| | |
|---|---|
| TEST TYPE: | ASTM E-330 STRUCTURAL TESTING |
| TESTING AUTHORITY: | ASTM |
| TEST NAME: | FLEXURAL MOMENT CAPACITY |
| TEST DATE: | JANUARY 21, 2001 |
| TEST COMPLETED BY: | THOMAS M. SHINGLER, P.E. REGISTERED STRUCTURAL ENGINEER |
| TESTING LABORATORY | DESIGN DYNAMICS, INC. |
| PANEL TYPE: | 1 ½" SNAP-SEAM ROOF PANEL |
| PANEL WIDTH: | 16.00 IN. WIDE X 24 GAGE STEEL WITH 20 GA. CLIP |
| CLIP SPACING: | 2.0 TO 5.0 FT |
| DECKING CONSTRUCTION: | PURLINS |

PURPOSE: This series of metal roof panel testing is designed to establish the positive/negative flexural moment capacity, flexural stiffness index (Moment of Inertia) and the clip/sidejoint interactive capacity of the Metalforming, Inc. 1 ½" Snap-Seam product using the industry-accepted ASTM E-330 chamber procedure.

METHOD: The positive/negative flexural moment capacity and the flexural stiffness index of the panel were determined using a single span (6 ft.) test panel arrangement. There were four (4) full width test panels with male/female joint starter and terminal edges.

The male/female joint starter and terminal edges were utilized to render continuity to the lay-up of the panel assembly and prevent the influence of so-called "edge effects".

For the positive flexural moment capacity and positive flexural stiffness index, the panels were installed with the rib configuration in an "up" position.

For the negative flexural moment capacity and negative flexural stiffness index, the panels were installed with the rib configuration in a "down" position.

The positive/negative flexural stiffness indices were computed using load vs. deflection points at eight (8) levels of loading.

The clip/sidejoint interactive capacity was determined using a series of five (5) ASTM E-330 chamber tests.

The first two (2) tests had panel edge fastening spaced at 1.0 ft. o/c. The second set of three (3) tests had panel edge fastening spaced at 4.0 ft o/c.

There were six (6) full width test panels with male/female joint starter and terminal edges.

The male/female joint starter and terminal edges were utilized to render continuity to the lay-up of the panel

ASSEMBLY AND PREVENT THE INFLUENCE OF SO-CALLED "EDGE EFFECTS".

FOR THE CLIP/SIDEJOINT INTERACTIVE CAPACITY TEST, THE PANELS WERE INSTALLED WITH THE RIB CONFIGURATION IN A "DOWN" POSITION.

SET-UP:   IN-PLAN, THE TEST CHAMBER FOR THE SINGLE SPAN FLEXURAL MOMENT CAPACITY AND FLEXURAL STIFFNESS INDEX EVALUATION WAS 6 FT. 5 ½" WIDE X 6 FT. 9" LONG. IN-PLAN, THE TEST CHAMBER FOR THE CLIP/SIDEJOINT INTERACTIVE STRENGTH EVALUATION WAS 8 FT. 6" LONG X 16 FT. LONG.

RELATIVE TO THE POSITIVE/NEGATIVE FLEXURAL MOMENT CAPACITY AND THE POSITIVE/NEGATIVE FLEXURAL STIFFNESS INDEX, THE ASTM E-330 TESTING PROCEDURE IS DESIGNED TO APPLY A UNIFORM NEGATIVE PRESSURE TO THE ROOF PANEL SPECIMEN.

FOR THE FLEXURAL MOMENT CAPACITY TESTING............ A "RIB UP" ORIENTATION FORCES THE TOP PORTION OF THE RIB ELEMENT INTO COMPRESSION AND THE PANEL BROAD FLAT INTO TENSION......EMULATING SINGLE CURVATURE POSITIVE BENDING.

THE NET RESULT OF TESTING THIS PANEL ORIENTATION TO BUCKLING FAILURE IS THE ESTABLISHMENT OF THE POSITIVE FLEXURAL MOMENT CAPACITY.

A FACTOR-OF-SAFETY OF 2.00 APPLIED TO THE POSITIVE FLEXURAL MOMENT CAPACITY DETERMINES THE ALLOWABLE POSITIVE FLEXURAL MOMENT OF THE PANEL.

A "RIB DOWN" ORIENTATION FORCES THE TOP PORTION OF THE RIB ELEMENT INTO TENSION AND THE PANEL BROAD FLAT INTO COMPRESSION..... EMULATING SINGLE CURVATURE NEGATIVE BENDING.

THE NET RESULT OF TESTING THIS PANEL ORIENTATION TO BUCKLING FAILURE IS THE ESTABLISHMENT OF THE NEGATIVE FLEXURAL MOMENT CAPACITY.

A FACTOR-OF-SAFETY OF 2.00 APPLIED TO THE NEGATIVE FLEXURAL MOMENT CAPACITY DETERMINES THE ALLOWABLE NEGATIVE FLEXURAL MOMENT FOR THE PANEL.

