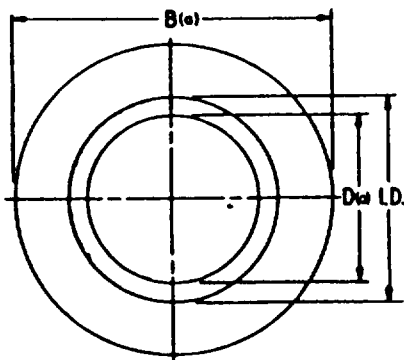


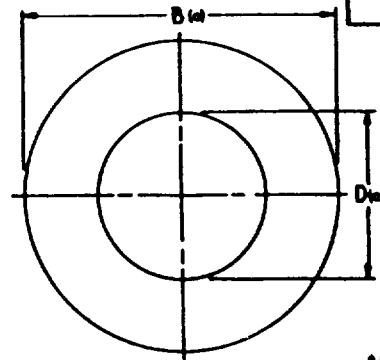
FED. SUP CLASS
5310

NET SYMBOL:

DEFINER SYMBOLS:



COUNTERSUNK WASHER
(FOR USE UNDER BOLT HEAD)



PLAIN WASHER
(FOR USE UNDER NUT)



Whenever information is correct as of the date of this document, for future completion of changes to this document, draft circulation should be based on the information in the current MS2129.

This military standard is mandatory for use by all Departments & agencies of the Department of Defense. Solicitation for all new engineering and design applications and for reprints use shall be made from this document.

| NOMINAL SIZE | WASHER NUMBER | | B(a) | | D(a) | | I.D. | | V | | FLATNESS MAX | APPROX WEIGHT LB/100 |
|--------------|---------------|-------|-------|-------|-------|-------|-------|-------|------|------|--------------|----------------------|
| | CBS | PLAIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | | |
| 1/10 | C3 | 3 | .387 | .377 | .195 | .191 | .290 | .280 | .069 | .057 | .007 | .15 |
| 1/4 | C4 | 4 | .491 | .481 | .255 | .251 | .340 | .340 | | | | .24 |
| 5/16 | C5 | 5 | .598 | .588 | .318 | .314 | .402 | .402 | | | | .35 |
| 3/8 | C6 | 6 | .712 | .702 | .380 | .376 | .507 | .497 | | | | .45 |
| 7/16 | C7 | 7 | .831 | .821 | .443 | .439 | .569 | .559 | .085 | .071 | .010 | .57 |
| 1/2 | C8 | 8 | .950 | .940 | .505 | .501 | .622 | .622 | | | | .89 |
| 9/16 | C9 | 9 | 1.069 | 1.059 | .568 | .564 | .694 | .684 | | | | 1.12 |
| 5/8 | C10 | 10 | 1.192 | 1.182 | .631 | .627 | .788 | .778 | | | | 1.40 |
| 3/4 | C12 | 12 | 1.433 | 1.423 | .756 | .752 | .913 | .903 | .119 | .099 | .015 | 2.03 |
| 7/8 | C14 | 14 | 1.668 | 1.658 | .881 | .877 | 1.038 | 1.028 | | | | 2.75 |
| 1 | C16 | 16 | 1.905 | 1.895 | 1.006 | 1.002 | 1.163 | 1.153 | | | | 3.59 |
| 1 1/8 | C18 | 18 | 2.150 | 2.140 | 1.131 | 1.127 | 1.288 | 1.278 | | | | 4.44 |
| 1 1/4 | C20 | 20 | 2.391 | 2.381 | 1.256 | 1.252 | 1.443 | 1.433 | .099 | .071 | .015 | 5.64 |
| 1 3/8 | C22 | 22 | 2.637 | 2.627 | 1.381 | 1.377 | 1.570 | 1.560 | | | | 6.97 |
| 1 1/2 | C24 | 24 | 2.884 | 2.874 | 1.506 | 1.502 | 1.695 | 1.685 | | | | 8.31 |

(a) MINIMUM BEARING AREA BASED ON A BEARING STRESS OF 90 KSI AT THE ULTIMATE TENSILE VALUE OF 240 KSI BOLT, OR THE FLANGE DIAMETER OF MS21085 NUTS WHICHEVER IS GREATER.

MATERIAL: ALLOY STEEL, MIL-S-4788, .MIL-S-18279.

HARDNESS: ROCKWELL C 39-48.

SURFACE TEXTURE: 125/IN ACCORDANCE WITH ASA B46.1-1962 (AMST).

PLATING: CADMIUM PLATE, QQ-P-416, TYPE II, CLASS 2.

PARALLELISM: WASHER FACES SHALL BE PARALLEL WITHIN .002 INCH.

WASHER SHALL BE FREE FROM ALL HANGING BURRS AND SLIVERS WHICH MIGHT BECOME DISLOGGED UNDER USAGE.

DIMENSIONS IN INCHES.

DESIGN AND USAGE INFORMATION: THESE WASHERS ARE PRIMARILY FOR USE WITH MS21085 NUTS AND MS21298 BOLTS.

FOR DESIGN FEATURE PURPOSES, THIS STANDARD TAKES PRECEDENCE OVER DOCUMENTS REFERENCED THEREIN. REFERENCE SHALL BE MADE TO THE EFFECT ON DATE OF INVITATIONS FOR BID.

EXAMPLE OF PART NUMBER: MS21299-3 WASHER, PLAIN, FOR NO. 10 SIZE, 240 KSI BOLT.
MS21299-C3 WASHER, COUNTERSUNK, FOR NO. 10 SIZE, 240 KSI BOLT.

APPROVED 28 JAN 1972 REVISED

| | | |
|--|---|------------------------------|
| P.A. NAVY - AB Other Code USAF-11 ARMY-AV | TITLE | MILITARY STANDARD MS21299 |
| | WASHER, COUNTERSUNK AND PLAIN FOR USE WITH BOLTS AND NUTS UP TO AND INCLUDING 240 KSI TENSILE | |
| PROCUREMENT SPECIFICATION | SUPERSEDES | SHEET 1 OF 1 |