

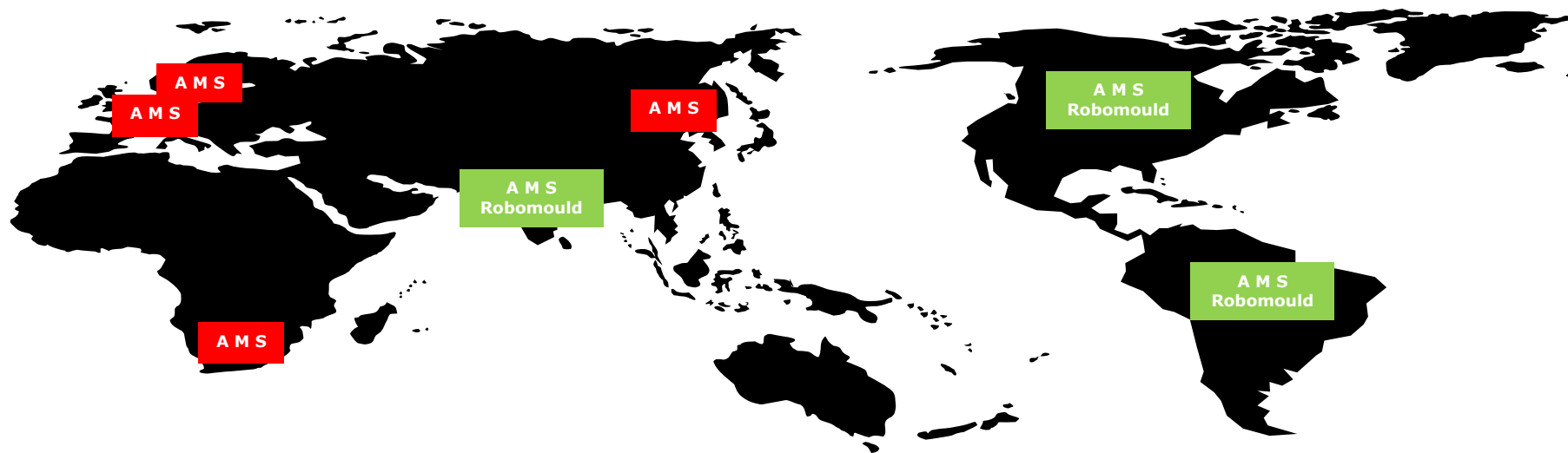
# AMS

## Robomould

Robomould & Smartmould Technology

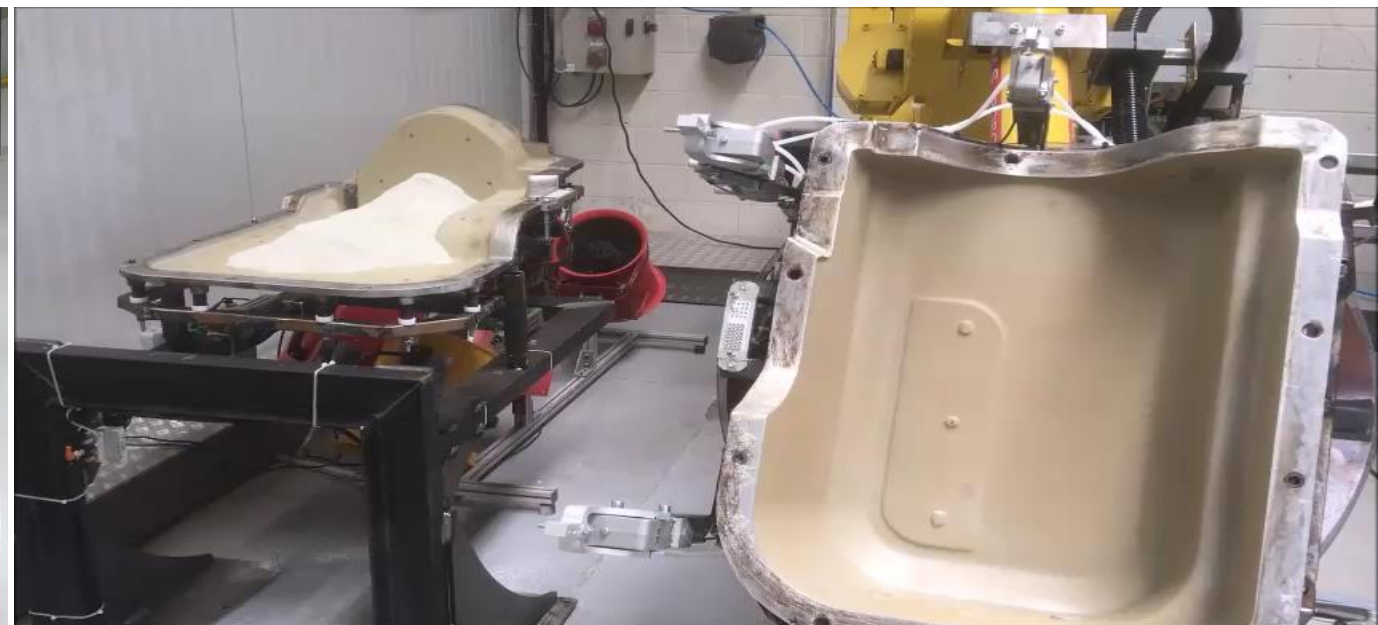
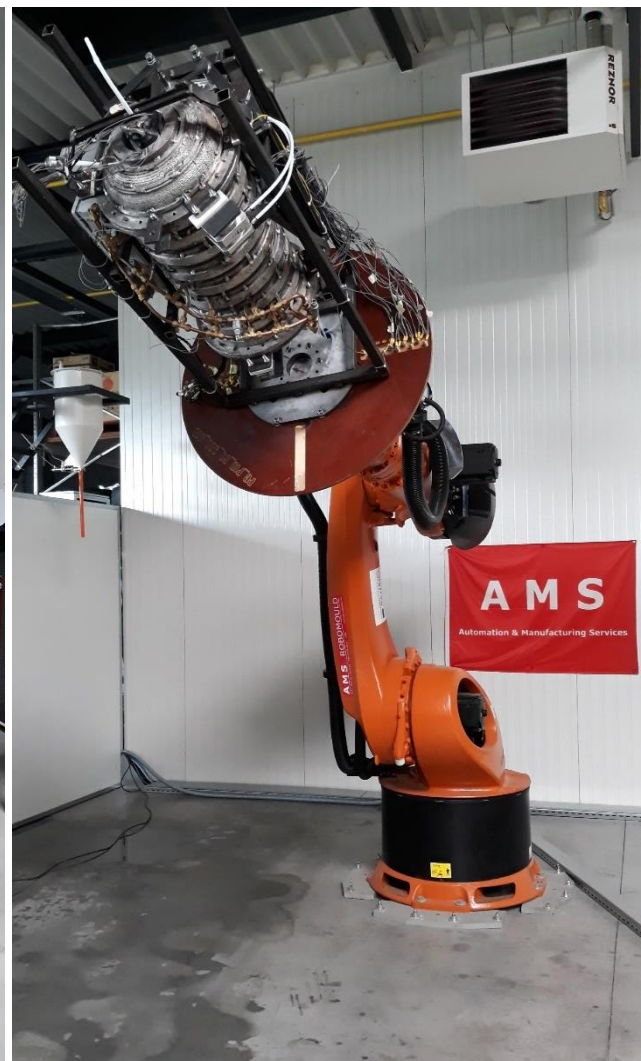


**AMS Robomould** your 4.0 fully automated & integrated world class rotational molding manufacturing system



# AMS ROBOMOULD unmanned equipment

Actual machines handling capacity from 160 to 600kg



**GLOBALLY PATENTED SYSTEM EP284 444 6B01**

ROBOMOULD from 160 to 300 ... 600kg

# ROBOMOULD – handling capacity 1200kg

Unmanned manufacturing and Industry 4.0 (big data – A.I.) new up to 2300kg !!!

