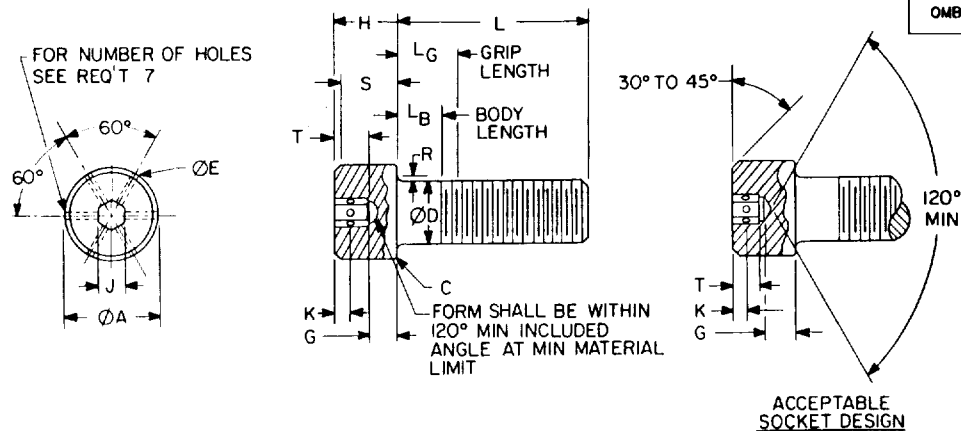


THE REQUIREMENTS FOR ACQUIRING THE PRODUCT(S) DESCRIBED HEREIN SHALL CONSIST OF THIS SPECIFICATION SHEET AND THE ISSUE OF THE FOLLOWING SPECIFICATION LISTED IN THAT ISSUE OF THE DODISS SPECIFIED IN THE SOLICITATION: FF-S-86

THIS SPECIFICATION IS APPROVED FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE.



Form Approved  
OMB No. 0704-0188

TABLE I. DASH NUMBERS AND DIMENSIONS

NOMINAL SIZE			#6 (.138)	#8 (.164)	#10 (.190)	1/4 (.250)				
THREAD SIZE			.138-40UNF-3A	.164-36UNF-3A	.190-32UNF-3A	.250-28UNF-3A				
ØD	BODY	MAX	.1380	.1640	.1900	.2500				
		MIN	.1329	.1585	.1840	.2435				
ØA	HEAD	MAX	.226	.270	.312	.375				
		MIN	.218	.262	.303	.365				
H	HEAD HEIGHT	MAX	.138	.164	.190	.250				
		MIN	.134	.159	.185	.244				
S	HEAD SIDE HEIGHT	MIN	.124	.148	.171	.225				
J	SOCKET WIDTH ACROSS FLATS	MAX	.1111	.1426	.1587	.1900				
		MIN	.1094	.1406	.1562	.1875				
T	KEY ENGAGEMENT	MIN	.064	.077	.090	.120				
G	WALL THICKNESS	MIN	.047	.056	.065	.095				
C	CHAMFER OR RADIUS	MAX	.005	.005	.005	.008				
R	FILLET EXTENSION	MAX	.010	.012	.014	.014				
		MIN	.006	.007	.009	.009				
K	HOLE LOCATION	MAX	.050	.060	.065	.085				
		MIN	.035	.040	.045	.065				
ØE	HOLE	MAX	.039	.050	.050	.050				
		MIN	.033	.044	.044	.044				
	RECOMMENDED WIRE DIAMETER	MAX	.028	.040	.040	.040				
		MIN	.020	.032	.032	.032				
ALIGNMENT PLUG DIAMETER 1/			.025	.030	.030	.030				
TENSILE STRENGTH, LBS 2/ MIN			1,830	2,650	3,600	6,190				
L LENGTH	TOLERANCE	DASH NO	L <sub>G</sub> MAX	L <sub>B</sub> MIN	DASH NO	L <sub>G</sub> MAX	L <sub>B</sub> MIN	DASH NO	L <sub>G</sub> MAX	L <sub>B</sub> MIN
.250		1								
.375		2			6			9		19
.500	+0.00	3			7			10		20
.625	-0.03	4			8			11		21
.750		5						12		22
.875								13		23
1.000								14		24
1.250								15	.38	.17
1.500	+0.00							16	.38	.17
1.750	-0.04							17	.88	.67
2.000								18	.88	.67
2.250										
							</			

