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Common Interpretation & Analysis Problems in Industry

(Only a beginning list)

- 1) Most of industry is not aware of the significant differences between the current and past revisions of the Y14.5 Standard
 - a) As an example, most of industry is not aware of the applicable rules related to applications of MMC, LMC and RFS per rules 2, 2A and 3 of the various revisions of Y14.5.
 - b) In addition, applicable companies are also not aware of the differences between ASME Y14.5 and ISO 1101 and related standards.
- 2) Majority of industry is not truncating drawing specification limits by magnitude of measurement uncertainty which results higher risk in accepting non-conforming product.
 - a. ASME B89.7.3.1 establishes criteria for companies to define “Decision Rules” which established their basis for how they will deal with measurement uncertainty.
- 3) Individuals that are doing uncertainty analysis are not taking into consideration or correcting for some of the largest applicable error sources due to their lack of proper interpretation and application knowledge of GD&T.
- 4) Most of industry is not utilizing functional datum features to optimally represent design intent.
 - a) Datums are being established with inherent biases which can cause rework.
 - b) Functional datum features in most cases are not defined in a restrained state which has negative impacts to applicable tolerances specified in relationship to the datums.
- 5) Diametral features of size measured as 2-point check or Go & No-go gage
 - a) +/- Tolerancing of simple rectangular shapes perceived to result in concentric rectangular boundaries.
 - b) +/- Tolerancing of hole-locations is perceived to result in square tolerance zones, which it does not.
- 6) Major misunderstanding of zero tolerance conditions that derive from corner radii and +/- angles.
 - a) Most of industry is not aware of the major negative result which comes from specifying partial arc features with a size and position callout.
- 7) Most of industry is not applying projected tolerancing zones correctly to threaded and pined type features.
 - a) Threads have their axis measured using axis of largest pin in minor diameter. Major problem if axis of pitch is different than axis of minor or major diameter.
- 8) Most individuals doing statistical analysis on geometric characteristics are assuming the values are correct and in most cases are not considering magnitude of applicable measurement uncertainty.
- 9) Lower portions of composite position callouts interpreted as short hand method of stating perpendicularity, which is not correct.
 - a) Most analysis is being completed in a 2D restrained state which is incomplete.
 - b) Most individuals do not know how to calculate lower portions of composite callouts.
 - c) Majority off individuals at best aware of 2D restrained paper gaging method of analysis but not 2D unrestrained.
- 10) Most of industry is misinterpreting Concentricity & Symmetry and are measuring these features the same as they would a Position callout.
 - a) A major problem with using Concentricity & Symmetry is that it can result in rejection of functionally good parts.
- 11) Most of industry is not aware of the tremendous benefits they could leverage if they better understood the global simplification opportunities that currently exist which would have a positive impact on internal and external harmonization as well as overall industrial simplification.