

Electrical Technologies Panel

June 18, 2009

Alexandria, Virginia

Connectors

National Shipbuilding Research Program



Advanced Shipbuilding Enterprise

Connectors

OVERVIEW:

- An item on the original issues list as a major concern from PEO Ships
- On several programs, the lead hulls have many connectorization issues

Connectors

CURRENT ISSUES:

- Instances where connectors, backshells, extenders, angles, and adaptors from various manufacturers don't fit each other.
- These are noted in the Encyclopedia of Connectors as "*Obsolete for New Construction*".
- GFE connectors don't fit newer cables
- GFE connectors and backshells don't fit each other
- GFE equipment still has these connectors
- Foreign and / or COTS equipment connectors don't fit MIL-SPEC cables or allow for proper grounding

**THE ENCYCLOPEDIA
of
CONNECTORS**

**COMMERCIAL AND MILITARY
CYLINDRICAL CONNECTORS**

**THE ENCYCLOPEDIA
of
CONNECTORS
VOLUME VII
BOOK 1**

**MILITARY AND COMMERCIAL
RECTANGULAR RACK & PANEL CONNECTORS**

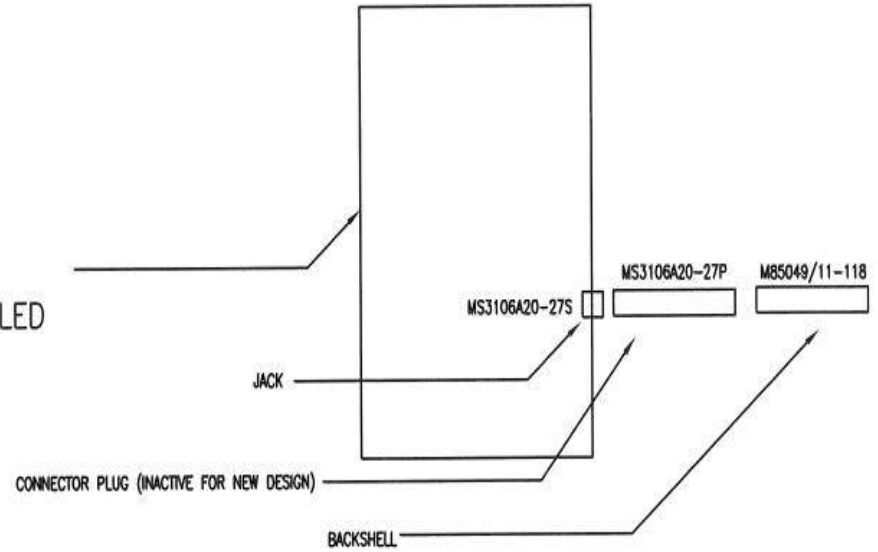


EDWARD'S PUBLISHING COMPANY, INC.

14129 Chadron Avenue, P.O. Box 1668
Hawthorne, CA 90251-1668

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Representaion of Government Furnished Equipment (GFE)
WITH MIL SPEC 5015 BOX MOUNT RECEPTACLE (JACK) INSTALLED



MIL-C-5015 SOLDER ORDERING INFORMATION

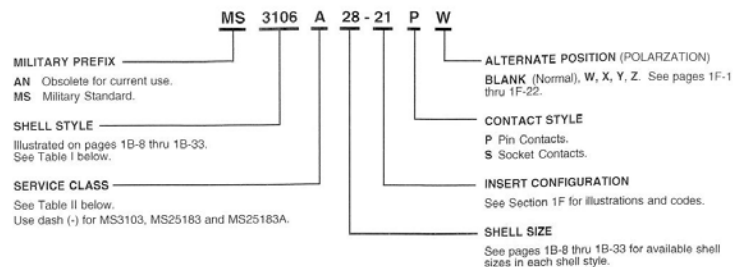


TABLE I. SHELL STYLE

MS NO.	DESCRIPTION	AVAILABLE IN CLASS	SEE PAGE
MS3100	Wall mount receptacle	A, C, E, F, K, R	1B-8 thru 1B-11
MS3101	In-line receptacle	A, B, F, R	1B-12 thru 1B-14
MS3102	Box mount receptacle	A, C, E, K, R	1B-15 thru 1B-17
MS3103	Wall mount receptacle, potting seal	-	1B-18
MS3106	Straight plug	A, B, E, F, K, R	1B-19 thru 1B-23
MS3107	Quick disconnect plug	A, B	1B-24
MS3108	90° angle plug	A, B, E, F, K, R	1B-25 thru 1B-28
MS3142	Box mount receptacle, hermetic seal. See page 1B-29 for ordering information	H	1B-30
MS3143	Solder mount receptacle, hermetic seal. See page 1B-29 for ordering information	H	1B-31
MS3436	Straight plug. See page 1B-32 for ordering information	A	1B-32
MS3507	Quick disconnect plug. See page 1B-32 for ordering information	A	1B-32
MS25183	Straight plug, potting seal	-	1B-33
MS25183A	Straight plug, potting seal, with ground lug	-	1B-33

