



EcoRange™

LIGHTWEIGHT ALUMINIUM SYSTEM
FOR BUS AND COACH BODIES



What is EcoRange™?

EcoRange™ is the way to develop and build lightweight bus and coach bodies:

- ▶ A package of standardised technical solutions and methods
- ▶ Using standard structural components and bolted connections
- ▶ Based on proven aluminium and composite design

Development time and costs can thus be reduced to a minimum, while increasing flexibility to meet specific operator and end-user requirements.

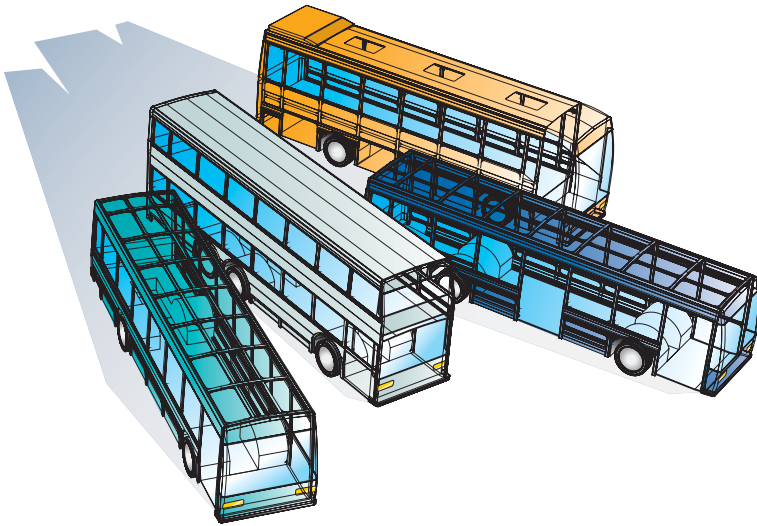
EcoRange™ covers today's most common vehicle types and dimensions, and is particularly well-suited for small-to mid-sized bus series.

EcoRange™ products and services

- ▶ A wide range of aluminium and composite elements for use in bus and coach bodybuilding
- ▶ Individual adaptation of existing body designs to your specific needs
- ▶ Supply of materials and components for prototype and series production
- ▶ Technical and logistics support for prototype and series production
- ▶ Implementation of maintenance and repair concepts

Further options

- ▶ FE calculations and test support
- ▶ Fabrication/machining of parts and components
- ▶ Supply of complete subassemblies



Technical characteristics

- ▶ Standardised aluminium extrusions with integrated T-slot channels for maximum flexibility
- ▶ Aluminium cast and forged connection elements
- ▶ Large composite components
- ▶ Cold joining of extrusions via bolted connections
- ▶ Structural adhesive bonds between aluminium and composite elements
- ▶ Limited use of rivets

Benefit for the body builder

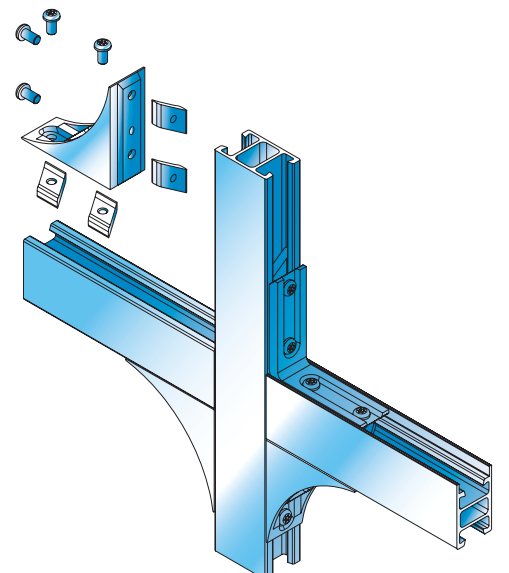
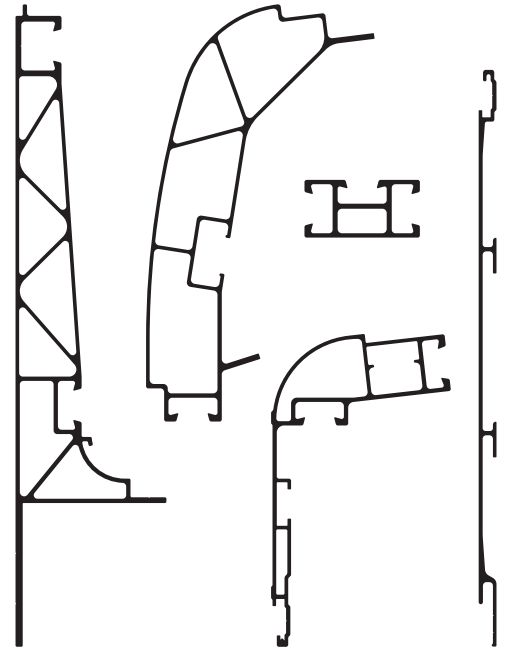
- ▶ Reduced development and tooling costs
- ▶ Bolted connections:
 - simple and fast assembly
 - improved tolerances
 - excellent fatigue properties
 - no welding required
 - low-cost jigs and fixtures
- ▶ Minimal corrosion protection measures required
- ▶ Significant reduction of labour costs
- ▶ Increased productivity
- ▶ High flexibility in meeting individual operator and end-user requirements

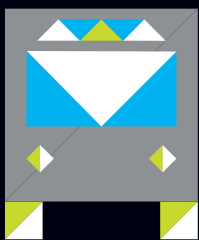
Cost-optimized production!

Benefit for the operator

- ▶ Reduced bodyshell weight:
 - higher payloads
 - reduced output of greenhouse gases (CO₂)
- ▶ Reliable and durable construction:
 - excellent corrosion resistance
 - reduced maintenance and repair costs
 - slower depreciation (higher resale/recycling value)

Attractive life cycle costs!





Constellium

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