

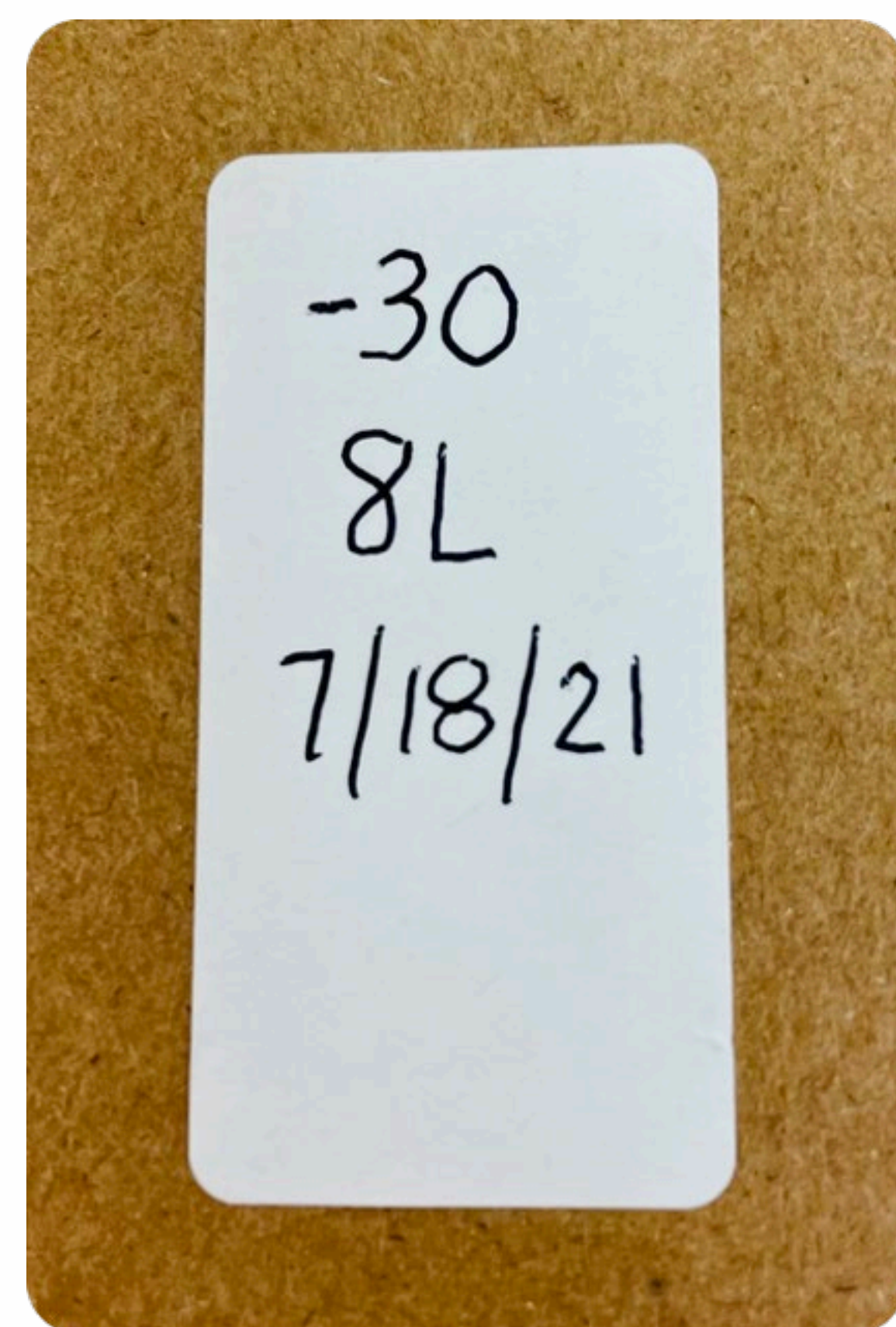
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## Introduction

- Fiber Areal Weight (FAW) is an important material property for film impregnation processes as it affects prepreg quality
- Material that is out of specifications results in:
  - Low fiber volume fraction (FVF) material with low FAW
  - Dry, high void content and sections with high FAW

## Identification

- All samples are properly labeled to ensure correct tracking of FAW information
- Identifiers include fabrication date and distance from end of roll



