

# Spirallock Corporation Engineering Document

APPROVALS	DATE	<h2 style="margin: 0;">Definition of Acceptable Gaging Practices</h2>
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CHIEF ENG.: B.J.M.	15 OCT 03	
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PATH: \\SPLSRV1\Engineering\Standard\Spirallock Standards\

### 1. Conventional Spirallock threads:

Conventional Spirallock threads are defined as those of 32 threads per inch and coarser in English sizes and 0.80 mm lead and coarser in Metric sizes. These threads utilize a three (3) member gaging system. It consists of one (1) GO Pitch Diameter & Ramp Gage, one (1) NOT-GO Pitch Diameter Gage and one (1) NOT-GO Ramp Gage. In the catalog, these gages are defined as GO PLUG, HI-LIMIT P.D. and HI-LIMIT RAMP, respectively (See Section 13.3).

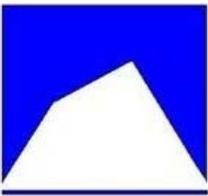
### 2. Sawtooth Spirallock Threads:

Spirallock sawtooth threads are defined as those finer than 32 threads per inch in English sizes and finer than 0.80 mm lead in Metric sizes. These threads utilize a two (2) member gaging system. It consists of one (1) GO Pitch Diameter & Ramp gage and one (1) NOT-GO Ramp gage. In the catalog these gages are defined as GO PLUG and HI-LIMIT respectively (See Section 13.4).

### 3. GO Gage Utilization Practice:

The GO PLUG gage is designed to check that the minimum feature limits of the threaded hole have been met. This is to ensure that the mating screw manufactured to the maximum tolerance limits of Class 2A English sizes and Class 6g Metric sizes will enter the threaded hole.

The Spirallock GO PLUG gage should enter the tapped hole or fastener from the same direction as would the male threaded member, and should enter for the full length of engagement.

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It is preferred that the gage be free spinning in the threaded hole so as to minimize the wear on the gage. Drag on the gage caused by metal-to-metal contact is acceptable provided that the gage is still within certifiable limits. Provided that only hand threading of the gage into the hole is used, the amount of drag is not limited. However, it must be recognized that drag induces wear and that re-certification of the gages must be performed more frequently.

### 4. NOT-GO Gage Utilization Practice:

The NOT-GO Gages are designed to check that the threaded hole does not surpass the maximum feature limits. This is to ensure that the mating screw manufactured to the minimum tolerances limits of Class 2A English sizes and Class 6g Metric sizes will seat properly.

#### 4.1. HI-LIMIT Pitch Diameter Plug Gage:

4.1.1. Threads are acceptable as within the maximum feature limits of the pitch diameter if the NOT-GO Pitch Diameter Gage does not enter the threaded hole.

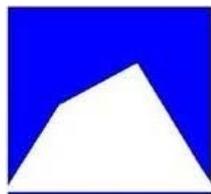
4.1.2. Threads are also acceptable if all complete product threads can be entered, provided that a definite drag from contact with the product material results on or before the third turn of entry. The gage should not be forced after the drag is definite. Special requirements such as exceptionally thin or ductile material, or small number of threads, may necessitate modification of this practice.

#### 4.2. HI-LIMIT Ramp Plug Gage:

4.2.1. Threads are acceptable as within the minimum material limits of ramp position if the NOT-GO Ramp Gage does not enter the threaded hole.

4.2.2. Threads are also acceptable if the NOT-GO Ramp Gage enters the threaded hole, up to a maximum of three (3) full revolutions into the threaded hole. Special requirements such as exceptionally thin or ductile material, or small number of threads, may necessitate modification of this practice.

Drag on the gage is a result of metal-to-metal contact and under no circumstances should the NOT-GO Gage be forced when the gage will no longer turn by hand.



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### 5. Gaging Heat Treated Spirallock Threads:

When gaging Spirallock threads that will be heat treated, all gage members (GO & NOT-GO) must function properly both before and after heat treating. [Exceptions may be handled by use of a functional gage. Contact Spirallock for more information.]

### 6. Gaging Spirallock Threads in Fasteners:

When gaging Spirallock fasteners, the GO and NOT-GO Gages are utilized as outlined in Section 3 with the gage entering from same direction as would the male threaded member. Threads are acceptable or rejectable per Sections 4.1 and 4.2 guidelines.

