



# **FUEL TANK ACM Technology**

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# Technology overview

- ACM Technology
  - ACM Technology  
*Autoclave Composite Monocoque Technology*
  - no cutting, trimming or bonding needed
  - part outer shape is finished at unmolding process
  - all inserts are installed in lamination process before part is autoclaved  
(without resin accumulation in threads)



# Components overview

- Fixing inserts
  - All brass inserts are laminated before part is autoclaved
- Internal tubing
  - gasoline and ethanol resistant 3 layer internal tube
  - Pre-formable in any shape with radius  $> 10\text{mm}$
  - special designed brass coupling inserts with protective cap to avoid accidental disconnection
  - insert - tube junction has double fuel resistant orings
  - tube and insert allowable overpressure is 10bar or more



# Components overview

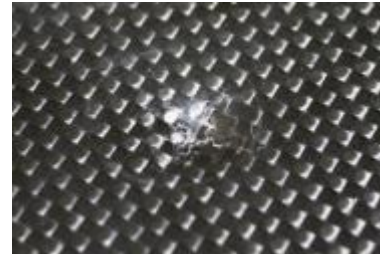
- Internal coating
  - gasoline and ethanol resistant coating
  - applied with vacuum and inert gases
  - 100% covered surface
  - UV pigment for quality testing



# Ply book overview

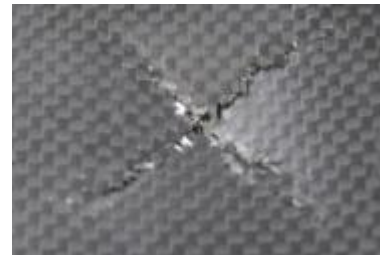
- Laminat T31

- 8 layers, 5 different materials
- Weight = 3044,79g/m<sup>2</sup> , thickness = 2,31mm
- Stiff, penetration and abresion resistant with de-laminating layer
- Penetration protection according to directive 97/24/EC
- Exposed areas



- Laminat T44

- 5 layers, 4 different materials
- Weight = 2058,13g/m<sup>2</sup>, thickness = 1,39mm
- Stiff laminat with de-laminating layer



# Cold impact test – Shock test

- Test description
  - Filled to nominal capacity
  - Cooled to  $253^{\circ}\text{K} \pm 5^{\circ}\text{K}$
  - Pendulum peak curvature 3mm, with 15kg
  - Impact energy not less than 30,0J
- Test
  - Tank with laminate T31 was tested all around surface every 10cm



# Fixing inserts

- Material
  - Brass
  - All standard threads M4, M5...
  - Custom threads and shapes
- Tests
  - Thread torque test = over 48Nm @M6 -> screw broke
  - Pull out test = over 3431N @M5 -> composite part broke





# Tank properties

- OEM alu tank
  - Weight = 2900g
- ACM Technology
  - Weight = 2000g
  - \* or less – depends on ply book*

