mobilverde

Plastic injection magnets

Connecting people with technology

Agenda

- Magnet Site Profile
- Use cases
  - Automotive
  - Home appliance
- Injection molding
  - About
  - Flow Chart
  - Quality Assurance
  - Material presentation: SmFeN
- Reference
- Contact

Injection magnet site profile

Plant Space
12 000 m²

Total Staff
135

Sales Revenue
12.14M €
(2022)

Certification
IATF16949 since 2013
ISO14001

Production Scale
47 Injection Machines

Application: automotive

mobilverde

Window Lifter

Sunroof Motor

E-Shifter

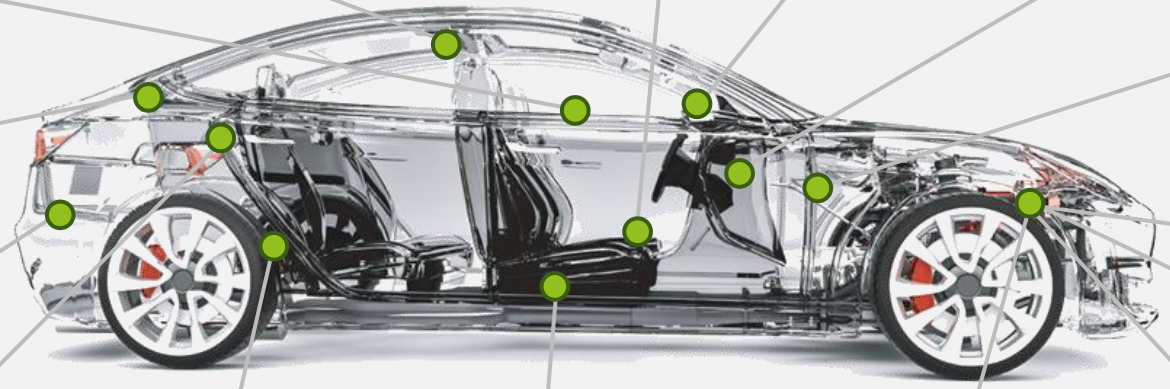
Panel Switch

Rear Mirror Switch

EPS Motor

AC Stepper Motor

Power Liftgate



Headlamp Stepper Motor

Camera System

Speaker System

Torque Sensing (all-wheel drive)

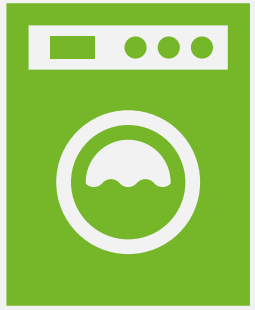
Seat Adjuster

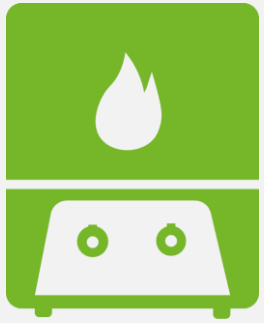
Thermal Management (Pump)

EGR Valve

Engine Displacement Transducer

Application: home appliance





Lift pump

Heat pump

Hand drill

Coffee machine

About injection molding

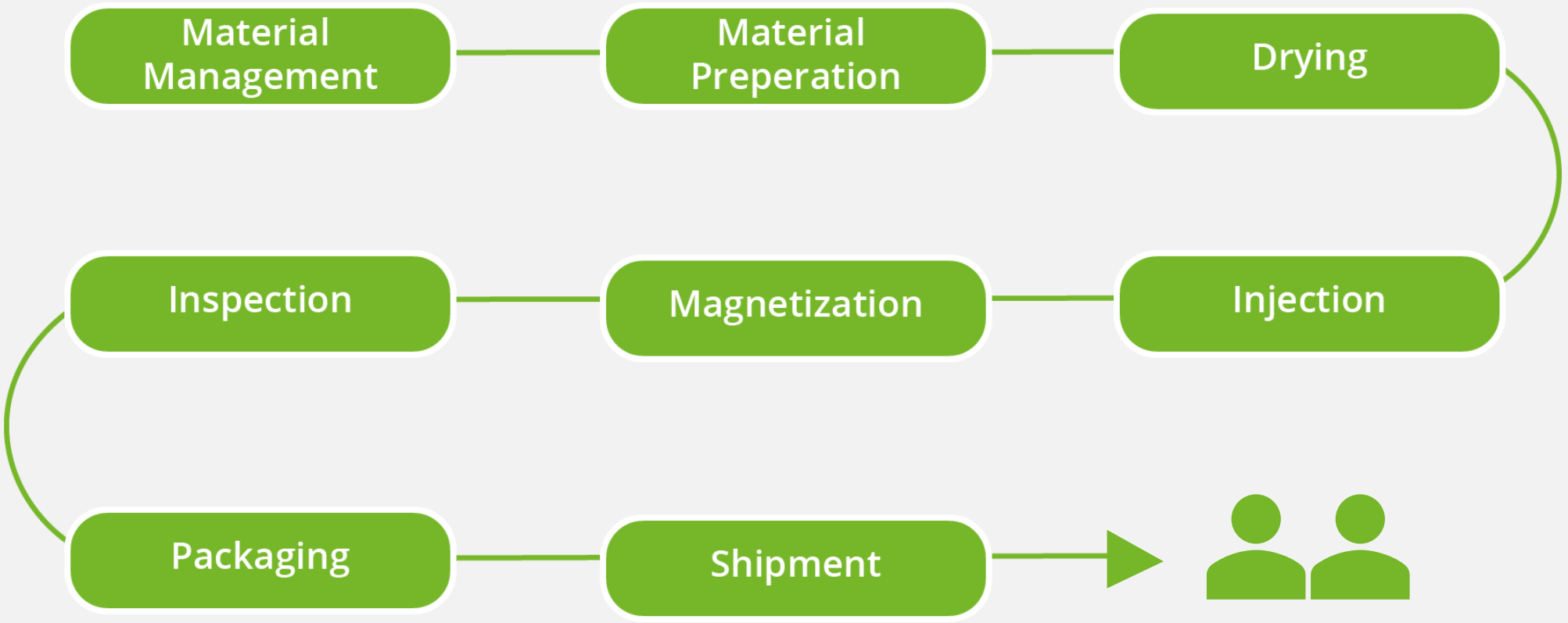
Material Combination
Nylon/PPS + Magnetic Powder
Nylon 6/12 or PPS takes around 10% - 15% in compound

