

RESULTS OF DEFLECTION TESTS ACCORDING TO ASTM E72

4.1 INTRODUCTION

Deflection testing is carried out in accordance with the provisions of the depressurization-chamber method in ASTM E72. This method consists in submitting panel samples to a series of uniformly distributed static loads and measuring the resultant deflection.

The loads are gradually increased until panel failure. The results make it possible to determine the maximum loads for simple and multiple spans, and for deflection limits of $L/180$ (wall), $L/240$ (roof), and $L/360$ (brick veneer).

The results obtained show the maximum loads based on free span and panel thickness. The load calculations in psf were carried out according to three distinct limitation criteria. The first criterion is panel deflection based on its free span; the second is maximum bending stress; and the third is maximum load over supports. Based on the rupture mode, the loads recorded were limited to the ultimate load divided by 1,5 (safety factor).

The results demonstrate that the bending stiffness (EI) varies proportionally to the square of panel thickness. This demonstrates that, for the loads considered, the assembly behaves like a partially solid assembly comprised of rigid composites and that it benefits fully from the separation of the steel sheets from the neutral axis.

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4.2 LOAD TABLE

Single Span, L / 180 (psf)

Span (ft)	Thickness (in)				
	2	3	4	5	6
6	40	68	81	85	131
7	35	58	70	72	113
8	30	51	61	63	99
9	23	45	54	56	88
10	17	35	49	51	79
11	13	26	44	46	72
12	10	20	41	42	66
13	8	16	38	39	61
14	6	13	33	36	56
15	5	10	27	34	49
16	—	9	22	30	40
17	—	7	19	25	33
18	—	6	16	21	28
19	—	5	13	18	24
20	—	—	11	15	21
21	—	—	10	13	18
22	—	—	9	12	15
23	—	—	8	10	14
24	—	—	7	9	12
25	—	—	6	8	11
26	—	—	5	7	9
27	—	—	5	6	8
28	—	—	—	6	7
29	—	—	—	5	7
30	—	—	—	5	6

4.3 LOAD TABLE

Multiple Span, L / 180 (psf)

Span (ft)	Thickness (in)				
	2	3	4	5	6
6	40	68	81	85	131
7	35	58	70	72	113
8	30	51	61	63	99
9	27	45	54	56	88
10	24	41	49	51	79
11	22	37	44	46	72
12	20	34	41	42	66
13	18	31	38	39	61
14	15	29	35	36	56
15	12	25	33	34	53
16	10	21	31	32	49
17	8	17	29	30	46
18	7	15	27	28	44
19	6	12	26	27	41
20	5	11	24	25	39
21	—	9	23	24	38
22	—	8	21	23	36
23	—	7	18	22	33
24	—	6	16	21	29
25	—	5	14	19	25
26	—	5	13	17	23
27	—	—	11	15	20
28	—	—	10	13	18
29	—	—	9	12	16
30	—	—	8	11	15

NOTES:

- 1) Above values were obtained using a 26 gauge steel and a Silkline profile on each faces.
- 2) The tables are showing values limited by the flexional stress, the support points stress and the deflection of a panel. The most limiting criteria determines the design load shown.
- 3) The tables do not consider connection loads and installation location.
- 4) The resistance of the support structure is not considered in the values above. It must be validated by an independent structural engineer.
- 5) Values from these tables cannot be considered for evaluating a roof, a floor or a ceiling.

RESULTS OF DELFECTION TESTS ACCORDING TO ASTM E72

4.4 LOAD TABLE

Single Span, L / 240 (psf)

Span (ft)	Thickness (in)				
	2	3	4	5	6
6	40	68	81	85	131
7	35	58	70	72	113
8	25	51	61	63	99
9	17	36	54	56	88
10	13	26	49	51	79
11	9	20	44	46	72
12	7	15	40	42	66
13	6	12	31	39	56
14	5	10	25	34	45
15	—	8	20	27	37
16	—	6	17	22	30
17	—	5	14	19	25
18	—	5	12	16	21
19	—	—	10	13	18
20	—	—	9	12	15
21	—	—	7	10	13
22	—	—	6	9	12
23	—	—	6	8	10
24	—	—	5	7	9
25	—	—	—	6	8
26	—	—	—	5	7
27	—	—	—	5	6
28	—	—	—	—	6
29	—	—	—	—	5
30	—	—	—	—	5

