3form Koda XT™ deflection charts

The following charts were designed using Finite Element Analysis (FEA) modeling software with the known material properties of 3form Koda XT™. The amount of deflection the material experiences is largely controlled by the support structure. Presented here are models for the three most common support conditions: Simple Support, Fully Framed Support, and Point Support. Please note that these models are presented for simple applications only. This document is not intended to be used in place of formal engineering calculations for matters of structural feasibility or life safety.

These models are presented for flat, horizontally oriented panels. Vertical panels will not experience deflection if supported properly with no applied loads. A vertical panel should be fully supported, supported from the top of the panel, or have properly placed point supports. A vertical panel not supported by the top of the panel may sag. The following deflection diagrams may also be used to estimate deflections of vertical applications with applied loads.

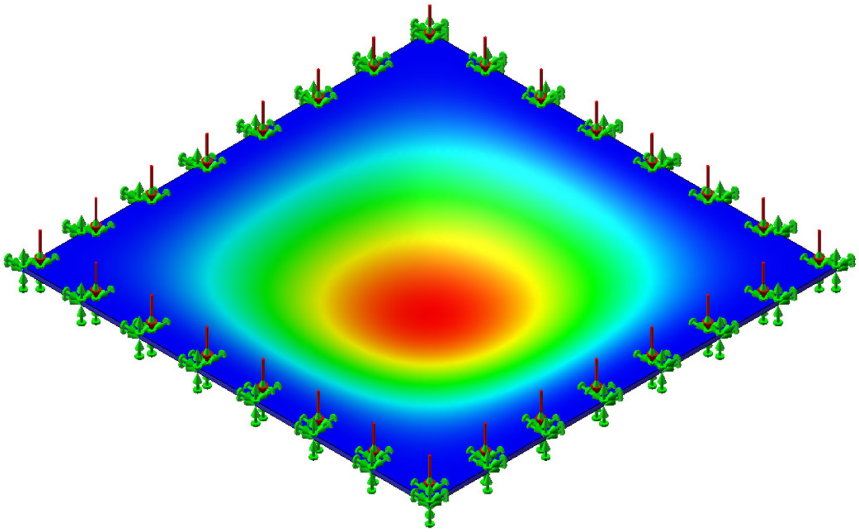

Figure 1. Fully framed support deflection diagram

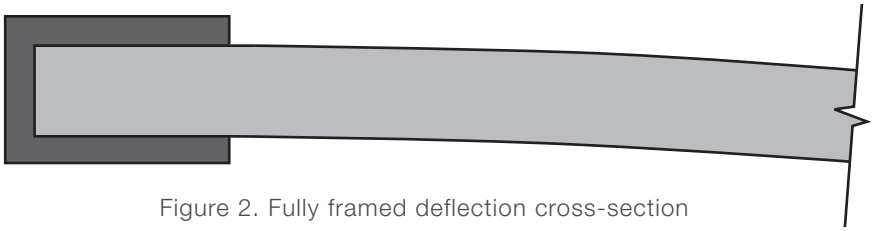

Figure 2. Fully framed deflection cross-section

FULLY FRAMED SUPPORT CONDITION (1” FRAME)

In a fully framed application, Koda XT panels are fixed in place around the entire perimeter of the panel. This is the best support configuration to minimize material deflection. The edge is fixed with a frame or adhesive bonding as shown in Figure 2. Because the edge is fixed in place, the panel is less likely to exhibit deflection. Deflection of fully framed panels is entirely dependent on the “short” dimension of the panel. For example; A 48” x 96” (1.2 m x 2.4 m) fully framed panel will exhibit similar deflection as a 48” x 48” (1.2m x 1.2m) panel of the same gauge. For both panels, 48” (1.2 m) is the critical dimension for deflection measurement. The amount of edge capture is also critical. Increased edge capture will result in lesser amounts of deflection. For these models, an edge capture of 1 inch (2.54 cm) was chosen to produce the following static deflection charts. The