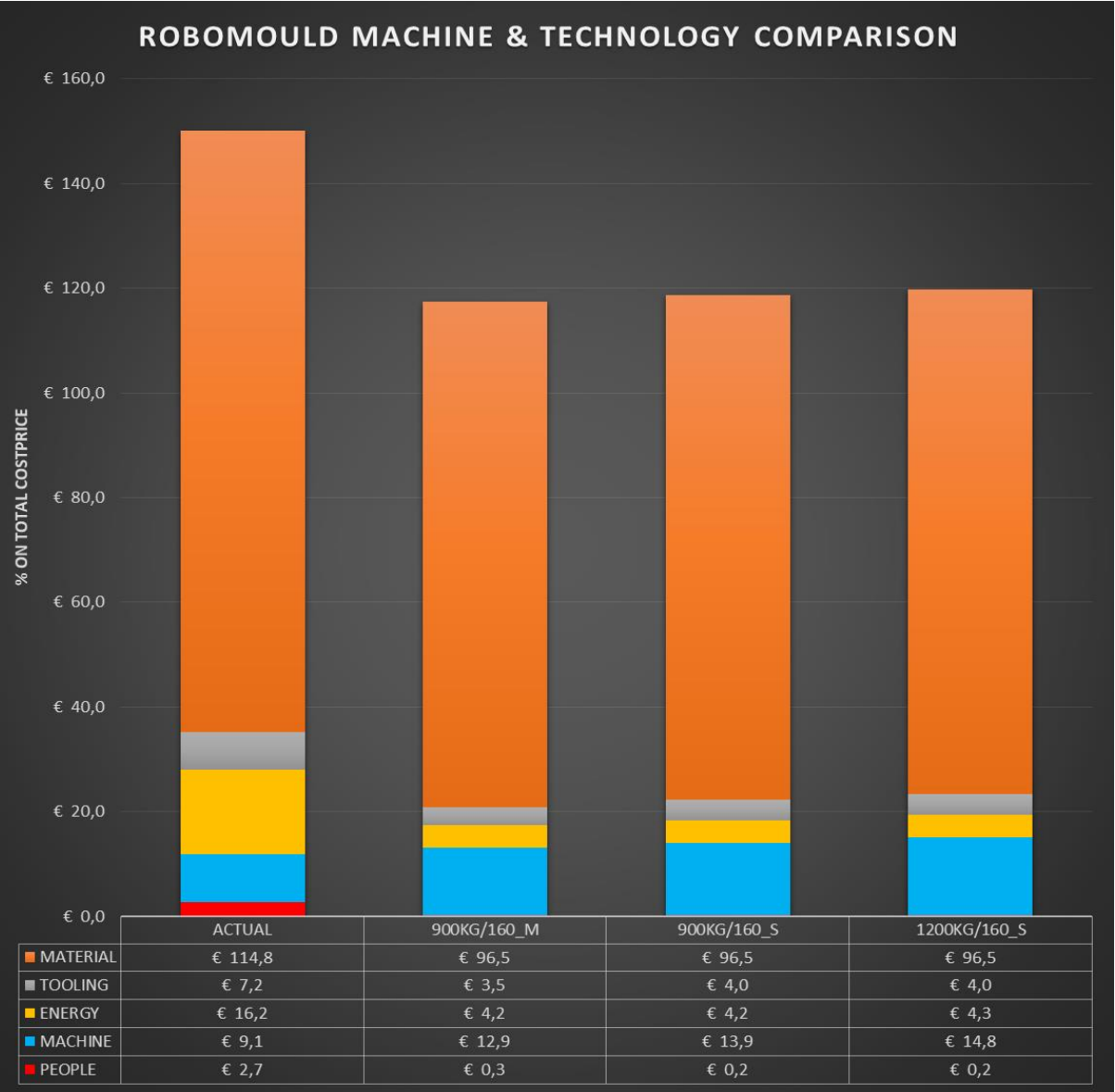
GLOBAL PATENTED SYSTEM EP284 444 6B01



AMS Robomould 1200

# ROBOMOULD – Payback and ROI

Real casestudy

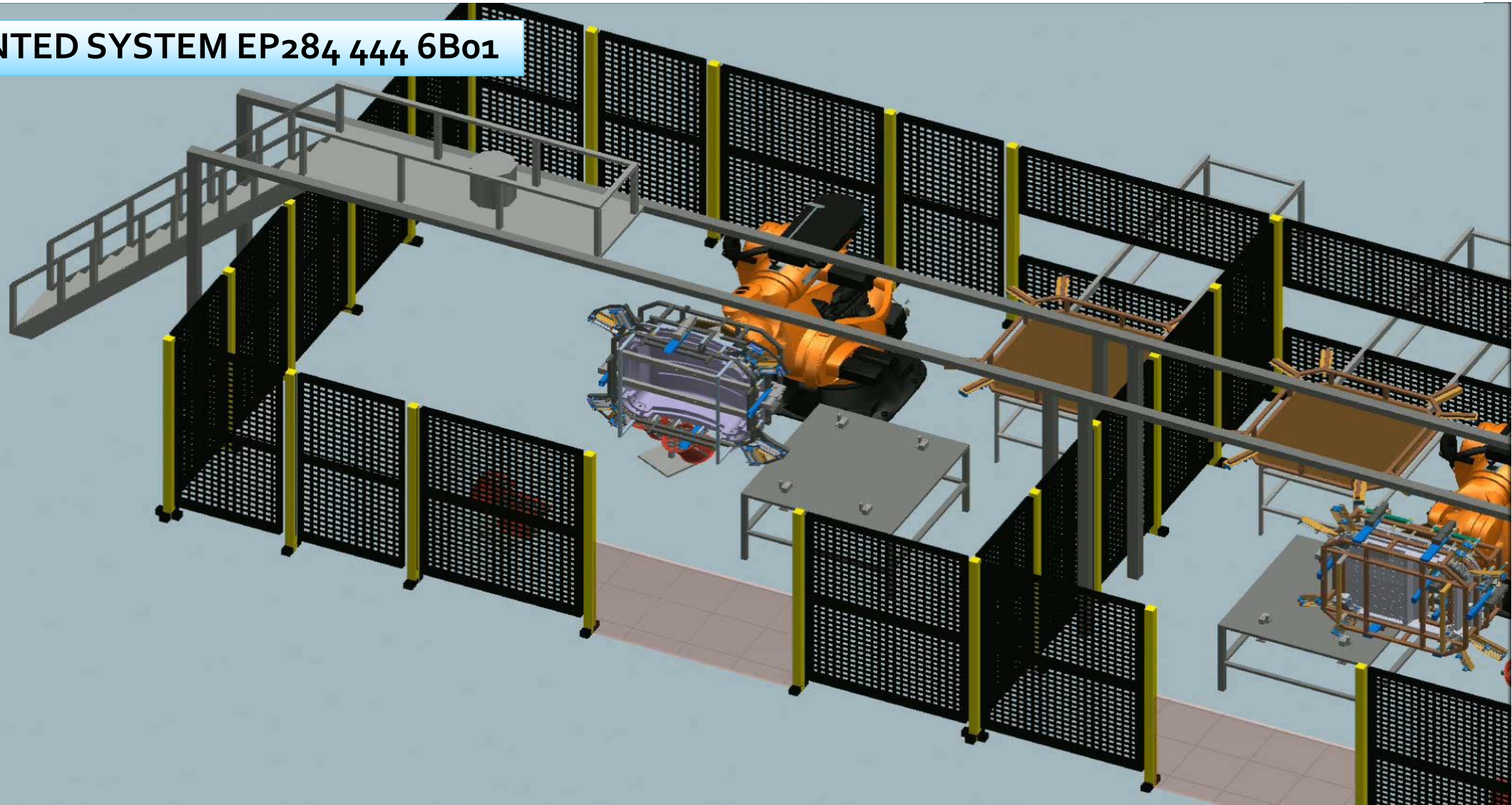


		ACTUAL	900KG/160_M	900KG/160_S	1200KG/160_S
COMPARISION	MARGE +		€ 32,6	€ 31,3	€ 30,2
	MATERIAL	€ 114,8	€ 96,5	€ 96,5	€ 96,5
	TOOLING	€ 7,2	€ 3,5	€ 4,0	€ 4,0
	ENERGY	€ 16,2	€ 4,2	€ 4,2	€ 4,3
	MACHINE	€ 9,1	€ 12,9	€ 13,9	€ 14,8
	PEOPLE	€ 2,7	€ 0,3	€ 0,2	€ 0,2
	TOTOAL PROD COST	€ 150,0	€ 117,4	€ 118,7	€ 119,8
	COST SAVINGS		-28%	-26%	-20%
PAYBACK CALC	PROD/YR MAX		9360	9360	9360
	SAVING/YEAR		€ 305 120	€ 292 790	€ 282 409
	INVEST MACH	€ 300 000	€ 415 000	€ 445 000	€ 476 000
	INVEST TOOLING	€ 180 000	€ 115 000	€ 130 000	€ 130 000
	TOTAL INVEST	€ 480 000	€ 530 000	€ 575 000	€ 606 000
	PAYBACK YR		1,74	1,96	2,15
NEW % SPLIT	MATERIAL	77%	82%	81%	81%
	TOOLING	5%	3%	3%	3%
	ENERGY	11%	4%	4%	4%
	MACHINE	6%	11%	12%	12%
	PEOPLE	2%	0%	0%	0%
	TOTOAL PROD COST	100%	100%	100%	100%
SAVINGS	MATERIAL	€ 114,8	-€ 18,3	-€ 18,3	-€ 18,3
	TOOLING	€ 7,2	-€ 3,7	-€ 3,2	-€ 3,2
	ENERGY	€ 16,2	-€ 12,0	-€ 12,0	-€ 11,9
	MACHINE	€ 9,1	€ 3,9	€ 4,8	€ 5,8
	PEOPLE	€ 2,7	-€ 2,5	-€ 2,5	-€ 2,5
	TOTAL PROD COST	€ 150,0	-€ 32,6	-€ 31,3	-€ 30,2

