

Proper Care and Usage of Gages

Part dimensions to be gaged should be cleaned and burr free to prevent gaging interference. Grit and part chips which become lodged in thread gages will create scratches and wear on the flanks of threads and on the outside and inside diameters of cylindrical plain gages. Various materials such as aluminum and castings are extremely abrasive and will tend to wear out gages more quickly than other types of materials. Finer pitch and smaller diameter thread gages tend to wear quicker than larger and coarser pitch gages and have less gage tolerance as well. Regarding thread gages, it only takes a small amount of wear to have a significant effect on the pitch diameter. The wear on each flank angle is multiplied by almost 4 times to determine the total impact of wear on the pitch diameter. 50 microinches or 1 micron of wear per thread flank will impact the measured size by .0002" which can be the total tolerance of many thread gages.

Selecting higher precision gagemaker tolerances for cylindrical plug and ring gages will consume less product tolerance and will allow the acceptance of slightly more product but with less gage wear life and greater expense. Thread Check's engineering staff can make recommendations in selecting the correct gagemaker tolerances for a given application. The normal rule of practice requires that 10% of part tolerance be divided between the Go and the No Go gages. Applying this practice results in gage tolerance always being included in the part tolerance by up to 10%. This could result in the possibility that 10% of good parts may fail inspection but that no bad product would ever pass. Assuming that higher precision gagemaker tolerances are better, is not valid, and may create quality issues as these gages tend to wear quicker with the potential of becoming undersized and passing bad parts.

Gages should be turned or pushed slowly and gently into or onto the dimension being checked. Forcing gages will result in faulty gaging and the

possibility of damaging both the part and gage. Spinning thread ring gages or thread plug gages onto or into parts will create greater friction and increased wear thus reducing the life of the gage.

Using hard chrome plated thread gages can extend the wear life by more than 100% over standard tool steel gages which can provide dramatic savings on replacement costs. Thread Check supplies all standard size thread plug gages in inches and metric up to 1 ½ or 39mm in diameter in hard chrome at no additional cost. Other options for coatings and alternate material for thread gages and cylindrical gages include tin coat, carbide, alternate steels and even ceramic. There are pros and cons to utilizing various coatings and materials in gage applications which should be discussed with your gage maker. For example, gages made of carbide and ceramic are extremely durable and have excellent wear properties, but can be extremely brittle and break and chip if not handled carefully.

A thin coating of gage lubricant will help reduce friction from gage to part.

Proper training of personnel involved in the use of gages will pay dividends on ensuring the gages are treated with care and last longer. Review the current inventory of gages and look for visual signs of nicks, dents and scratches on gage members and handles. Evidence of this may suggest the gages are not being handled properly.

The effects of thermal expansion should be taken into consideration on both the part and the gage.

The temperature of the part and the gage should be the same. 68° F is the ideal temperature at which both part and gage should be at when inspected because gages are calibrated at 68° F. This effectively eliminates any error due to thermal expansion.

Protecting gages from excessive heat, humidity, moisture and corrosive chemicals will extend the life of your gages. After use, gages should be cleaned and recoated with a thin-film rust preventative or dipped in an easy to peel oil-based waxed coating, and stored properly.

Gages should be periodically inspected and calibrated to assure accuracy. Go member gages tend to wear quicker with normal use. NOGO gages will wear on the ends that receive the greatest usage. Frequency of inspection and calibration should be dependent on such factors as the amount of usage, part and gage material, tolerance, and quality procedures.

Feel free to contact us by phone or email if you have any questions or requirements regarding this topic.

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