THE POSITIVE/NEGATIVE FLEXURAL STIFFNESS INDICES (POSITIVE/NEGATIVE MOMENTS OF INERTIA) WERE DETERMINED FROM SINGLE SPAN RIB UP/ RIB DOWN LOAD VS. DEFLECTION VALUES INSERTED INTO THE ESTABLISHED SINGLE SPAN MAXIMUM DEFLECTION EQUATION AND THEN SOLVING FOR THE APPLICABLE (+/-) MOMENT OF INERTIA VALUE.

FOR EXTREME ACCURACY, A SERIES OF EIGHT (8) LOAD VS. DEFLECTION INCREMENTS FALLING WITHIN THE ELASTIC RANGE OF THE PROFILE WERE INCORPORATED INTO THE TEST PROCEDURE FOR DETERMINING FLEXURAL STIFFNESS.

THE CLIP/SIDEJOINT INTERACTIVE CAPACITY TESTING INVOLVED THE DEVELOPMENT OF A HIGH INTENSITY CLIP REACTION FORCES THRU THE APPLICATION OF EVER-INCREASING TEST PRESSURE.

THE TEST PRESSURE WAS APPLIED TO THE PANEL ASSEMBLY IN A "RIBS DOWN" ORIENTATION TO SIMULATE THE EFFECTS OF WIND INDUCED "LIFT".

THE TEST PRESSURE WAS GRADUALLY APPLIED UNTIL CLIP/SIDEJOINT FAILURE OCCURRED, WITH THE POINT OF FAILURE BEING DEFINED AS THE CLIP/SIDEJOINT INTERACTIVE STRENGTH.

A Factor-of-Safety of 1.875 applied to the test-determined clip/sidejoint interactive strength capacity value determines the allowable clip/sidejoint reaction.

The applicable deflection equation is as follows...................

$$\text{DEFLECTION} = \frac{22.5 \times w \times L^4}{E \times I}$$

DEFLECTION = recorded test deflection for a corresponding test pressure value, in.

| | | |
|---|---|---|
| w | = | test pressure value, psf |
| L | = | test span, ft. |
| L | = | 6.0 ft |
| I | = | Moment of Inertia, in$^4$ |
| E | = | Modulus of Elasticity of material, #/in$^2$ |
| E | = | 29.5 x 10$^6$ #/in$^2$ (steel) |

Re-arranging terms and solving for the Moment of Inertia value, the equation becomes.........................

$$I = \frac{22.5 \times w \times L^4}{E \times \text{deflection}}$$

Test Results:

Positive Stiffness Index, (+) I Determination...............................

| Test Pressure, psf | Test No. 1 | Test No. 2 | Test No. 3 | Test-Determined (+) I, in$^4$ avg |
|---|---|---|---|---|
| 15.0 | 0.040 | 0.041 | 0.040 | 0.040 |

(+) I (average) = 0.040 in$^4$

Positive Flexural Moment Capacity:

The applicable flexural moment equation is as follows........................

M (ultimate) = 1.50 x w (ultimate) x L$^2$

$$M \text{ (allowable)} = \frac{M \text{ (ultimate)}}{\text{F.S.} = 2.00}$$

| Test No. | W (ultimate), #/ft$^2$ | M (ultimate), in-# | M (allowable), in-# |
|---|---|---|---|
| 1 | 38.85 | 2098 | 1049 |
| 2 | 39.04 | 2108 | 1054 |
| 3 | 38.95 | 2103 | 1052 |

(+) M (allowable, average) = 1052 in-#

Determine the (+) Section Modulus for the profile based on an allowable flexural stress level Fb of 30,000 #/in$^2$...............

$$(+) S = \frac{(+) M \text{ (allow)}}{Fb} \quad \frac{1052 \text{ in-\#}}{30,000 \text{ #/in}^2}$$

(+) S = 0.035 IN^3

NEGATIVE STIFFNESS INDEX, (-) I DETERMINATION....................................

| TEST PRESSURE, PSF | TEST NO. 1 | TEST NO. 2 | TEST NO. 3 | TEST-DETERMINED (-) I, IN^4, (AVG) |
|---|---|---|---|---|
| 15.0 | 0.018 | 0.018 | 0.018 | 0.018 |

(-) I (AVERAGE) = 0.018 IN^4

NEGATIVE FLEXURAL MOMENT CAPACITY:

| TEST NO. | W (ULTIMATE), #/FT^2 | M (ULTIMATE), IN-# | M (ALLOWABLE), IN-# |
|---|---|---|---|
| 1 | 39.80 | 2149 | 1074 |
| 2 | 39.20 | 2116 | 1058 |
| 3 | 38.76 | 2093 | 1046 |

(-) S = 0.035 IN^3

CLIP/SIDEJOINT INTERACTIVE STRENGTH CAPACITY:     20 GA. CLIP

THE APPLICABLE CLIP/SIDEJOINT REACTION EQUATION IS AS FOLLOWS......