# FACTORY of the FUTURE concepts

AMS your partner into complete solutions – from manual to semi-automated to full automated ... unmanned

GLOBAL PATENTED SYSTEM EP284 444 6B01



AMS your partner into YOUR manufacturing of the FUTURE

# ROBOMOULD – MULTILAYER & PE\_foam

PARTS examples skin-foam-skin or skin-foam PE – interior/exterior parts excavator



MULTILAYER TECHNOLOGY !!!!!



GLOBAL PATENTED SYSTEM EP284 444 6B01

AMS Robomould skin-foam-skin or skin-foam PE-PE

# ROBOMOULD and WEIGHT SAVING structures

Up to off-road machinery and equipment

Weight saving in offroad machinery ... so less CO2



ROBOMOULD up to Engineering plastic materials

# ROBOMOULD and WEIGHT SAVING structures

Up to off-road machinery and equipment

## Weight saving in offroad machinery ... so less CO2



ROBOMOULD up to Engineering plastic materials

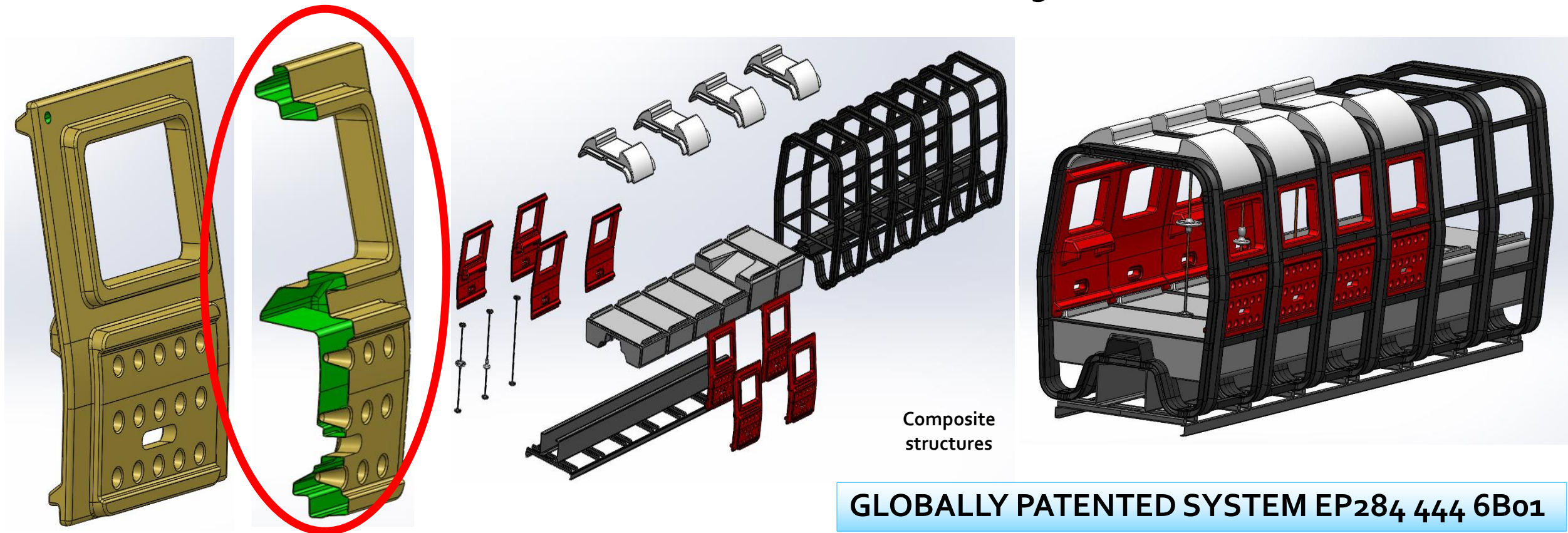
# ROBOMOULD and WEIGHT SAVING structures

Up to train, tram, truck, bus

## Weight saving in the railway ... so less CO2

Railway industry – objective: - 40% gain in mass reduction

**The future :**  
a rolling stock in combined materials



# ROBOMOULD – FIBRE TECHNOLOGY & MAT.COMBINED

Up to new ideas and future target market – light weight!



