



SPG Pre-Series Tooling & Prototyping

# Shaping the world of tomorrow

Lighting & Optics







**ARRK**

SPG Pre-Series Tooling & Prototyping

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# Driven by experience, motivated by your ideas

In the product development cycle, testing and prototyping are indispensable. At ARRK SPG, we can create prototype and low volume parts that satisfy all quality constraints and provide all the necessary materials and knowledge in every step of the product development cycle.

# Why ARRK SPG?



**Professionality**



**Entrepreneurship**



**Passionate**



**Solution & oriented  
thinking**



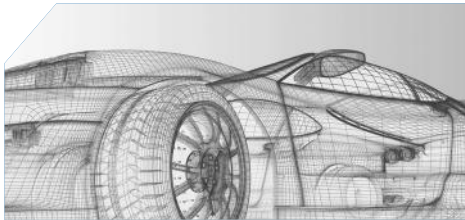
**Maximum service,  
keeping promises**



**Look and think beyond  
customer demand**



# Technical Excellence, Seamless Supply



1. Engineering



2. Rapid Prototyping



3. Raw Materials



4. Toolmaking



10. Logistics



5. Parts Production



9. Warehousing



8. Quality Control



7. Assembly



6. Finishing

# Project Management

**We take care of the supply chain, so you don't have to.**

## **Motivated to fulfill**

Together with our valued partners in our supply chain, we can manage any project from A to Z. First, we map all of our customer's wishes. Next, we plan, arrange and oversee the execution and deliver the final product. This way, ARRK SPG can offer complete fulfilment, or surpass expectations.

## **Supply Chain & Logistics**

- Sense of ownership & pro-active approach
- Strong and frequent communication
- Planning & EDI
- Packaging & RFID-Labeling
- Warehousing & Logistics

## **Quality Control**

Finally, we execute various quality checks to make sure the products we deliver meet the highest standards.

- Parts measurement 3D CMM, tactile or digital scanning
- Process FMEA and control plan
- PPAP / EMPB & IMDS registration

## **Certificates**

- ISO9001:2015 / ISO14001:2015
- ISO27001:2017 and TISAX-Label





# Finishing

**Using various finishing techniques, we ensure your prototype is of the highest possible quality.**

## **Make it unique**

In order to truly assess a product's aesthetics in the early stages of product development, it is absolutely worthwhile to build a prototype with a high-quality finish. Using various finishing techniques, we can match or surpass the quality standards of the final product.

## **Surface treatment and decoration**

- Painting: texture painting & HSP diffuse painting
- Laser texturing (femtosecond) and laser etching
- Metallization (translucent) and PVD-coating
- Matt translucent silkscreen printing
- And many more...

# Assembly

**Regardless of its complexity, we can assemble various parts into a complete product.**

## **Ready to install**

Besides the production of single parts, we can also take care of the assembly of an integrated module or even a full product. We are especially skilled in:

- Complex assemblies with multiple options, e.g. bumper facias and door panels
- Functional lighting modules including PCB's



# Prototyping

From 1 up to ...

## CNC-machining

- Optical materials like PMMA, PC, Zeonex, etc. including engineering plastics
- Metals including aluminium for heatsinks and reflectors
- Milling radius from R0.5 up to R0.05 for optics
- Unique diamond polishing technology for small optics
- Laser texturing (femtosecond) for “cold ablation” on milled PMMA
- ARRK Fasttool technology for milled parts in series materials (e.g. milky, smoke)
- SPDT (Single Point Diamond Turning) and Diamond Machining Technology

## PU-vacuum casting

- Including 2-/3-shot casting
- Standardized colours for (semi-)translucent materials
- Reflex patterns can be included
- Silicone tools based on CNC-machined masters for excellent surface quality, highest accuracy and optimum dimensional stability
- Acomon RAVolution™ PU optical clear material resistant to UV yellowing
- PU Back molding of polymer foils include in-mold structural electronics IMSE ®