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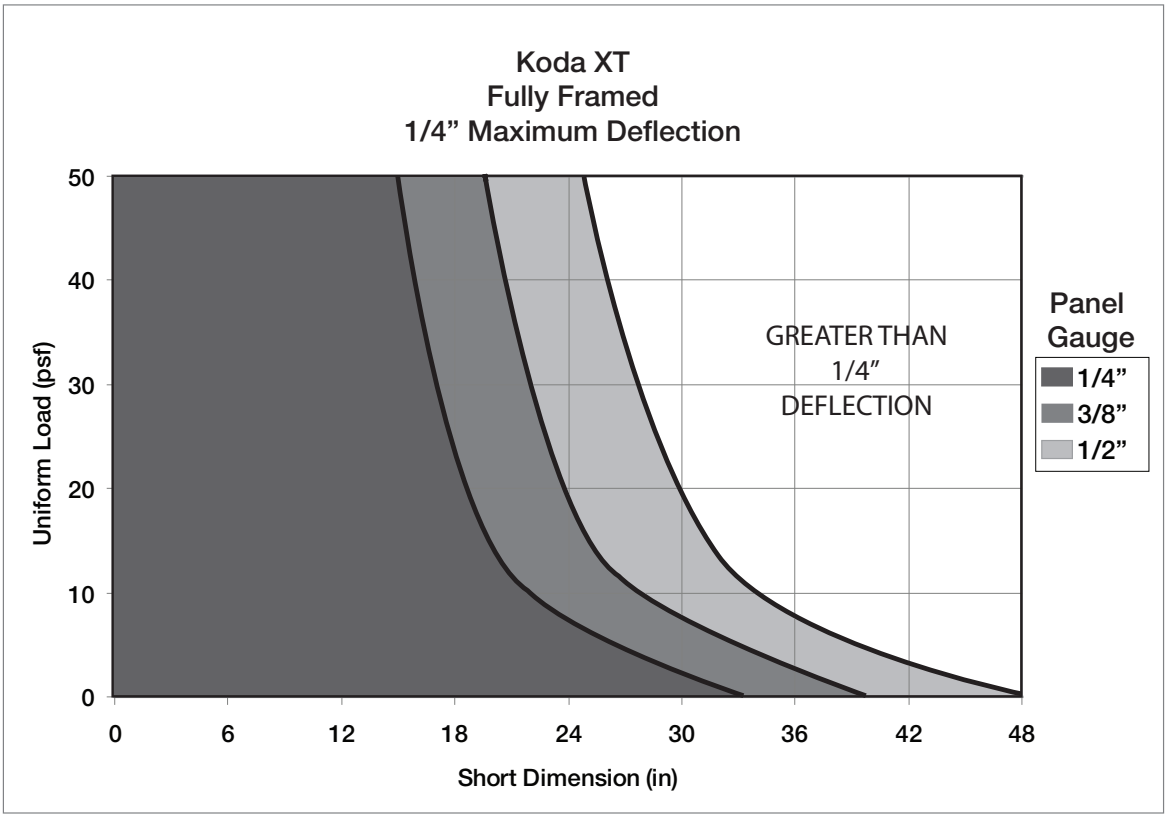

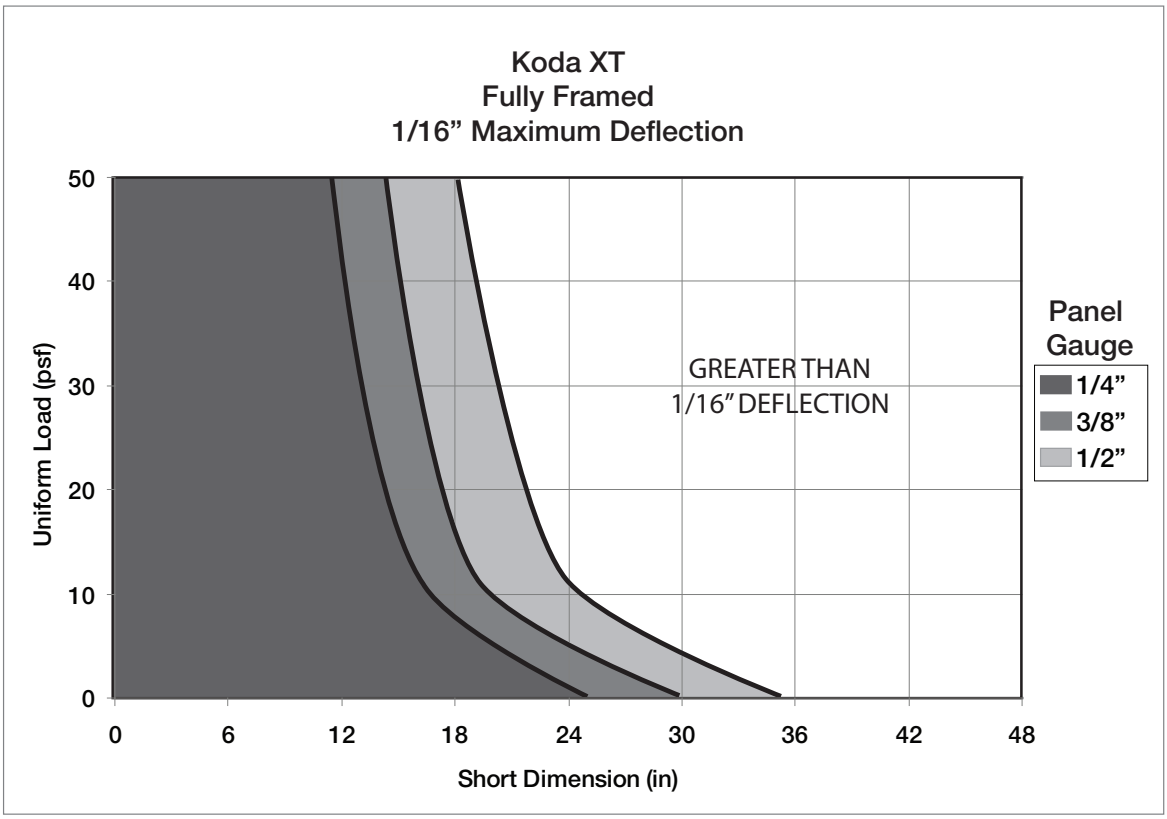

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loads presented in the chart are uniform static loads on the surface of the panel.