AMS Robomould up to the cycling business

# ROBOMOULD – FIBRE TECHNOLOGY & MAT.COMBINED

Up to new ideas and future target market / sport goods – light weight!



AMS Robomould up to the cycling business

# ROBOMOULD O&O, Technology & design

Investments into ROBOMOULD growth 2019

Fase 1 – AMS Building (2014)



Fase 2 – QU Belfast (2015)



Fase 3 – KUL Hasselt (2019)



Fase 4 – IPT Wismar Hamburg Germany (2019)

**ACTUAL** expertise centers to reach 50ppm and cycle time of 10min, OLP from simulate to optimize and to generate, from virtual product design to unmanned curved controlled manufacturing AMS Robomould & Smartmould Technology

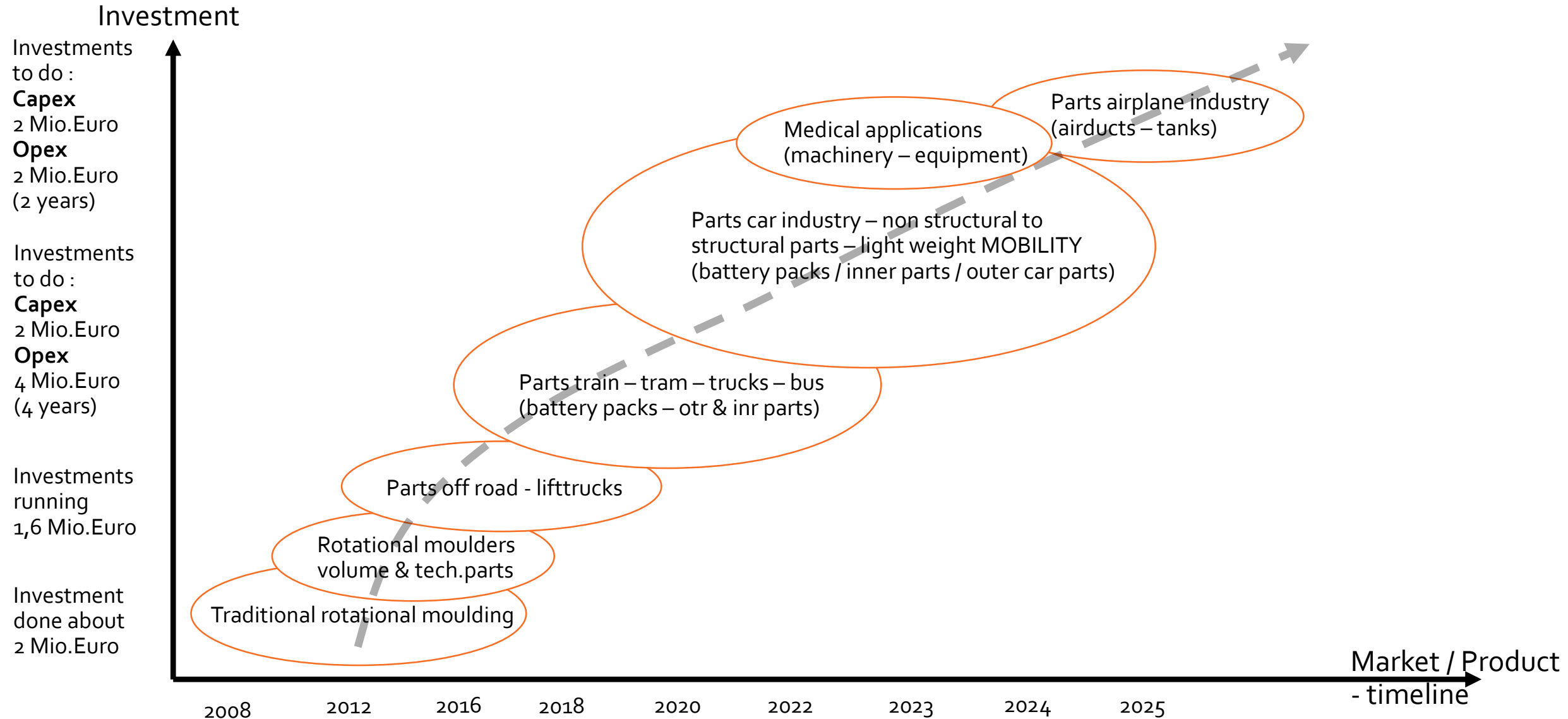
# ROBOMOULD – FUTURE Market

Up to automotive ideas and future target market – PLANNING and TRL levels

Rotational moulders	Machine parts	Consumer Appliances	Bus – Truck Offroad	Train – Tram - Boat	OEM Tier1 Auto	Airplane industries
50.000ppm CT=45min OEE25%	10.000ppm CT=30min OEE55%	5.000ppm CT=30min OEE65%	1.000ppm CT=25min OEE70%	100ppm CT=25min OEE70%	50ppm CT=20min OEE85%	6sigma CT=20min OEE75%
----- Watertanks Light design Flowerpots Kayaks	----- Tanks Machine cover Vessels Airchannel Health care	----- Pump house Household appliances Plastic parts Tennis racket Bike frame/rim	----- Fueltank Hydraulic tanks Seats Filter housing	----- Fueltank Hydraulic & Water tanks Seats Airducts	----- Fueltank Water tanks Seats Airducts Car interior	----- Airplane interior parts + seats, airducts, luggage compartment
2016	2018	2018 _ 2019	2019 _ 2020	2021 _ 2022	2022 _ 2023	2023 _ ....>
TRL 9 – 8	TRL 8	TRL 7	TRL 6	TRL 6-5-4	TRL 5- 4	TRL 3-2
... into leisure (tennis), bicycles (frame&rim), light weight transportation, fueltanks, non-structural to structural parts						
... OEE +95%, CT<20min, Qual.<50ppm, high end polymers, composites, multilayer (fire retardant, paintable, strength)						

