



THERMOPLASTIC NANOCOMPOSITES

THERMOPLASTIC NANOCOMPOSITES

Materials Development

CHALLENGE

Meet automotive interior standards for high-performance materials to be used for seat backs by investigating the potential of new-generation nanocomposites. The goal would be the creation of materials that offer properties superior to conventional composites along with the opportunity to reduce part weight and process costs.

SOLUTION

A CFI (Center For Innovation) Materials Engineering Team was established, bringing together engineers from Cascade Engineering and Noble Polymers. The team met to compare notes and technologies and later attended conferences focused on nanocomposites. Market studies were conducted to identify areas of concentration and determined that polypropylene (PP) nanocomposites offered considerable potential. Multiple formulations were developed using different PP and Nanofiller grades. These were compounded using the lab extruder. Numerous variations were run and tested. Two formulations were eventually developed and molded into seat back parts that had a history of warpage and processing difficulties.

RESULTS

The development program exceeded expectations, producing thermoplastic nanocomposites that offered:

- No warpage in the part
- Lighter parts, by 15%,
- Material replacement without need for product design changes
- Improved process ability
- Ability to consistently meet initial cost targets with potential for long-term savings
- Better barrier properties
- Enhanced modulus and strength
- Recyclable
- Very little change in impact
- Better high-temperature resistance
- Decreased gas permeability
- Lower processing temperatures – Cycle time reduction
- Less wear and tear on tools and machines
- Larger processing window
- Environmentally friendly
- Better thermal characteristics
- Better aesthetics

For additional information about this project or other Cascade Engineering case histories, visit our web site at cascadeng.com or call 800.968.2278.