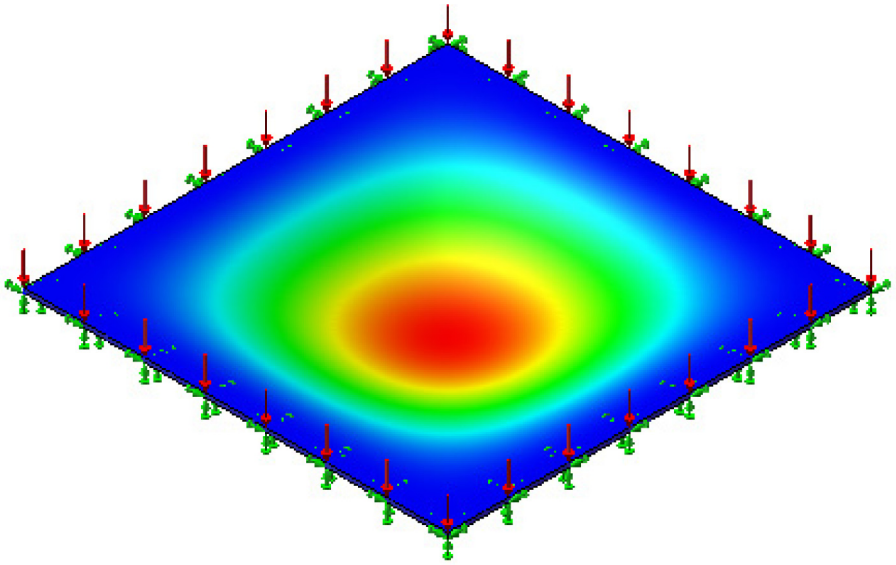

Figure 3. Simple support deflection diagram

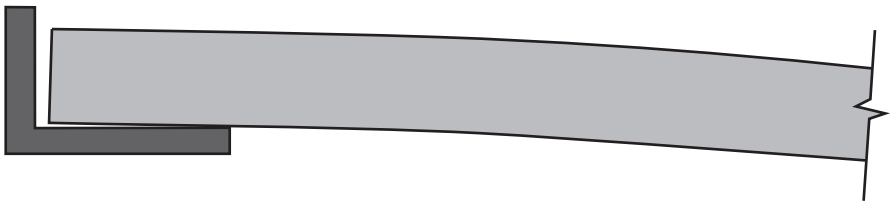

Figure 4. Simple support deflection cross-section

SIMPLE SUPPORT CONDITION (1” FRAME)

Koda XT panels in a simple supported application are supported (but not fixed) around the entire perimeter of the panel. This type of support is commonly used for ceiling panels that are installed into support grids. The edge of the panel is not fixed, and therefore contributes to deflection as shown in Figure 4. Deflection of simple suppported panels is entirely dependent on the “short” dimension of the panel. For example; A 48” x 96” (1.2 m x 2.4 m) fully framed panel will exhibit similar deflection as a 48” x 48” (1.2m x 1.2m) panel of the same gauge. For both panels, 48” (1.2 m) is the critical dimension for deflection measurement. The amount of edge capture is also critical. Increased edge capture will result in lesser amounts of deflection. For these models, an edge capture of 1 inch (2.54 cm) was chosen to produce the following static deflection charts. The loads presented in the chart are uniform static loads on the surface of the panel.

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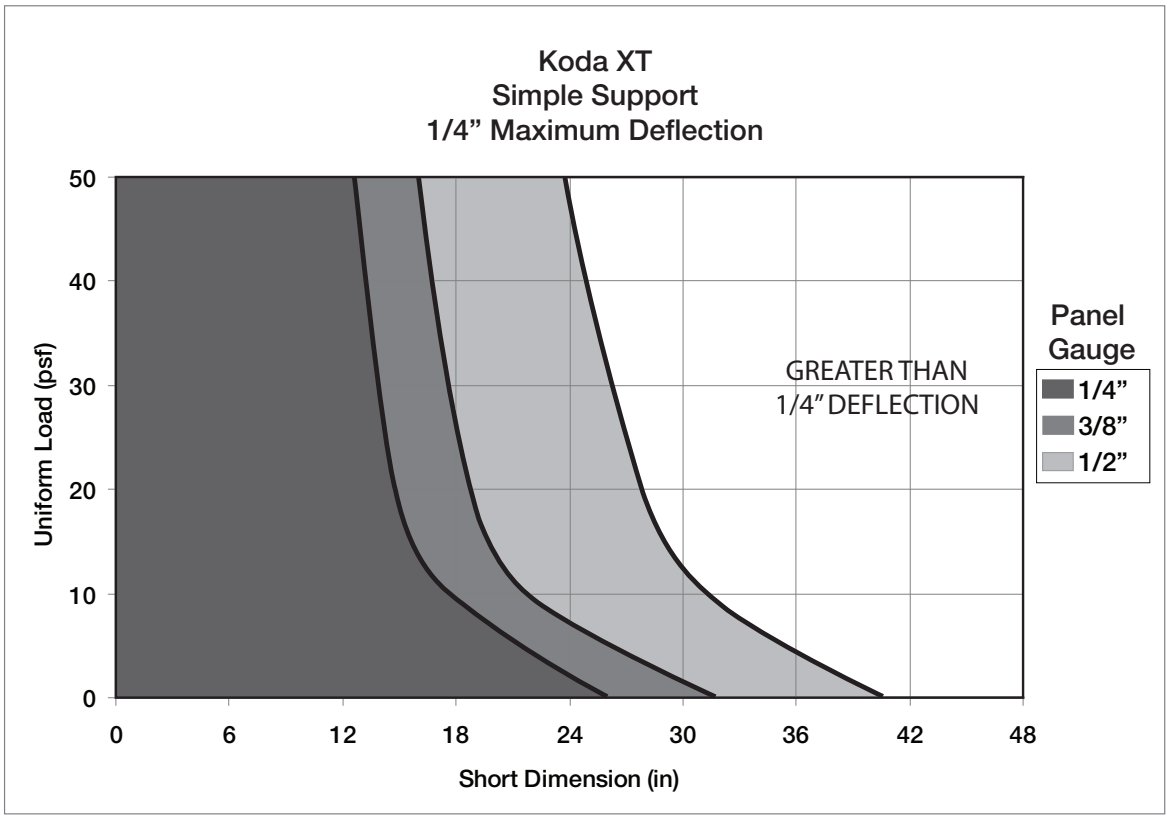

