Generic thermoplastic body floor for electric vehicles

Fraunhofer Institute for Production Technology IPT

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Generic thermoplastic composite body floor for electric vehicles

- Side panel: Tape placement
- Sandwich structure: Local reinforcement
- Profiles: Thermoforming & Local reinforcement
- Joining: Insert integration Ultrasonic welding
- Battery pack housing assembly
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Laser-assisted tape placement / winding

- Load and weight optimized design
- Complex tubular geometries are feasible
- Placement speeds of over 1 m/sec
- Selective reinforcement enables
  - Multi-material solutions
  - Significantly improved mechanical properties
  - Efficient material usage
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Thermoforming

Potential

- Efficient process / short cycle time
- Combination with further processes
  - Insert integration
  - Trimming
  - Joining

Thermoformed profiles
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Joining via inserts

Potential

- Fiber fair bionic process (forked branch principle)
- Joining strength: + 35.8 %
- Part strength: + 62.5 %
- Energy absorption till final failure: + 168 %
- Economic efficiency due to parallelized functionalization
- Process is suitable for large volumes
- Minimized tool wear
- Undercuts / form fit of inserts are feasible
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Joining via ultrasonic welding

Innovation

- Utilization of unidirectional fiber reinforced tapes as ED (energy director)
- Application of ED with laser assisted tape placement head

Advantages

- Standard materials
- Process technology is established
Your contact

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