R= w x L

| TEST NO. | SPAN FT. | W (ULTIMATE) #/FT^2 | R (ULTIMATE) #/FT | R (ALLOWABLE) #/FT |
|---|---|---|---|---|
| 1 | 1.00 | 78.11 | 78.11 | 41.6 |
| 2 | 1.00 | 76.74 | 76.74 | 40.9 |
| 3 | 4.00 | 49.88 | 199.52 | 106.4 |
| 4 | 4.00 | 42.58 | 170.32 | 90.8 |
| 5 | 4.00 | 47.86 | 191.44 | 102.1 |

R (ALLOW, AVG) @ 1.0 FT = 41.2 #/FT          NOTE: LINEAR INTERPOLATION WILL BE USED TO DEFINE INTERMEDIATE VALUES BETWEEN TEST EXTREMES

R (ALLOW, AVG) @ 4.0 FT. = 99.8 #/FT

STATE EFFECTIVE SECTION PROPERTIES PER FT OF WIDTH OF PROFILE

PROFILE: 1 ½" SNAP-SEAM @ 16.00" WIDE X 24 GAGE STEEL

(+) I (EFF) =     [0.71 X 0.40] + [0.29 X 0.018] = 0.034 IN^4

(+) S (EFF) =     $\frac{1052 \text{ IN-}\#}{30,000 \text{ }\#/\text{IN}^2}$ = 0.035 IN^3

(-) I (EFF)    =     [0.71 X 0.018] + [0.29 X 0.040] = 0.024 IN^4

(-) S (EFF)    =     $\frac{1059 \text{ IN-}\#}{30,000 \text{ }\#/\text{IN}^2}$  =   0.035 IN^3

R (ALLOW, AVG) @ 1.0 FT = 41.2                    WITH 20 GA. CLIP

R (allow, avg) @ 4.0 ft = 99.8 #/ft

Note:  Use (+) I (eff) for deflection considerations when the panel is experiencing downward (positive) loading normal to the plane of the roof.

Use (-) I (eff) for deflection considerations when the panel is experiencing upward (negative) loading normal to the plane of the roof.

Use R (allowable) for the consideration of  panel clip/ sidejoint interactive capacity when panel experiences upward (negative) loading normal to the plane of the roof.

@ 1.00 :  R (allow)  =  41.2 #/ft
   1.25 :            =  46.0
   1.50:             =  50.9
   1.75:             =  55.8
   2.00:             =  60.7 #/ft
   2.25:             =  65.6
   2.50:             =  70.5
   2.75:             =  75.3
   3.00:             =  80.2 #/ft
   3.25:             =  85.1
   3.50:             =  90.0
   3.75:             =  94.9
   4.00:             =  99.8 #/ft

| Metalforming, Inc.          1 ½" Snap Seam Profile 24 gage steel 16.0" wide – 6'-0" span          Ribs = UP   Test Span= 6.0 ft. | | | |
|---|---|---|---|
| **E-330** | **Deflection Values @ Key Panel Location** | | |
| Load, psf | Test One | Test Two | Test Three |
| 3.00 | 0.052 | 0.050 | 0.055 |
| 6.00 | 0.124 | 0.119 | 0.129 |
| 9.00 | 0.199 | 0.197 | 0.203 |
| 12.00 | 0.275 | 0.275 | 0.281 |
| 15.00 | 0.367 | 0.360 | 0.367 |
| 18.00 | 0.474 | 0.466 | 0.464 |
| 21.00 | 0.597 | 0.592 | 0.591 |
| 24.00 | 0.750 | 0.750 | 0.756 |
| 27.00 | 0.914 | 0.929 | 0.942 |
| 30.00 | 1.143 | 1.205 | 1.211 |
| W(ult) | 32.08 | 31.39 | 31.38 |