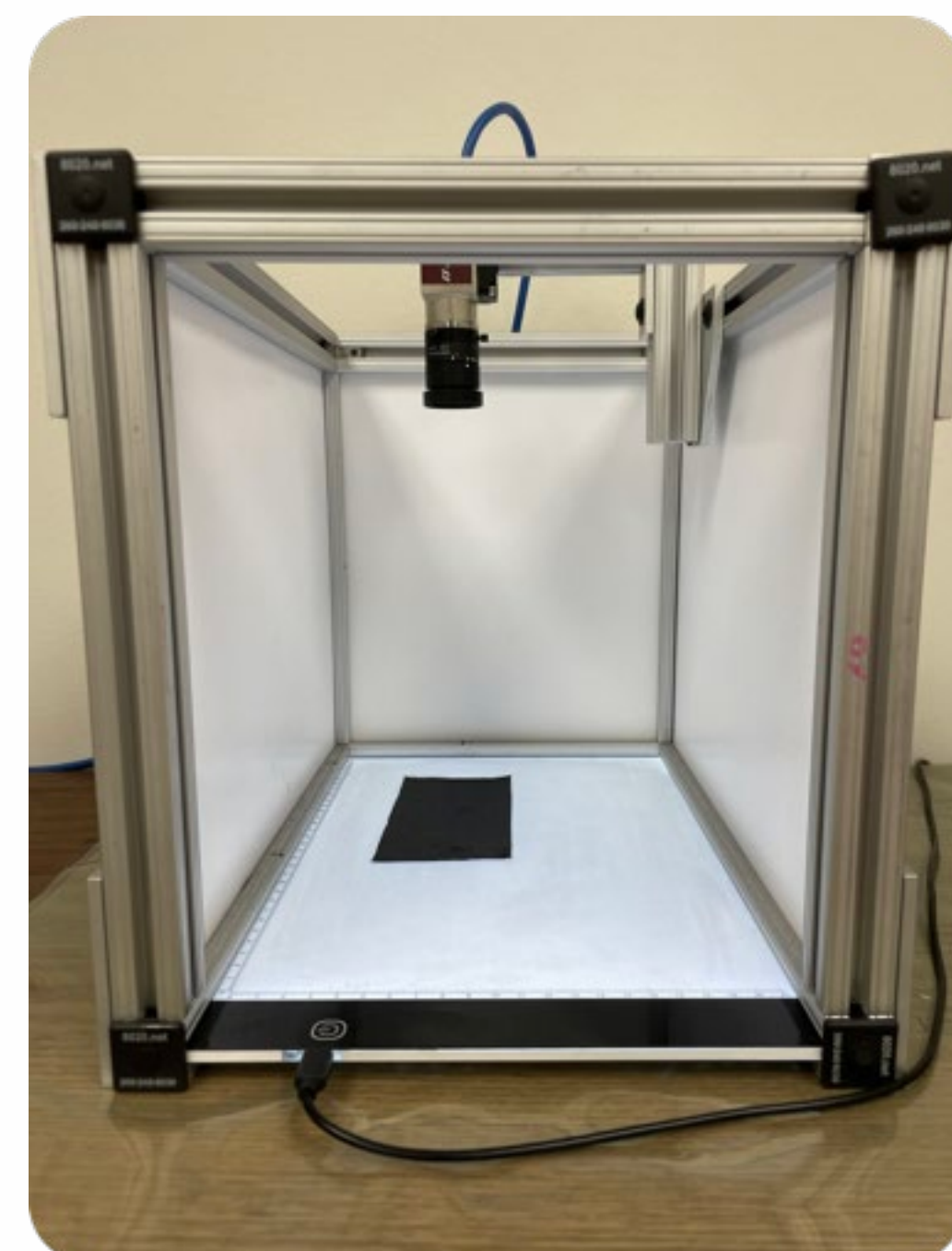
Example Label

## Measurement Approach

- Coupon strips are cut periodically (every 10ft) from continuous TuFF roll
  - Consistency of FAW is measured during manufacture
  - Coupon size (approx. 5" x 3") is large enough to allow for accurate weight and area measurement
- Strips are dried on a heater to remove any excess water
- Three pieces (left, right, middle) are cut from each strip and individually weighed



- Samples are placed into a light box, which measures coupon area



- The Labview software calculates FAW in  $g/m^2$  (gsm):

