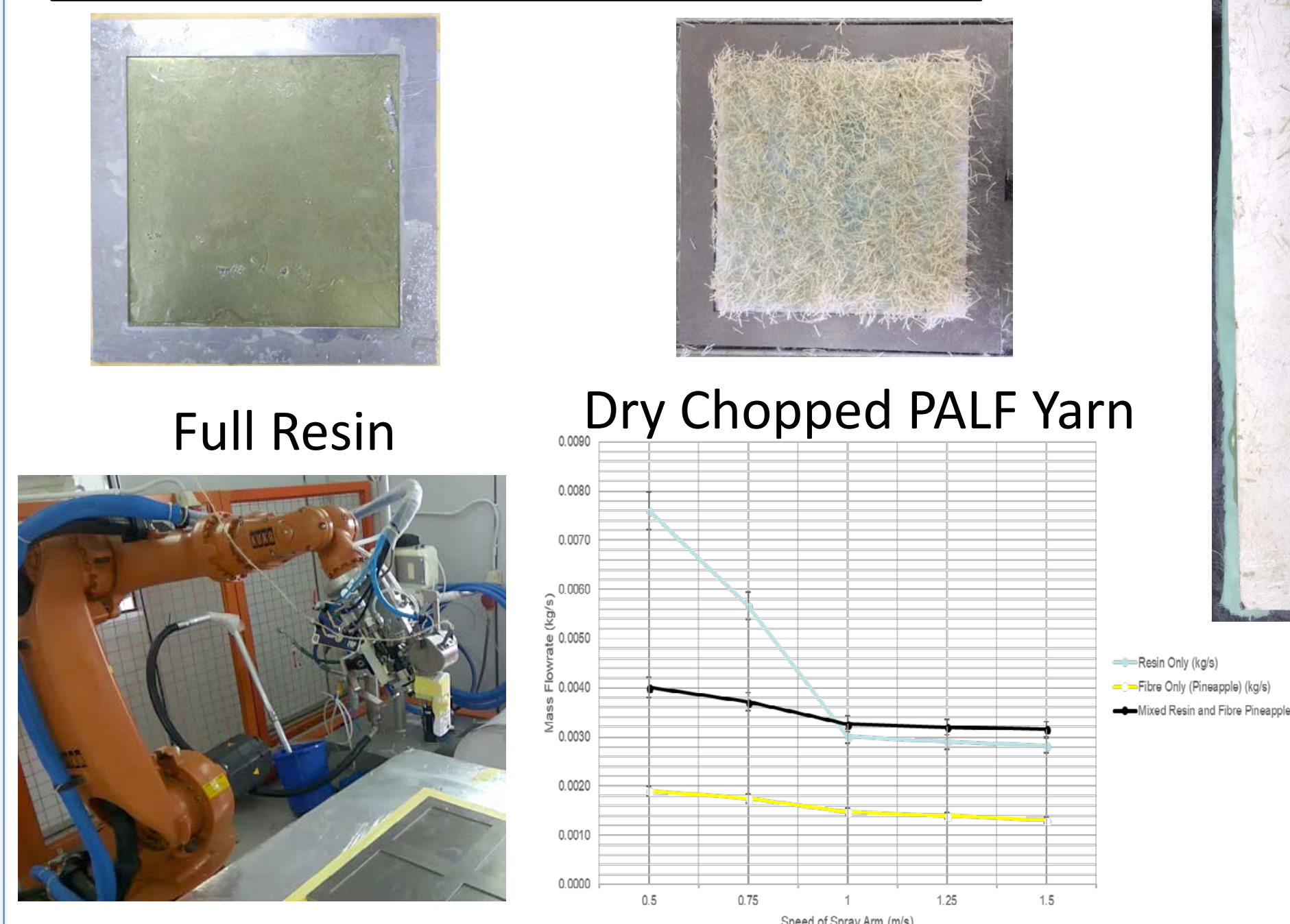


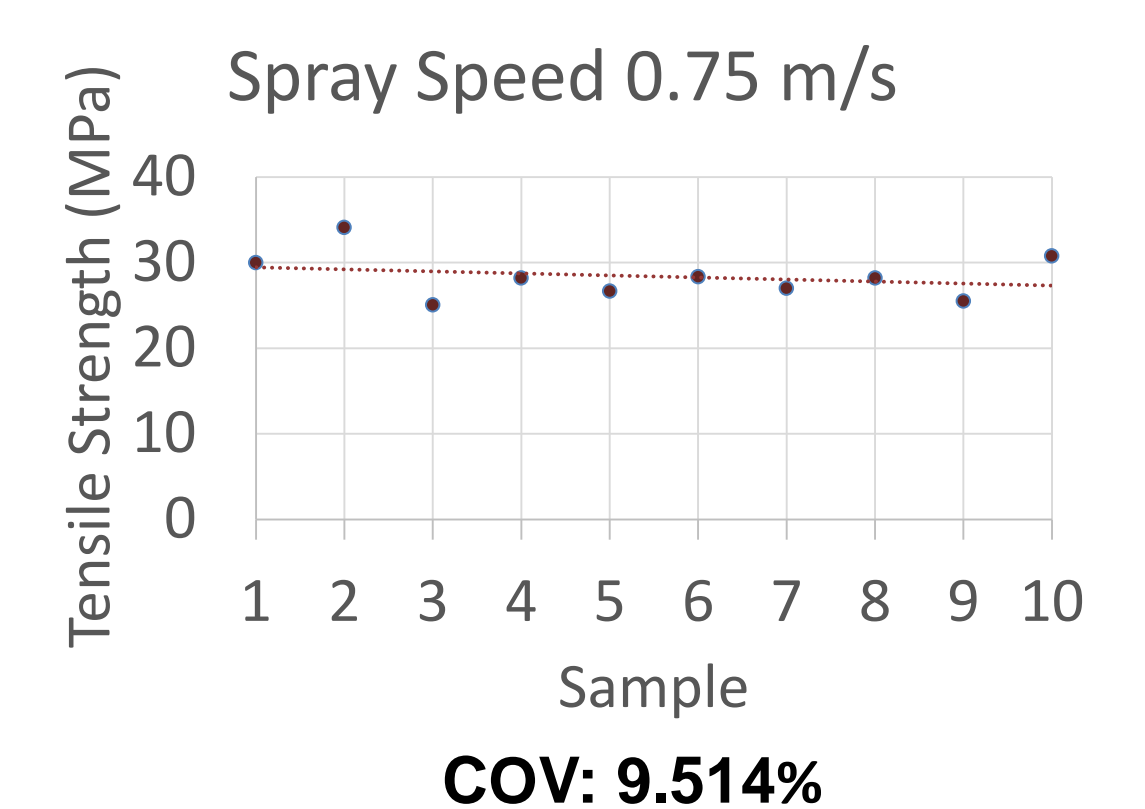