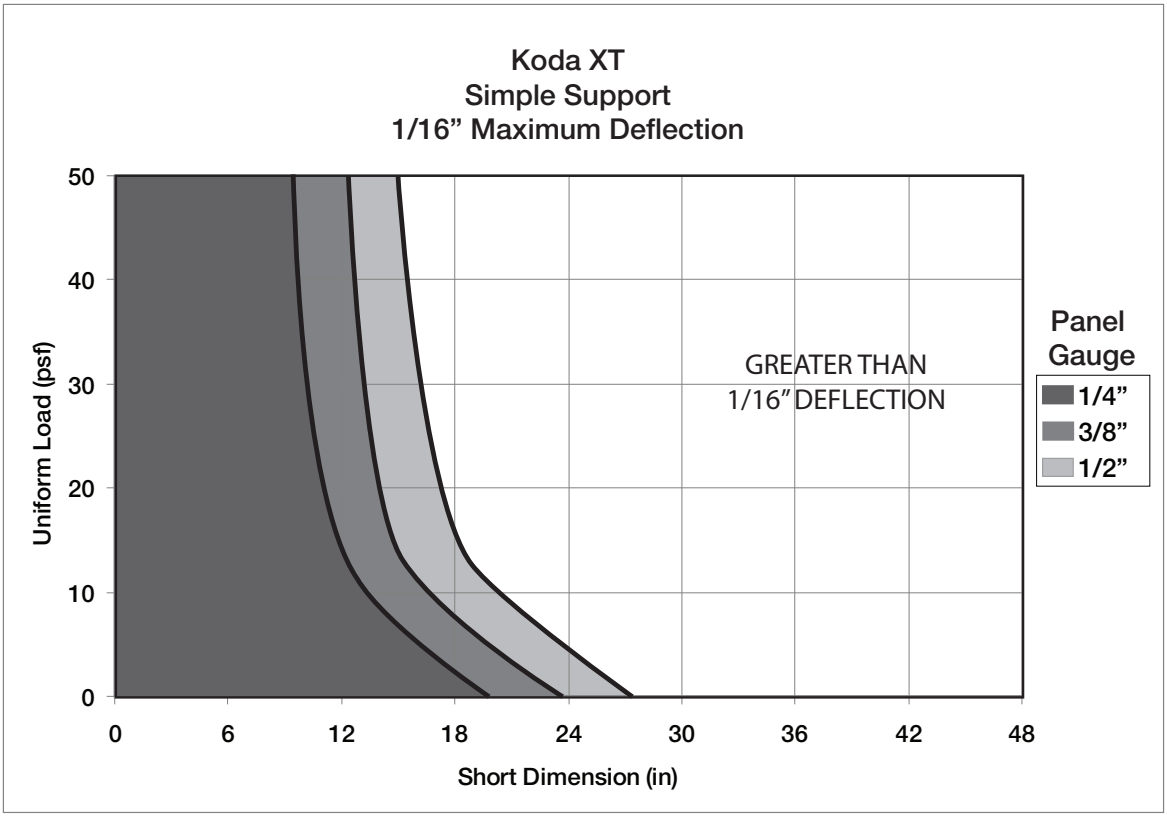

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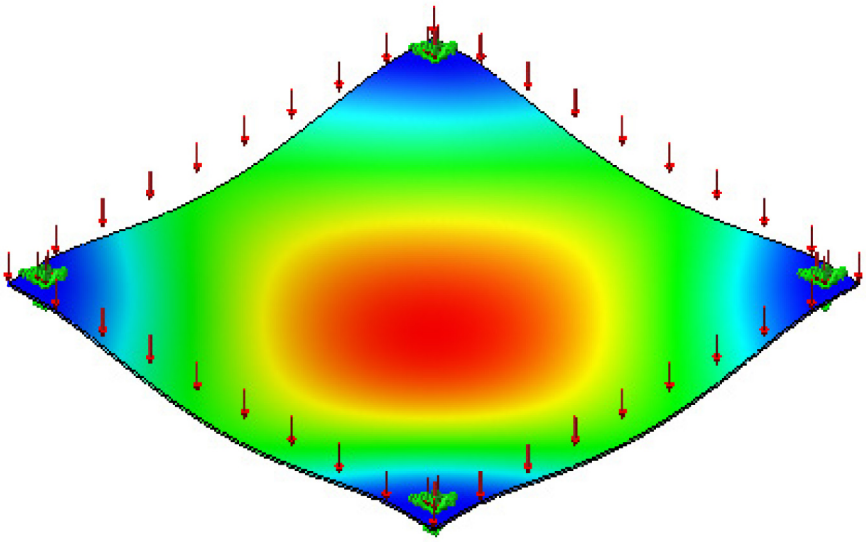

