

Mechanical-recycle technology of automobile shredder residue

-Mechanical-recycle technology of simulated automobile shredder residue-

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KEY WORDS:resources, Recycling, Material recycling, Automobile Shredder Residue (ASR) [D2]

The National Composite Center (NCC) at Nagoya University is advancing research and development of mechanical recycling technology for automotive shredder residue (ASR), aiming for a resource-recycling society for automotive materials.

Currently, ASR is limited to thermal recycling. Figure 1 illustrates the mechanical recycling methods for ASR being studied by the NCC.

Pattern 1 involves mixing ASR, crushed to approximately 10 mm, with virgin PP in a twin-screw extruder to produce pellets, which are then injection molded.

Pattern 2 involves directly thermoforming solidified ASR.

Figure 2 shows the Charpy impact strength of the pellets obtained in Pattern 1. Adding 20% ASR reduces the Charpy impact strength by 30%. However, when ASR is used as the core material and PP as the skin material in sandwich injection molding, the Charpy impact strength increases (Figure 3).

Figure 4 shows the flexural modulus of the pressed sheets obtained in Pattern 2.

The flexural modulus increases when a sandwich structure is created by laminating virgin PP sheets on the top and bottom.



Fig.1 NCC Mechanical recycle technology of ASR

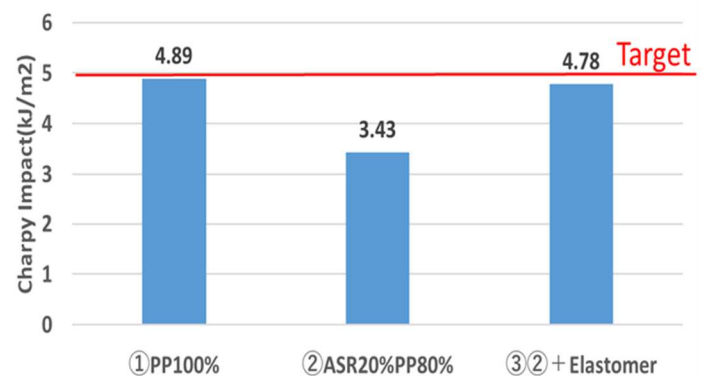


Fig.2 Charpy impact strength (Normal injection)

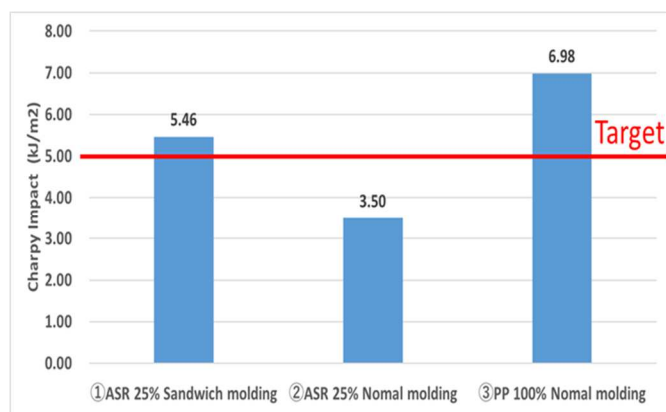


Fig.3 Charpy impact strength (Sandwich injection)

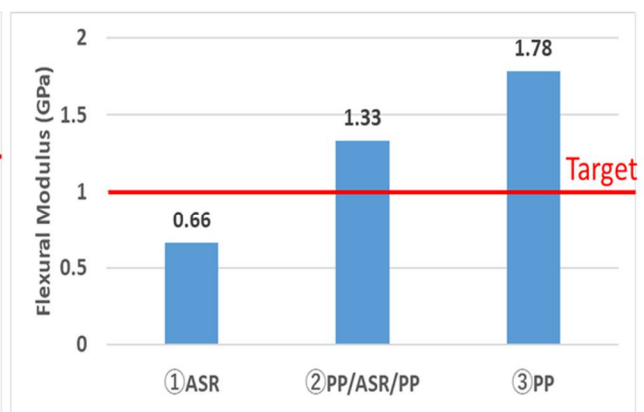


Fig.4 Flexural Modulus in Pattern 2