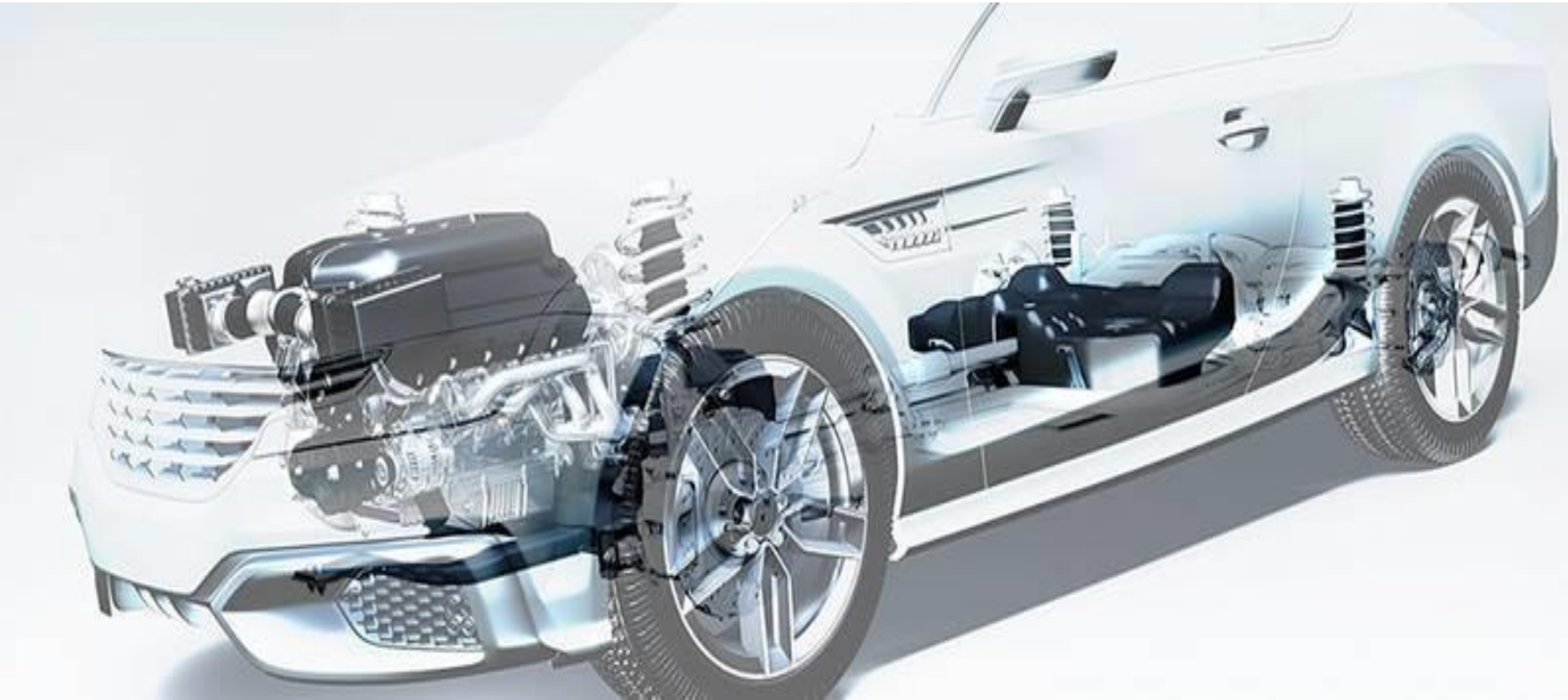
# AMS Robomould – our target market

From traditional moulding into high tech robotmoulding



# ROBOMOULD – Automotive NON-structural parts

Up to automotive ideas and future target market!



# ROBOMOULD – TANKS - high end materials PA6/11

PA6 materials, hydrogen liner, space lab tank ... fire retardant



AMS Robomould up to PA6 ... PA11 ... PA12 – combined with PE

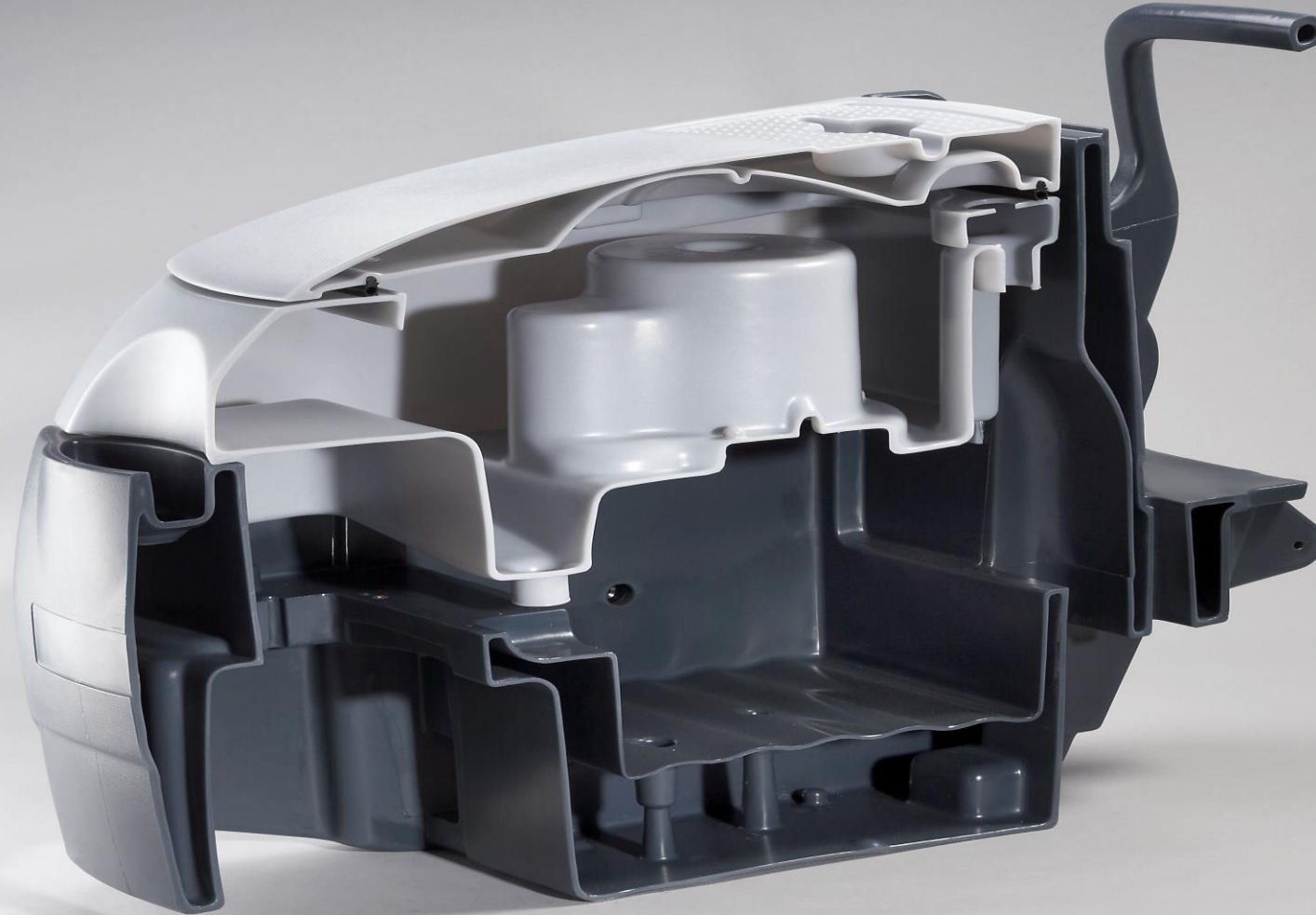
# ROBOMOULD – NON-structural parts

Up to Rotomolders + and future target market!