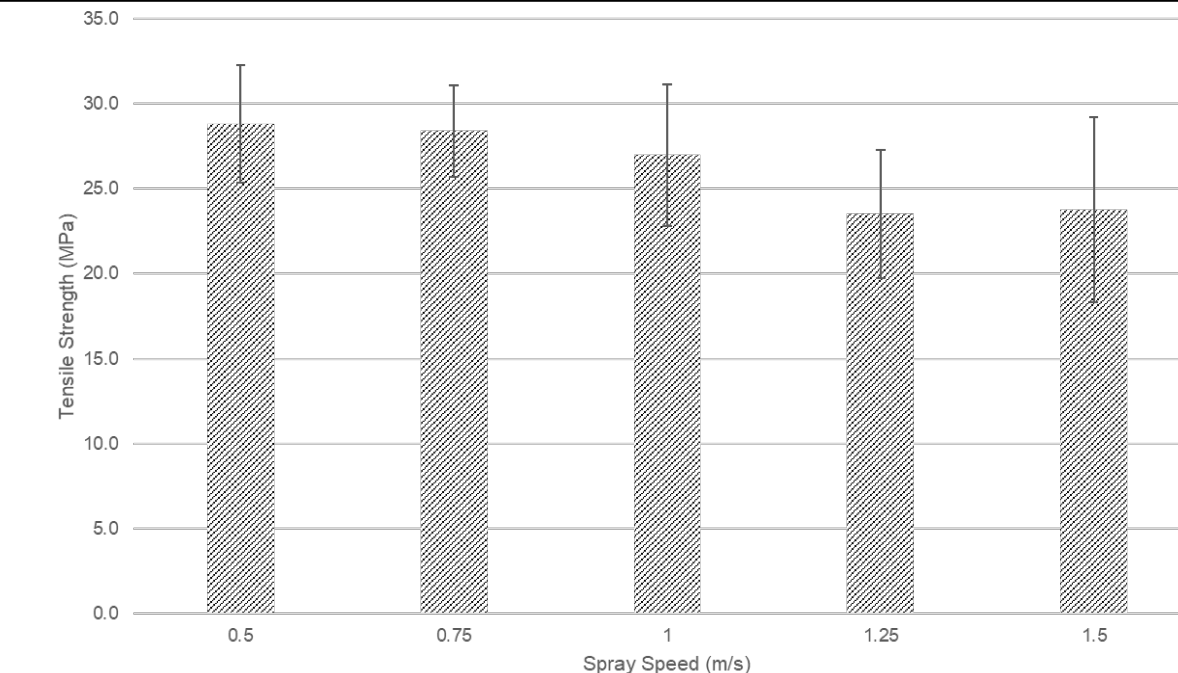
Robotic Spray Up Technology for Rapid Biocomposite Mass Production