## Optical silicone casting

- Optical silicone parts with DOW materials by using steel prototype tooling

## ARRK global 3D-Rapid Prototyping

- SLS Selective Laser Sintering
- SLA Stereolithography
- Polyjet (Objet)
- DMLS / SLM Metal Sintering
- DLP Technology





# Low Volume Production

**50 ~ 2000 parts or assemblies**

## **Injection moulding**

- Using aluminium moulds at ARRK SPG as well as rapid steel non-export moulds operated from our ARRK Far-East facilities
- PRE-TENSION Tool® for large mouldings
- In-Mould-Decoration (IMD) & IML/FIM with printing electronics
- Including 2-/3-shot overmoulding, gas injection (GID) and Sequential Valve Gating (SQV)
- Expandable polypropylene EPP & PUR-Foaming

## **Light-weight solutions**

- MuCell® and Chemical foaming
- CRFP composite solutions
- Thermoplastic-prepreg overmoulding include Mitsui Tafnex™ CF-PP UD Tapes
- D-LFT Direct Long Fiber Thermoplastic moulding

## **Sustainable solutions**

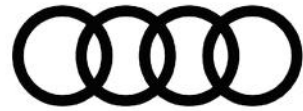
- Using high-flow PP compounds from Mitsui Chemicals
- Using PCR and bio-based material & additives

## **Other solutions**

- Compression Moulding (Rubber) & Liquid Silicone Rubber (LSR)
- Blow moulding
- Thermoforming
- Aluminium Sand Casting & High Pressure Die-Casting (HPDC)
- Extrusion (Aluminium, plastics and silicone rubber)
- Sheet metal (Stamping, deep drawing and pressing)



# Our clients





"I would like to thank you for the perfect cooperation and quality of parts from your company. We are very satisfy with your kindly communication and perfect support for all projects, because the effort is excellent and you are able to gives us the best information about technologies and possible production method of separately parts for projects, which are becomes still more complicated! ARRK SPG is a very reliable and flexible partner for us."



