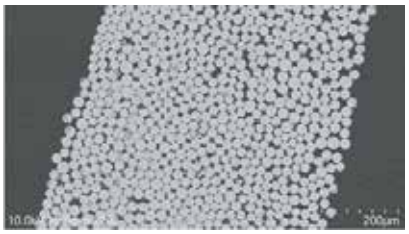
Johns Manville NeoMera® ORGANOSHEETS

Advanced Composites Portfolio Overview

Johns Manville, a leading manufacturer of glass fiber reinforcements, has developed an innovative process for producing **polyamide-6 (PA-6) composite sheets**. The new proprietary technology is based on **anionically polymerized PA 6** (AP nylon) and **fiber reinforcements** (glass fiber, carbon fiber or hybrids).

Technology

JM's expertise in glass fiber manufacturing and in-depth understanding of fiber polymer interfaces in composites led to the development of a pioneering manufacturing technology to produce **fully impregnated PA-6 composite sheets.**



Fully impregnated Neomera® PA-6 Organosheet

The proprietary technology, covered by multiple U.S. and foreign patents, is versatile in terms of reinforcing materials and can be used to **impregnate glass, carbon, aramid, and hybrid reinforcements.** It enables the control of fiber content in composites and offers design flexibility for specific applications by incorporating the desired fiber orientations into fabrics with various weaving architecture. Neomera® PA-6 composite sheets are **produced in a continuous process** through the impregnation of fiber reinforcements with low viscosity caprolactam monomer, followed by the in situ anionic polymerization of caprolactam to form the thermoplastic polyamide matrix.

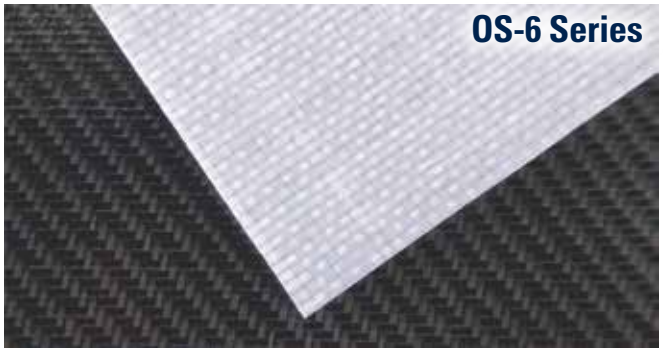
Neomera® PA-6 Composites Portfolio and Advantages

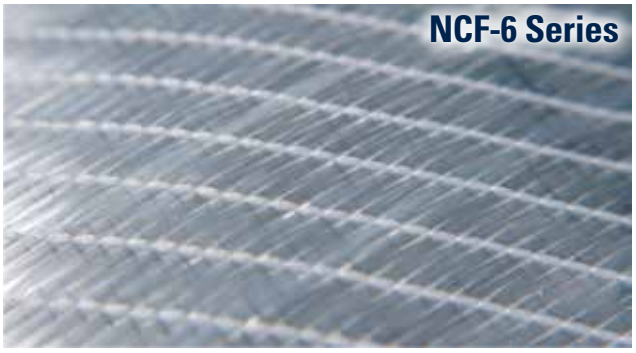
- **OS-6 Series:** PA-6 organosheets based on continous, woven fabrics
- **NCF-6 Series:** PA-6 composite sheets based on continous, non-crimp fabrics

JM Neomera® PA-6 composite sheets are manufactured continously at different thicknesses up to 3 mm through impregnation and in situ polymerization of caprolactam, a very low viscosity monomer. This leads to:

- favourable cost position
- complete impregnation of reinforcing fibers
- high molecular weight PA-6 resulting from anionic polymerization of caprolactam
- low LCA value of < 6.8 GWP
- no thermal degredation
- high impact strength

	OS- 6 SERIES	NCF- 6 SERIES
Resin	PA-6	PA-6
Fibers*	continuous, woven	continuous, non-crimp
Strength	• • •	• • • •
Stiffness	• • • •	• • • •
Impact Resistance	• • • •	• • • •
Formability	• •	• • •

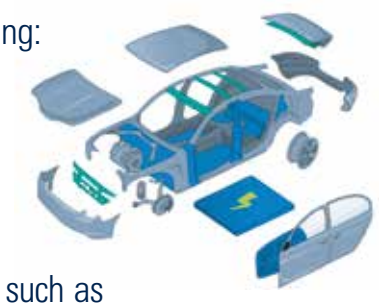




Applications and Processing

The Neomera® PA-6 composite sheets are ideal for applications requiring:

- light weighting
- part integration
- design flexibility
- high volume composite manufacturing
- short cycle time
- recyclability



OS-6 and NCF-6 Series products are ideal for hybrid molding processes such as injection and compression overmolding.

Underbody Shield

Material: Neomera® OS-6 Organosheet
Project Partner: National Research Council Canada (STAMP Composites industrial R&D group)
Process: Stamping
Challenge: Complex shape
Benefits: Light weighting
Weight comparison (to standard metal part): 50% weight saving

Samples

Johns Manville's Composites in the OS-6 and NCF-6 Series are semi-finished sheets. Samples, including cut to-shape sheets, are available on request. Depending on fabric configuration, wider sheets (up to 1.6 meter) are available.

About Johns Manville

Johns Manville, a Berkshire Hathaway company (NYSE: BRK.A, BRK.B), is a leading manufacturer and marketer of premium-quality building and specialty products. In business since 1858, the Denver-based company has annual sales of $4 billion and holds leadership positions in all the key markets that it serves. Johns Manville employs 8,000 people and operates 44 manufacturing facilities in North America and Europe.

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