

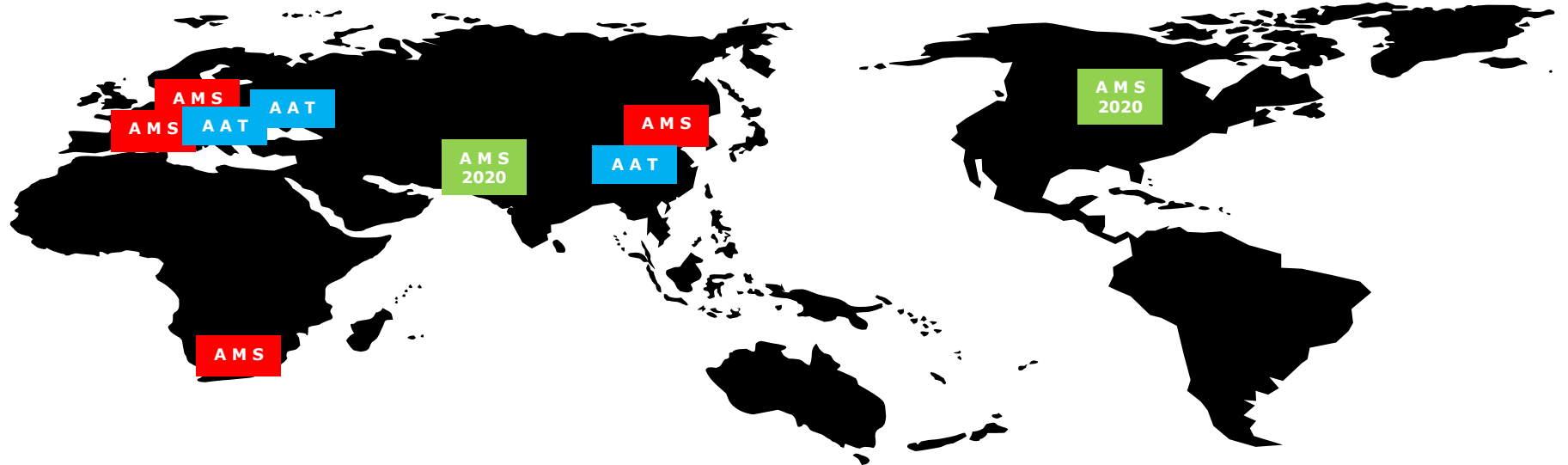
AMS

Automation

Automation & Manufacturing Services



AMS your **global** turnkey **automation** partner





AMS AUTOMATION PROJECTS & REFERENCES

AUTOMOTIVE automation, workcells & projects

AMS BELGIUM supports our customers worldwide in global partnership and expertise into AUTOMATION & TURNKEY projects



Mercedes Berlin– 384 robots commissioning



BMW Tiexi & Dadong, Regensburg, Rosslyn - 421 robots



Volvo Ghent, Sweden, Taizhou – 396 robots commissioning

- Robot & PLC programming project
- Robots = 384
- PLC = 26

- Turnkey robot & PLC programming project
- Nominated best supplier
- Robots = 421
- PLC = 36

- Turnkey robot & PLC programming project
- Nominated best supplier
- Robots = 396

FOOD automation, workcells & projects

AMS THE NETHERLANDS & AMS TRENTO supports our customers global in food automation



Friesland Campina – cheese manufacturing

- Robot & PLC progr. project
- Robots = 28, PLC = 8, AGV systems = 8
- Integration WMS/PMS, OEE table, time optimization

- Turnkey robot & PLC programming project
- Robots = 4, PLC = 3
- Integration WMS/PMS and OEE table (ind.4.0)

- Turnkey robot & plc biscuits handling
- Robots = 8, PLC = 2

LOGISTICS, FLEX CELLS, AGV Technology

AMS in Germany (AAT Automation GmbH) – Logistics, warehousing, airport handling, sorting, SCADA applications



INTRALOGISTICS and several automation projects – logistics & FLEX cells

- Newest technology AGV and moving robots
- Flex-cells for automation and new car manufacturing
- E-commerce and fully integrated software WMS
- Cooperation with Locanis Singapore and Prozys Belgium

LOGISTICS, AIRPORT CELLS

AMS in Germany (AAT Automation GmbH) – Logistics, warehousing, airport handling, sorting, SCADA applications



INTRALOGISTICS and several automation projects – AIRPORT logistics

- Big data analysis
- Upfront calculation bin space and luggage sorting

- 1Mio luggage's/cell/year
- 200 bags/hour
- 85 to 90% filling capacity

LOGISTICS, mixed palletizing CELLS

AMS in Germany (AAT Automation GmbH) – Logistics, warehousing, airport handling, sorting, SCADA applications



INTRALOGISTICS and MIXED Palletizing

- Big data analysis
- Your overnight shipment preparation for warehouses ... last mile logistic !!!

