WE ARE MAKING YOUR CARS LIGHTER & SAFER
Because the most important part of the car are supporting your electrification. Decreasing environmental impact. Improving driving dynamics.

Experts for LIGHTWEIGHT car body, chassis and seating components people inside. goals.

Understanding your challenges - delivering best solutions.

PRODUCT DESIGN PRODUCTION PROCESSES (VIRTUAL) ENVIRONMENTSMART

AvtoIN
The TPV Group Corporation is a development supplier operating on the global market. Our product programmes are contained in three business divisions:

- **The Vehicles** division contains the programme of sales of new and second hand cars and light trailers and the programme of overall aftersale services for vehicles users.
  
  TPV Avto is the biggest passenger car dealer in SE part of Slovenia and the sole dealer of Renault, Nissan, Dacia and Toyota vehicles. It has two operational units - in Novo mesto and Brežice.

- **AvtoIN** presents our core business. Within this division we develop and manufacture car body and chassis assemblies, seat components and engine gaskets for the needs of OEMs and system suppliers. In addition, we develop and provide comprehensive solutions for smart factories, where the automated guided vehicles (AGVs), which are the result of our own development, are one of the key products.

  In our **Trailers** division we develop and produce light transport trailers in cooperation with German partner Bockmann. The company is one of the leading manufacturers of trailers in Europe. We manufacture more than 25,000 trailers a year.

  We offer more than 80 types of trailers for a wide range of applications. The range of TPV trailers extends from light universal trailers, camp trailers to professional trailers for transportation of motorcycles, motor boats, cars and other cargo.

- **TPV Trailers** division we develop and produce light transport trailers in cooperation with German partner Böckmann. The company is one of the leading manufacturers of trailers in Europe. We manufacture more than 25,000 trailers a year.

  We offer more than 80 types of trailers for a wide range of applications. The range of TPV trailers extends from light universal trailers, camp trailers to professional trailers for transportation of motorcycles, motor boats, cars and other cargo.

**TPV Group**

**Turnover** (2018): 152 mio €

**Manpower** (2018): over 1,200 employees
Locations

Our Headquarters are located in Slovenia from where Group central activities such as Management, Development, Sales and Purchasing are managed.

Europe:
- Novo mesto (HQ)
- Brežice
- Velika Loka
- Suhor
- Ptuj
- Kragujevac

USA:
- Aiken, SC

China:
- Shenyang

Timeline

- 1954: Beginnings of the automotive industry in Novo mesto
- 1989: TPV establishes joint-stock company TPV, which starts building its future on a strong automotive heritage
- 1992: TPV introduces its first robot and thus becomes one of the pioneers of robotisation in Slovenia
- 2007: Internationalisation - first production plant outside Slovenia
- 2011: First TPV protected patent for a seating innovation
- 2013: Inhouse developed solutions for Smart Factories offered to the market
R&D goals are directed toward achieving a broader development capability and a growth of new development solutions improving the innovative visibility of TPV. With the use of composites, new materials and innovative assembly technologies we will follow our light weight and environmental orientation in our key product segments.

Strong competencies in the area of virtual development that we use at all stages – from the product design, virtual analysis to virtual development of smart factories – enable us to fully encompass the development in the virtual environment.

**RESEARCH**
Our activities are aimed at analyzing trends in engineering development and performing R&D projects relevant for the automotive industry.

We have extensive knowledge on lightweight materials and hybrid product manufacturing.

Special emphasis is given on strengthening the competencies in the field of aluminium and high-strengthened steels.

**DESIGN**
Design is the core activity within the virtual development and within the entire process of product development, where we use advanced design knowledges on structural assemblies of chassis and body, and elements for electrified vehicles.

Activities:
- preparation of 3D environment,
- selection of concepts and solutions,
- design of connection between elements,
- adjustments, search for new solutions, analyses.

Concern for:
- function of the product,
- technological applicability, quality,
- environment, weight,
- price.

Result:
- 3D CAD model,
- drawings,
- bill of material.

**VIRTUAL ANALYSES**
Virtual analyses comprise strength, endurance, vibration, kinematic and collision analyses as well as other analyses required for the product definition.
Activities:
- collisions, kinematics,
- deformations, strength, endurance, vibrations,
- crash simulations.

**PROTOTYPE MANUFACTURE**

Fully equipped prototype manufacturing is managed in-house as an important step in the process of product development.

It is aimed at providing appropriate prototypes for testing and validation of product functional characteristics. It also serves for indirect examination of product definition in terms of technological applicability where the selected technology, prescribed quality procedures and perfection of definition are examined.