Robotic Spray Process



Mixed Resin & Fibre
Density: 9.8 g/cm^3
wt% : 27.4

Experimental Results



Multiple Comparisons						
Dependent Variable: Tensile						
LSD						
(I) Speed	(J) Speed	Mean Difference (I-J)	Std. Error	Sig.	90% Confidence Interval	
.50	.75	.4394	1.79435	.808	-2.5741	3.4529
	1.00	1.8617	1.79435	.305	-1.1518	4.8751
	1.25	5.3116	1.79435	.005	2.2981	8.3251
	1.50	5.0539	1.79435	.007	2.0404	8.0674
.75	.50	-.4394	1.79435	.808	-3.4529	2.5741
	1.00	1.4223	1.79435	.432	-1.5912	4.4367
	1.25	4.8722	1.79435	.009	1.8587	7.8857
	1.50	4.6145	1.79435	.013	1.6010	7.6280

Future Works:
Seat Pan

INTRODUCTION OF TECHNOLOGY

The usage of natural fibres as reinforcement in composite fabrication for automotive and aerospace application has gained much interest from the researchers worldwide in the past decades.

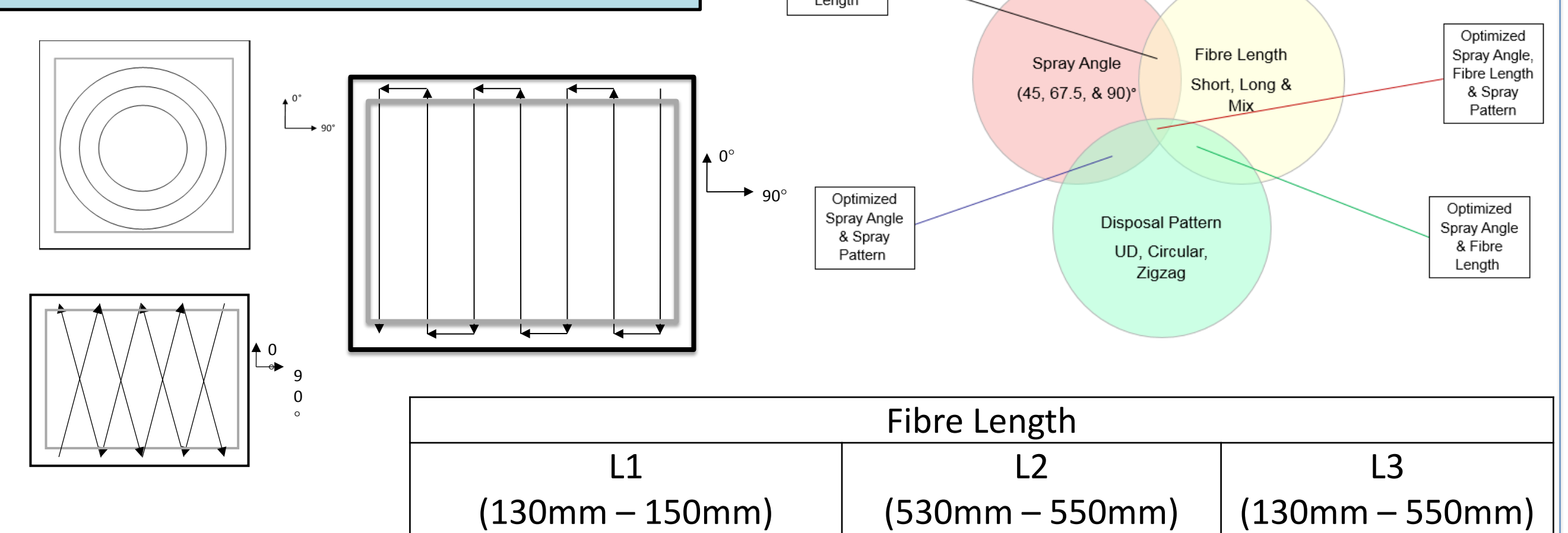
Natural fibres are well known for their unique advantages such as biodegradable, good mechanical properties, less abrasive, and economical. However, there are some limitations and drawback associated with the usage of natural fibres, such as inconsistent properties resulting in weak structure, and highly dependable on human skill, which is the biggest challenge to bring production to a larger scale.

INVENTION

This study investigated a directed fibre compounding (DFC) method to fabricate natural fibre reinforced composites (NFRC), whereby the resin and fibre are sprayed out from a modified chopper spray gun, integrated with automatic industrial robotic arm.

To produce consistent spray output, it is vital to understand critical process parameters such as the spray angle, robot linear travel speed, fibre length and spray path. In this study, the robot linear travel speed is investigated, and the relationship towards the mass discharge flowrate as well as performance properties are evaluated.

Process Parameters



ADVANTAGES

The application of the automate spray gun composites have many advantages such as

- **Higher production rate**
- **Lower labor cost**
- **Consistency of product properties**
- **Green innovation**

MARKET POTENTIAL

Consumer/End User

- Composite boards
- Furniture
- Household
- Sports equipment

Industry

- Composite manufacturers
- Building and construction
- Aircraft interior cabin components
- Automotive



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