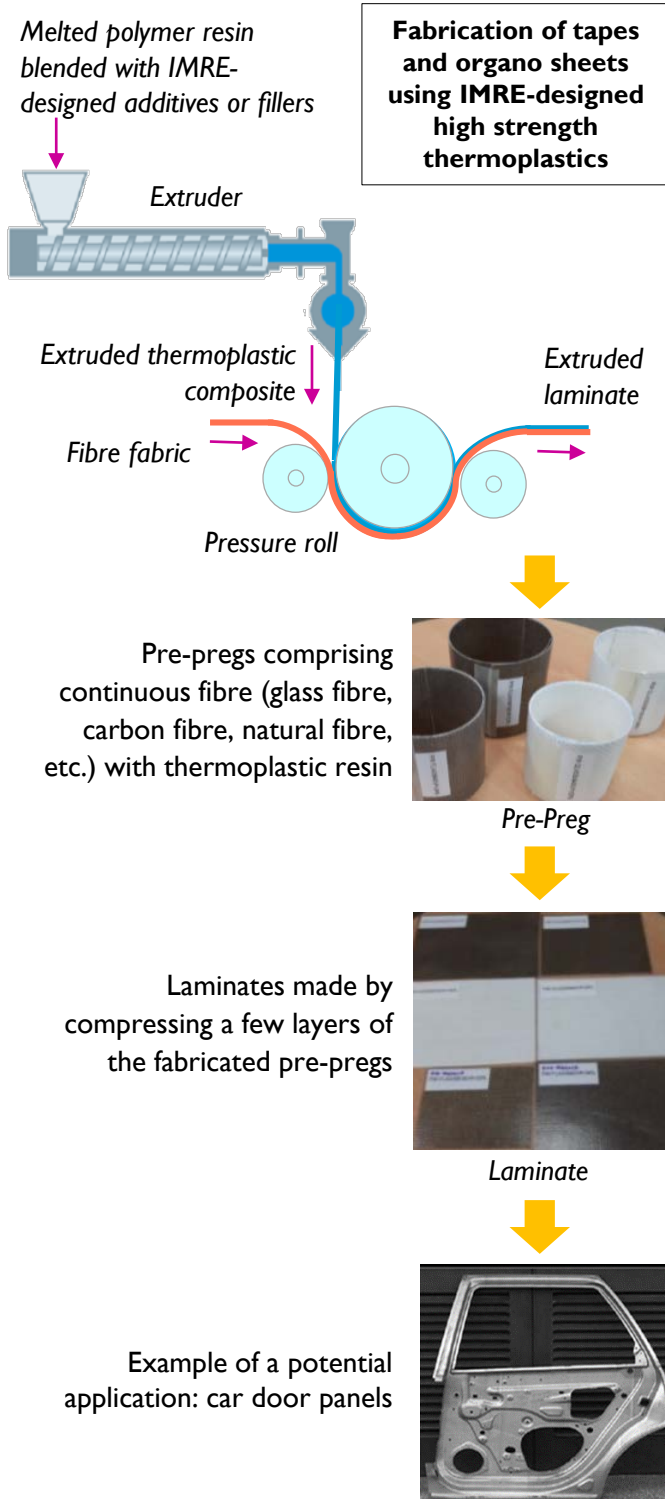


# Lightweight yet High Strength Thermoplastics



## About the Capability



## Addressing ...

- the need for lightweight yet high strength and high impact resistant thermoplastics incorporated with versatile functions

## Key Features of IMRE-developed Thermoplastic Composites

IMRE is able to develop thermoplastic composites that :

- Are lightweight, yet strong and tough
- Possess enhanced properties as very good additive or filler dispersion has been achieved
- Are easy to process due to low additive or filler content
- Are sustainable, as natural fibres (renewable source) can be used as fillers
- Can incorporate multiple functions
- Can be applied to fabricate a variety of end products

## Potential Applications

- Building materials (partition)
- High pressure pipes
- Interior decorative materials, furniture

## Collaboration Opportunities

We have the capability to work with you to:

- Design and synthesise fillers and additives
- Enhance filler-matrix interface
- Design and modify formulations
- Conduct processability studies using extrusion, injection moulding, lamination and coating



For more information, please contact :  
industry@imre.a-star.edu.sg



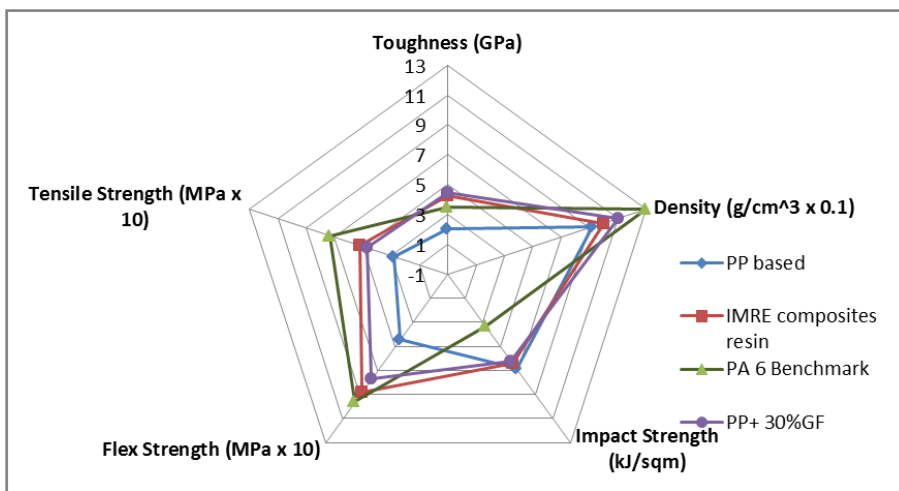
IMRE website: <https://www.a-star.edu.sg/imre/>  
A\*STAR website: <https://www.a-star.edu.sg/>



## Performance Data

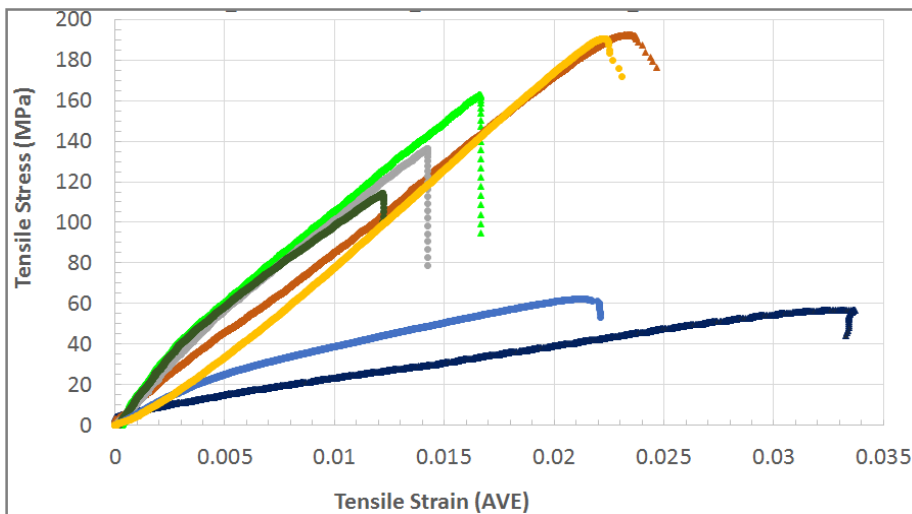
Performance highlights of thermoplastic composite resin with IMRE-designed additives :

### Mechanical performance of IMRE developed polyolefin resins compared with commercially available resins (PA6)



- Toughness and impact strength greater than PA6 Benchmark
- Strength is 70-90% of PA6
- 10-20% lighter than PA6 and PP with 30% glass fibre (GF)

### Tensile performance of polyolefin (thermoplastic) composite organo-sheet



- Polypropylene and polyethylene were successfully impregnated on the continuous fibre (i.e., glass fibre and natural fibre).
- Continuous natural fibre-reinforced polyolefin products have the potential to replace reinforced engineering plastic, but are lighter and of higher strength than reinforced engineering plastic.