Figure 5. Point-support deflection diagram

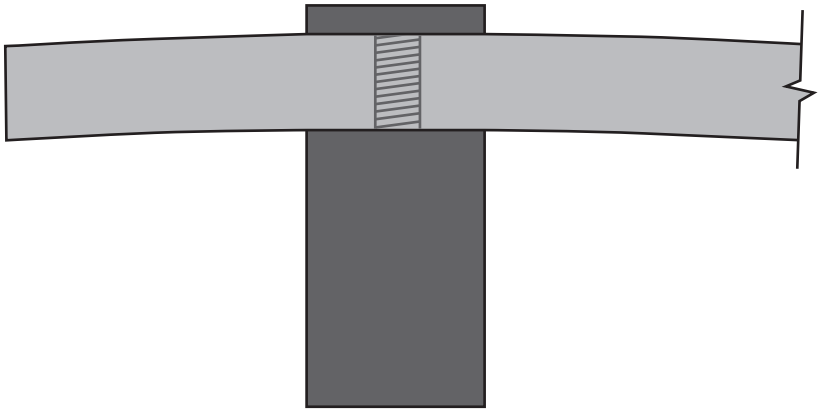

Figure 6. Point-support deflection cross-section

POINT SUPPORT CONDITION (1” CAP AND BARREL)

Koda XT panels in a point-support condition are fixed at the points of attachment to the panel. Because the amount of support is minimal when compared to a fully supported panel, point-supported panels are more susceptible to deflection. Unlike framed conditions, deflection of point-suppported panels is dependent on the all dimensions of the panel. A 48” x 96” (2.4 m x 1.2 m) point-supported panel will deflect considerably more than a 48” x 48” (1.2 m x 1.2 m) panel of the same gauge and support. Another consideration is point-support size. Increased point-support diameter will increase the amount of support, resulting in lesser deflection. A cap and barrel size of 1 inch (2.54 cm) was selected to model the following deflection charts. Lastly, the location of point-supports will affect the panel deflection. Point supports located 2” (5.1 cm) from each edge on the corners of the panel were chosen to model the following deflection charts.

It is important to note that point-supports suspended from cables will exhibit more deflection than point-supports connected using threaded rod. Threaded rod is more rigid and prevents lateral movement of the panel at the support location. Cables only offer support normal to the panel and will not prevent lateral movement that will ultimately result in increased deflection.

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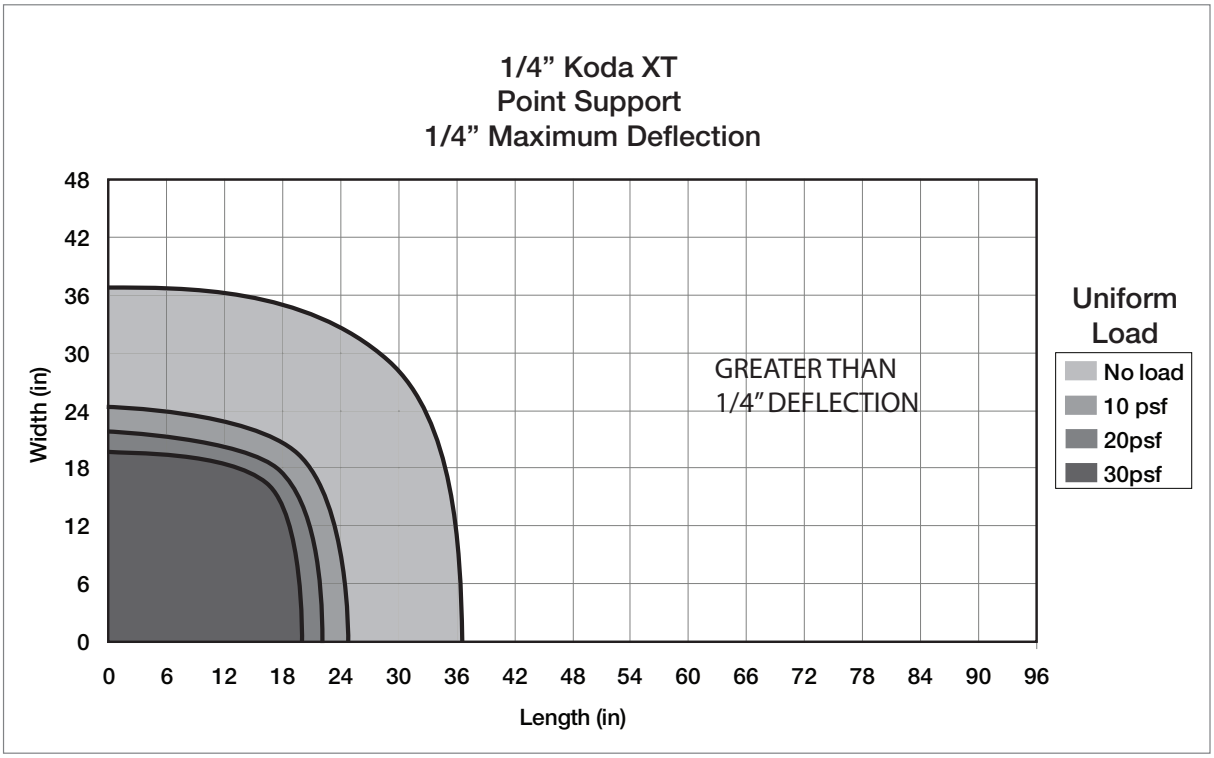