**Test One**
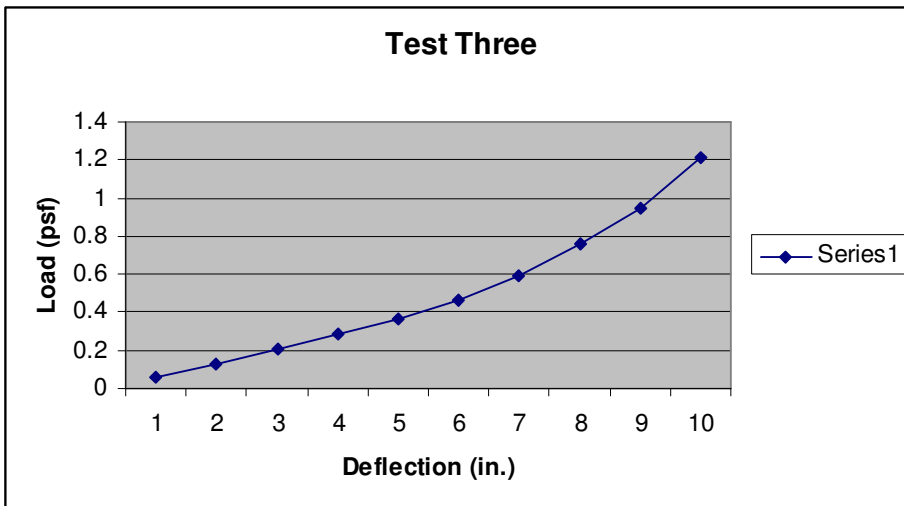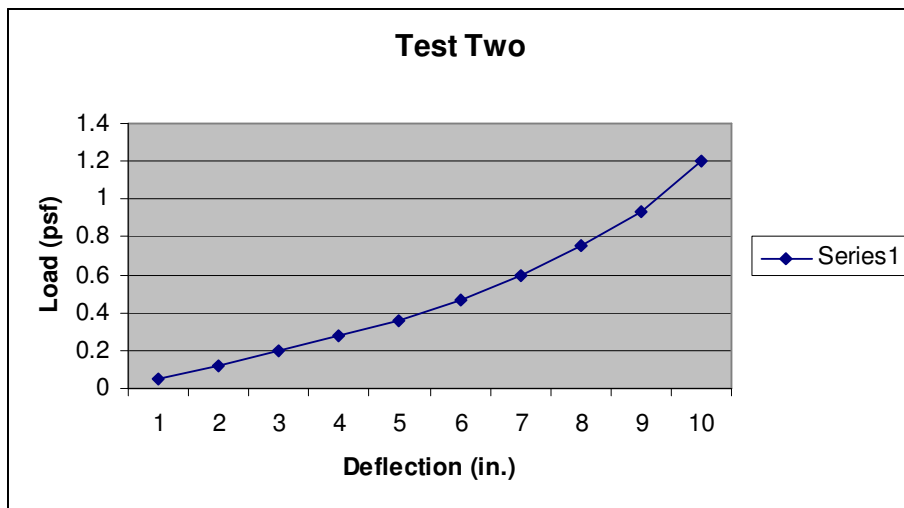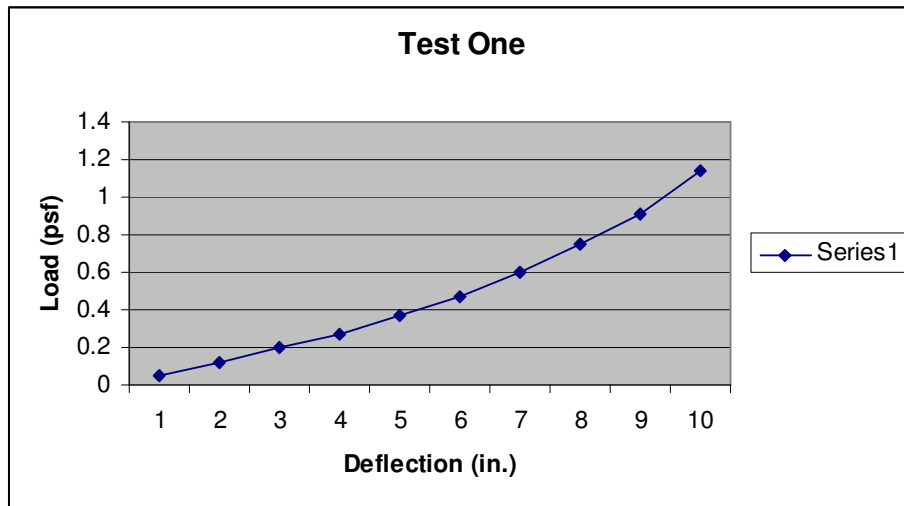


