



October 7th, 2019

Shipper/Manufacturer Information: XXXXXXXXXX
Renew Box
1 Glenwood Avenue
Raleigh, NC 27603

Lab Technician: Brennan Lytle, CPLP-Technician
ISTA Certified Lab – ST-2382

Test Performed:

- Atmospheric Conditioning per TAPPI T-402
- Compression Test per TAPPI T-804

Product Description:

- Wrapped Paperboard Box
 - 45 Total Samples (15 in each orientation)
- Unwrapped Paperboard Box
 - 45 Total Samples (15 in each orientation)

Test Plan:

- English units were used for this test

Test Results:

- Units were compressed to failure

Test Laboratory Comments:

- Conditions in the lab during test were 23°C and 50% RH
- Samples were atmospherically conditioned prior to testing
 - Conditioning: (23°C +/- 1.0 C and 87% +/- 2% RH) – 48 hours
- Samples were tested in the same environment as specified by conditioning.



Compression Test:

- Test Setup:
 - Lansmont Squeezer was used for this test
 - Test parameters were as follows:
 - Preload – 0 lbs.
 - Fixed Upper Platen
 - Load Rate – 0.5 in./min
 - Test Type – Constant Rate
 - Each box was tested in 3 orientations. Wrapped and Unwrapped tested in same orientations. On Face 3, Face 4 and Face 6. See figures 1-4.
 - Face 3 (or 1) – the box is flat on its 2 longest dimensions.
 - Face 4 (or 2) – the box is on its longest and shortest dimension.
 - Face 5 (or 6) - the box is on its middle and shortest dimension.

Identify faces according to the diagram below.

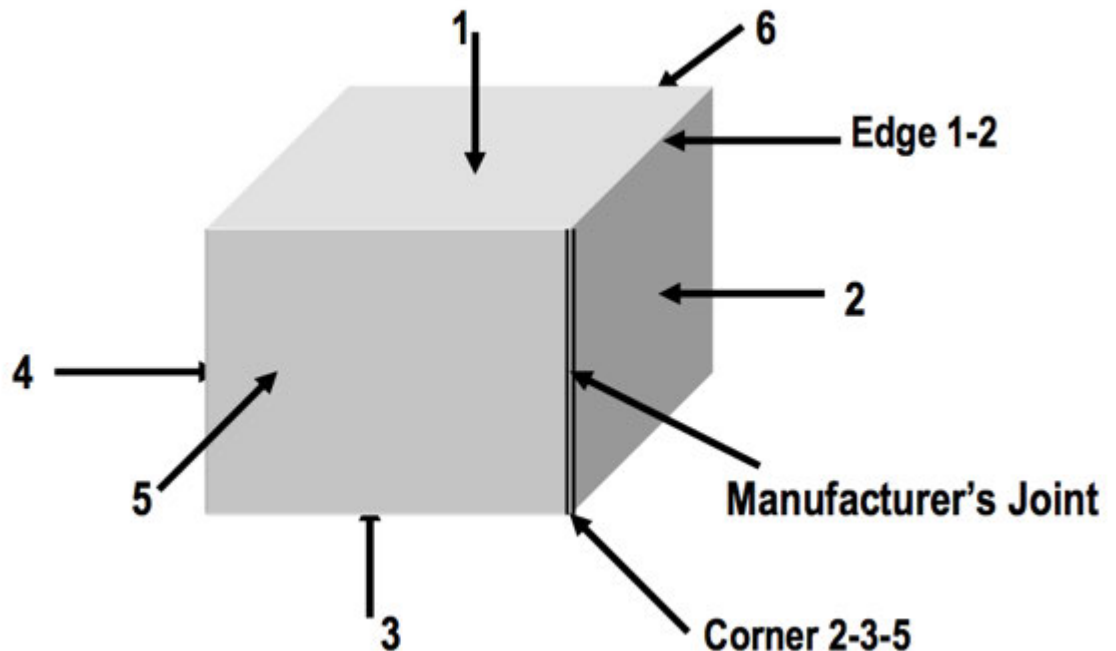


Figure 1 – Box Faces were labeled in accordance with this diagram.



Figure 2 – Face 3 (or 1)



Figure 3 – Face 4 (or 2)



Figure 4 – Face 5 (or 6)



Test Results:

<i>Box Type</i>	Average Peak Load (lbs)	Standard Deviation Load at 1σ (lbs)	Average Peak Deflection (in)	Standard Deviation Deflection at 1σ (in)
<i>Wrapped Face 3 (or 1)</i>	256.43	22.177	0.221	0.03
<i>Wrapped Face 4 (or 2)</i>	62.67	12.997	0.463	.108
<i>Wrapped Face 6 (or 5)</i>	87.27	12.222	0.425	0.078
<i>Unwrapped Face 3 (or 1)</i>	266.45	16.164	0.502	0.196
<i>Unwrapped Face 4 (or 2)</i>	69.61	19.108	0.321	0.081
<i>Unwrapped Face 6 (or 5)</i>	60.11	5.594	0.384	0.055

Table 1 – Test Results

Standard Deviations are based on normal Gaussian distribution. See table below:

<i>Standard Deviation</i>	<i>Confidence Level</i>
1 σ	68.5 %
2 σ	95%
3 σ	99.7%
4 σ	99.9%

Table 2 – Standard Deviation according to normal Gaussian distribution.



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