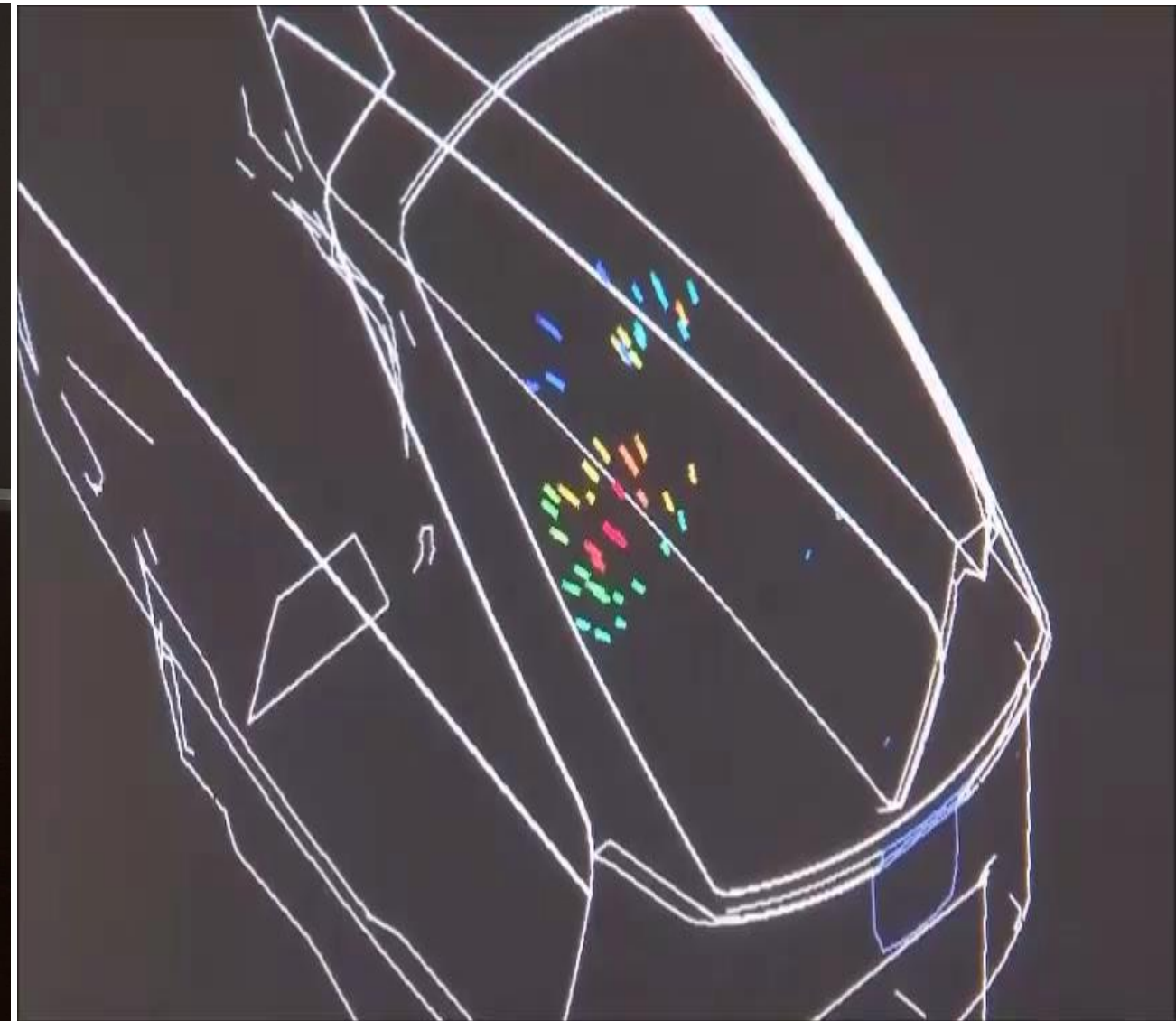
# ROBOMOULD – NON-structural parts

Up to Rotomolders + and future target market!