**Test Two**



**Test Three**

| METALFORMING, INC. 1 ½" SNAP SEAM PROFILE 24 GAGE STEEL 16.0" WIDE – 6'-0" SPAN RIBS = DOWN TEST SPAN= 6.0 FT. | | | |
|---|---|---|---|
| **E-330** | **DEFLECTION VALUES @ KEY PANEL LOCATION** | | |
| LOAD, PSF | TEST ONE | TEST TWO | TEST THREE |
| 3.00 | 0.145 | 0.160 | 0.159 |
| 6.00 | 0.302 | 0.324 | 0.321 |
| 9.00 | 0.464 | 0.487 | 0.489 |
| 12.00 | 0.637 | 0.661 | 0.660 |
| 15.00 | 0.816 | 0.844 | 0.838 |
| 18.00 | 1.001 | 1.038 | 1.028 |
| 21.00 | 1.208 | 1.235 | 1.223 |
| 24.00 | 1.425 | 1.444 | 1.429 |
| 27.00 | 1.661 | 1.666 | 1.651 |
| 30.00 | 1.914 | 1.885 | 1.891 |
| 33.00 | 2.196 | 2.144 | 2.193 |
| W(ULT) | 34.07 | 34.20 | 33.98 |
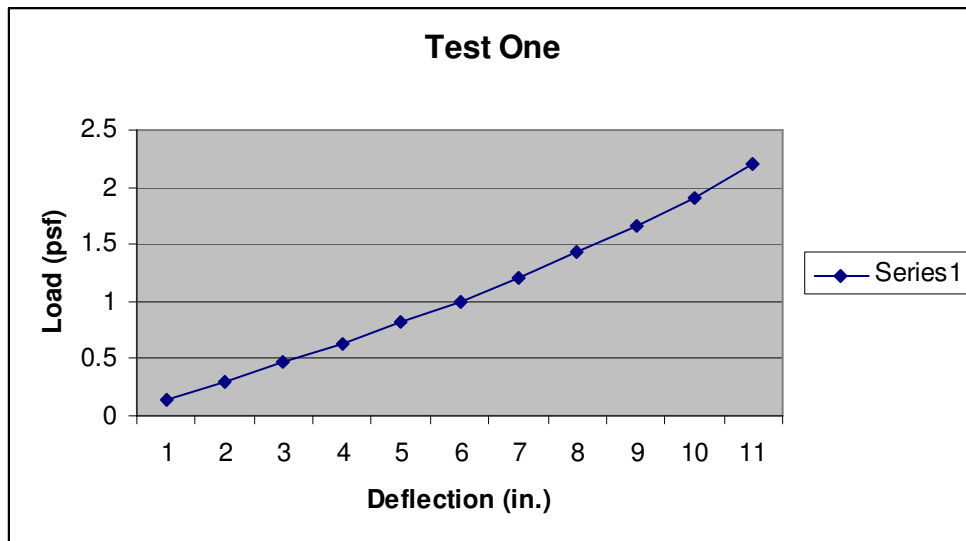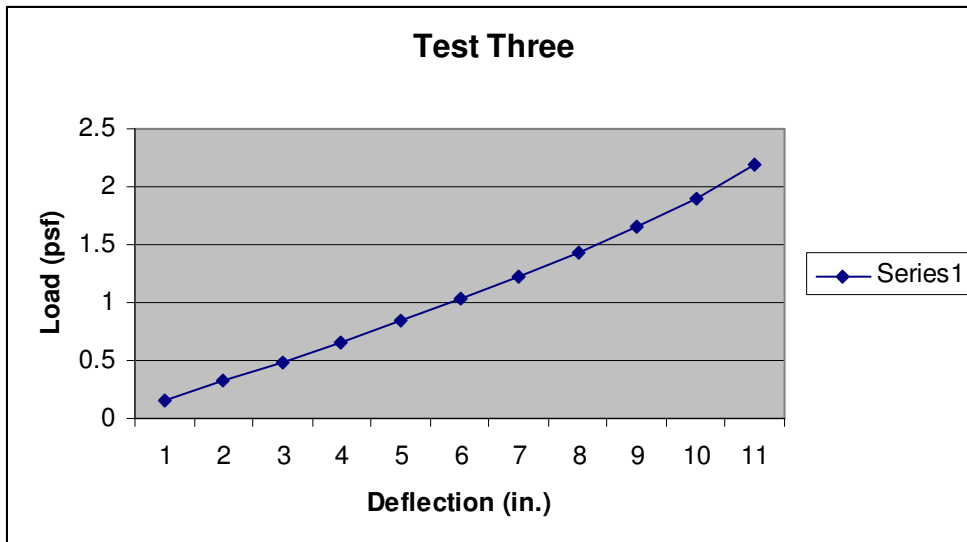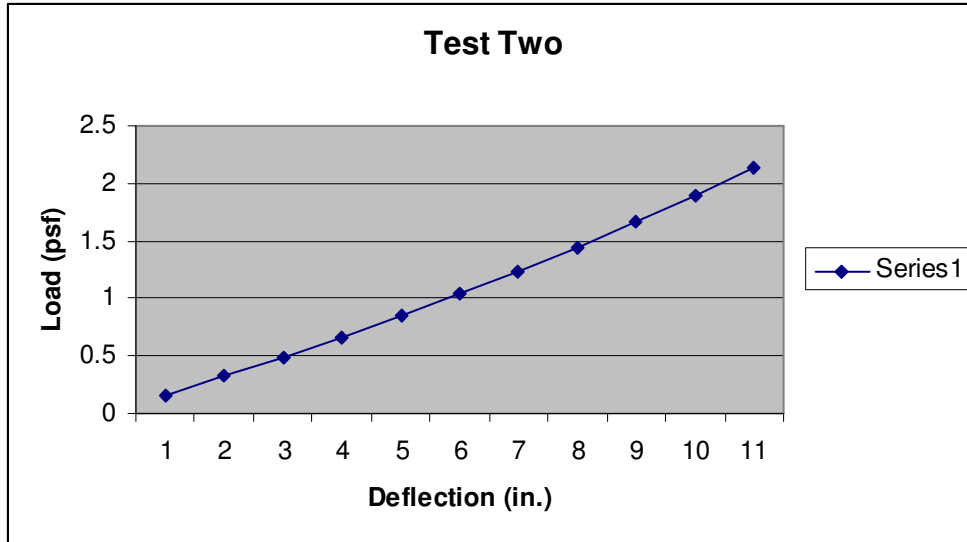


Test One

## Test Two



## Test Three



DESIGN INPUT DATA FOR 1 ½" SNAP-SEAM @ 16 X 24 GA.