### 7. Gaging Plated Spirallock Threads:

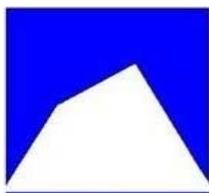
When gaging Spirallock threads, it should be the practice to gage threads with Spirallock GO and NOT-GO gages before plating to determine acceptability. Given all of the different types and thicknesses of platings, Spirallock Corporation does not produce taps or gages to compensate for plating thickness. Spirallock gages check for function as well as size, so Spirallock does not rely on plating to make the thread gageable due to the fact that platings are usually softer than the base material of the tapped hole. The free running feature of Spirallock can only be guaranteed in non-plated tapped holes. Because of the variations in plating thicknesses the GO gage may drag, or not fully enter, the thread in some cases. If the thread was gaged successfully before plating Spirallock will function properly.

### 8. Gaging as a Service Procedure:

When a product using Spirallock threads returns from the field and the servicing procedure calls for thread inspection, Spirallock recommends re-gaging the threads to validate that the thread form is still within acceptable dimensional limits. Residual debris in the tapped hole must be cleared away first by either washing or blowing out the hole or by running a Spirallock tap into the hole. CAUTION: using a standard 60° tap to clean out a Spirallock hole will cut away the Spirallock locking feature.

Only the NO-GO gages are required for re-gaging a Spirallock hole since they will show if any distortion has occurred in either the pitch diameter or the ramp feature.

If quantitative data is needed to requalify the hole(s), please contact Spirallock to learn about more advanced analytical services offered.



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### 9. Certification and Re-certification:

The goal of Spirallock Corporation is to maintain the integrity of the Spirallock thread form in the marketplace. Spirallock Corporation maintains strict controls on the thread form specifications, gage specifications, and the manufacturing of Spirallock products. At the time of manufacture a unique serial number is assigned to each gage member for traceability, and a long form certification is also supplied for each gage member. A copy of each certification (or re-certification) is retained at Spirallock Corporation for the life of the gage and may be used to evaluate wear at the time of re-certification.

It is Spirallock Corporation's suggestion that customers use this document as a "controlled document" to govern the use and re-certification of Spirallock gages. Establish a regular re-certification schedule, through Spirallock Corporation, based on the number of uses of a gage (rather than a fixed time period) to ensure that used gages remain within specification.

Spirallock gaging practices and procedures are per the U.S. Department of Commerce and National Bureau of Standards, Screw-Thread Standards for Federal Services, Handbook H28, Section VI (FED-STD-H28)

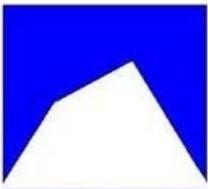
Gage tolerances are per ANSI/ASME/B1.2 and FED-STD-H28 Class "X" (Unified Inch) and ANSI/ASME/B1.16M Class "X" (Metric)

Standard gage blanks and handles are per ANSI/ASME B47.1

Gages are inspected and certified per MIL-STD-45662A and ANSI/NSCL Z540-1-1994

### 10. Compatibility with non-Spirallock threads:

Spirallock gages should only be used to gage holes created by Spirallock tooling (taps, thread mill cutters, carbide inserts, etc.). Spirallock gages cannot determine the functionality of non-Spirallock threads. Spirallock gages can be damaged by attempted insertion into non-Spirallock threads.



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### 11. Trademarks

Spirallock is a registered trademark of Spirallock Corporation, a Detroit Tool Industries Company. Spirallock Corporation and its licensed subsidiaries (see section 12 below) are the only authorized distributors of Spirallock tooling and fasteners.

The symbol "SPL" is a registered trademark of Spirallock Corporation, a Detroit Tool Industries Company. Where the symbol "SPL" or the word "Spirallock" are designated on engineering drawings, purchase orders, or other documentation only tooling, fasteners and gages supplied by Spirallock Corporation can be used.

### 12. Applicable Documents:

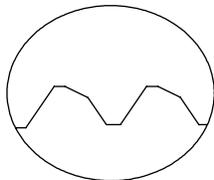
These defined Spirallock gaging practices are taken in whole or in part from, and are in conformance with, standard gaging practices as defined in the General Services Administration, Federal Standards, Screw Thread Standards for Federal Services, FED-STD-H28.

