

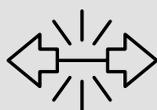


Vistamaxx™ performance polymers

Vistamaxx™ performance polymers — for improved product quality, enabling higher post-consumer recycled content (PCR) incorporation



Better
processability



Similar tenacity & elongation
with increased PCR content



Compound
cost reduction

Data and results presented herein apply specifically to the noted application under this case study. Your results may differ depending on factors such as operating conditions, equipment and materials used.

Raffia is one of the largest growing sectors of the polypropylene (PP) market, and woven sacks represent a significant portion of its global consumption. Demand of raffia PP woven fabric is mainly driven by packaging needs within the infrastructure and industrial segments for products including cement, fertilizers, chemicals, food grains, sugar and vegetables, etc.

The process starts by extruding raffia tapes that are sent to circular weaving machines (looms) to form fabric. Once the fabric is woven, it can be coated with polymer. Through the bag conversion process, the extrusion-coated woven fabric can then be made into woven sacks, flexible intermediate bulk containers (FIBC's) or block bottom bags.

Challenge

- PCR* (rPP**) generated during the manufacturing, bag conversion process and after end use
- Converters & BOs actively looking for solution to incorporate more PCR to meet regulatory compliance
- Limited PCR inclusion in raffia due to drop in mechanical properties
- Increase of PIR/PCR during raffia tape manufacturing process leading to:
 - Processing difficulty
 - Tape breakage
 - Drop in tenacity & elongation
 - Difficulty in downgauging

*Post Consumer Recycle
**rPP - recycled PP

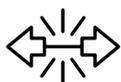
Potential benefits of Vistamaxx™ 3980 in PCR loading

Vistamaxx performance polymers can deliver enhanced tenacity and elongation compared to incumbent PP homo-polymers, which can have limited ability to stretch. The inherent elongation property of Vistamaxx performance polymers help the tapes in which it is used to stretch more, yielding higher tenacity at lower denier. These attributes help manufacturers incorporate post-consumer recycled content (PCR).



Better processability

Vistamaxx performance polymer is a versatile material, with a molecular architecture that helps with filler acceptance and dispersion, acting as a compatibilizer between multiple polyolefin components such as polyethylene and polypropylene in PCR. The Vistamaxx performance polymer-based solution demonstrates easy processability, even at lower processing temperatures and higher line speeds. It can increase elongation properties and powder deposition during the tape making and weaving process.



Similar tenacity & elongation properties, even with increased PCR content

Vistamaxx performance polymer is an elastomeric material. Its elastic behavior helps enable a higher stretch ratio. Higher elongation can help to reduce tape breakage during processing and enables better toughness during end use.



Compound cost reduction

Vistamaxx performance polymer helps enable a drop-in solution with potential cost saving through increased PCR incorporation while maintaining mechanical properties.

Study formulation details

The following formulations have been evaluated partnering with "Lohia TTRC" (The Academy of Technical Textiles) to demonstrate the performance benefits of Vistamaxx performance polymers using Vistamaxx™ 3980 grade (8 MFR).

Trial description	PCR incorporation without Vistamaxx™ 3980FL (%)	PCR incorporation with Vistamaxx™ 3980FL (%)
Polypropylene (~3 MFR)	75	56
PCR	15	30
Vistamaxx™ 3980FL	--	4
AFMB and other additives	Standard dosage	Standard dosage
Total	100	100

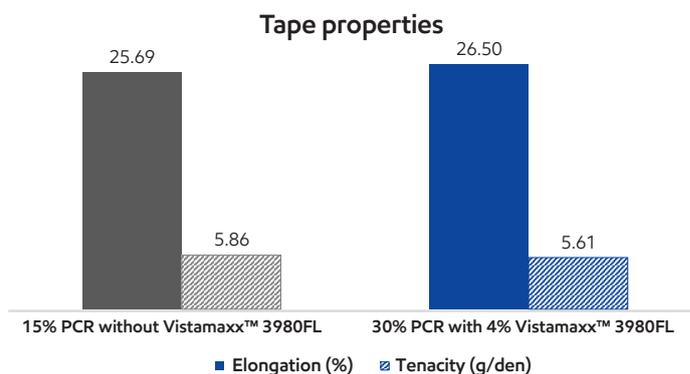
*Notes

- Reference formulation is with 15% PCR without Vistamaxx performance polymer. Trial formulation is with 30% PCR with Vistamaxx™ 3980.
- PCR represents Post Consumer Recycled content; commercially available PCR (~13.24% ash content) is used in this study.
- AFMB and other additives loading remained same for all formulations.
- Quality of the palletization was observed to be good, and the process was very smooth.
- MFR (Melt flow Rate) – g/10 min 230°C/2.16 kg.
- Test method: Elongation at Break and Tenacity – LOHIA TTRC (The Academy of Technical Textiles) method.

Results

Vistamaxx™ performance polymers demonstrated the possibility to incorporate more post-consumer recycled content (PCR) while maintaining tenacity as well as elongation properties.

Process parameters were observed to be unaffected, with higher PCR loading with Vistamaxx™ performance polymer-based solution.



Test method: Elongation at Break and Tenacity – LOHIA TTRC (The Academy of Technical Textiles) method.

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