- Complete automated system
- Complete warehouse architecture
- Automated loading and packaging

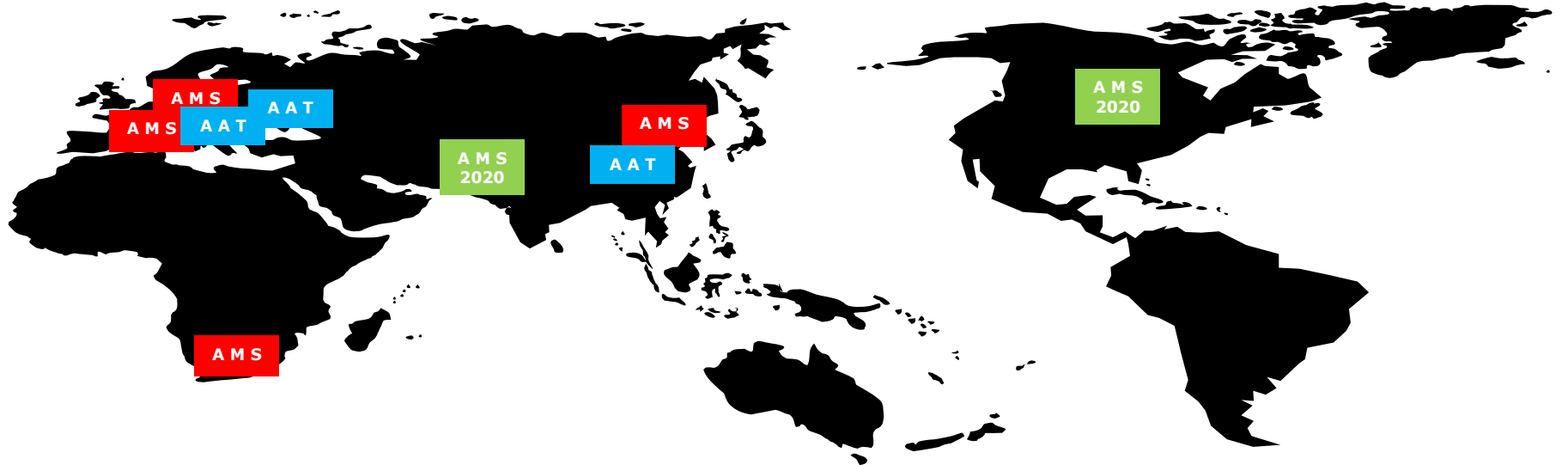
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Automation -
Industry 4.0
Cobots

Automation & Manufacturing Services



AMS your Industry 4.0 & Cobot integrator partner



INDUSTRY 4.0 dashboards, A.I, big data analysis

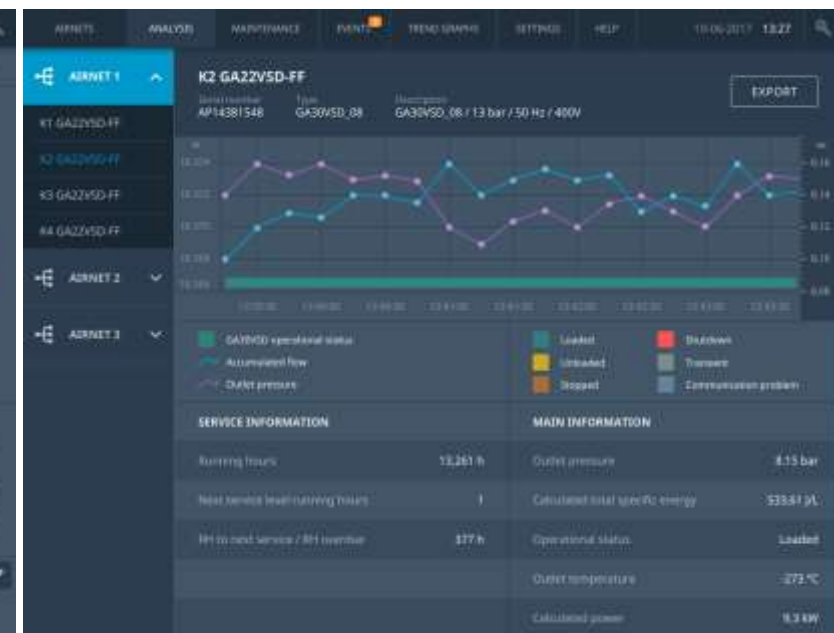
AMS BELGIUM and INDUSTRY 4.0 up to SCADA systems – your connectivity into the future



Monitoring system



SCADA_OEE appliances



CLOUD database structured

- **A.I. ready & self-learning ... in process optimizing**
- Big Data analysis
- **Realtime monitoring**
- **Quality inspector installed**
- **Automated reporting system**

- Scada application based upon MyScada technology or Siemens Mindsphere
- **Real live factory/machinery information (graphical)**
- **Connected WMS/PMS**

- Database cloud system
- Achievable with all PC programs or all apps on smartphone/ipad
- **Predictable maintenance & report generator**

COBOT SYSTEMS and "gestures" to "machine learning"

AMS BELGIUM in cooperation with IMEC, Audi, VLAIO, ... something NEW will be launched from August 2019 !!!!



INTRALOGISTICS and MIXED Palletizing

- Cobot and communication with the operator by gestures
- In cooperation with IMEC, Audi and VLAIO
- Built into AMS software technology in 2019

- Glueing process at Audi Brussels
- Camera and vision application programmed with the robot in ROS
- Machine learning applications !!!