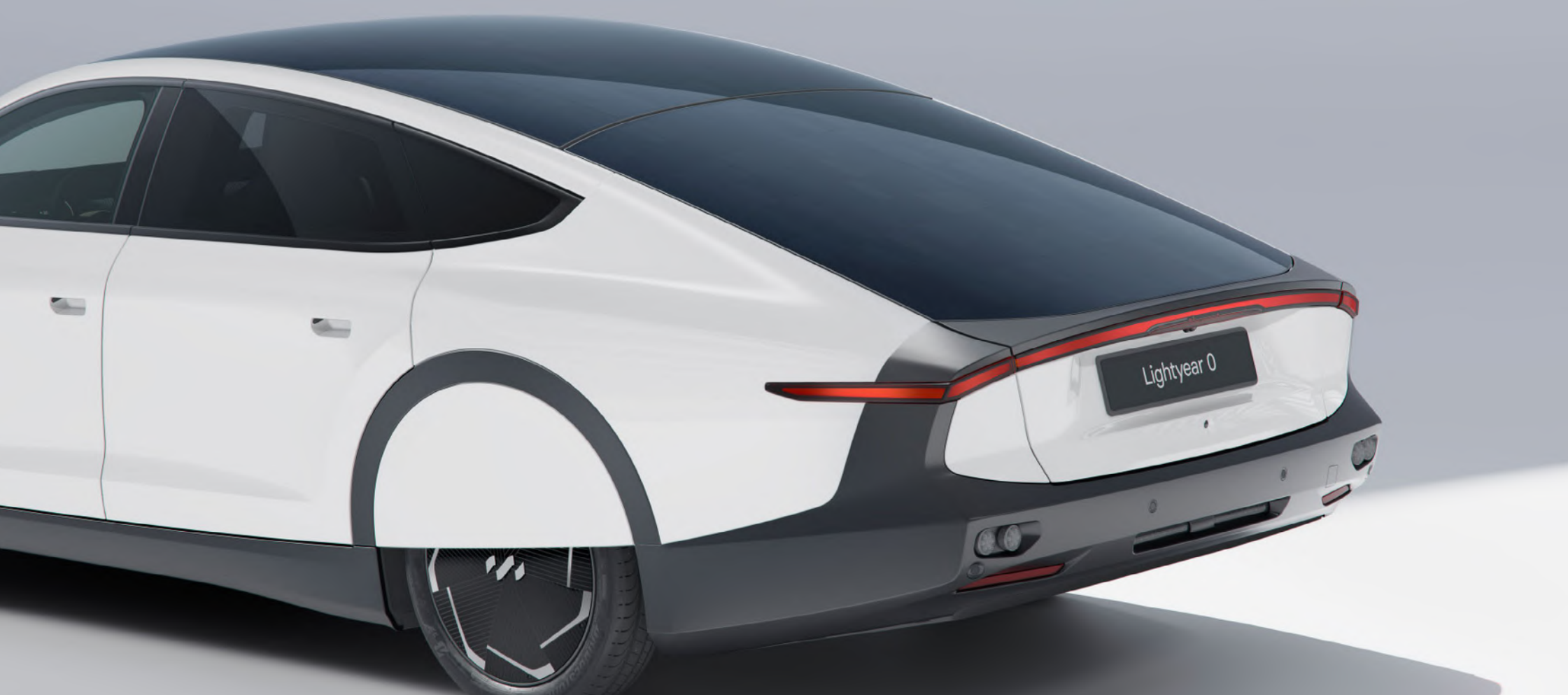


“Recently, DAF introduced a new generation of trucks to which ARRK SPG collaborated in the design and styling phase. We really appreciated your cooperation from the beginning in realizing all deadlines and getting the styling models ready for management presentations on time with excellent quality. The prototypes helped us to make the right choices along the way. A personal highlight for me was the fact that the headlight was already operational in the early prototype phase of the project. That helped us to implement LED lighting on the entire vehicle, which is an important step towards a sustainable future.”



“ARRK SPG delivers rapidly and with a consistent quality. We rely on the fast response time of the ARRK SPG team to provide first prototypes of plastic optical systems. The quality and delivery time always meets our demands. Our flagship lamp XP30R was first built with lenses made by ARRK SPG to successfully prove out the concept - thank you!”