<sup>1/</sup> SEE REQUIREMENT 8

<sup>2/</sup> SEE REQUIREMENT 9

(E) ENTIRE STANDARD REVISED

INCH - POUND

PREPARING ACTIVITY: ARMY-AR

CUSTODIANS: ARMY-

NAVY-OS

AIR FORCE-99

DLA-

REVIEW: EA,ER,IS,SH

USER: AS,AT,AV,MC,ME,YD

PROJECT NUMBER: 5305-1917

DISTRIBUTION STATEMENT

A. Approved for public release; distribution is unlimited.

MILITARY SPECIFICATION SHEET

TITLE

SCREW, CAP, SOCKET HEAD, HEXAGON,  
DRILLED ALLOY STEEL, (UNF-3A)

SPECIFICATION SHEET NUMBER

MS24678E 2 JAN 92

SUPERSEDING MS24678D 5 MARCH 1986  
AND MS24675

AMSC- N/A

FSC- 5305

Page 1 of 4

DD Form 672, MAY 88

PREVIOUS EDITIONS ARE OBSOLETE

GPO: 1989-506-945

THE REQUIREMENTS FOR ACQUIRING THE PRODUCT(S) DESCRIBED HEREIN SHALL CONSIST OF THIS SPECIFICATION SHEET AND THE ISSUE OF THE FOLLOWING SPECIFICATION LISTED IN THAT ISSUE OF THE DODISS SPECIFIED IN THE SOLICITATION: FF-S-86

THIS SPECIFICATION IS APPROVED FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE.

Form Approved  
OMB No. 0704-0188

TABLE I. DASH NUMBERS AND DIMENSIONS - CONTINUED

NOMINAL SIZE			5/16 (.3125)	3/8 (.375)	7/16 (.4375) <sup>3/</sup>	1/2 (.500)								
THREAD SIZE			.3125-24UNF-3A	.375-24UNF-3A	.4375-20UNF-3A	.500-20UNF-3A								
ØD	BODY	MAX	.3125	.3750	.4375	.5000								
		MIN	.3053	.3678	.4294	.4919								
ØA	HEAD	MAX	.469	.562	.656	.750								
		MIN	.457	.550	.642	.735								
H	HEAD HEIGHT	MAX	.312	.375	.438	.500								
		MIN	.306	.368	.430	.492								
S	HEAD SIDE HEIGHT	MIN	.281	.337	.394	.450								
J	SOCKET WIDTH	MAX	.2530	.3160	.3790	.3790								
	ACROSS FLATS	MIN	.2500	.3125	.3750	.3750								
T	KEY ENGAGEMENT	MIN	.151	.182	.213	.245								
G	WALL THICKNESS	MIN	.119	.143	.166	.190								
C	CHAMFER OR RADIUS	MAX	.008	.008	.010	.010								
R	FILLET EXTENSION	MAX	.017	.020	.023	.026								
		MIN	.012	.015	.018	.020								
K	HOLE LOCATION	MAX	.104	.123	.141	.160								
		MIN	.084	.103	.121	.140								
ØE	HOLE	MAX	.050	.067	.067	.067								
		MIN	.044	.061	.061	.061								
	RECOMMENDED WIRE DIAMETER	MAX	.040	.057	.057	.057								
		MIN	.032	.045	.045	.045								
	ALIGNMENT PLUG DIAMETER 1/		.030	.051	.051	.051								
TENSILE STRENGTH, LBS 2/ MIN			9,860	14,900	20,200	27,200								
L LENGTH	TOLERANCE SIZE		DASH NO	L <sub>G</sub> MAX	L <sub>B</sub> MIN	DASH NO	L <sub>G</sub> MAX	L <sub>B</sub> MIN	DASH NO	L <sub>G</sub> MAX	L <sub>B</sub> MIN	DASH NO	L <sub>G</sub> MAX	L <sub>B</sub> MIN
	.375 OR UNDER	.4375 AND OVER												
.500	+0.00 -0.03	+0.00 -0.03	30			41								
.625			31			42								
.750			32			43								
.875			33			44								
1.000			34			45			53			57		
1.250			35			46			54			58		
1.500	+0.00 -0.04	+0.00 -0.06	36			47			55			59		
1.750			37	.62 .35	48	.50 .19				60				
2.000			38	.62 .35	49	.50 .19	56	.62 .27	61					
2.250			39	1.12 .85	50	1.00 .69			62	.75 .36				
2.500			40	1.12 .85	51	1.00 .69			63	.75 .36				
3.000					52	1.50 1.19			64	1.50 1.12				