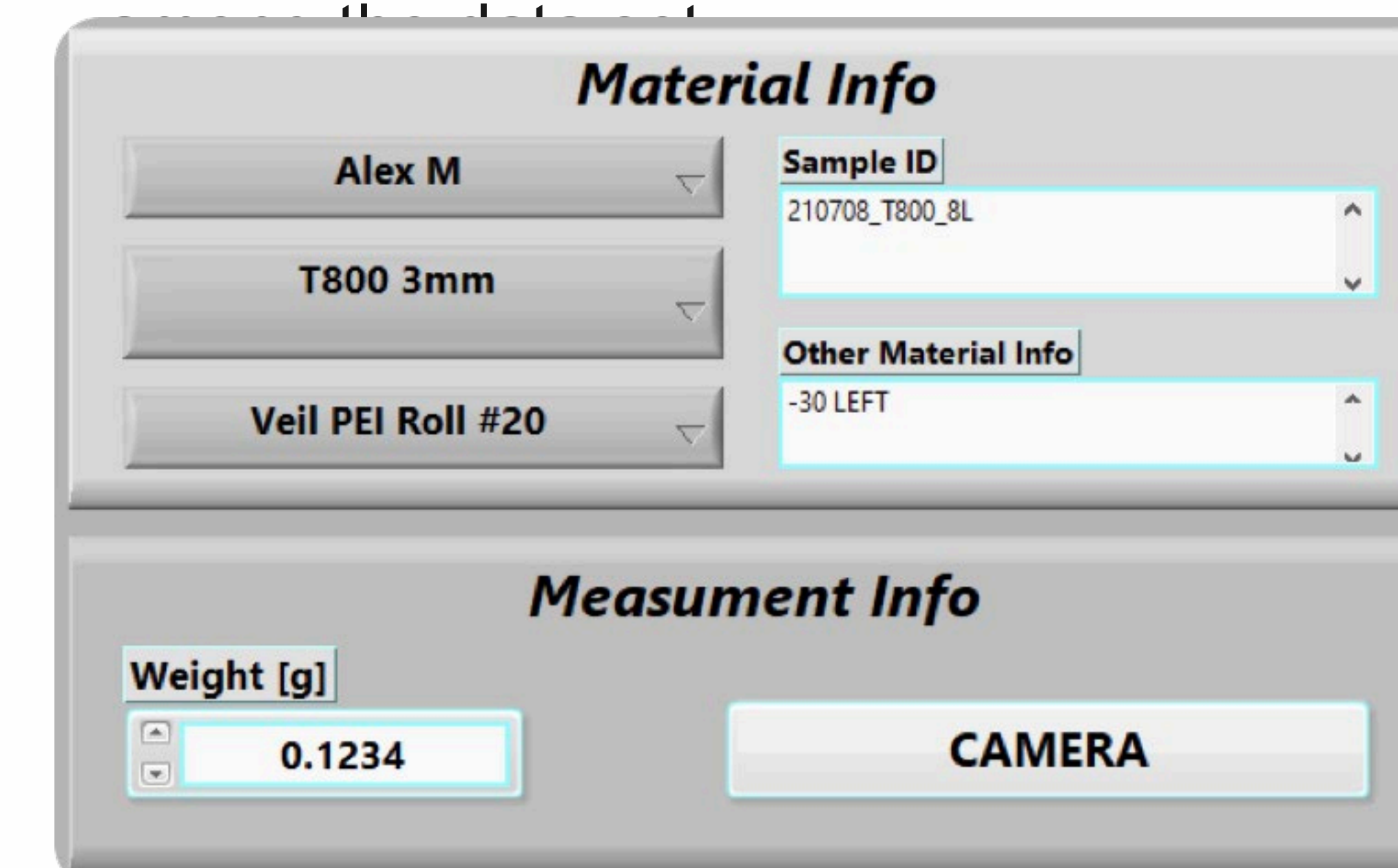
$$FAW = \frac{Weight}{Area}$$

## Repeatability Study

- One sample was measured ten times to assess repeatability of measurement approach

	FAW Repeatability Study Results		
	Area (m <sup>2</sup> )	Weight (g)	FAW (gsm)
1	0.01089	0.7180	65.92
2	0.01087	0.7176	66.00
3	0.01088	0.7179	66.00
4	0.01087	0.7177	66.02
5	0.01087	0.7177	66.01
6	0.01085	0.7175	66.12
7	0.01086	0.7178	66.08
8	0.01086	0.7175	66.09
9	0.01090	0.7178	65.86
10	0.01085	0.7174	66.09
<b>Average</b>	0.01087	0.7177	66.02
<b>Std. Dev.</b>	0.00002	0.0002	0.08
<b>COV (%)</b>	0.18399	0.0279	0.12