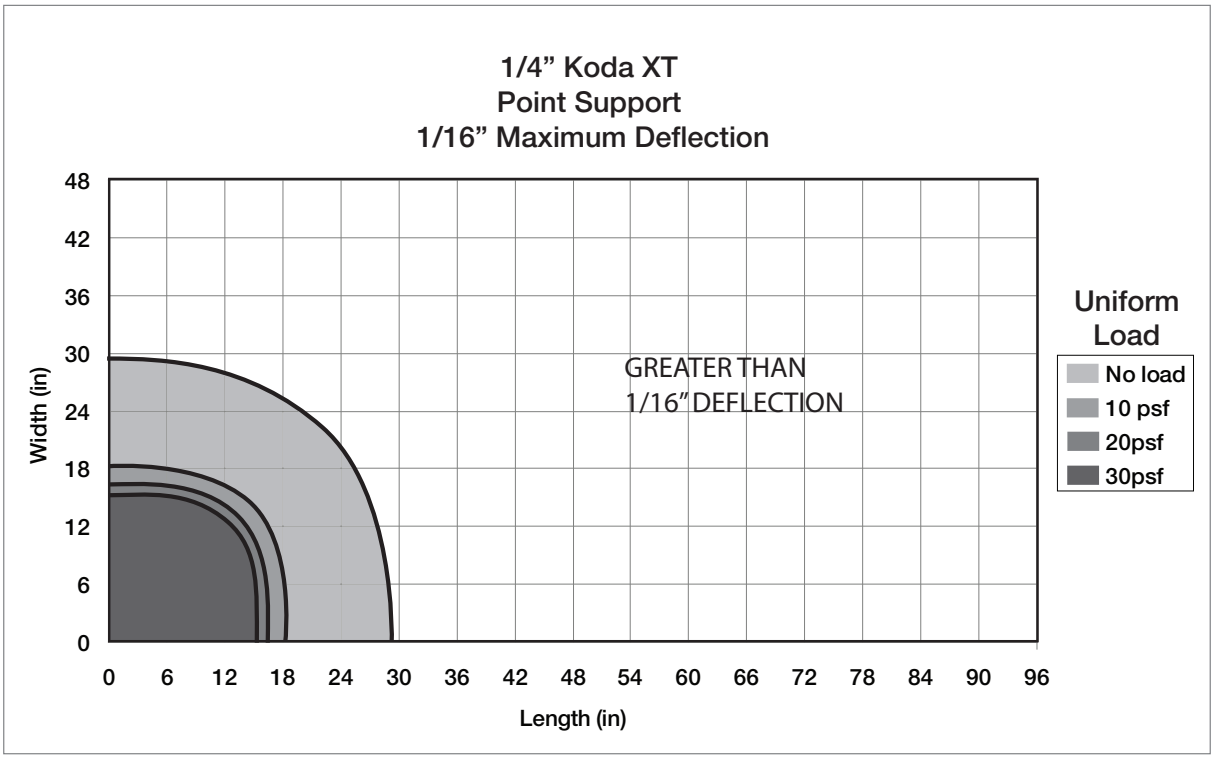

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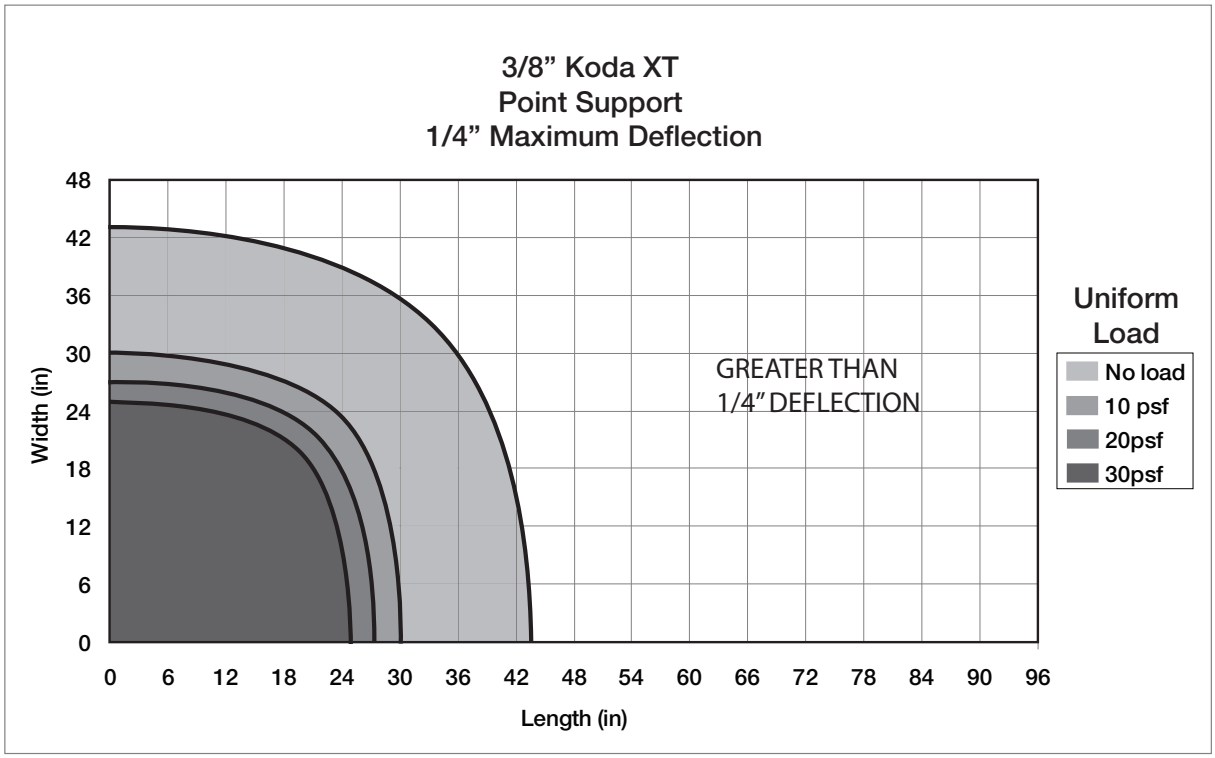

