

LOADING AND SEISMIC ANALYSIS REPORT FOR DDB ENCLOSURES

Prepared for:

DDB UNLIMITED

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June 25, 2018

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INNOVATIVE SOLUTIONS

EXECUTIVE SUMMARY

A Numerical Analysis was performed on multiple Aluminum Enclosures to validate the structural integrity during lifting and the integrity during seismic events. For the purpose of this report, Aluminum Enclosures refers to 4 families of enclosure designs and their constituent configurations. There are no explicit structural requirements for this type of device during lifting. However, the correlation to rigging and a “below the hook device” Edge Innovative Solutions has utilized techniques established by the American Society of Mechanical Engineers (ASME) regarding rigging and overhead lifting devices. For seismic events, Telcordia GR 63 is considered as the most applicable standard. This report details the requirements set forth by ASME B30.20, B30.9, and BTH 1, as well as Telcordia GR 63, and the steps taken to verify compliance. These techniques provide a conservative method to determining the safety of this type of device. The analysis proves the Aluminum Enclosures and its constituent parts meet the ASME and Telcordia code and are safe for lifting or installation under the advertised operating conditions.



CONCLUSION

Based on the analysis presented the enclosures studied meet or exceed the design criteria set out by ASME B30.20, B30.9, and BTH-1 for lifting as well as Telcordia GR 63 for seismic conditions. This conclusion is dependent on the following chart showing the maximum recommended loads and noted assumptions.

Table 2: Tabulation of maximum load based on enclosure size

LIFTING LOAD						SEISMIC LOAD					
Height ↓	Depth ↓	Width				Height ↓	Depth ↓	Width			
		OD	WOD	2OD	3OD			OD	WOD	2OD	3OD
16	DX	2000 ₁	2000 ₁	4000	4000	16	DX	4000	4000	4000	4000
30		2000 ₁	2000 ₁	4000	4000	30		4000	4000	4000	4000
50		4000	4000	4000	4000 ₃	50		4000 ₄	4000	4000	4000
62		4000	4000	4000 ₂	4000 ₃	62		4000 ₄	4000 ₄	4000	4000
78		4000	4000	4000 ₂	4000 ₃	78		4000 ₄	4000 ₄	4000	4000
16	DD	2000 ₁	2000 ₁	4000	4000	16	DD	4000	4000	4000	4000
30		2000 ₁	2000 ₁	4000	4000	30		4000	4000	4000	4000
50		4000	4000	4000	4000 ₃	50		4000 ₄	4000	4000	4000
62		4000	4000	4000 ₂	4000 ₃	62		4000 ₄	4000 ₄	4000	4000
78		4000	4000	4000 ₂	4000 ₃	78		4000 ₄	4000 ₄	4000	4000
16	DDX	----	2000 ₁	4000	4000	16	DDX	----	4000	4000	4000
30		2000 ₁	2000 ₁	4000	4000	30		4000	4000	4000	4000
50		4000	4000	4000	4000 ₃	50		4000 ₄	4000	4000	4000
62		4000	4000	4000 ₂	4000 ₃	62		4000 ₄	4000 ₄	4000	4000
78		4000	4000	4000 ₂	4000 ₃	78		4000 ₄	4000 ₄	4000	4000

⁰Load assumed to be distributed evenly in all three directions unless noted, rigging to be vertical with respect to each lifting point, and anchors for seismic installation installed per manufacturers recommendation at each provided location of enclosure.

¹Load reduced based on physical size of enclosure

²Load to be distributed evenly in each bay of enclosure, any one bay not to contain more than 60% of load

³Load to be distributed evenly in each bay of enclosure, any one bay not to contain more than 40% of load

⁴Load to be distributed vertically with 60% or more in the lower half of the enclosure