COMPARISON OF COUPLING AGENTS EFFICIENCY IN GLASS FIBER REINFORCED POLYPROPYLENE

INTRODUCTION

By using the coupling agent: PP, grafted with maleic anhydride, we can improve mechanical properties of composites with PP + short-chopped glass fibers.

In this report we compared tensile properties, Charpy impact strength and Fogging buildup of GRAFTABOND™ PP-MAH 70025 CA and Scona® TSPP 10213 GB.

MATERIALS USED

PP matrix: Resinex 2004 RXP PP Homopolymer

Glass fibers: ThermoFlow 636

Coupling agents: **SCONA® TSPP 10213 GB**

GRAFTABOND™ PP-MAH 70025 CA

The two mixtures were prepared in the following wt. %:

Matrix PP	69%
Glass Fibers	30%
Coupling Agent	1%

SAMPLE TESTING AND PREPARATION

Samples were prepared and tested (Pictures from left to right):

- Twin screw extrusion of PP with GF
- Injection molding of specimen for mechanical tests –
  (all mechanical teste were performed 1 week after injection molding)
- Tensile test (ISO 527)
- Charpy Impact Test (ISO 179)
- Fogging Test (ISO 6452)

GRAFT POLYMER D.O.O.
Emonska Cesta 2, Ljubljana Slovenia
Company Num. 8056200000, VAT. SI 30561345
Phone Num. +38640867937
office@graftpolymer.com

GRAFT POLYMER UK LTD
Central Working Victoria Eccleston Yards 25,
Eccleston Pl, London, UK, SW1W 9NF.
Company Num. 10776788, VAT. 281712016
www.graftpolymer.com

Material Report

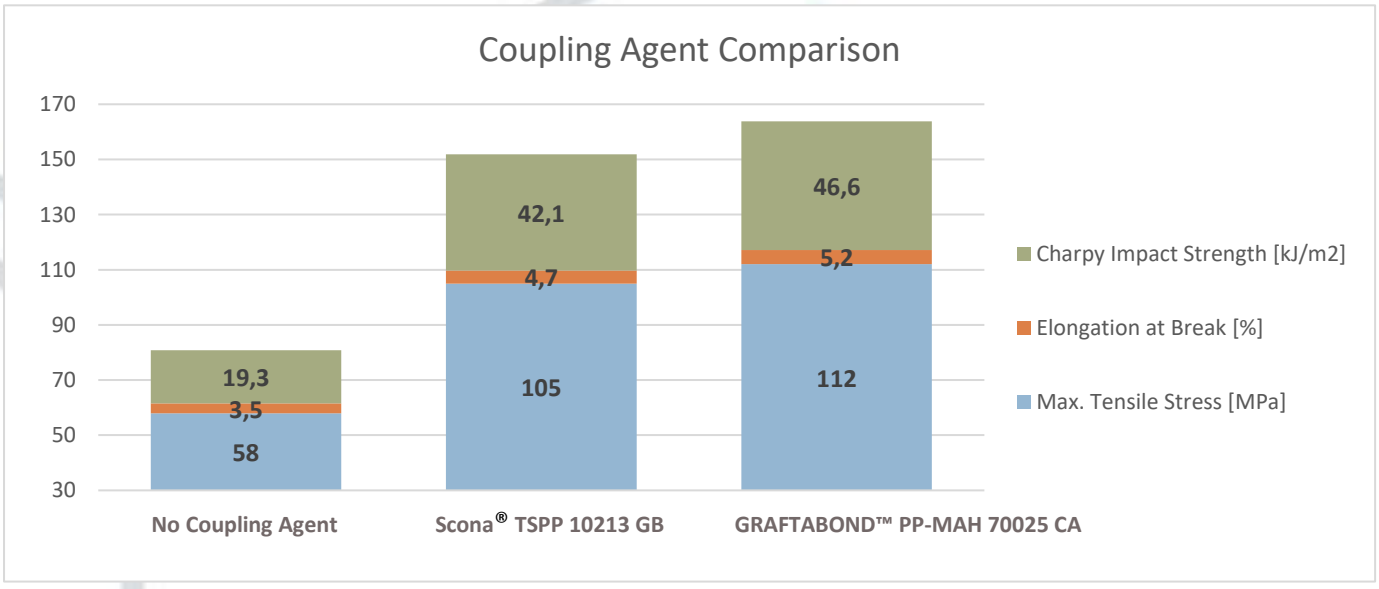



RESULTS

Mechanical Test Results

Tensile tests were done in A1 specimen, with testing speed of 50 mm/min.
Charpy Impact Strength was done on 1eU specimen (Unnotched).

Coupling agent used	Max. Tensile stress [MPa]	Elongation at Break [%]	Charpy Impact Strength [kJ/m²]
No Coupling Agent	58	3,5	19,3
SCONA® TSPP 10213 GB	105	4,7	42,1
GRAFTABOND™ PP-MAH 70025 CA	112	5,2	46,6



GRAFT POLYMER D.O.O.
Emonska Cesta 2, Ljubljana Slovenia
Company Num. 8056200000, VAT. SI 30561345
Phone Num. +38640867937
office@graftpolymer.com

GRAFT POLYMER UK LTD
Central Working Victoria Eccleston Yards 25,
Eccleston Pl, London, UK, SW1W 9NF.
Company Num. 10776788, VAT. 281712016
www.graftpolymer.com

Fogging Test Results

Fogging test was done at 100°C for 12 h, on 1 g of the prepared PP-GF30 compound.

Coupling agent used	Fog Deposit [mg]
Scona® TSPP 10213 GB	16,2
GRAFTABOND™ PP-MAH 70025 CA	0,2

What is fogging?

The additives contained in the materials used as automotive interior materials volatilize in the inside of a car when the temperature rises and condense onto the internal surfaces of the window panes that have been cooled by outside air. As a result, the front glass and window panes are clouded, disturbing a field of view. This phenomenon is called “fogging”, and the fogging properties of the materials are reproduced and evaluated.

CONCLUSIONS

- When using coupling agents, tensile properties and Charpy impact strength all increase considerably
- GRAFTABOND™ PP-MAH 70025 CA has slightly better mechanical properties than Scona® TSPP 10213 GB.
- The fogging buildup of Scona® TSPP 10213 GB is significantly higher, which leads to clouded glass surfaces in automotive interior.
- GRAFTABOND™ PP-MA 70025 CAF offers the best color and properties together, and it is made in a one-step process with extrusion only. (granules can be provided with underwater pelletizing)

CONTACTS

MANAGEMENT

CEO/CTO | Victor Bolduev +386 40 534 739

Executive Director / CMO | Pavel Kobzev +386 40 867 937

Pavel@graftpolymer.com

GRAFT POLYMER D.O.O (OFFICE)

Emonska Cesta 8, Ljubljana Slovenia.

Company Num. 8056200000,

VAT. SI 30561345

Tel +386 1 777 6561

office@graftpolymer.com

www.graftpolymer.com

GRAFT POLYMER D.O.O (PRODUCTION/WAREHOUSE)

Mejaceva ulica 2, 1353 Borovnica Slovenia

Company Num. 8056200000,

VAT. SI 30561345

office@graftpolymer.com

www.graftpolymer.com

GRAFT POLYMER (UK) LTD

Central Working Victoria Eccleston Yards 25,

Eccleston Pl, London, UK, SW1W 9NF.

Company Num. 10776788, VAT. 281712016

www.graftpolymer.com