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COMMERCIAL LARGE VOLUME MAT RUN

Prepared By:

**Stephen Meatherall
Engineer, Composite Applications EIT
Composites Innovation Centre, Manitoba Inc.**

Approved By:

**Sean McKay
Executive Director
Composites Innovation Centre, Manitoba Inc.**

EXECUTIVE SUMMARY

There is currently no source of natural fibre matting available in North America to the composite research or manufacturing sectors on a commercial scale. Despite a large amount of research into the design and production of natural fibre matting for thermoset composite applications, only small quantities in research scale form have ever been produced at one time.

The purpose of this project was to manufacture nonwoven natural fibre matting for thermoset composite applications on a large volume scale. The matting was to be produced using randomly orientated fibres of which the cleanliness (i.e. hurd content), composition and constituent proportions was extracted from the research and testing performed in the preceding Composites Innovation Centre (CIC) Biofibre Initiative project; 07-020-03 Development of an Agricultural Fibre Mat for Reinforcing Composite Panels. The method of mat manufacturing to be utilized in this project was also extracted from 07-020-03. Other properties including mat thickness and areal weight were specified based on composite part design criteria as set forth in the concurrent Agriculture Policy Framework (APF) funded CIC project; 08-020-04 Implementation of Natural Fibre Reinforced Bus Parts Phase I.

Based on these research previous findings and from industry requirements, two matting forms were designed with the following specifications:

Table 1: Natural Fibre Mat Design Specifications

	CIC09-H500	CIC09-H750
Material	100% hemp fibre	100% hemp fibre
Form	Non-woven	Non-woven
Areal Weight	500 gsm (1.64 oz/ft ²)	750 gsm (2.46 oz/ft ²)
Average Thickness*	0.256 in	0.394 in
Role Width	50 in	50 in
Role Diameter	20 in	20 in
Role Length	91 ft	63 ft
Role Weight	40 lbs	40 lbs

* As per ASTM standard D 5736 – 95

The hemp fibre was sourced from Stemergy Renewable Fibre Technologies of Delaware Ontario and the mat manufacturing trial was performed by Federal Mogul Systems Protection in Exton Pennsylvania.

Approximately 5,000 lbs of hemp fibre was utilized to produce 52 roles of each the 500 gsm and 750 gsm matting at commercial scale roll lengths and widths.

Creating this source of natural fibre commercial scale matting that is now readily available to the research and manufacturing sectors to develop products, produce prototypes and perform research will greatly assist in the market development and the furthering of knowledge of natural fibres in the composite industry.

This project was coordinated through the Composites Innovation Centre with funding being provided by Agriculture and Agri-food Canada through their Agricultural Policy Framework (APF) program.