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TABLE II. SERVICE CLASS

CLASS	DESCRIPTION	MATERIAL	FINISH	TEMP.
A	Solid shell, non-environmental	Aluminum alloy	Cadmium, olive drab, 96 hr. salt spray	125° C
B	Split shell, non-environmental	Aluminum alloy	Cadmium, olive drab, 96 hr. salt spray	125° C
C	Pressurized	Aluminum alloy	Cadmium, olive drab, 96 hr. salt spray	125° C
E	Environmental, superseded by R or F	Aluminum alloy	Cadmium, olive drab, 96 hr. salt spray	125° C
F	R type with strain relief	Aluminum alloy	Cadmium, olive drab, 96 hr. salt spray	125° C
H	Hermetic	Steel	Cadmium, olive drab, 96 hr. salt spray	125° C
K	Firewall	Steel	Cadmium, olive drab, 96 hr. salt spray	125° C
M	Replaced by class E	-	-	125° C
PR	Replaced by class C	-	-	125° C
R	Environmental grommet seal	Aluminum alloy	Cadmium, olive drab, 96 hr. salt spray	125° C

1007

MIL-C-5015 SOLDER ORDERING INFORMATION

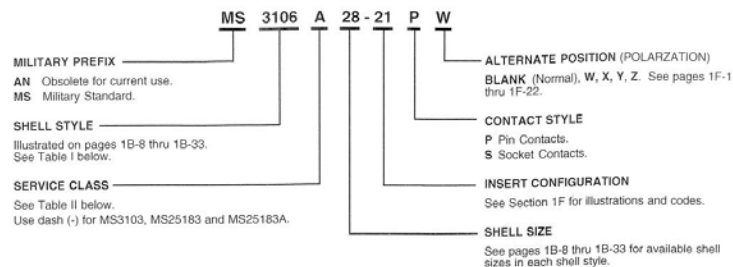


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MS3102	Box mount receptacle	A, C, E, K, R	1B-15 thru 1B-17
MS3103	Wall mount receptacle, potting seal	-	1B-18
MS3106	Straight plug	A, B, E, F, K, R	1B-19 thru 1B-23
MS3107	Quick disconnect plug	A, B	1B-24
MS3108	90° angle plug	A, B, E, F, K, R	1B-25 thru 1B-28
MS3142	Box mount receptacle, hermetic seal. See page 1B-29 for ordering information	H	1B-30
MS3143	Solder mount receptacle, hermetic seal. See page 1B-29 for ordering information	H	1B-31
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F	R type with strain relief	Aluminum alloy	Cadmium, olive drab, 96 hr. salt spray	125° C
H	Hermetic	Steel	Cadmium, olive drab, 96 hr. salt spray	125° C
K	Firewall	Steel	Cadmium, olive drab, 96 hr. salt spray	125° C
M	Replaced by class E	-	-	125° C
PR	Replaced by class C	-	-	125° C
R	Environmental grommet seal	Aluminum alloy	Cadmium, olive drab, 96 hr. salt spray	125° C

