencing provides many examples of identifying datum targets on a drawing. This section provides recommendations for datum feature selection and datum target location. In general, tolerances may be smaller on features made in the same die segment as the datum features.

SYMBOL FOR INDICATING:

Parting Line	
All around this side of parting line	
All over this side of parting line	
A dimensional limit may increase due to draft	+DFT
A dimensional limit may decrease due to draft	-DFT
Draft is contained within the stated tolerance	DFT INCL
Movable datum target (now included in ASME Y14.5-2009)	

▲ New symbols to be used on mechanical drawings have been added in the 2009 edition of ASME Y14.8 Castings, Forgings, and Molded Parts.

The Y14.8M-1996 standard introduced the movable datum target symbol which has been included in the latest revision of ASME Y14.5 Dimensioning and Tolerancing. This symbol improves readability of the drawing. It is especially helpful where axis and center planes are established in order to balance the tolerances across parting lines. This section also discusses how to relate machined datum features to cast, forged, or molded datum features. A section on datum targets and profile tolerancing has been added. In this section the affect of applying profile of a surface to datum features which contain datum targets, is explained.

The Standard also includes a section on drawing notes, a glossary, and sample drawings. ■

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