**TESTING**

Testing activities include all prototypes testing required for validation of functional characteristics of virtually developed product.

**PRODUCTION PROCESS DEVELOPMENT**

With long-year experience in the field of factory design, development of production processes, and simulations of operational processes in the virtual environment we provide and assure our competitiveness through innovative engineering solutions. For technology planning and design of production process we use virtual analysis, FMEA and feasibility studies based on statistical analysis of existing comparable processes. Process development activities are conducted through team work and in close communication with customers, suppliers and our production experts.
Product Competences

**Seat Components**
Our seat component development and production in light of functionality, performance, ergonomics and style, offers versatile solutions to our customers’ needs.

**Engine Gaskets**
Long time tradition and experience with engine gaskets production are enabling us further strengthening of our market position.

**Body and Chassis Components**
Combining advanced materials and state of the art manufacturing technologies with innovative approach, we supply our customers with a number of viable solutions for body and chassis components.
Seat components
- Seat frames
- Armrest structures
- Headrest structures
- Backrest structures and components
- Seat cushion structures and components
- Front seat towel bars
- Seat height-adjuster components
- Car seat cushion wire frames
- Other seat components

Engine gaskets
- Engine gaskets for aftermarket

Body and chassis components
- Cross car beams
- Lower front bumper beams
- Rear differential carriers
- Manual transmission shift levers
- ABS/ESP brackets
- Hood panel struts
- Sliding bar of safety belts
- Door latch systems
- Hood latch systems
- Door hinges
- Other body and chassis components
Manufacturing Technologies

Manufacturing, as one of our core capabilities, is supported by following technologies:

- Welding and other joint systems
- Assembling
- Cold stamping
- Tube and wire bending
- E-coating and powder coating
- Laser cutting and welding
Innovative thinking

- More than 15,000 innovative proposals through integrated system of innovations (since 2007).
- Applications and Modules for Smart Factories
- Advanced Robotics Systems
- AI – Bin Picking
- Prototyping Process integrated in 3D print
- In house machine building shop and automation division

- In 2018:
  - 8 award for innovations
  - 40 awarded innovators
  - Best all Slovenian Innovation - people’s choice Award

- Applications and Modules for Smart Factories
- Advanced Robotics Systems
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Digitalization – internet of things
Virtual tools for advanced design
Build Up of Internal APPs
Generic Design Process
Innovative ECO SYSTEM

- Innovative EMPLOYEES
- Innovative WORK PROCESSES
- Innovative ECOSYSTEM
- Innovative TECHNOLOGICAL SOLUTIONS
- Innovative PRODUCT DESIGN

Simple, Functional and Safe Development Focus
Technology Advanced Solutions
Specialist in „Lightweight“ Design
Modules for smart factories

Based on our extensive experience of continuous improvement in the automotive industry, we initiated brand new product group: modules for smart factories.

We develop and implement smart systems for handling and supervision using 3D machine vision, laser technologies, systems for proactive management of machinery and equipment using visual sound technologies, systems for autonomous handling and automated logistics with automated guided vehicles. We are developing advanced solutions based on artificial intelligence together with partners. In addition to our standard modules for smart factories, we also develop solutions customized to individual needs of our buyers.

MODULE example: Complete production logistics solutions (AGV)

We develop and provide complete cost effective solutions for production logistics management with automated guided vehicles (AGVs), that increase efficiency and reduce costs. The solutions are ideal for multiple, point-to-point material movements and are perfectly suited for all manufacturing companies.

We developed our own AGV, only 160 mm high, which significantly reduces the investment cost of logistics automation. The height corresponds to the height of standard pallets and trolleys used in production, which therefore do not need to be transformed. Our own central control system represents “the brain” of all operations connecting multiple AGVs with complete periphery.

Our solutions increase production efficiency through:

- Reliable and effective deliveries
- Automated KAN BAN
- Return of investment takes less than 1 year
- Increased productivity
- Reduction of human error
- Annual energy savings - up to 25 000 kWh per AGV
- Small space needed
Customers

TPV is a strong partner in the automotive industry supporting number of automotive manufacturers and system suppliers.

OEM customers

Tier 1 customers

Our products are integrated in the following car brands

Mercedes-Benz
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Supporting your electrification goals.

Decreasing environmental impact.

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Because the most important part of the car are people inside.

SMART
PRODUCT DESIGN
PRODUCTION PROCESSES
(VIRTUAL) ENVIRONMENT

Understanding your challenges - delivering best solutions.

TPV GROUP CORPORATION

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