# ROBOMOULD and future products – LIGHT WEIGHT

Up to automotive, ... = Robomould the STANDARD for ELECTRICAL cars



AMS Robomould up to BIO PLASTIC materials PLA skin-foam-skin

# AMS ROBOMOULD unmanned equipment

Machining of the rotomoulded part



ROBOMOULD and full service

# AMS ROBOMOULD unmanned equipment

Machining of the part



ROBOMOULD and full service

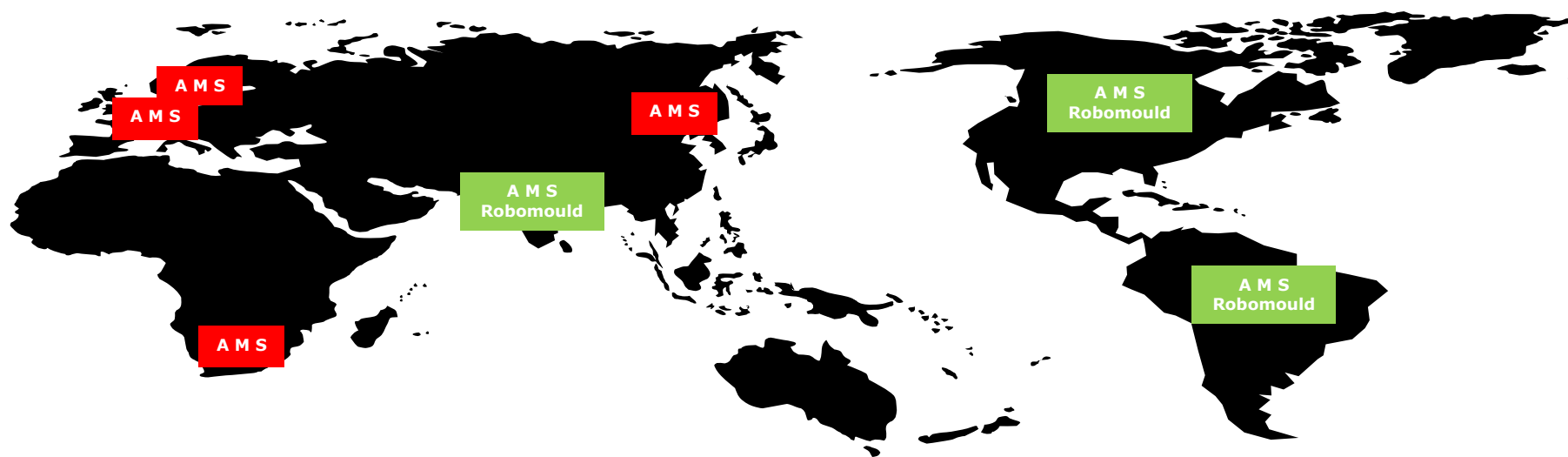
# AMS

Robomould  
O&O center

Robomould & Smartmould Technology



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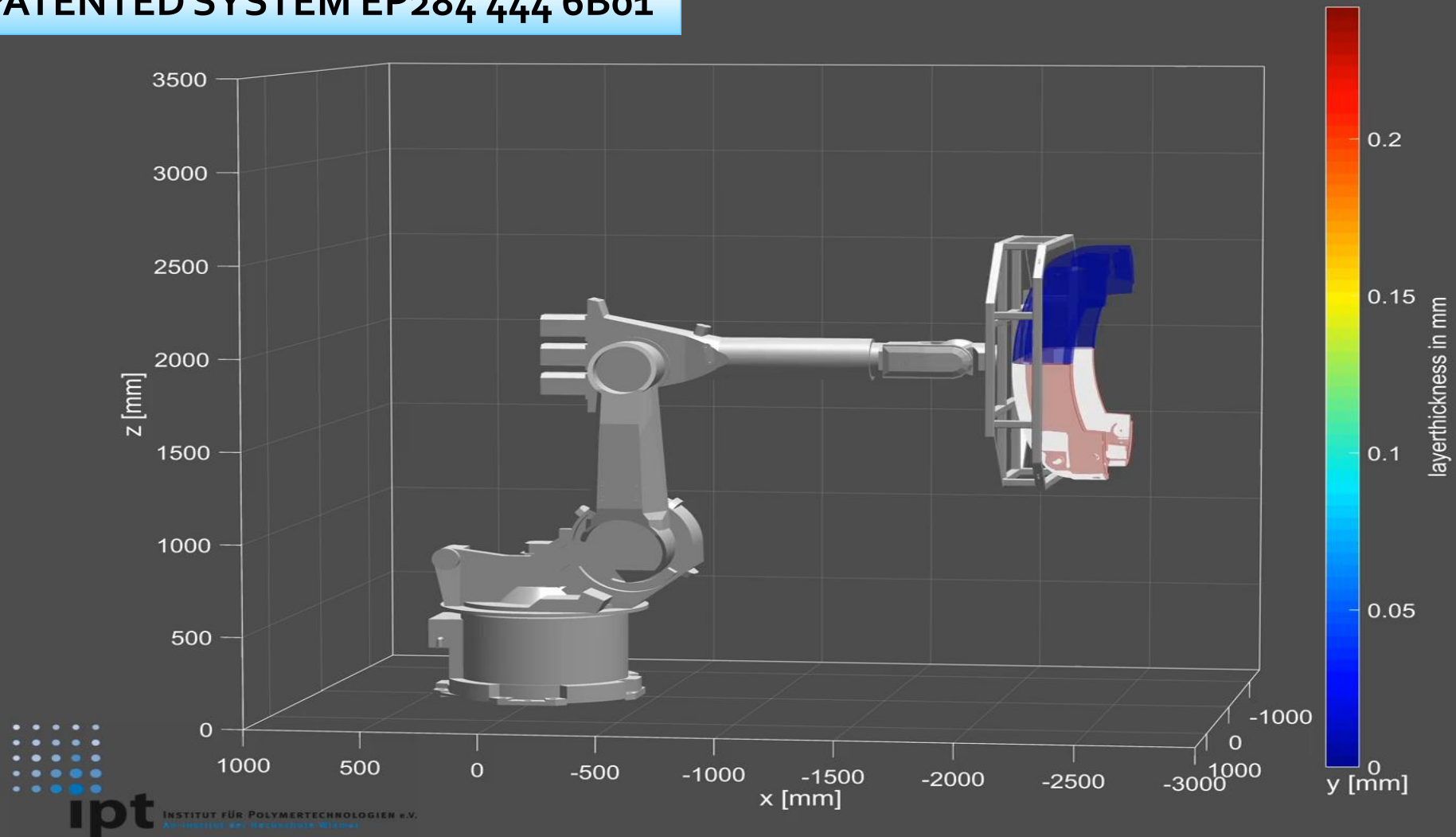
RoThor = your design & engineering support into the manufacturing of automotive parts.

- **Part design, material selection, FEA** ... = part structures: single layer or multi-layer parts based on PE, PP, PLA and composite reinforcements.
- **Process simulation** to optimization.
- **Mould design and testing** in to optimization
- **Product testing:** NDT, mechanical testing,...
- **Process validation.**
- **Part Pre-Manufacturing** until **small serial runs.**
- **Support** into setup of your local manufacturing production unit.
- **After service & support** in further and future product developments.

# Robomould – O&O OFFLINE progr. & design

OFF LINE PROGRAMMING from SIM to OPT into GEN ... IPT, UCLL and UHasselt...

GLOBAL PATENTED SYSTEM EP284 444 6B01



# FLANDERS & Robomould – O&O up to 2300kg

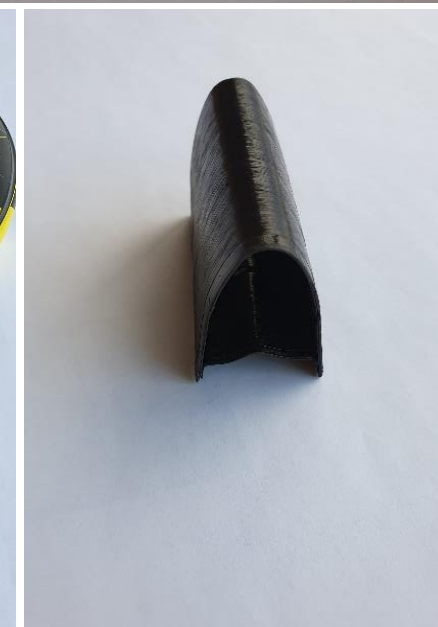
Up to automotive, ... = Robomould the STANDARD for ELECTRICAL cars



AMS Robomould up to BIO PLASTIC materials PLA skin-foam-skin

# Robomould – the O&O airplane ind. & rotocomposite

NEW MATERIALS - PA6 materials and up to ROTOCOMPOSITE ... OR SKIN\_SKIN FIRE RETARDENT

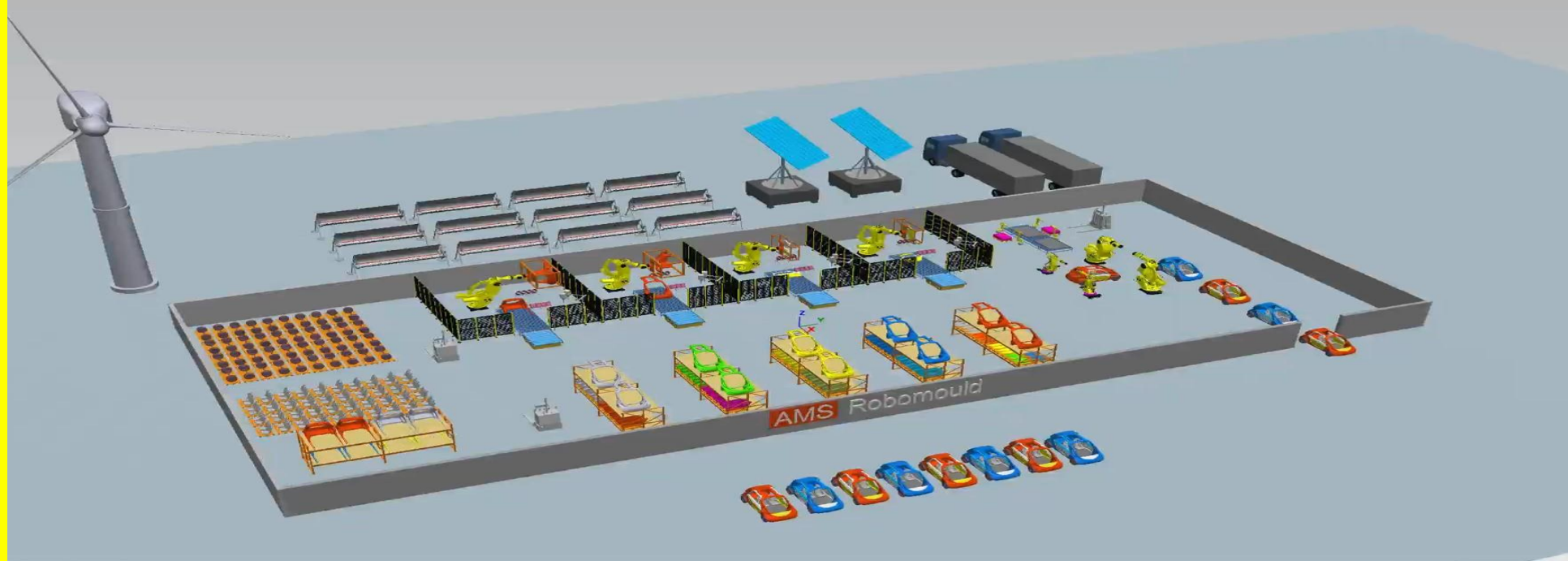


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AMS Robomould up to PA6 ... PA11 ... PA12 – combined with PE and up to ROTOCOMPOSITE