PRODUCT PROPERTIES:

E = 29500 KSI
I = .0240 IN4/FT              S = .0350 IN3/FT

DESIGN PARAMETERS:
DEFLECTION = L/ 180

ALLOW. BENDING STRESS (PSI)                        =      30000.
ALLOW. END SUPPORT REACTION (#/FT)                 =      41.2
ALLOW. INTERMEDIATE SUPPORT REACTION (#/FT)        =      41.2

LOAD-SPAN TABLE FOR 1 ½" SNAP-SEAM @ 16 X 24 GA.

| SPAN | THREE EQUAL SPAN | | |
|------|--------|------|------|
| (FT) | W(PSF) | RE | RI |
| 1.00 | 37.45 | 15.0 | 41.2 |

W   = ALLOWABLE UNIFORM LOAD
RE  = END SUPPORT REACTION AT ALLOW. LOAD (#/FT)
RI  = INTERMEDIATE SUPPORT REACTION AT ALLOW. LOAD (#/FT)

## DESIGN INPUT DATA FOR 1 ½" SNAP-SEAM @ 16 X 24 GA.

PRODUCT PROPERTIES:

E   = 29500. KSI
I   = .0240 IN4/FT        S = .0350 IN3/FT

DESIGN PARAMETERS:
DEFLECTION = L/ 180

ALLOW. BENDING STRESS (PSI)                    =    30000.
ALLOW. END SUPPORT REACTION (#/FT)             =    46.0
ALLOW. INTERMEDIATE SUPPORT REACTION (#/FT)    =    46.0

## LOAD-SPAN TABLE FOR 1 ½" SNAP-SEAM @ 16 X 24 GA.
DEFLECTION = L/ 180

| SPAN | THREE EQUAL SPAN | | |
|------|--------|------|------|
| (FT) | W(PSF) | RE | RI |
| 1.25 | 33.45 | 16.7 | 46.0 |

W   = ALLOWABLE UNIFORM LOAD
RE  = END SUPPORT REACTION AT ALLOW. LOAD (#/FT)
RI  = INTERMEDIATE SUPPORT REACTION AT ALLOW. LOAD (#/FT)

## DESIGN INPUT DATA FOR 1 ½" SNAP-SEAM @ 16 X 24 GA.

PRODUCT PROPERTIES:

E   = 29500 KSI
I   = .0240 IN4/FT        S = .0350 IN3/FT

DESIGN PARAMETERS:
DEFLECTION = L/ 180

ALLOW. BENDING STRESS (PSI)                    =    30000.
ALLOW. END SUPPORT REACTION (#/FT)             =    50.9
ALLOW. INTERMEDIATE SUPPORT REACTION (#/FT)    =    50.9

## LOAD-SPAN TABLE FOR 1 ½" SNAP-SEAM @ 16 X 24 GA.

| SPAN | THREE EQUAL SPAN | | |
|------|--------|------|------|
| (FT) | W(PSF) | RE | RI |

| 1.50 | 30.85 | 18.5 | 50.9 |
|---|---|---|---|

W  = ALLOWABLE UNIFORM LOAD
RE  = END SUPPORT REACTION AT ALLOW. LOAD (#/FT)
RI  = INTERMEDIATE SUPPORT REACTION AT ALLOW. LOAD (#/FT)

**DESIGN INPUT DATA FOR 1 ½" SNAP-SEAM @ 16 X 24 GA.**

PRODUCT PROPERTIES:

E  = 29500. KSI
I  = .0240 IN4/FT        S = .0350 IN3/FT

DESIGN PARAMETERS:
DEFLECTION = L/ 180

ALLOW. BENDING STRESS (PSI)              =      30000.00
ALLOW. END SUPPORT REACTION (#/FT)       =      55.8
ALLOW. INTERMEDIATE SUPPORT REACTION     =      55.8

**LOAD-SPAN TABLE FOR 1 ½" SNAP-SEAM @ 16 X 24 GA.**

| SPAN | THREE EQUAL SPAN | | |
|---|---|---|---|
| (FT) | W(PSF) | RE | RI |
| 1.75 | 28.99 | 20.3 | 55.8 |

W  = ALLOWABLE UNIFORM LOAD
RE  = END SUPPORT REACTION AT ALLOW. LOAD (#/FT)
RI  = INTERMEDIATE SUPPORT REACTION AT ALLOW. LOAD (#/FT)

**DESIGN INPUT DATA FOR 1 ½" SNAP-SEAM @ 16 X 24 GA.**

PRODUCT PROPERTIES:

E  = 29500. KSI
I  = .0240 IN4/FT        S = .0350 IN3/FT

DESIGN PARAMETERS:
DEFLECTION = L/ 180

ALLOW. BENDING STRESS (PSI)              =      30000.00
ALLOW. END SUPPORT REACTION (#/FT)       =      60.7
ALLOW. INTERMEDIATE SUPPORT REACTION     =      60.7

**LOAD-SPAN TABLE FOR 1 ½" SNAP-SEAM @ 16 X 24 GA.**

| SPAN | THREE EQUAL SPAN | | |
|---|---|---|---|
| (FT) | W(PSF) | RE | RI |
| 2.00 | 27.59 | 22.1 | 60.7 |

W  = ALLOWABLE UNIFORM LOAD

RE    = END SUPPORT REACTION AT ALLOW. LOAD (#/FT)
RI    = INTERMEDIATE SUPPORT REACTION AT ALLOW. LOAD
(#/FT)

## DESIGN INPUT DATA FOR 1 ½" SNAP-SEAM @ 16 X 24 GA.

PRODUCT PROPERTIES:

E     = 29500. KSI
I     = .0240 IN4/FT          S = .0350 IN3/FT

DESIGN PARAMETERS:
DEFLECTION = L/ 180

ALLOW. BENDING STRESS (PSI)                =       30000.00
ALLOW. END SUPPORT REACTION (#/FT)         =       65.6
ALLOW. INTERMEDIATE SUPPORT REACTION       =       65.6

## LOAD-SPAN TABLE FOR 1 ½" SNAP-SEAM @ 16 X 24 GA.

| SPAN | THREE EQUAL SPAN | | |
| --- | --- | --- | --- |
| (FT) | W(PSF) | RE | RI |
| 2.25 | 26.51 | 23.9 | 65.6 |

W     = ALLOWABLE UNIFORM LOAD
RE    = END SUPPORT REACTION AT ALLOW. LOAD (#/FT)
RI    = INTERMEDIATE SUPPORT REACTION AT ALLOW. LOAD
(#/FT)

## DESIGN INPUT DATA FOR 1 ½" SNAP-SEAM @ 16 X 24 GA.

PRODUCT PROPERTIES:

E     = 29500. KSI
I     = .0240 IN4/FT          S = .0350 IN3/FT

DESIGN PARAMETERS:
DEFLECTION = L/ 180

ALLOW. BENDING STRESS (PSI)                =       30000.00
ALLOW. END SUPPORT REACTION (#/FT)         =       70.5
ALLOW. INTERMEDIATE SUPPORT REACTION       =       70.5

## LOAD-SPAN TABLE FOR 1 ½" SNAP-SEAM @ 16 X 24 GA.

| SPAN | THREE EQUAL SPAN | | |
| --- | --- | --- | --- |
| (FT) | W(PSF) | RE | RI |
| 2.50 | 25.64 | 25.6 | 70.5 |

W     = ALLOWABLE UNIFORM LOAD
RE    = END SUPPORT REACTION AT ALLOW. LOAD (#/FT)
RI    = INTERMEDIATE SUPPORT REACTION AT ALLOW. LOAD
(#/FT)

**DESIGN INPUT DATA FOR 1 ½" SNAP-SEAM @ 16 X 24 GA.**

PRODUCT PROPERTIES:

E    = 29500. KSI
I    = .0240 IN4/FT        S = .0350 IN3/FT

DESIGN PARAMETERS:
DEFLECTION = L/ 180

ALLOW. BENDING STRESS (PSI)             =      30000.00
ALLOW. END SUPPORT REACTION (#/FT)       =      75.3
ALLOW. INTERMEDIATE SUPPORT REACTION     =      75.3

**LOAD-SPAN TABLE FOR 1 ½" SNAP-SEAM @ 16 X 24 GA.**

| SPAN | THREE EQUAL SPAN | | |
|------|--------|------|------|
| (FT) | W(PSF) | RE | RI |
| 2.75 | 24.89 | 24.4 | 75.3 |

W    = ALLOWABLE UNIFORM LOAD
RE   = END SUPPORT REACTION AT ALLOW. LOAD (#/FT)
RI   = INTERMEDIATE SUPPORT REACTION AT ALLOW. LOAD (#/FT)

**DESIGN INPUT DATA FOR 1 ½" SNAP-SEAM @ 16 X 24 GA.**

PRODUCT PROPERTIES:

E    = 29500. KSI
I    = .0240 IN4/FT        S = .0350 IN3/FT

DESIGN PARAMETERS:
DEFLECTION = L/ 180

ALLOW. BENDING STRESS (PSI)             =      30000.00
ALLOW. END SUPPORT REACTION (#/FT)       =      80.2
ALLOW. INTERMEDIATE SUPPORT REACTION     =      80.2