### 13. Gage Illustrations:

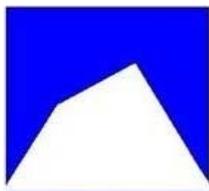
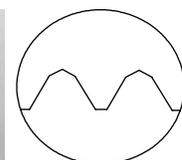
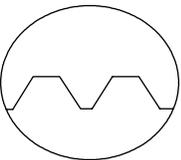
#### 13.1. Conventional Spirallock Thread Gages:

This three part gaging system is used with all Spirallock cutting tools making equal to or coarser than 32 TPI (0.80 mm).

GO Pitch Diameter and Ramp Gage



NOT-GO Pitch Diameter and Ramp Gage



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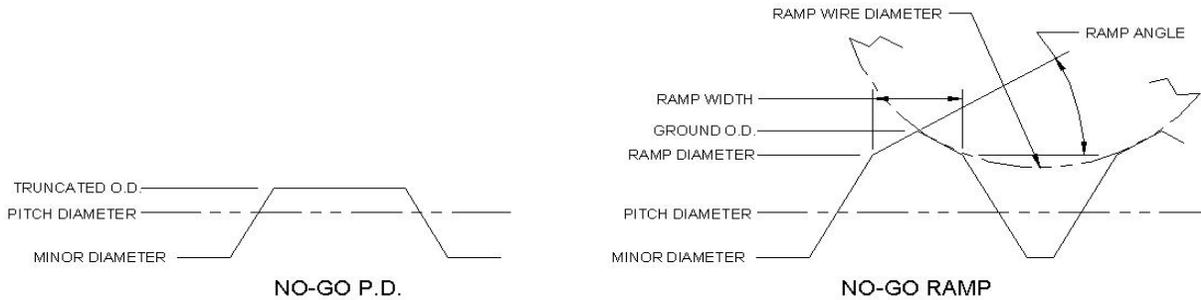
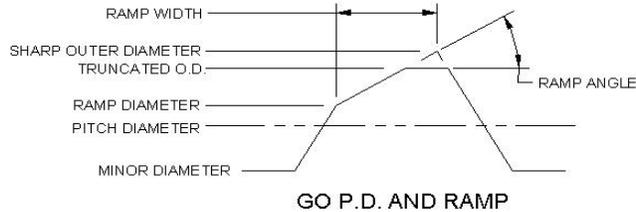
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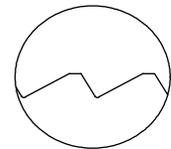
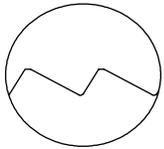
### 13.2. Conventional Spirallock Gage Specifications Pitches Coarser Than and Including 32 Threads Per Inch



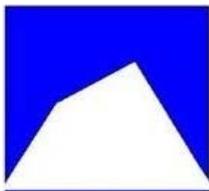
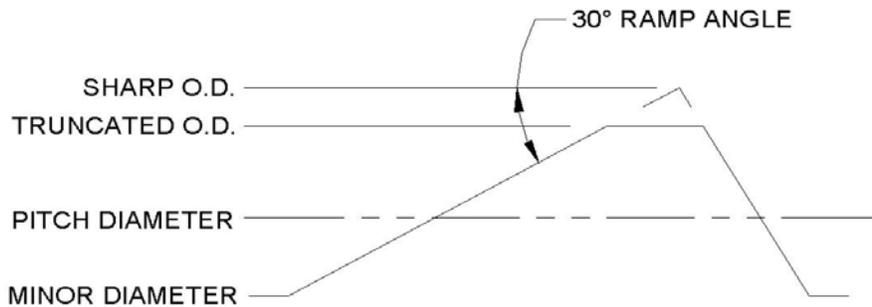
### 13.3. Spirallock Sawtooth Thread Gages:

Two gage system for use with all Spirallock cutting tools making finer than a 32 TPI (0.80 mm).

#### GO Pitch Diameter and NOT-GO Ramp Gage



### 13.4. Sawtooth Spirallock Gage Specifications Pitches Finer Than 32 Threads Per Inch



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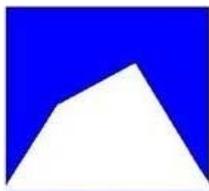
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### 14. Revisions

<u>Date</u>	<u>Revision</u>	<u>Description</u>	<u>Initials</u>
03 DEC 10	5.2	Add section 8, switch 13.2 & 13.3	JRJ
08FEB11	5.3	Add Exceptions to section 5	JRJ



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