<sup>1/</sup> SEE REQUIREMENT 8

<sup>2/</sup> SEE REQUIREMENT 9

<sup>3/</sup> INACTIVE FOR NEW DESIGN

PREPARING ACTIVITY: ARMY-AR CUSTODIANS: ARMY- NAVY- OS AIR FORCE- 99 DLA- REVIEW: EA,ER,IS,SH USER: AS,AT,AV,MC,ME,YD PROJECT NUMBER: 5305-1917 DISTRIBUTION STATEMENT	MILITARY SPECIFICATION SHEET TITLE SCREW, CAP, SOCKET HEAD, HEXAGON, DRILLED ALLOY STEEL, (UNF-3A)	SPECIFICATION SHEET NUMBER <b>MS24678E</b> 2 JAN 92 SUPERSEDING MS24678D 5 MARCH 1986 AND MS24675 AMSC- N/A FSC- 5305
A. Approved for public release; distribution is unlimited.		Page <u>2</u> of <u>4</u>

THE REQUIREMENTS FOR ACQUIRING THE PRODUCT(S) DESCRIBED HEREIN SHALL CONSIST OF THIS SPECIFICATION SHEET AND THE ISSUE OF THE FOLLOWING SPECIFICATION LISTED IN THAT ISSUE OF THE DODDS SPECIFIED IN THE SOLICITATION: FF-S-86

THIS SPECIFICATION IS APPROVED FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE.

Form Approved  
OMB No. 0704-0188

TABLE I. DASH NUMBERS AND DIMENSIONS - CONTINUED

NOMINAL SIZE			5/8 (.625)		
THREAD SIZE			.625-18UNF-3A		
ØD	BODY	MAX	.6250		
		MIN	.6163		
ØA	HEAD	MAX	.938		
		MIN	.921		
H	HEAD HEIGHT	MAX	.625		
		MIN	.616		
S	HEAD SIDE HEIGHT	MIN	.562		
J	SOCKET WIDTH	MAX	.5050		
	ACROSS FLATS	MIN	.5000		
T	KEY ENGAGEMENT	MIN	.307		
G	WALL THICKNESS	MIN	.238		
C	CHAMFER OR RADIUS	MAX	.010		
R	FILLET EXTENSION	MAX	.032		
		MIN	.024		
K	HOLE LOCATION	MAX	.198		
		MIN	.178		
ØE	HOLE	MAX	.067		
		MIN	.061		
	RECOMMENDED	MAX	.057		
	WIRE	MIN	.045		
1/	ALIGNMENT PLUG DIAMETER		.051		
2/	TENSILE STRENGTH, LBS	MIN	43,500		
L LENGTH	TOLERANCE		DASH NO	L <sub>G</sub> MAX	L <sub>B</sub> MIN
1.000	+0.00		65 66 67 68 69 70		
1.250	-0.03				
1.500					
1.750	+0.00				
2.000	-0.06				
2.500					
				.75	.30

1/ SEE REQUIREMENT 8

2/ SEE REQUIREMENT 9

#### INTERCHANGEABILITY DATA

EFFECTIVE 7 JULY 1975, MS24675 WAS CANCELLED AND SUPERSEDED BY MS24678

MS24675 AND THE SCREWS COVERED BY THE PART NUMBERS LISTED IN THE STANDARD ARE CANCELLED AFTER THE DATE INDICATED ON THIS DOCUMENT.

USE ONLY THE PART NUMBER FROM MS24678 FOR DESIGN AND REPLACEMENT.

CANCELLED MS24675 SCREWS CANNOT ALWAYS REPLACE MS24578 SCREWS AND SHOULD BE USED ONLY WHERE APPLICABLE UNTIL EXISTING STOCK IS DEPLETED.