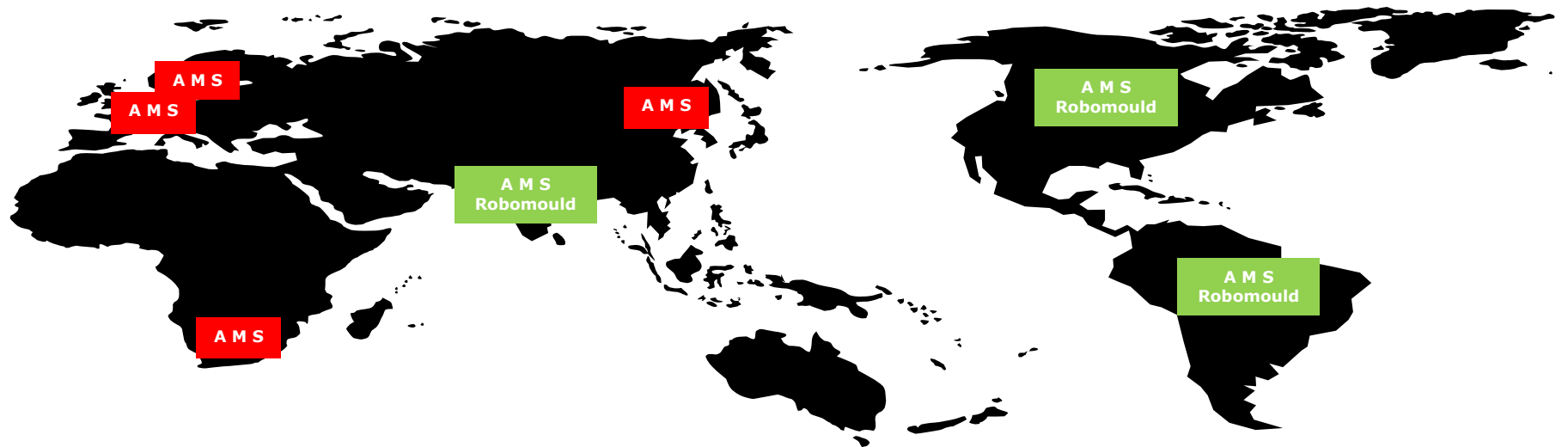
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Robomould

Robomould & Smartmould Technology

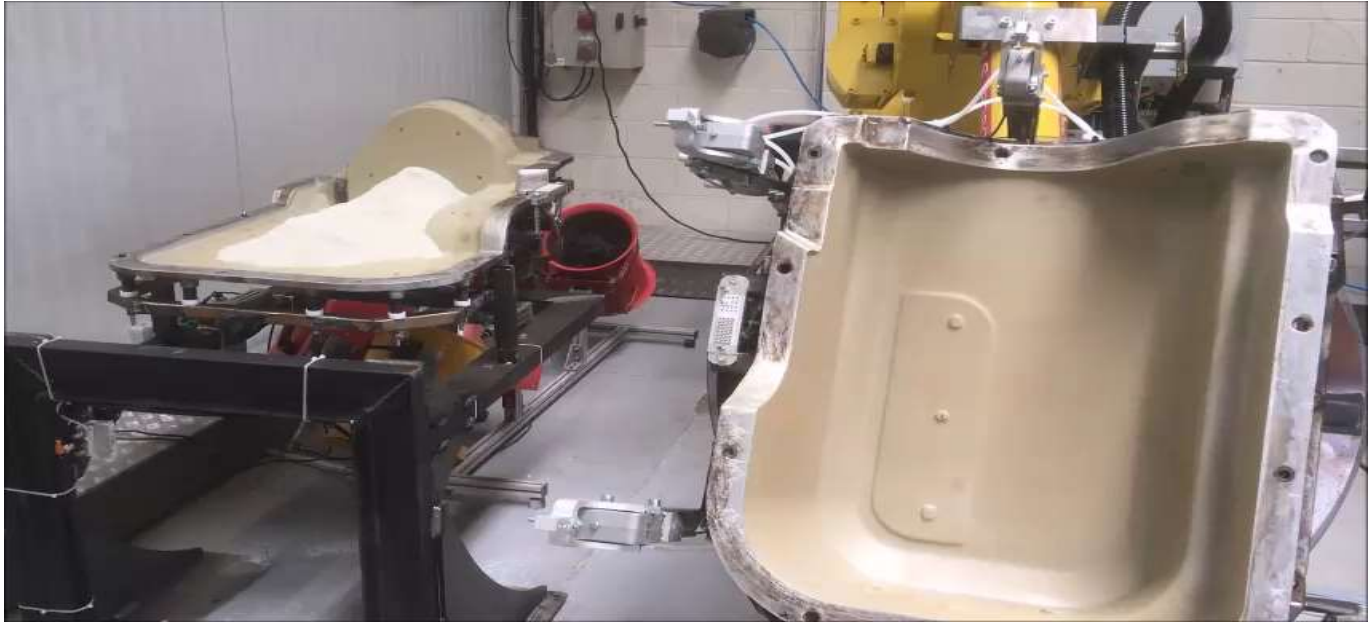


AMS Robomould your 4.0 fully automated & integrated world class rotational molding manufacturing system



