

September 16, 2024

File: EJ240087-01 R2

The Rolling Lid Company
4905 55 Ave
Two Hills, AB T0B 4K0

RE: Rolling Lid Modification

This letter confirms that EngRx Corp. ("EngRx") has completed a design review of the rolling lid modifications by The Rolling Lid Company.

EngRx's review considered:

- Customer provided 3D model, drawings, Assembly Manuals and Videos
- Customer provided list of container size and weight
- Total 8 x ½"-13 Grade 5 mounting bolts for connection between tracks and containers
- 1/8" fillet welds for tracks to containers, 4 places with 2.75" weld length each

Based on customer provided information, EngRx has performed FEA analysis and Mathcad calculation and confirmed that the modified rolling lid design can survive under the snow load and wind as the table below indicated.

Container Size (yd)	length (in)	Wall Hight (in)	Weight (lbf)	Maximum Lid Snow load (kpa)	Sustained Tipping Wind Load Estimate (mph)
50	288	103	6150	5.2	47.57
40	288	103	6174	5.2	47.67
40	240	97	5346	5.2	50.71
30	240	72	4698	5.2	57.46
20	240	59	4376	5.2	62.21
12	144	68	2168	5.2	52.38
10	144	46	2740	5.2	73.23
8	120	46	2542	5.2	77.86

Based on analysis results, the modified rolling lid can hold the maximum ground snow load of 5.2 Kpa or 108 psf which will add 15550 lbf evenly distributed load to the lid.

Please be aware of that the snow load indicated in the table is the estimated maximum snow load the lid can take before collapse happens, it is not the recommended working snow load for the lid.

The analysis is performed only with 288 in (Length) x 90 in (Width) container with one cross member in the middle of the lid frame. The shorter length container can take at least the same amount of snow load as the one performed only if keep the unsupported length is not over 144 inches.

The analysis treats the roof panels as a load transfer only. Detail study of roof panels is out of this work scope.

The wind load indicated on the table above is calculated only for container tipping over only, the container might start to slip before tipping over, make sure container to be fixed to the ground or support bases. Structural integrity of the lid frame and support due to wind loading is not

considered here. Note that these results are an estimate only, maximum wind load prior to tipping will depend on actual container geometry used.

The 1/2" bolts for connection between the tacks and containers are safe enough. Please be sure to pre tight all bolts with 280 lbf.in torques.

The 4 x 2.75" lg x 1/8" fillet weld size is strong enough to connect the tracks to containers.

Thank you for the opportunity to complete this design review. If you have any questions, please contact us.

Yours truly,
EngRx Corp.
Per:

Wen Jiang, P.Eng.

Mechanical Engineer