MS24678 SCREWS SHALL BE USED IN LIEU OF THE CANCELLED MS24675 SCREWS OF THE SAME DASH NUMBERS. FOR EXAMPLE:

SCREWS MS24675-1 THROUGH MS24675-70  
ARE CANCELLED AND SUPERSEDED BY  
SCREWS MS24678-1 THROUGH MS24678-70

PREPARING ACTIVITY: ARMY-AR

CUSTODIANS: ARMY-

NAVY- OS

AIR FORCE- 99

DLA-

REVIEW: EA,ER,IS,SH

USER: AS,AT,AV,MC,ME,YD

PROJECT NUMBER: 5305-1917

DISTRIBUTION STATEMENT

#### MILITARY SPECIFICATION SHEET

TITLE

SCREW, CAP, SOCKET HEAD, HEXAGON,  
DRILLED ALLOY STEEL, (UNF-3A)

SPECIFICATION SHEET NUMBER

**MS24678E** 2 JAN 92

SUPERSEDING MS24678D 5 MARCH 1986  
AND MS24675

AMSC- N/A

FSC- 5305

A. Approved for public release; distribution is unlimited.

Page 3 of 4

THE REQUIREMENTS FOR ACQUIRING THE PRODUCT(S) DESCRIBED HEREIN SHALL CONSIST OF THIS SPECIFICATION SHEET AND THE ISSUE OF THE FOLLOWING SPECIFICATION LISTED IN THAT ISSUE OF THE DODISS SPECIFIED IN THE SOLICITATION: FF-S-86

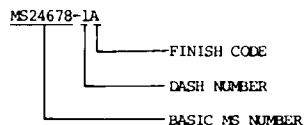
THIS SPECIFICATION IS APPROVED FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE.

Form Approved  
OMB No. 0704-0188

# REQUIREMENTS:

1. MATERIAL: ALLOY STEEL IN ACCORDANCE WITH PROCUREMENT SPECIFICATION.
2. PROTECTIVE COATING AND SURFACE TREATMENT: UNCOATED, CADMIUM PLATE IN ACCORDANCE WITH QQ-P-416, TYPE II, CLASS 3, OR ALUMINUM ION VAPOR DEPOSITED IN ACCORDANCE WITH MIL-C-83488, TYPE II, CLASS 3 (SEE REQ 11).
  - (a) DO NOT USE CADMIUM PLATED SCREWS FOR TEMPERATURES ABOVE 450°.
  - (b) ALUMINUM ION VAPOR DEPOSITED COATING CAN BE USED FOR TEMPERATURES UP TO 850°F.
3. HARDNESS: IN ACCORDANCE WITH PROCUREMENT SPECIFICATION.
4. THREADS: THREADS SHALL BE IN ACCORDANCE WITH FED-STD-H28/2. ACCEPTABILITY OF SCREW THREADS SHALL BE IN ACCORDANCE WITH FED-STD-H28/20, SYSTEM 22.
5. THREAD LENGTH: SCREWS ABOVE HEAVY LINE SHALL HAVE COMPLETE (FULL FORM) THREADS EXTENDING WITHIN TWO THREADS OF THE HEAD.
6. HEAD: HEAD MAY OR MAY NOT BE KNURLED AT MANUFACTURER'S OPTION. TYPE OF KNURLING OPTIONAL. DIAMETER OF KNURLED HEAD SHALL NOT EXCEED THE MAXIMUM HEAD DIAMETER SPECIFIED.
7. DRILLED HOLE DATA:
  - (a) SCREWS #6 (.138) SHALL HAVE ONE (1) HOLE DRILLED THROUGH THE HEAD. SCREWS #8 (.164) AND LARGER SHALL HAVE (3) HOLES DRILLED THROUGH THE HEAD.
  - (b) ON SCREWS SMALLER THAN #8 (.164) THE DRILLED HOLE SHALL BE CENTERED AS CLOSE AS PRACTICABLE ON THE FLAT OF THE HEXAGON SOCKET. ON SCREWS #8 (.164) AND LARGER THE DRILLED HOLES SHALL BE WITHIN THE FLATS ON THE HEXAGON SOCKET AND SHALL NOT BREAK THE CORNERS OF THE HEXAGON SOCKET.
  - (c) EDGES OF THE HOLES ON THE OUTSIDE OF THE HEAD SHALL BE CHAMFERED 45° BY 0.010 TO 0.020 DEEP.
8. ALIGNMENT PLUG: PLUG SHALL PASS COMPLETELY THROUGH THE DRILLED HOLES IN THE HEAD WITHOUT DEFLECTION.
9. TENSILE STRENGTH: BASED ON MINIMUM ULTIMATE TENSILE OF 180,000 PSI FOR SIZES #4 (.112) THRU #10 (.190) AND 170,000 PSI FOR SIZES OVER #10 (.190). LOAD POUNDS CALCULATED BY THE STRESS AREAS INDICATED IN FED-STD-H28/2.
10. FINISH CODE:
 