1007

SOLDER **MIL-C-5015**
SUPERSESION DATA

MS NUMBER	SIZES	STATUS	FOR REPLACEMENT USE:	FOR NEW DESIGN USE:
MS3100A or C	8S-40	Cancelled 1 Jan 1991	MS3100F or MS3100R	MS3450W + M85049/31
MS3100A or C	44-48	Inactive for new design ¹		Not Applicable
MS3100E	8S-40	Cancelled 1 Jan 1991	MS3100F or MS3100R	MS3450W + M85049/31
MS3100K	8S-40	Inactive for new design ²		MS3450K + M85-049/31
MS3100F	8S-40	Inactive for new design ²		MS3450W + M85049/52
MS3100R	8S-40	Inactive for new design ²		MS3450W + M85049/31
MS3101A or B	8S-40	Cancelled 1 Jan 1991	MS3101F or MS3101R	MS3451W + M85049/31
MS3101A or B	44-48	Inactive for new design ¹		Not Applicable
MS3101E	8S-40	Cancelled 1 Jan 1991	MS3101F or MS3101R	MS3451W + M85049/31
MS3101F	8S-40	Inactive for new design ²		MS3451W + M85049/52
MS3101R	8s-40	Inactive for new design ²		MS3451w + M85049/31
MS3102A or C	8S-40	Inactive for new design ²	MS3102R	MS3452W
MS3102A or C	44-48	Inactive for new design ²		Not Applicable
MS3102E	8S-40	Cancelled 1 Jan 1991	MS3102R	MS3452W
MS3102K	8S-40	Inactive for new design ²		MS3452K
MS3102R	8S-40	Inactive for new design ²		MS3452W
MS3103	8S-40	Inactive for new design ²		None Specified
MS3106A	8S-40	Inactive for new design ²		MS3456W + M85049/31
MS3106A	44-48	Inactive for new design ²		Not Applicable
MS3106B	8S-40	Inactive for new design ²	MS3106A	MS3456W + M85049/31
MS3106E	8S-40	Cancelled 1 Jan 1991	MS3106F or MS3106R	SM3456W + M85049/31
MS3106F	8S-40	Inactive for new design ²		MS3456W + M85049/52
MS3106K	8S-40	Inactive for new design ²		MS3456K + M85049/31
MS3106R	8S-40	Inactive for new design ²		MS3456w + M85049/31
MS3107A	8S-28	Inactive for new design ²		None Specified
MS3107B	8S-28	Cancelled 1 Jan 1991	MS3107A	None Specified
MS3108A	8S-40	Inactive for new design ¹	MS3108A	None Specified
MS3108B	8S-40	Inactive for new design ¹		None Specified
MS3108E	8S-40	Cancelled 1 Jan 1991	MS3108R + M85049 Clamp	None Specified
MS3108K	8S-40	Inactive for new design ²		None Specified
MS3108R 8S-40	8S-40	Inactive for new design ²		None Specified
MS3142H	All	Inactive for new design ³		None Specified
MS3143H	All	Inactive for new design ³		None Specified

1. Inactive for new design prior to 1 January 1991.
2. Inactive for new design 1 January 1991.
3. Inactive for new design 25 April 1974.

SOLDER **MIL-C-5015**
SUPERSESSSION DATA

MS NUMBER	SIZES	STATUS	FOR REPLACEMENT USE:	FOR NEW DESIGN USE:
MS3100A or C	8S-40	Cancelled 1 Jan 1991	MS3100F or MS3100R	MS3450W + M85049/31
MS3100A or C	44-48	Inactive for new design ¹		Not Applicable
MS3100E	8S-40	Cancelled 1 Jan 1991	MS3100F or MS3100R	MS3450W + M85049/31
MS3100K	8S-40	Inactive for new design ²		MS3450K + M85-049/31
MS3100F	8S-40	Inactive for new design ²		MS3450W + M85049/52
MS3100R	8S-40	Inactive for new design ²		MS3450W + M85049/31
MS3101A or B	8S-40	Cancelled 1 Jan 1991	MS3101F or MS3101R	MS3451W + M85049/31
MS3101A or B	44-48	Inactive for new design ¹		Not Applicable
MS3101E	8S-40	Cancelled 1 Jan 1991	MS3101F or MS3101R	MS3451W + M85049/31
MS3101F	8S-40	Inactive for new design ²		MS3451W + M85049/52
MS3101R	8s-40	Inactive for new design ²		MS3451w + M85049/31
MS3102A or C	8S-40	Inactive for new design ²	MS3102R	MS3452W
MS3102A or C	44-48	Inactive for new design ²		Not Applicable
MS3102E	8S-40	Cancelled 1 Jan 1991	MS3102R	MS3452W
MS3102K	8S-40	Inactive for new design ²		MS3452K
MS3102R	8S-40	Inactive for new design ²		MS3452W
MS3103	8S-40	Inactive for new design ²		None Specified
MS3106A	8S-40	Inactive for new design ²		MS3456W + M85049/31
MS3106A	44-48	Inactive for new design ²		Not Applicable
MS3106B	8S-40	Inactive for new design ²	MS3106A	MS3456W + M85049/31
MS3106E	8S-40	Cancelled 1 Jan 1991	MS3106F or MS3106R	SM3456W + M85049/31
MS3106F	8S-40	Inactive for new design ²		MS3456W + M85049/52
MS3106K	8S-40	Inactive for new design ²		MS3456K + M85049/31
MS3106R	8S-40	Inactive for new design ²		MS3456w + M85049/31
MS3107A	8S-28	Inactive for new design ²		None Specified
MS3107B	8S-28	Cancelled 1 Jan 1991	MS3107A	None Specified
MS3108A	8S-40	Inactive for new design ¹	MS3108A	None Specified
MS3108B	8S-40	Inactive for new design ¹		None Specified
MS3108E	8S-40	Cancelled 1 Jan 1991	MS3108R + M85049 Clamp	None Specified
MS3108K	8S-40	Inactive for new design ²		None Specified
MS3108R 8S-40	8S-40	Inactive for new design ²		None Specified
MS3142H	All	Inactive for new design ³		None Specified
MS3143H	All	Inactive for new design ³		None Specified