AMS ROBOMOULD unmanned equipment

Actual machines handling capacity from 160 to 2300Kg



GLOBALLY PATENTED SYSTEM EP284 444 6B01

ROBOMOULD – handling capacity 1200kg

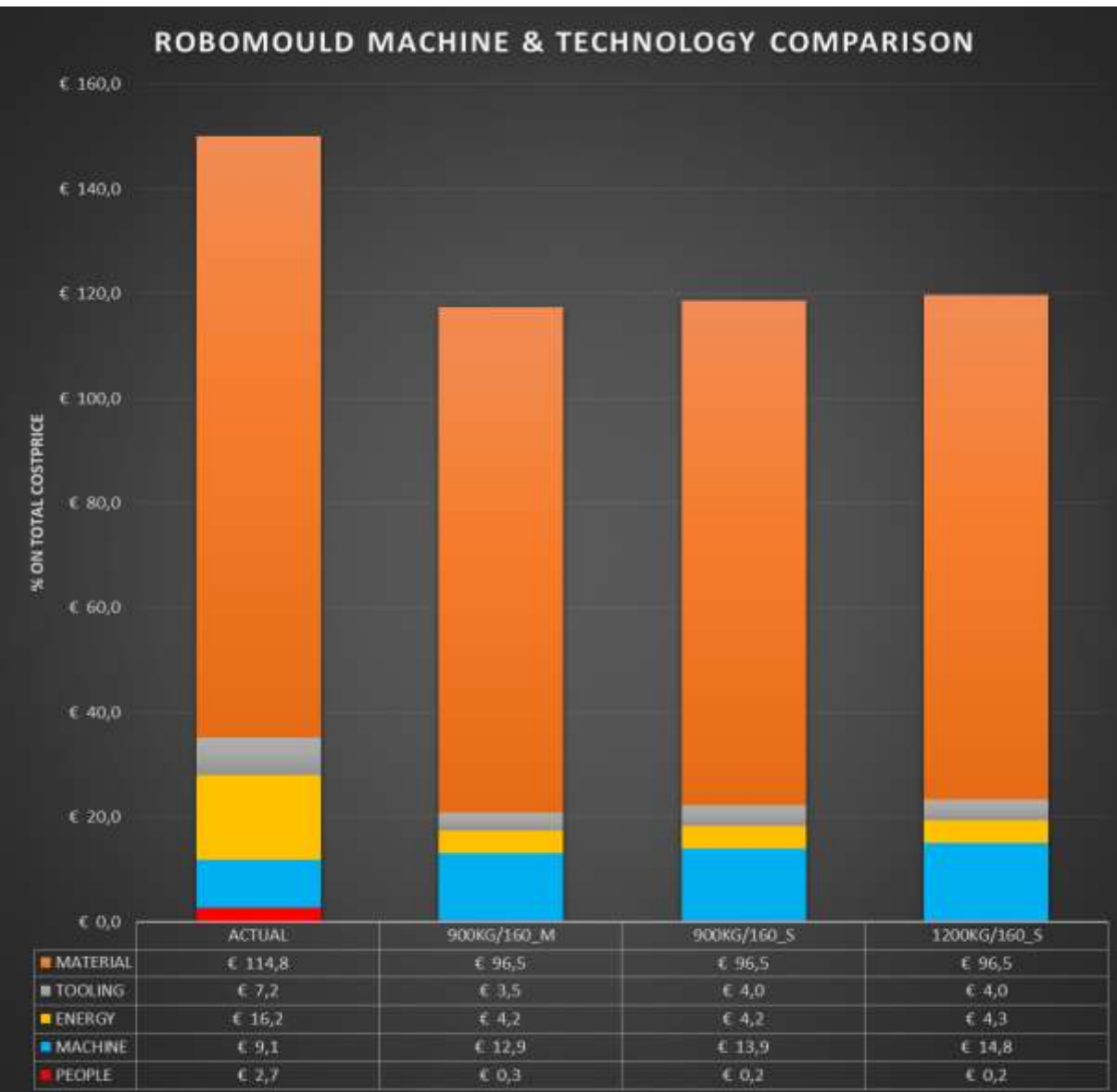
Unmanned manufacturing and Industry 4.0 (big data – A.I.) new up to 2300kg !!!

GLOBALLY PATENTED SYSTEM EP284 444 6B01



ROBOMOULD – Payback and ROI

Real casestudy



		ACTUAL	900KG/160_M	900KG/160_S	1200KG/160_S
COMPARISON	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%
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

CASE STUDY

Calculation – comparison

NEW % SPLIT	MATERIAL	58%	67%	66%	65%	
	TOOLING	3%	4%	4%	4%	
	ENERGY	18%	10%	10%	9%	
	MACHINE	10%	17%	18%	20%	
	PEOPLE	11%	3%	3%	3%	
	TOTAL PROD COST	100%	100%	100%	100%	
SAVINGS	MATERIAL	€ 53,1	-€ 8,0	-€ 8,0	-€ 8,0	LESS MATERIAL, LESS SCRAP
	TOOLING	€ 3,1	-€ 0,6	-€ 0,6	-€ 0,6	LESS MAINTENANCE ON TOOLING
	ENERGY	€ 16,7	-€ 9,9	-€ 10,2	-€ 10,2	LESS ENERGY COSTS
	MACHINE	€ 9,1	€ 2,4	€ 2,8	€ 4,6	
	PEOPLE	€ 9,9	-€ 8,0	-€ 8,1	-€ 8,1	
	TOTAL PROD COST	€ 91,8	-€ 24,1	-€ 24,0	-€ 22,3	
SUMMARY USED FIGURES		ACTUAL	900KG/160_MA	900KG/160_SA	900KG/160_SW	
PERSONS	BLUE COLOR/MACHINE	2	0,2	0,2	0,2	LESS DIRECT MANUFACTURING PEOPLE ...
PERSONS	WHITE COLOR/MACHINE	0,5	0,1	0,1	0,1	LESS INDIRECT OVERHEAD PEOPLE AND COSTS
RUN %	OEE EFFECTIVE HOURS	75%	90%	90%	90%	GUARANTEED CONTINUED OUTPUT, NO LINE STOP
QTY	MOULDS QTY/MACHINE	3	1	1	1	LESS MOULDS, LESS MAINTENANCE PEOPLE ON MOULD
QTY	RUN/8 HR/MACHINE	8	12	12,5	13	HIGHER YEARLY THROUGHPUT, LESS WIP
QTY	MACHINES/CELL	1	1	1	1	LESS SURFACE M2, TRANSPORTABLE
QTY	YEARLY VOLUME MFG	7250	7250	7250	7250	HIGHER OUTPUT/MOULD
KG/PRODUCT	MATERIAL NEEDED	32,2	28	28	28	LESS MATERIAL NEEDED
QTY	QUALITY LOSSES	3,0%	0,5%	0,5%	0,5%	LESS SCRAP COSTS !

