Guidelines for Implementing GD&T

By Alex Krulikowski

When beginning to implement geometric dimensioning and tolerancing, how much GD&T needs to be specified? Here are some guidelines that can help an organization use GD&T appropriately.

Guideline	Reason for Using GD&T
1. All parts (except a very simple part, like a pin or a sphere) must have assembly (or mounting) datum features identified.	Datums are the origin for measurement. Every part (or at least 99% of them) needs at least one set of datums. The surfaces that orient and locate the part in the assembly are used as datum features.
2. The interrelationship between the datum features (orientation and location) must be specified with GD&T.	Since datums are the origins for measurement, the datum feature boundaries need to be clearly defined for datum simulation. Using GD&T to define the interrelation between datum features allows the datum simulator boundaries to be easily calculated.
3. All mating surfaces must be oriented and located with GD&T.	Part mating surfaces are important features for tolerancing functional relationships on a part. Mating surfaces are often related to the part assembly datum(s). Therefore, they need to be dimensioned in a repeatable, measurable method.
4. All critical functional relationships must be oriented and located with GD&T.	These are the tolerance-sensitive relationships that make your product a success. To avoid any confusion in these sensitive areas, GD&T should be used to establish one set-up for inspection and to ensure clear definition of the tolerance zones.
5. Form tolerances for datum features, mounting features, and mating features must be specified with GD&T.	The form of a surface dictates how much contact it will have with its mating surfaces. Using form controls on datum features establishes the part-to-gage contact. Using form tolerances on mating surfaces establishes the part-to-part contact. Using GD&T is the clearest method for specifying form requirements on drawings.
6. Non-critical part features may be defined with coordinate tolerances or general tolerances.	Non-critical feature are those with no effect on part-to-gage set up, mating relationships, or critical functional relationships. A few examples are wall thickness, fillets, tangent radii, hole depths, and non-mating surfaces. These may be defined with coordinate tolerances or general tolerances.

This list of guidelines is from "Guidelines for Implementing GD&T on Drawings," by Alex Krulikowski, in *ETImail, Volume 2, Issue 5*: http://www.etinews.com/etimail.