

# Ring & Plug Thread Gages

*"Let the Gage Guys get your gage!"*



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## Hardened Steel Growth

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#### TECH INFO:

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### Hardened steel does have the propensity to grow.

The growth is usually noticed in larger sizes because it is an inch per inch type growth. What happens is when the steel is hardened the molecules are trapped in stasis. Slowly the molecules relax and as they relax they cause an expansion of the material. The gradual relaxation process takes about a year. The larger size the more the change is noticed. The tighter the tolerance the more the movement is noticed.

To combat this phenomenon gage makers require that their hardened steel be triple cold stabilized. The process requires the gage to be cycled three times through a freeze/thaw process. This procedure will reduce the probability of gage growth. Note the use of the word 'reduce' instead of 'eliminate'.

The probability of growth is most likely noticeable:

1. If the gage is over an inch in size. Because the growth is compounded as size gets larger it will be more apparent. On smaller tools the growth will most likely be considered within the range of measurement uncertainty or be explained away as being from different technician, equipment or laboratory variation.
2. In the first year after it has been hardened. Most of the movement is aged out of the steel after the first year. Things like temperature variation and gage use will encourage faster aging. Being unused and in a box may encourage slower aging to a small degree. Any growth detected after the first year will most likely be considered within the range of measurement uncertainty or be explained away as being from different technician, equipment or laboratory variation.

### COMMENTS

Refer comments/corrections to [gageguy@gagecrib.com](mailto:gageguy@gagecrib.com).

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