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MS3100K	8S-40	Inactive for new design ²		MS3450K + M85-049/31
MS3100F	8S-40	Inactive for new design ²		MS3450W + M85049/52
MS3100R	8S-40	Inactive for new design ²		MS3450W + M85049/31
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MS3101E	8S-40	Cancelled 1 Jan 1991	MS3101F or MS3101R	MS3451W + M85049/31
MS3101F	8S-40	Inactive for new design ²		MS3451W + M85049/52
MS3101R	8s-40	Inactive for new design ²		MS3451w + M85049/31
MS3102A or C	8S-40	Inactive for new design ²	MS3102R	MS3452W
MS3102A or C	44-48	Inactive for new design ²		Not Applicable
MS3102E	8S-40	Cancelled 1 Jan 1991	MS3102R	MS3452W
MS3102K	8S-40	Inactive for new design ²		MS3452K
MS3102R	8S-40	Inactive for new design ²		MS3452W
MS3103	8S-40	Inactive for new design ²		None Specified
MS3106A	8S-40	Inactive for new design ²		MS3456W + M85049/31
MS3106A	44-48	Inactive for new design ²		Not Applicable
MS3106B	8S-40	Inactive for new design ²	MS3106A	MS3456W + M85049/31
MS3106E	8S-40	Cancelled 1 Jan 1991	MS3106F or MS3106R	SM3456W + M85049/31
MS3106F	8S-40	Inactive for new design ²		MS3456W + M85049/52
MS3106K	8S-40	Inactive for new design ²		MS3456K + M85049/31
MS3106R	8S-40	Inactive for new design ²		MS3456w + M85049/31
MS3107A	8S-28	Inactive for new design ²		None Specified
MS3107B	8S-28	Cancelled 1 Jan 1991	MS3107A	None Specified
MS3108A	8S-40	Inactive for new design ¹	MS3108A	None Specified
MS3108B	8S-40	Inactive for new design ¹		None Specified
MS3108E	8S-40	Cancelled 1 Jan 1991	MS3108R + M85049 Clamp	None Specified
MS3108K	8S-40	Inactive for new design ²		None Specified
MS3108R 8S-40	8S-40	Inactive for new design ²		None Specified
MS3142H	All	Inactive for new design ³		None Specified
MS3143H	All	Inactive for new design ³		None Specified

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M85049/11
STRAIGHT BACKSHELL WITH CABLE CLAMP
 SUPERSEDES MS3437B

FOR MIL-C-5015

M85049 /11 - 06 N
MS3437 B 06 N

MIL SPEC

APPLICATION

SEE APPLICATION CODE
 TABLE BELOW

FINISH/MATERIAL

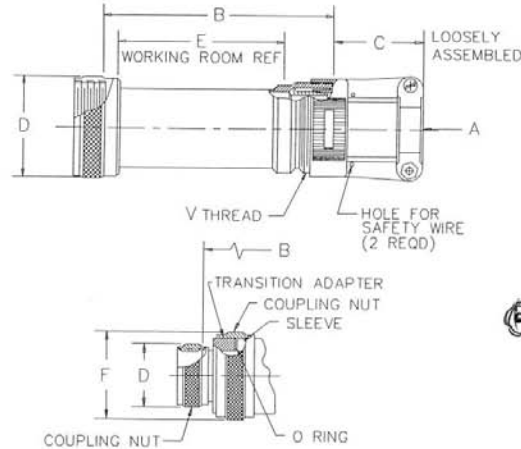
MS3189/M85049		FINISH	MATERIAL
A	W	CADMIUM, OLIVE DRAB OVER SUITABLE UNDERPLATE 1000 HR. SALT SPRAY	ALUMINUM
C	-	CADMIUM, OLIVE DRAB	ALUMINUM
N	N	ELECTROLESS NICKEL RESTRICTED TO SPACE APPLICATIONS ONLY	ALUMINUM
-	B	BLACK CADMIUM	STAINLESS STEEL
-	S	PASSIVATE	STAINLESS STEEL

DASH NO.