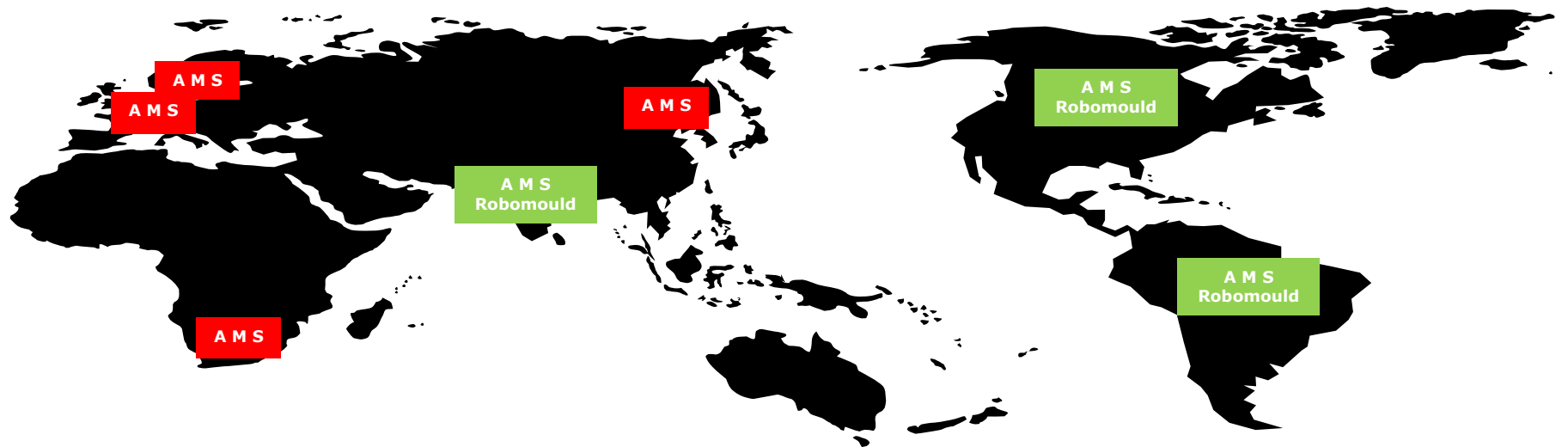
# Manufacturing in **FLANDERS** at "RoThor"

Based on Robomould &  
Smartmould Technology



## FLANDERS TECHNOLOGY INSIDE

**THE** next generation **mobility** & automotive manufacturing



# ROBOMOULD – O&O RoThor Automotive & IND.4.0

Unmanned manufacturing and Industry 4.0 – the FIRST bio-polymer car in the world...

Model Patented & designed by Softcar



BIO-POLYMER CAR based on AMS Technology – RECYCABLE !!!



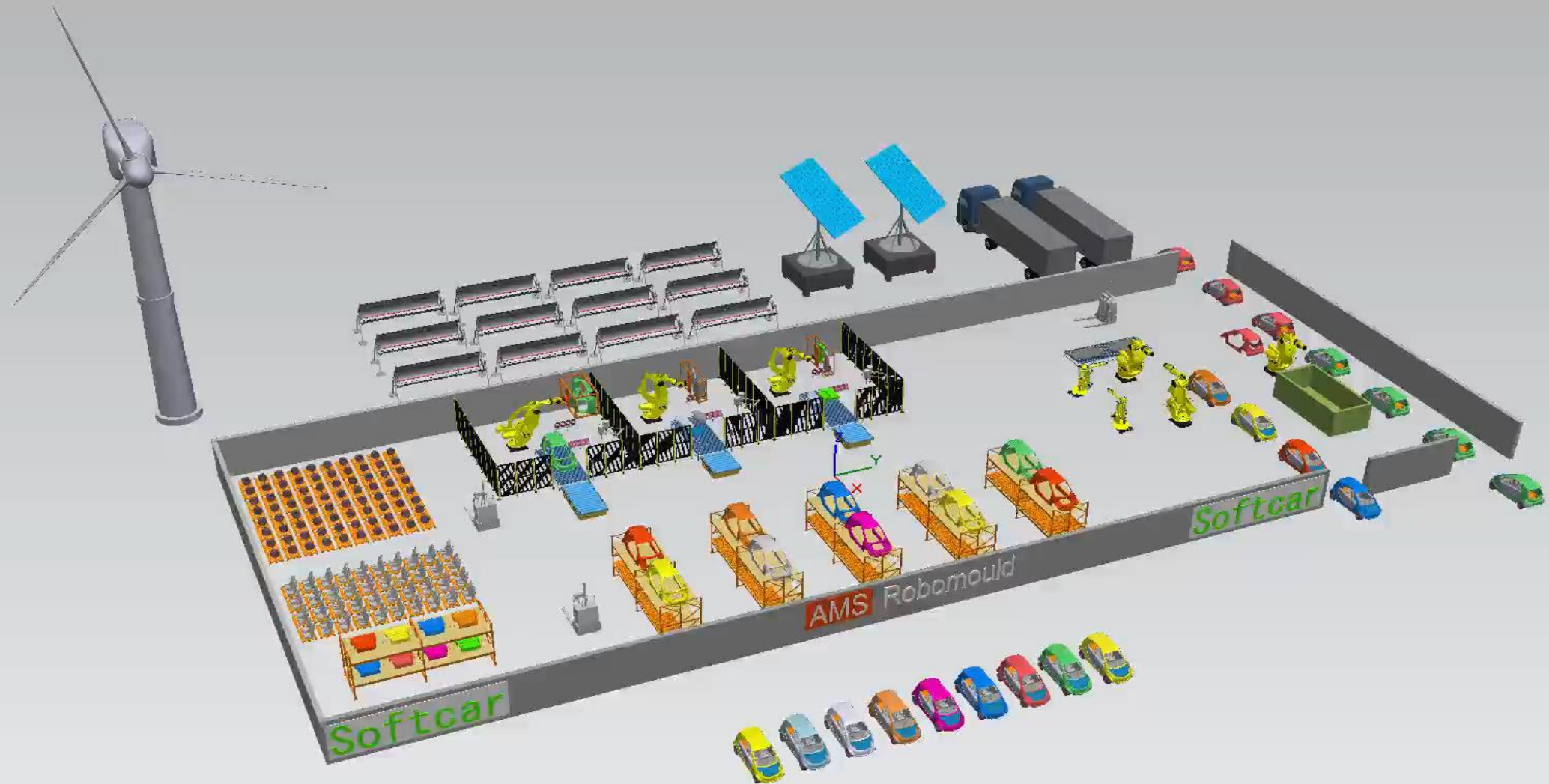
- Light weight city car (780kg)
- 230Km electrical driving 120km/h, all connected
- Local manufacturing
- New body assembled in 45min
- BIO-polymer material
- Complete recyclable

AMS Robomould up to BIO PLASTIC materials PLA skin-foam-skin (pictures SOFTCAR)

# FLANDERS & THOR PARK – the manufacturing campus

Unmanned manufacturing and Industry 4.0 (big data – A.I.) – the FIRST bio-polymer car in the world, SKIN-FOAM-SKIN

Model Patented & designed by Softcar



AMS Robomould up to BIO PLASTIC materials PLA skin-foam-skin

The background of the slide features a stylized globe with blue oceans and brown landmasses. Several large, thick, curved arrows in shades of orange and yellow are overlaid on the globe, indicating a global flow or network. In the center, there is a red rectangular box containing the company logo.

# AMS

Automation & Manufacturing Services

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AMS ROBOMOULD & AMS SMARTMOULD \_ GLOBALLY PATENTED SYSTEM EP284 444 6B01