AMS SMARTMOULD Technology

Complete tools according customer demand in COOPERATION with certified moldmakers !



GLOBALY PATENTED SYSTEM EP284 444 6B01

maus

avantech



MODELMAKERIJ HENGELO

LANULFI

ROBOMOULD and full service

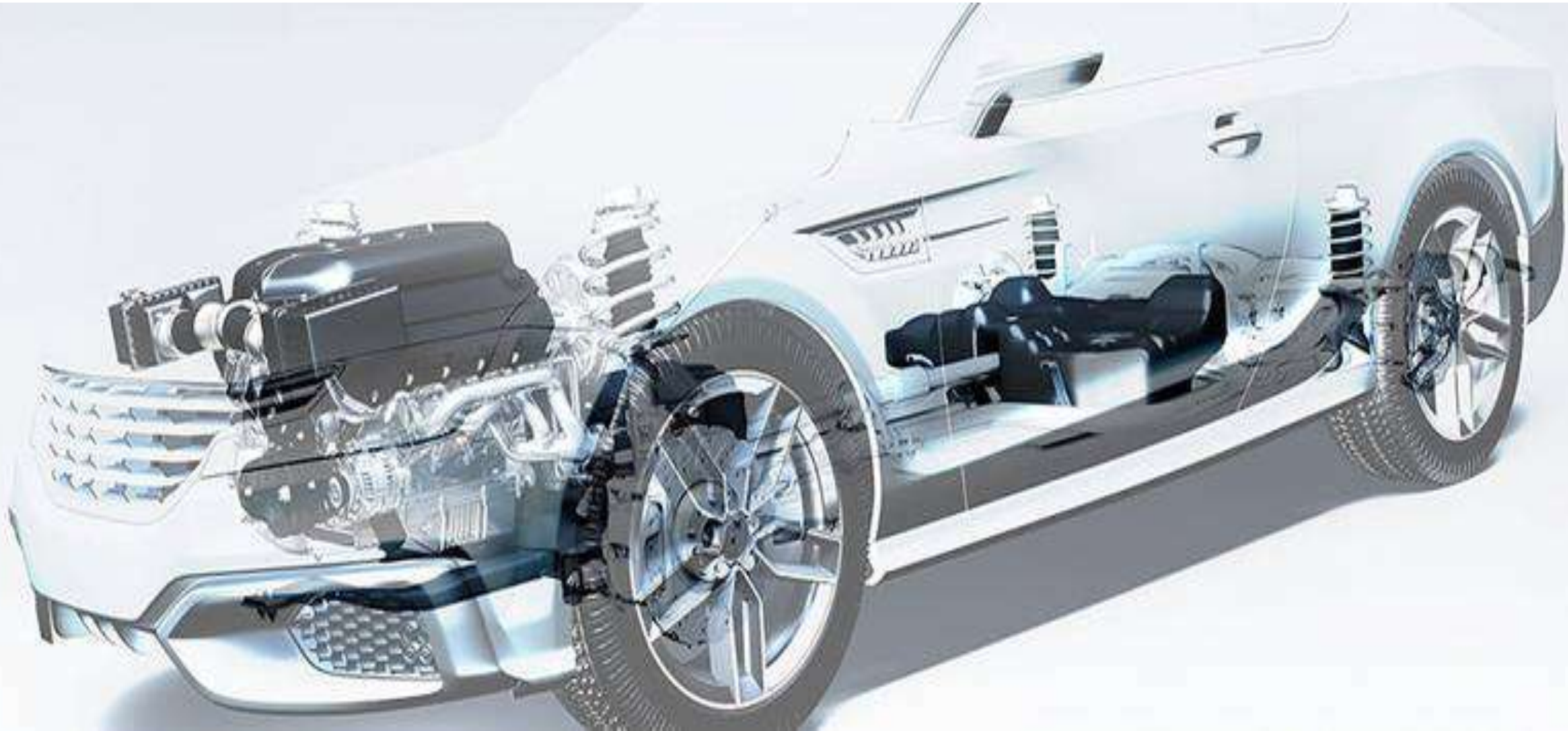
AMS ROBOMOULD unmanned equipment

Machining of the part – complete automation



ROBOMOULD – Automotive NON-structural parts

Up to automotive ideas and future target market!



