

FED. SUP CLASS
53GP

SCREW THREADED, RING LOCKED, INSERTS FOR TAPPED HOLES SHALL BE SUBJECT TO THE FOLLOWING LIMITATIONS AND USAGE:

1. SELF-LOCKING INSERTS SHALL NOT BE USED AS FOLLOWS:
- (a) AT JOINTS IN CONTROL SYSTEMS AT SINGLE ATTACHMENTS OR WHERE LOSS OF BOLT WOULD AFFECT SAFETY OF FLIGHT.
- (b) WITH AN EXTERNALLY THREADED PART THAT SERVES AS AN AXIS OF ROTATION FOR ANOTHER PART UNLESS THE EXTERNALLY THREADED PART IS HELD BY A POSITIVE LOCKING DEVICE THAT REQUIRES SHEARING OR RUPTURE OF MATERIAL BEFORE TORSIONAL LOADS WOULD BE APPLIED TO THE EXTERNALLY THREADED PART IN SUCH A MANNER AS TO RELIEVE THE INITIAL STRESSES OF THE ASSEMBLY.
- EXAMPLE:** BEARINGS, BUSHINGS, CLAMP-UP BUSHINGS, PULLEYS, CRANKS, LEVERS, LINKAGES, HINGE PINS, AXLES, SHAFTS, SPINDLES, GEARS, CAMS, CAM FOLLOWERS, SLIDING MECHANISMS, AND PIVOT POINTS.
- (c) AT ANY SINGLE BOLTED STRUCTURAL JOINT WHICH SERVES AS A PRIMARY LOAD PATH, THE FAILURE OF WHICH WOULD ENDANGER THE SAFETY OF PERSONNEL OR WOULD RENDER THE EQUIPMENT INOPERATIVE OR CAUSE ITS DESTRUCTION.
- EXAMPLE:** FIXED JOINTS, TIE ROD, STRUTS (FIXED LENGTH MEMBERS) WING ATTACHMENTS TO FUSELAGE, STABILIZER SURFACE ATTACHMENTS, LONGERON JOINTS, ALIGHTING GEAR JOINTS, AND ENGINE MOUNTS.
2. INSERTS USED AS STRUCTURAL FASTENERS ARE INTENDED TO BE LOADED PREDOMINATELY IN TENSION. STRUCTURAL JOINTS CARRYING SHEAR LOADS SHOULD BE DESIGNED TO PRECLUDE SUBJECTING THE INSERTS TO SHEAR LOADS.
3. INSERTS ARE PRIMARILY USED TO PROVIDE HIGHER STRENGTH CAPABILITIES OR MORE PERMANENT THREADS IN RELATIVELY LOW STRENGTH STRUCTURAL MATERIALS. THESE MATERIALS ARE REFERRED TO AS THE "PARENT MATERIAL" WITH RESPECT TO THIS STANDARD.
4. ROUND OR CHAMFERED END BOLTS, STUDS, OR SCREWS MUST EXTEND AT LEAST THE FULL ROUND OR CHAMFER THROUGH SELF-LOCKING INSERTS.
5. INSERTS WHICH ARE INSTALLED IN THE STRUCTURE SHALL BE INSTALLED IN A POSITIVE MANNER AS SPECIFIED IN MS51995 TO ELIMINATE THE POSSIBILITY OF THEIR ROTATIONAL DISPLACEMENT WHEN INSTALLING OR REMOVING THE MATING BOLTS OR SCREWS. INSTALLATION AND REMOVAL OF THE LOCKRING SHALL BE ACCOMPLISHED WITHOUT INJURY TO THE PARENT MATERIAL TO PERMIT REPLACEMENT BY AN IDENTICAL INSERT AND LOCKRING.
6. ALL SELF-LOCKING INSERTS THAT HAVE HAD THE LOCKING ELEMENT REWORKED OR REPROCESSED BY OTHER THAN THE INSERT MANUFACTURER SHALL NOT BE USED BY CONTRACTORS OR FIELD MAINTENANCE PERSONNEL OF THE SERVICES.
7. SELF-LOCKING INSERTS SHALL NOT BE USED IN CONJUNCTION WITH BOLTS OR SCREWS ON JET ENGINE AIRCRAFT IN LOCATIONS WHERE THE LOOSE BOLT OR SCREW COULD BE INGESTED THROUGH THE ENGINE AIR INTAKE SCOOP.
8. IN THE PROCESS OF MAKING A DESIGN SELECTION OF INSERTS IN STRUCTURAL APPLICATIONS IT IS NECESSARY THAT THE PROPER DEGREE OF CONSIDERATION BE GIVEN TO THE AXIAL LOAD CARRYING CAPABILITIES OF THE INSTALLED INSERT IN THE SPECIFIC PARENT MATERIAL.
- THE AXIAL LOAD CAPABILITY (RESISTANCE TO PULLOUT) OF AN INSTALLED INSERT IS THE PRODUCT OF THE SHEAR ENGAGEMENT AREA OF THE INSERT EXTERNAL THREAD AND THE SHEAR ULTIMATE STRESS OF THE PARENT MATERIAL.
- (a) THE SHEAR ULTIMATE STRESS (f_{su}) FOR MOST MATERIALS IS LISTED IN MIL HANDBOOK 5.
- (b) THE SHEAR ENGAGEMENT AREAS OF THE INSERT EXTERNAL THREADS ARE LISTED IN MIL-I-45910.
- (c) SHEAR ENGAGEMENT AREA IS THE ASSEMBLED DIMENSIONAL VALUE FOR THE OVERALL ENGAGED AREA OF MATING THREAD MEMBERS. IT DOES NOT REPRESENT A DIMENSION OF EITHER OF THE MEMBERS IN AN UNASSEMBLED CONDITION.

THIS IS A DESIGN STANDARD. NOT USED AS A PART NUMBER.

P.A. Other Cust	WC 82 AS	TITLE INSERT, SCREW THREAD-LOCKED IN, RING LOCKED, SERRATED, DESIGN AND USAGE LIMITATIONS FOR	MILITARY STANDARD MS51998
PROCUREMENT SPECIFICATION NOT APPLICABLE	SUPERSEDES:		SHEET 1 OF 1

This military standard is mandatory for use by all Departments and Agencies of the Department of Defense. Selection for all new engineering and design applications and for repetitive use shall be made from this document.

REVIEWER: AT, AV, EL, IS, MI, MU, NSA, 11
USER: GL, MC, ME, OS, YD

APPROVED 12 DEC 1967 REVISED