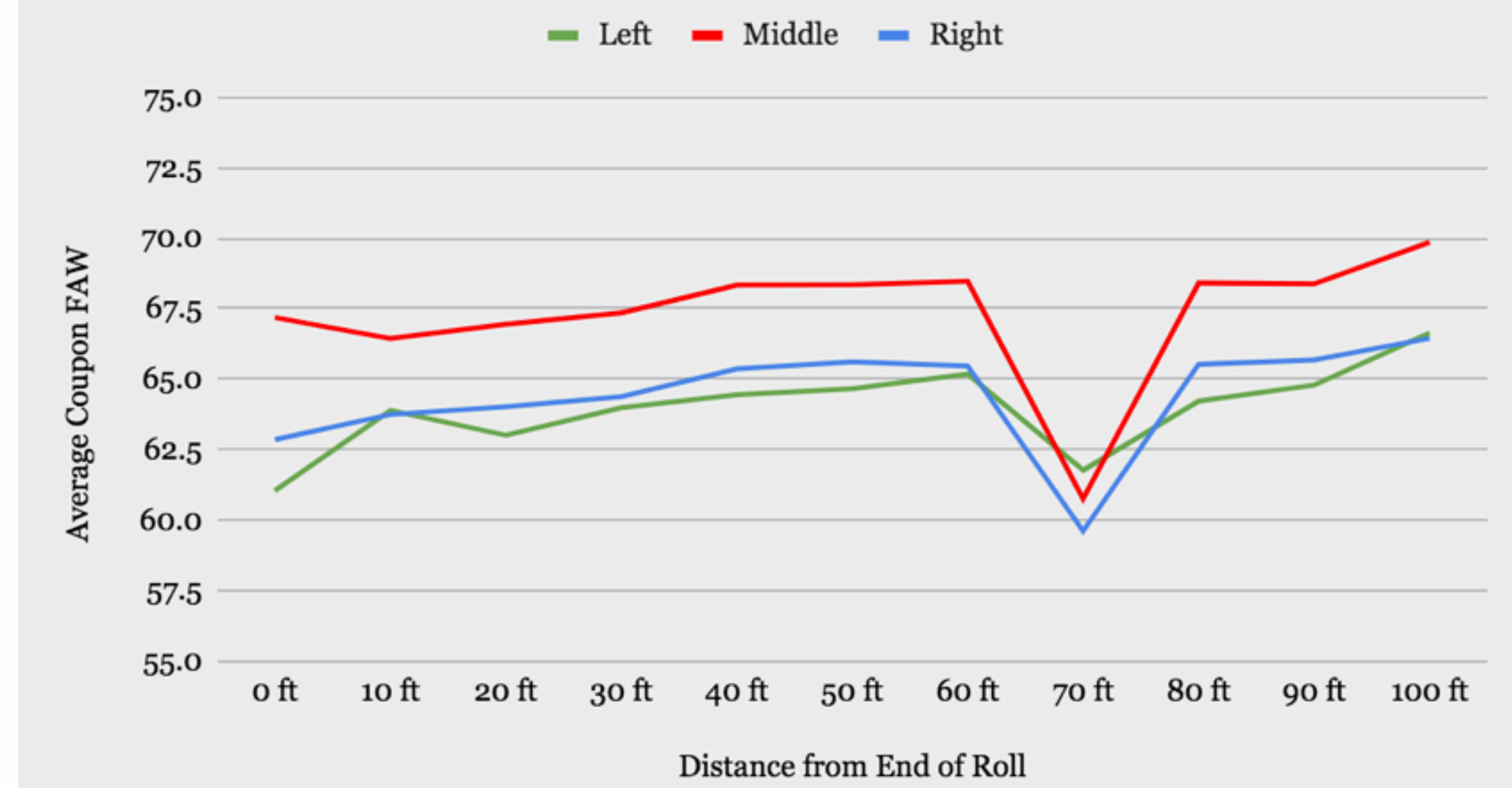
- FAW varies more than area or weight
- Overall, there is a low margin of deviation



Labview Software, used to calculate FAW

## Results

FAW Along Roll



201106_VR2_3IM7_8L					
belt speed			9.3		
length			100 ft		
	R avg	M avg	L avg	R-M-L avg	Avg Dev. RML
	64.43	67.32	63.97	65.24	1.81
std dev	1.91	2.37	1.56	1.84	
Avg/layer	8.05	8.41	8.00	8.16	

- Measurements show slightly higher FAW in the center coupon when compared to the side coupons
- Outlier at the 70 ft mark is most likely due to loss of material during the manufacturing process

- Recommendation** is to adjust TuFF process to reduce variability

## Acknowledgements

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