AMS ROBOMOULD – H2_TANKS - high end mat. PA6/11

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



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

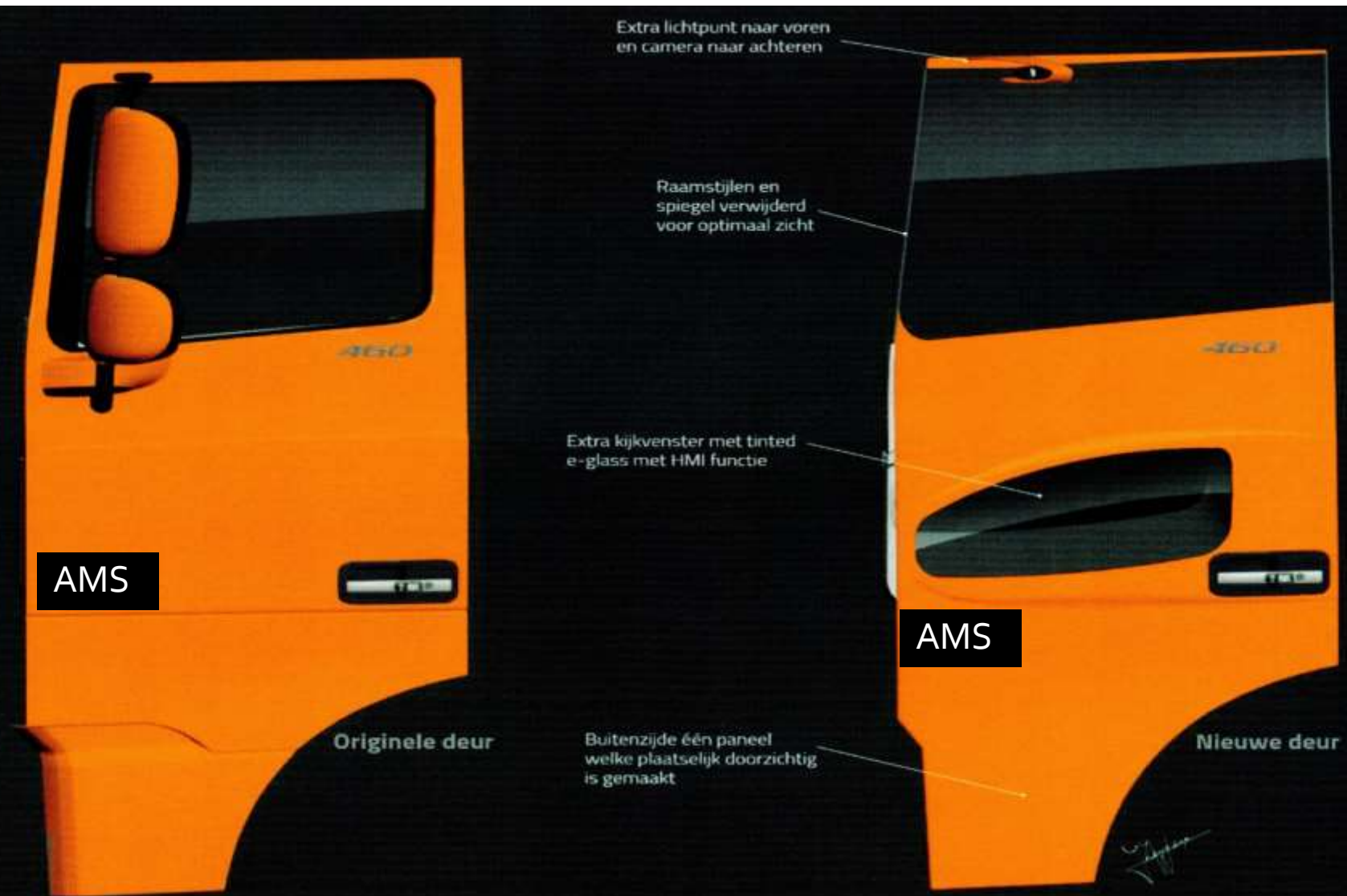
AMS ROBOMOULD – Automotive battery packs

Up to automotive ideas and future target market!