SEE DIMENSION TABLE

MS3437/M85049		APPLICATION
A	/10	FOR SHIELD TERMINATION AND ENVIRONMENTAL APPLICATIONS. ARMOR SHIELD TERMINATION AND ENVIRONMENTAL APPLICATIONS MAY BE ACHIEVED BY REVERSING THE FERRULES AND GROMMETS.
B	/11	FOR ENVIRONMENTAL APPLICATIONS ONLY AND IS TYPE "A"/10 LESS THE REAR ADAPTER AND FERRULES AND WITH GROMMET REPLACING THE FERRULES.
C	/25	FOR SHIELD TERMINATION APPLICATIONS ONLY AND IS TYPE "A" /10 LESS THE REAR ADAPTER AND GROMMET. (NON-ENVIRONMENTAL)

2 BACKSHELLS ENVIRONMENTAL



1A749

M85049/11
STRAIGHT BACKSHELL WITH CABLE CLAMP
 SUPERSEDES MS3437B

2
BACKSHELLS
ENVIRONMENTAL

DASH NO.	FITS SHELL OF CONN.					CLAMP SIZE	A		STYLE	B ±.125 ±.3.17	C REF.	øD MAX.	øE REF.	øF MAX.	V THREAD CLASS 2A
	MIL-C-81703 SERIES 3	MIL-C-26482 SERIES 2	MIL-C-5015 CRIMP	MIL-C-83723 SERIES III	WIRE BUNDLE ACCOMMODATION RANGE		MIN.	MAX.							
							[]	[]							
1	3	-	-	-	4	.125 [3.17]	.250 [6.35]	1	2.00 [50.80]	1.027 [26.09]	.669 [16.99]	1.06 [26.92]	-	625-24 UNEF	
2	3	-	-	-	4	.125 [3.17]	.250 [6.35]	1	3.00 [76.20]	1.027 [26.09]	.669 [16.99]	2.06 [52.32]	-	625-24 UNEF	
3	3	-	-	-	6	.250 [6.35]	.437 [11.10]	2	2.75 [69.85]	1.027 [26.09]	.669 [16.99]	1.81 [45.97]	.858 [21.79]	750-20 UNEF	
4	3	-	-	-	6	.250 [6.35]	.437 [11.10]	2	3.75 [95.25]	1.027 [26.09]	.669 [16.99]	2.81 [71.37]	.858 [21.79]	750-20 UNEF	
5	-	8	8S	8	4	.125 [3.17]	.250 [6.35]	1	2.00 [50.80]	1.027 [26.09]	.617 [15.67]	1.06 [26.92]	-	625-24 UNEF	
6	-	8	8S	8	4	.125 [3.17]	.250 [6.35]	1	3.00 [76.20]	1.027 [26.09]	.617 [15.67]	2.06 [52.32]	-	625-24 UNEF	
7	-	8	8S	8	6	.250 [6.35]	.437 [11.10]	2	2.75 [69.85]	1.027 [26.09]	.617 [15.67]	1.81 [45.97]	.858 [21.79]	750-20 UNEF	
8	-	8	8S	8	6	.250 [6.35]	.437 [11.10]	2	3.75 [95.25]	1.027 [26.09]	.617 [15.67]	2.81 [71.37]	.858 [21.79]	750-20 UNEF	
9	-	10	10S,10SL	10	4	.125 [3.17]	.312 [7.92]	1	2.00 [50.80]	1.027 [26.09]	.734 [18.64]	1.06 [26.92]	-	625-24 UNEF	
10	-	10	10S,10SL	10	4	.125 [3.17]	.312 [7.92]	1	3.00 [76.20]	1.027 [26.09]	.734 [18.64]	2.06 [52.32]	-	625-24 UNEF	
11	-	10	10S,10SL	10	6	.250 [6.35]	.437 [11.10]	2	2.75 [69.85]	1.027 [26.09]	.734 [18.64]	1.81 [45.97]	.858 [21.79]	750-20 UNEF	
12	-	10	10,10SL	10	6	.250 [6.35]	.437 [11.10]	2	3.75 [95.25]	1.027 [26.09]	.734 [18.64]	2.81 [71.37]	.858 [21.79]	750-20 UNEF	