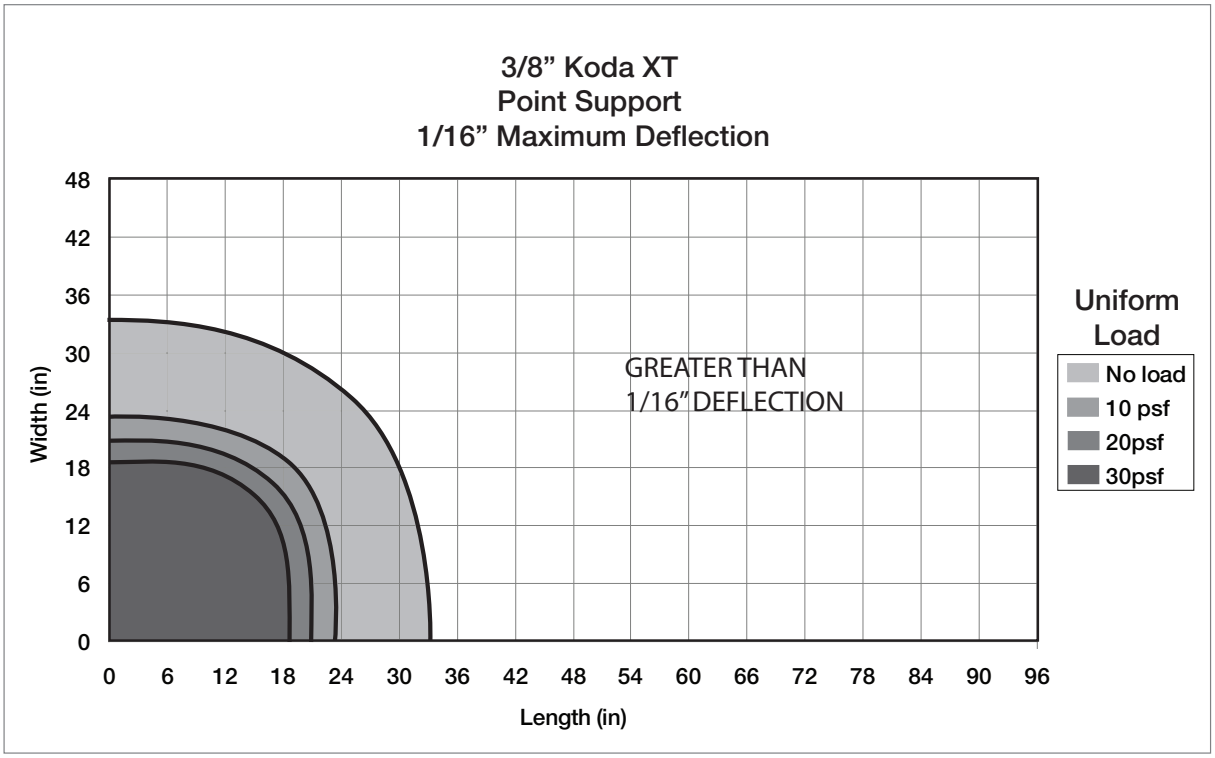

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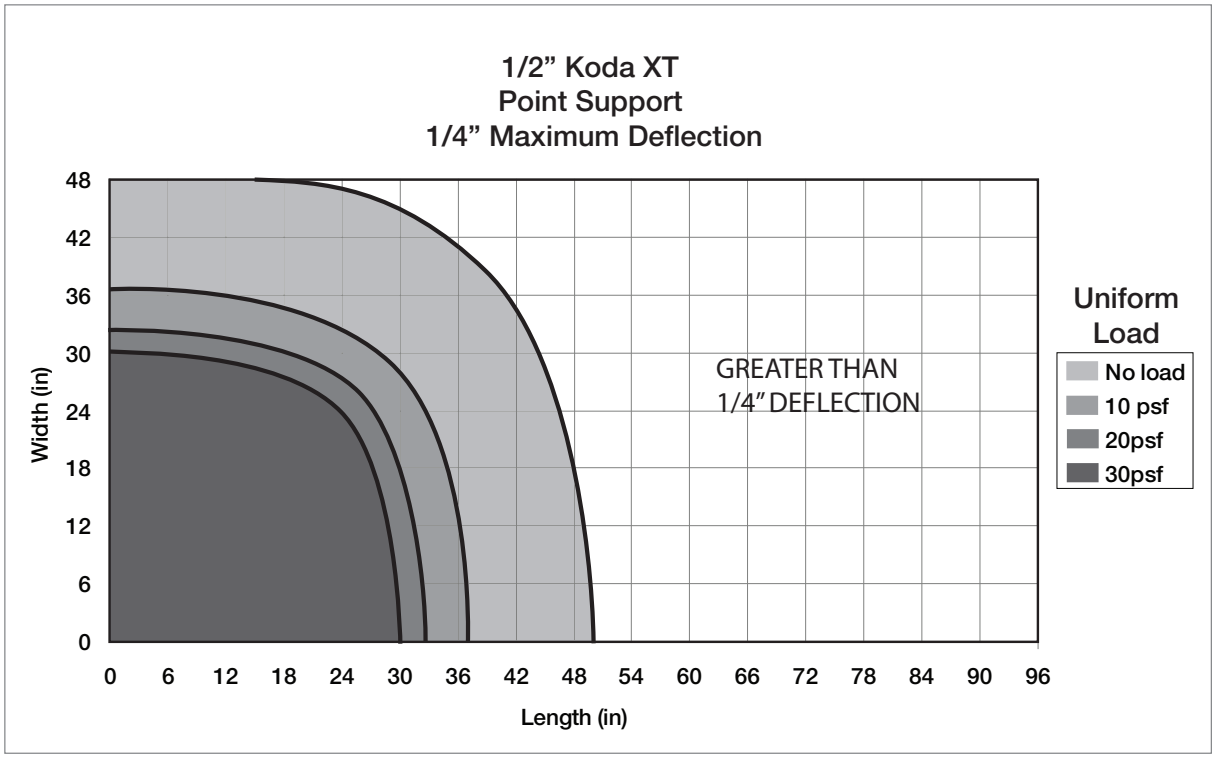

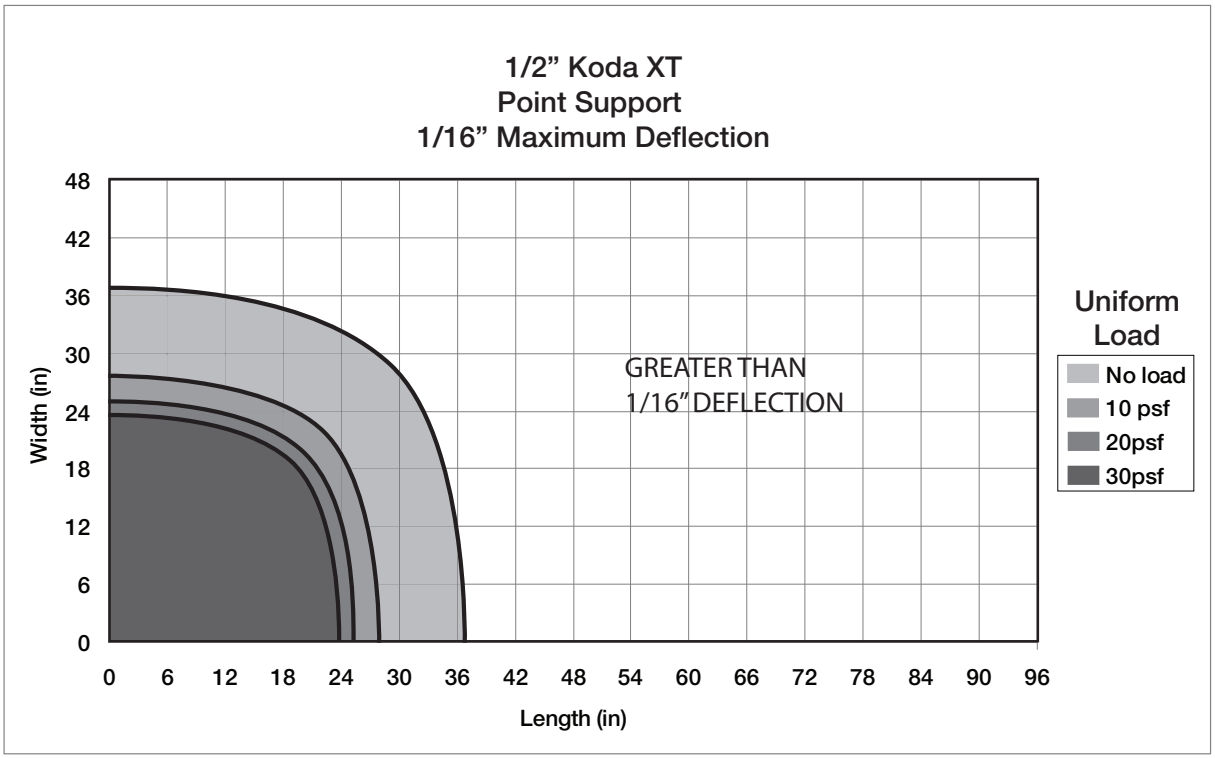

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The tables below will provide helpful conversions when using 3form deflection charts. If the desired load is not listed pick the higher value listed. Water load was calculated assuming a fresh water temperature of 77°F (25°C). Snow load was calculated assuming a worst case scenario of 50% density snow.

WIND LOAD (MPH)	PSF (LBS/FT²)
51	10
72	20
88	30
102	40
114	50

WATER LOAD (INCHES)	PSF (LBS/FT²)
1.9	10
3.9	20
5.8	30
7.7	40
9.6	50

SNOW LOAD (INCHES)	PSF (LBS/FT²)
3.8	10
7.8	20
11.6	30
15.4	40
19.2	50

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