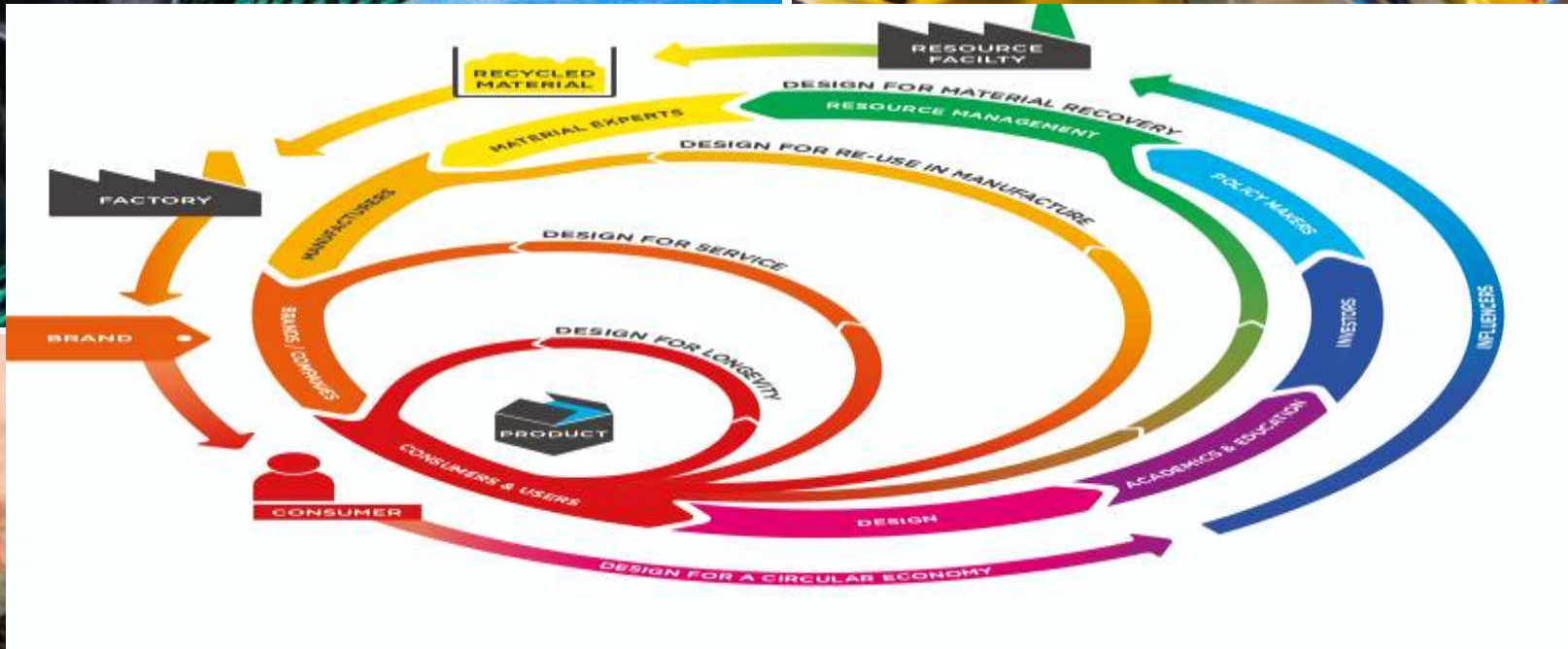
AMS ROBOMOULD – LV2025

Up to automotive ideas and future target market!



AMS Robomould – the world is changing

NEW TECHNOLOGIES



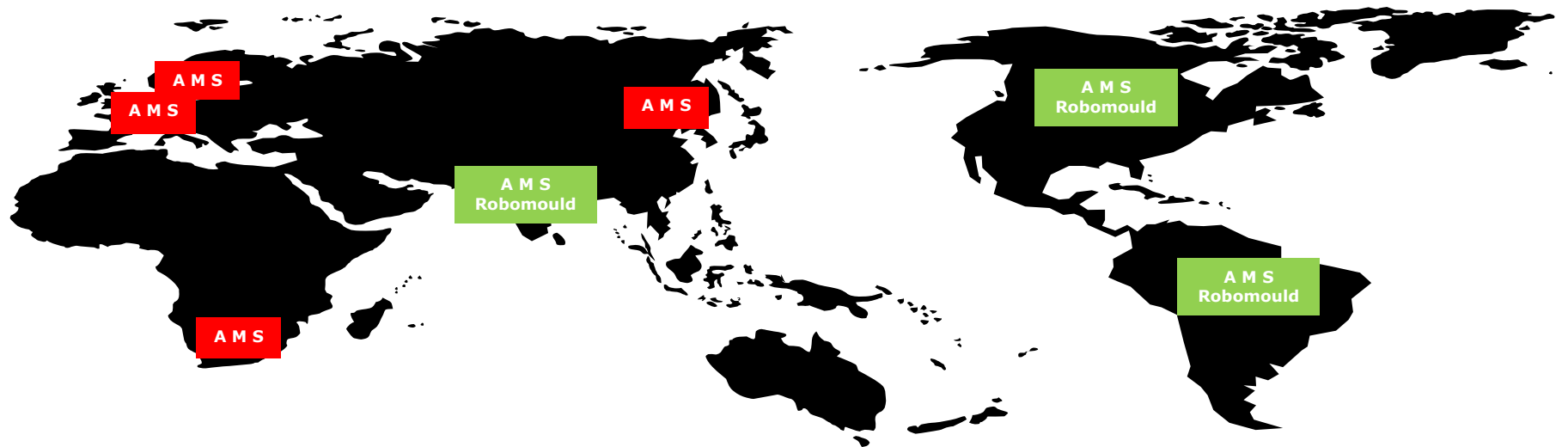
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Robomould
R&D center

Robomould & Smartmould Technology



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



Robomould – The Global Rotational Moulding R&D Center

New materials, new mould technology, from design to manufacturing,



AMS RoThor = your design & engineering support into the manufacturing of rotational moulded 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 – R&D Green Technology

Up to “green technology” for our mould heating system / ENERGYVILLE ... HYBRIDE ... !