13	7	12	12,12S	12	6	.250 [6.35]	.437 [11.10]	1	2.00 [50.80]	1.027 [26.09]	.858 [21.79]	1.06 [26.92]	-	750-20 UNEF	
14	7	12	12,12S	12	6	.250 [6.35]	.437 [11.10]	1	3.00 [76.20]	1.027 [26.09]	.858 [21.79]	2.06 [52.32]	-	750-20 UNEF	
15	7	12	12,12S	12	10	.350 [8.89]	.625 [15.87]	2	2.75 [69.85]	1.027 [26.09]	.858 [21.79]	1.67 [42.42]	1.112 [28.24]	1,000-20 UNEF	
16	7	12	12,12S	12	10	.350 [8.89]	.625 [15.87]	2	3.75 [95.25]	1.027 [26.09]	.858 [21.79]	2.67 [67.82]	1.112 [28.24]	1,000-20 UNEF	
17	12	14	14,14S	14	10	.350 [8.89]	.575 [14.60]	1	2.00 [50.80]	1.027 [26.09]	.984 [24.99]	.92 [23.37]	-	1,000-20 UNEF	
18	12	14	14,14S	14	10	.350 [8.89]	.575 [14.60]	1	3.00 [76.20]	1.027 [26.09]	.984 [24.99]	1.92 [48.77]	-	1,000-20 UNEF	
19	12	14	14,14S	1.4	12	.500 [12.70]	.750 [19.05]	2	2.75 [69.85]	1.059 [26.90]	.984 [24.99]	1.67 [42.42]	1.112 [28.24]	1,187-18 UNEF	
20	12	14	14,14S	1.4	12	.500 [12.70]	.750 [19.05]	2	3.75 [95.25]	1.059 [26.90]	.984 [24.99]	2.67 [67.82]	1.112 [28.24]	1,187-18 UNEF	
21	19	16	16,16S	16	12	.500 [12.70]	.700 [17.78]	1	2.00 [50.80]	1.059 [26.90]	1.112 [28.24]	.92 [23.37]	-	1,187-18 UNEF	
22	19	16	16,16S	16	12	.500 [12.70]	.700 [17.78]	1	3.00 [76.20]	1.059 [26.90]	1.112 [28.24]	1.92 [48.77]	-	1,187-18 UNEF	
23	19	16	16,16S	16	16	.625 [15.87]	.937 [23.80]	2	2.75 [69.85]	1.156 [29.36]	1.112 [28.24]	1.67 [42.42]	1.468 [37.29]	1,437-18 UNEF	
24	19	16	16,16S	16	16	.625 [15.87]	.937 [23.80]	2	3.75 [95.25]	1.156 [29.36]	1.112 [28.24]	2.67 [67.82]	1.468 [37.29]	1,437-18 UNEF	
25	27	18	18	18	10	.350 [8.89]	.625 [15.87]	1	2.00 [50.80]	1.027 [26.09]	1.218 [30.94]	.92 [23.37]	-	1,000-20 UNEF	
26	27	18	18	18	10	.350 [8.89]	.625 [15.87]	1	3.00 [76.20]	1.027 [26.09]	1.218 [30.94]	1.92 [48.77]	-	1,000-20 UNEF	
27	27	18	18	18	12	.500 [12.70]	.750 [19.05]	1	2.00 [50.80]	1.059 [26.90]	1.218 [30.94]	.92 [23.37]	-	1,187-18 UNEF	
28	27	18	18	18	12	.500 [12.70]	.750 [19.05]	1	3.00 [76.20]	1.059 [26.90]	1.218 [30.94]	1.92 [48.77]	-	1,187-18 UNEF	
29	27	18	18	18	16	.625 [15.87]	.937 [23.80]	2	2.75 [69.85]	1.156 [29.36]	1.218 [30.94]	1.67 [42.42]	1.468 [37.29]	1,437-18 UNEF	
30	27	18	18	18	16	.625 [15.87]	.937 [23.80]	2	3.75 [95.25]	1.156 [29.36]	1.218 [30.94]	2.67 [67.82]	1.468 [37.29]	1,437-18 UNEF	

1. DIMENSIONS IN BRACKETS [] ARE IN MILLIMETERS.

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DISCUSSION