**LOAD-SPAN TABLE FOR 1 ½" SNAP-SEAM @ 16 X 24 GA.**

| SPAN | THREE EQUAL SPAN | | |
|------|--------|------|------|
| (FT) | W(PSF) | RE | RI |
| 3.00 | 24.30 | 29.2 | 80.2 |

W    = ALLOWABLE UNIFORM LOAD
RE   = END SUPPORT REACTION AT ALLOW. LOAD (#/FT)
RI   = INTERMEDIATE SUPPORT REACTION AT ALLOW. LOAD (#/FT)

**DESIGN INPUT DATA FOR 1 ½" SNAP-SEAM @ 16 X 24 GA.**

PRODUCT PROPERTIES:

E   = 29500. KSI
I   = .0240 IN4/FT          S = .0350 IN3/FT

DESIGN PARAMETERS:
DEFLECTION = L/ 180

ALLOW. BENDING STRESS (PSI)               =      30000.00
ALLOW. END SUPPORT REACTION (#/FT)        =      85.1
ALLOW. INTERMEDIATE SUPPORT REACTION      =      85.1

**LOAD-SPAN TABLE FOR 1 ½" SNAP-SEAM @ 16 X 24 GA.**

| SPAN | THREE EQUAL SPAN | | |
|------|--------|------|------|
| (FT) | W(PSF) | RE | RI |
| 3.25 | 23.80 | 30.9 | 85.1 |

W   = ALLOWABLE UNIFORM LOAD
RE  = END SUPPORT REACTION AT ALLOW. LOAD (#/FT)
RI  = INTERMEDIATE SUPPORT REACTION AT ALLOW. LOAD (#/FT)

**DESIGN INPUT DATA FOR 1 ½" SNAP-SEAM @ 16 X 24 GA.**

PRODUCT PROPERTIES:

E   = 29500. KSI
I   = .0240 IN4/FT          S = .0350 IN3/FT

DESIGN PARAMETERS:
DEFLECTION = L/ 180

ALLOW. BENDING STRESS (PSI)               =      30000.00
ALLOW. END SUPPORT REACTION (#/FT)        =      90.0
ALLOW. INTERMEDIATE SUPPORT REACTION      =      90.0

**LOAD-SPAN TABLE FOR 1 ½" SNAP-SEAM @ 16 X 24 GA.**

| SPAN | THREE EQUAL SPAN | | |
|------|--------|------|------|
| (FT) | W(PSF) | RE | RI |
| 3.50 | 23.38 | 32.7 | 90.0 |

W   = ALLOWABLE UNIFORM LOAD
RE  = END SUPPORT REACTION AT ALLOW. LOAD (#/FT)
RI  = INTERMEDIATE SUPPORT REACTION AT ALLOW. LOAD (#/FT)

**DESIGN INPUT DATA FOR 1 ½" SNAP-SEAM @ 16 X 24 GA.**

PRODUCT PROPERTIES:

```
E      = 29500. KSI
I      = .0240 IN4/FT        S = .0350 IN3/FT


DESIGN PARAMETERS:
DEFLECTION = L/ 180


ALLOW. BENDING STRESS (PSI)              =      30000.00
ALLOW. END SUPPORT REACTION (#/FT)          =      94.9
ALLOW. INTERMEDIATE SUPPORT REACTION        =      94.9
```

**LOAD-SPAN TABLE FOR 1 ½" SNAP-SEAM @ 16 X 24 GA.**

| SPAN | THREE EQUAL SPAN | | |
|------|--------|------|------|
| (FT) | W(PSF) | RE | RI |
| 3.75 | 23.01 | 34.5 | 94.9 |

```
W      = ALLOWABLE UNIFORM LOAD
RE     = END SUPPORT REACTION AT ALLOW. LOAD (#/FT)
RI     = INTERMEDIATE SUPPORT REACTION AT ALLOW. LOAD
(#/FT)
```

**LOAD-SPAN TABLE FOR 1 ½" SNAP-SEAM @ 16 X 24 GA.**

| SPAN | THREE EQUAL SPAN | | |
|------|--------|------|------|
| (FT) | W(PSF) | RE | RI |
| 4.00 | 22.68 | 36.3 | 99.8 |

```
W      = ALLOWABLE UNIFORM LOAD
RE     = END SUPPORT REACTION AT ALLOW. LOAD (#/FT)
RI     = INTERMEDIATE SUPPORT REACTION AT ALLOW. LOAD
(#/FT)
```

**DESIGN INPUT DATA FOR 1 ½" SNAP-SEAM @ 16 X 24 GA.**

PRODUCT PROPERTIES:


E     = 29500. KSI
I      = .0240 IN4/FT          S = .0350 IN3/FT

DESIGN PARAMETERS:
DEFLECTION = L/ 180

ALLOW. BENDING STRESS (PSI)                =      30000.00
ALLOW. END SUPPORT REACTION (#/FT)         =        99.8
ALLOW. INTERMEDIATE SUPPORT REACTION       =        99.8