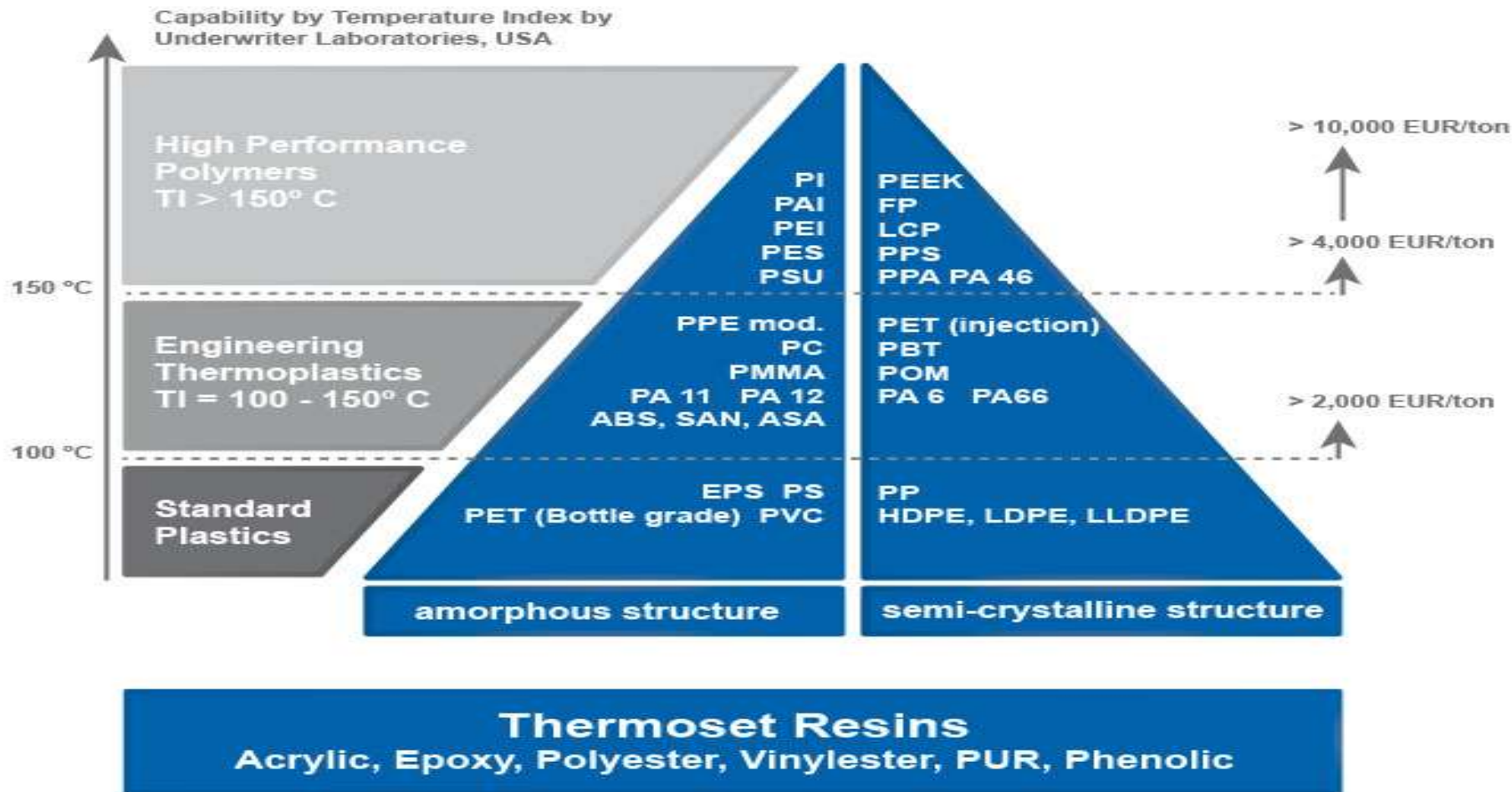


INTO the future 2020-2021 : LESS ENERGY, GREENTECHNOLOGY, faster heating and cooling cycles, fully integrated IND.4.0 Technology, your factory of the future based on the unmanned AMS Robomould & Smartmould Technology

Robomould – R&D and NEW MATERIALS

NEW MATERIALS and CURVE CONTROLLED MANUFACTURING

Triangle of thermoplastics by Structure, Capability and Price



- **Standard Plastics** includes Polyolefins, PS, EPS, PVC and PET (Bottle grade).
- **Engineering Plastics** with improved performance at higher costs.
- **High Performance Polymers** permitting exceptional end-use-applications specialized niche products at high costs.
- **Thermosets** generally stronger than thermoplastics, generally better suited to high temperatures, easy to prototype.

FLANDERS & Robomould – O&O up to 2300kg

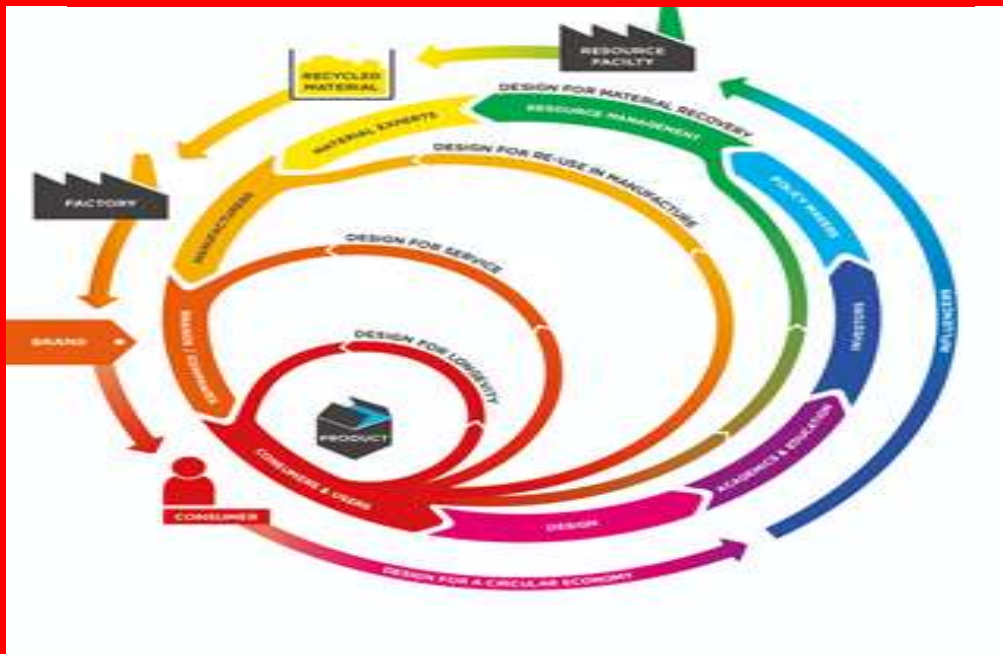
Up to automotive, ... = Robomould the STANDARD for ELECTRICAL cars

GLOBALLY PATENTED SYSTEM EP284 444 6B01



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

AMS Robomould



AMS BELGIUM bvba, Kieleberg 5,
3740 BILZEN/BELGIUM
Johan Potargent +32 475 286 682

Youtube channel : AMS Robomould
Johan.potargent@amsbelgium.com

Circular 4.0 Manufacturing Economics

AMS Robomould, the greatest innovation since 3 D printing, only 100x faster



AMS ROBOMOULD & AMS SMARTMOULD _ GLOBALLY
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