Lightyear

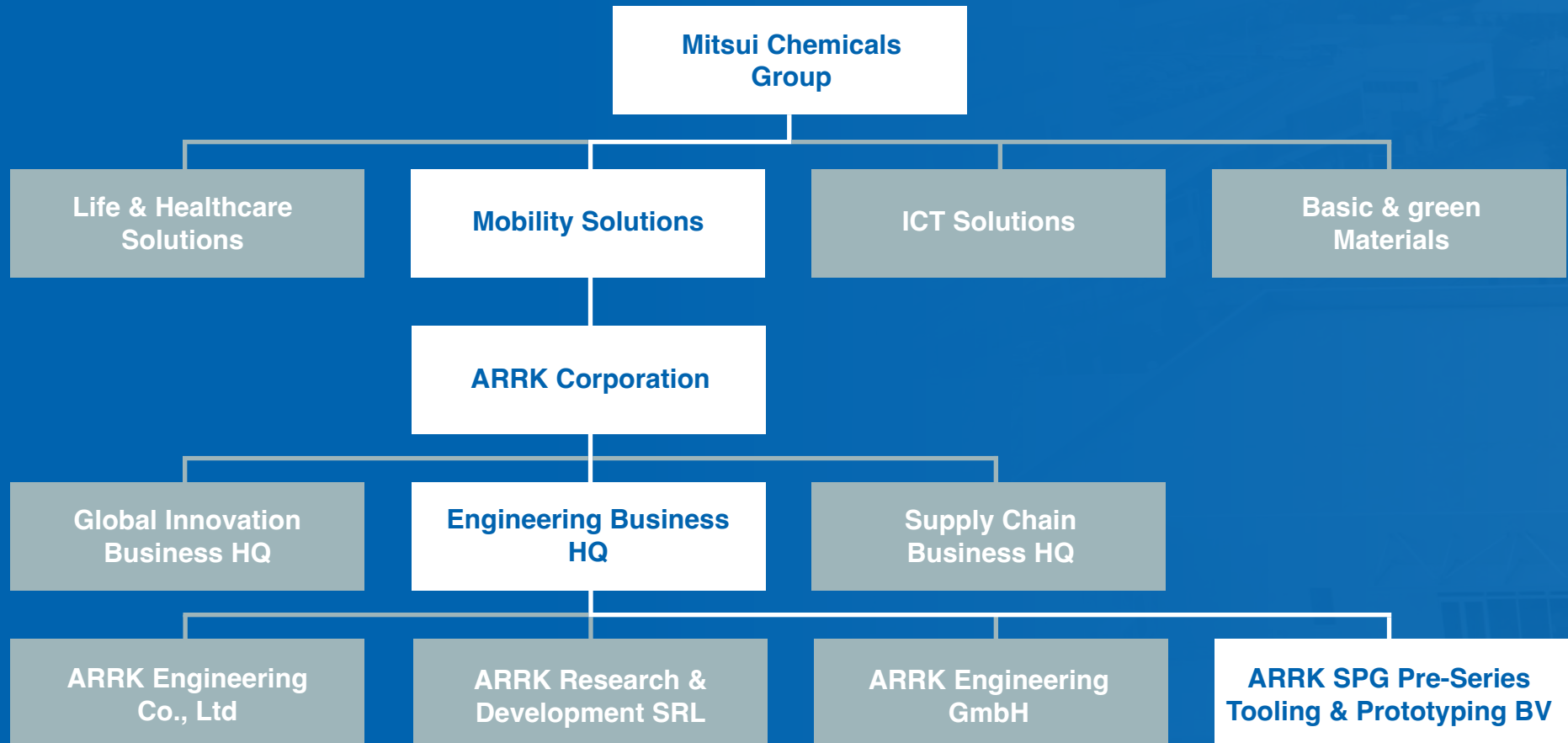
“ARRK SPG has guided us as a reliable and knowledgeable manufacturing partner from the first concept to the start of small-scale production of the Lightyear 0 rear lighting system. Their experience, knowledge and craftsmanship have made a major contribution to our development process.”





“During the early design stages of the Gazelle N01, ARRK SPG proved to be a reliable and knowledgeable partner. Their strong alignment with our Dutch heritage and way of working helped lay a solid foundation for this innovative bicycle lighting concept.”

# Our organisation



# Our history



**SPG Pre-Series Tooling & Prototyping BV was founded in 2001. Five years later, SPG became part of the ARRK Corporation, which then affiliated with Mitsui Chemicals Group in 2020.**





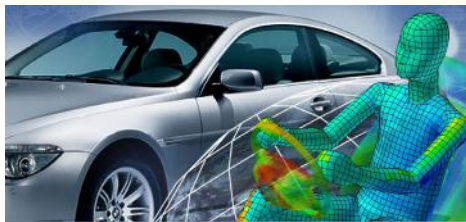


ENGINEERING

## Your specialist for forward-looking automotive development

ARRK Engineering's range of services pools skills from different thematic fields in order to achieve the best possible production results as well as consistent quality of manufactured components. Teams of experts work with certain key issues in mind to find interdisciplinary ways of realizing projects faster and in a more technically comprehensive manner.

### Interdisciplinary Topics



CAE & Simulation



Material



Acoustics



Composite



Digitalization & Software



Sustainability Management

## Modules



Car Body



High Voltage Battery



Powertrain



Chassis



Interior & Exterior



Optical Systems

## Entire Vehicle Systems



Automated Driving



Passive Safety



Thermal Management

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