4.5 LOAD TABLE

Multiple Span, L / 240 (psf)

Span (ft)	Thickness (in)				
	2	3	4	5	6
6	40	68	81	85	131
7	35	58	70	72	113
8	30	51	61	63	99
9	27	45	54	56	88
10	24	41	49	51	79
11	22	37	44	46	72
12	18	34	41	42	66
13	14	29	38	39	61
14	11	23	35	36	56
15	9	19	33	34	53
16	7	16	31	32	49
17	6	13	29	30	46
18	5	11	27	28	44
19	—	9	24	27	41
20	—	8	21	25	37
21	—	7	18	24	32
22	—	6	16	21	28
23	—	5	14	18	24
24	—	5	12	16	22
25	—	—	11	14	19
26	—	—	9	13	17
27	—	—	8	11	15
28	—	—	8	10	14
29	—	—	7	9	12
30	—	—	6	8	11

NOTES :

- 1) Above values were obtained using a 26 gauge steel and a Silkline profile on each faces.
- 2) The tables are showing values limited by the flectional stress, the support points stress and the deflection of a panel. The most limiting criteria determines the design load shown.
- 3) The tables do not consider connection loads and installation location.
- 4) The resistance of the support structure is not considered in the values above. It must be validated by an independent structural engineer.
- 5) Values from these tables cannot be considered for evaluating a roof, a floor or a ceiling.

RESULTS OF DELFECTION TESTS ACCORDING TO ASTM E72

4.6 LOAD TABLE

Single Span, L / 360 (psf)

Span (ft)	Thickness (in)				
	2	3	4	5	6
6	39	68	81	85	131
7	24	51	70	72	113
8	16	34	61	63	99
9	12	24	54	56	88
10	8	18	46	51	79
11	6	13	35	46	72
12	5	10	27	36	66
13	—	8	21	28	56
14	—	6	17	22	45
15	—	5	14	18	37
16	—	—	11	15	30
17	—	—	9	13	25
18	—	—	8	11	21
19	—	—	7	9	18
20	—	—	6	8	15
21	—	—	5	7	13
22	—	—	—	6	12
23	—	—	—	5	10
24	—	—	—	—	9
25	—	—	—	—	8
26	—	—	—	—	7
27	—	—	—	—	6
28	—	—	—	—	6
29	—	—	—	—	5
30	—	—	—	—	5

4.7 LOAD TABLE

Multiple Span, L / 360 (psf)

Span (ft)	Thickness (in)				
	2	3	4	5	6
6	40	68	81	85	131
7	35	58	70	72	113
8	30	51	61	63	99
9	27	45	54	56	88
10	20	41	49	51	79
11	15	32	44	46	72
12	12	25	41	42	66
13	9	19	38	39	61
14	7	15	35	36	56
15	6	13	33	34	53
16	5	10	27	32	48
17	—	9	23	30	40
18	—	7	19	25	34
19	—	6	16	22	29
20	—	5	14	19	25
21	—	5	12	16	21
22	—	—	10	14	19
23	—	—	9	12	16
24	—	—	8	11	14
25	—	—	7	9	13
26	—	—	6	8	11
27	—	—	6	8	10
28	—	—	5	7	9
29	—	—	5	6	8
30	—	—	—	5	7

NOTES:

- 1) Above values were obtained using a 26 gauge steel and a Silcline profile on each faces.
- 2) The tables are showing values limited by the flectional stress, the support points stress and the deflection of a panel. The most limiting criteria determines the design load shown.
- 3) The tables do not consider connection loads and installation location.
- 4) The resistance of the support structure is not considered in the values above. It must be validated by an independent structural engineer.
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