IMPACT PROTECTION
DESIGN AND MATERIAL SOLUTIONS
PROJECT KICK OFF BRIEF

Application: Protective sports equipment

Challenge: Provide functional material to protect against impact for chest protector

Requirements:

• Compact - reduce thickness and weight for improved comfort and functionality
• Meet EN standards
  • EN1621-1 level 2 & EN1621-2 level 1
• Eliminate the use of foam and glue
• Be waterproof and easy to clean
• Sustainable
• Easy to prototype & considers manufacturing efficiency
VIBRATION DAMPING TECHNOLOGY (VDT)

HOW DOES IT WORK?

Simplified Drop Test
- 65g steel ball
- Dropped from 305mm
- Onto 3.175mm thickness flat samples

Materials Tested
- Standard TPE 30 Shore A
- TPU alloy 60 Shore A
- Damping TPE 32 Shore A

VDT reduces bounce
Simulation of Impact

A weight dropped onto protective element in contact with rigid substrate

Image courtesy of Airobag TV
https://www.youtube.com/c/AirobagTV/videos
• A number of different shapes and designs are created and simulated to determine which one works best

• Refining to meet EN standard

• VDT TPEs can help reach compliance with EN1621-1 level 2 and EN1621-2 level 1

• Optimum protection can be achieved by combining industrial design and engineering
VALIDATION

PROTOTYPING WITH 3D PRINTING

VDT can be 3D printed for concept evaluation early in the design process.
SUMMARY

• Enabled a new, compact design with a customized VDT TPE formulation
• Improved user comfort and functionality
• Fulfilled EN standards
• Reduced number of prototyping tools required
• Reduced time spent in product development by 40 percent, enabling faster commercialization of product