A - ALUMINUM COATING  
U - NO PROTECTIVE COATING OR SURFACE TREATMENT  
NO CODE - CADMIUM PLATE (NOTE: MS24678D PART NUMBERS IN GOVERNMENT INVENTORY WITH ADDED "C" SHALL BE USED UNTIL STOCK IS DEPLETED.)
11. PART NUMBER: THE PART NUMBER SHALL CONSIST OF THE BASIC MS NUMBER FOLLOWED BY A DASH NUMBER TAKEN FROM TABLE I, FOLLOWED BY A FINISH CODE LETTER, IF APPLICABLE.



MS24678-1A INDICATES - SCREW, CAP, SOCKET HEAD, HEXAGON, DRILLED ALLOY STEEL; .138-40 UNF-3A; LENGTH .250; ALUMINUM COATING.

MS24678-1 INDICATES - SCREW, CAP, SOCKET HEAD, HEXAGON, DRILLED ALLOY STEEL; .138-40 UNF-3A; LENGTH .250; CADMIUM PLATE.

MS24678-1U INDICATES - SCREW, CAP, SOCKET HEAD, HEXAGON, DRILLED ALLOY STEEL, .138-40 UNC-3A, LENGTH .250; NO PROTECTIVE COATING OR SURFACE TREATMENT.

12. SOURCE IDENTIFICATION MARK: SCREWS WITH NOMINAL SIZES .190 AND LARGER SHALL BE PERMANENTLY MARKED TO IDENTIFY THE SOURCE ACCEPTING RESPONSIBILITY FOR THE SCREWS MEETING THE REQUIREMENTS SPECIFIED HEREIN. THE MARKING SHALL BE A SOURCE IDENTIFYING SYMBOL FOR A MANUFACTURER IN ACCORDANCE WITH GOVERNMENT REGULATIONS OR A PRIVATE LABEL DISTRIBUTOR'S SYMBOL AS APPLICABLE.

## NOTES:

1. ALL DIMENSIONS ARE IN INCHES.
2. IN THE EVENT OF A CONFLICT BETWEEN THE TEXT OF THIS STANDARD AND THE REFERENCES CITED HEREIN, THE TEXT OF THIS STANDARD SHALL TAKE PRECEDENCE.
3. REFERENCED GOVERNMENT (OR NON-GOVERNMENT) DOCUMENTS OF THE ISSUE LISTED IN THAT ISSUE OF THE DEPARTMENT OF DEFENSE INDEX OF SPECIFICATIONS AND STANDARDS (DODISS) SPECIFIED IN THE SOLICITATION FORM A PART OF THIS STANDARD TO THE EXTENT SPECIFIED HEREIN.

PREPARING ACTIVITY: ARMY-AR CUSTODIANS: ARMY- NAVY- OS AIR FORCE- 99 DLA- REVIEW: EA,ER,IS,SH USER: AS,AT,AV,MC,ME,YD PROJECT NUMBER: 5305-1917	<u>MILITARY SPECIFICATION SHEET</u> TITLE SCREW, CAP, SOCKET HEAD, HEXAGON, DRILLED ALLOY STEEL, (UNF-3A)	SPECIFICATION SHEET NUMBER <b>MS24678E</b> 2 JAN 92 SUPERSEDING MS24678D 5 MARCH 1986 AND MS24675 AMSC- N/A FSC- 5305
DISTRIBUTION STATEMENT A Approved for public release; distribution is unlimited.		Page 4 of 4

DD Form 672, MAY 88

PREVIOUS EDITIONS ARE OBSOLETE

GPO: 1989-606-645