How is compound made?
Plastic granulates and magnet powder are mixed in a hot kneader/thin-screw extruder. Afterwards they are granulated.

Special characteristics
Flexible shape, precise dimension & high mechanical performance

Application
Sensing & Driving System for Automotive & Appliance

Process flow



Quality Assurance

IATF 16949:2016

APQP/PPAP/ FMEA/MSA/ SPC/G-RR

Proficient Traceability, 8D Action, Continuous Improvement

Precise Measuring & Testing Facilities

SENIS 3D Magnetic Mapper

Hexagon CMM

Accretech Profilometer

Thermal Shock Chamber

New Material: injection bonded SmFeN

Agenda

- Comparison SmFeN vs NdFeB
- Different material compositions
- Performance ranking
- Comparison corrosion
- Overall comparison

Comparison of SmFeN vs. NdFeB

Equal or better magnetic performance

significant improved corrosion behaviour

cost advantages, less volatile prices

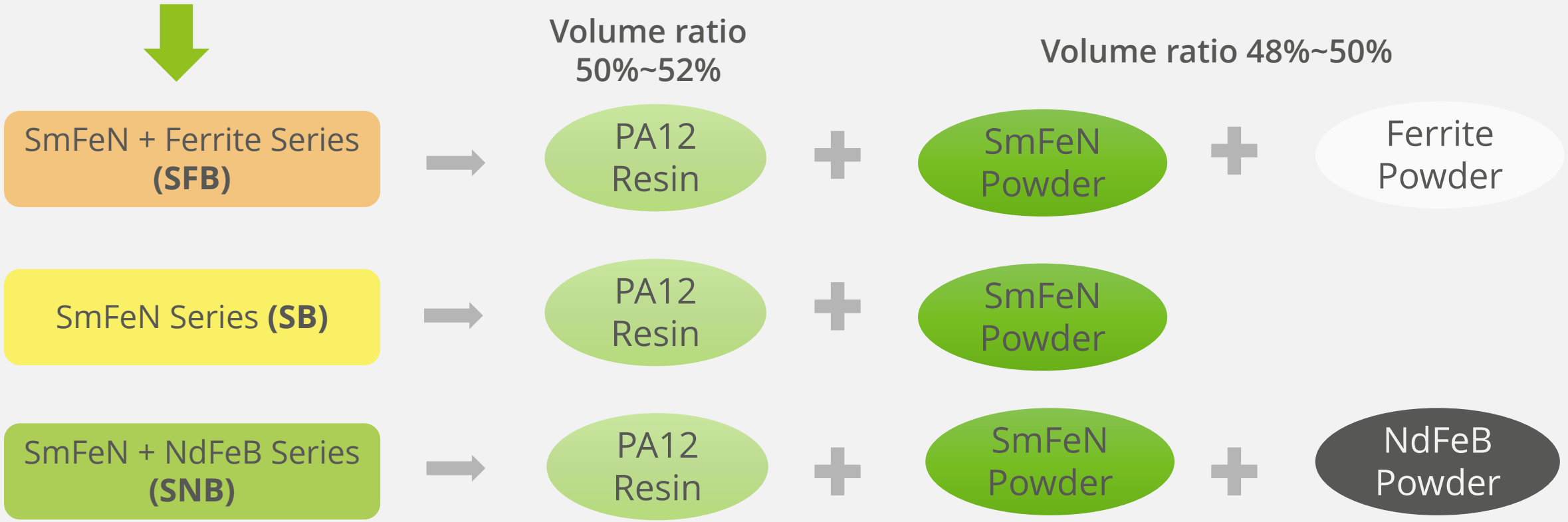
higher mechanical strength

environmentally friendlier, less rare earth

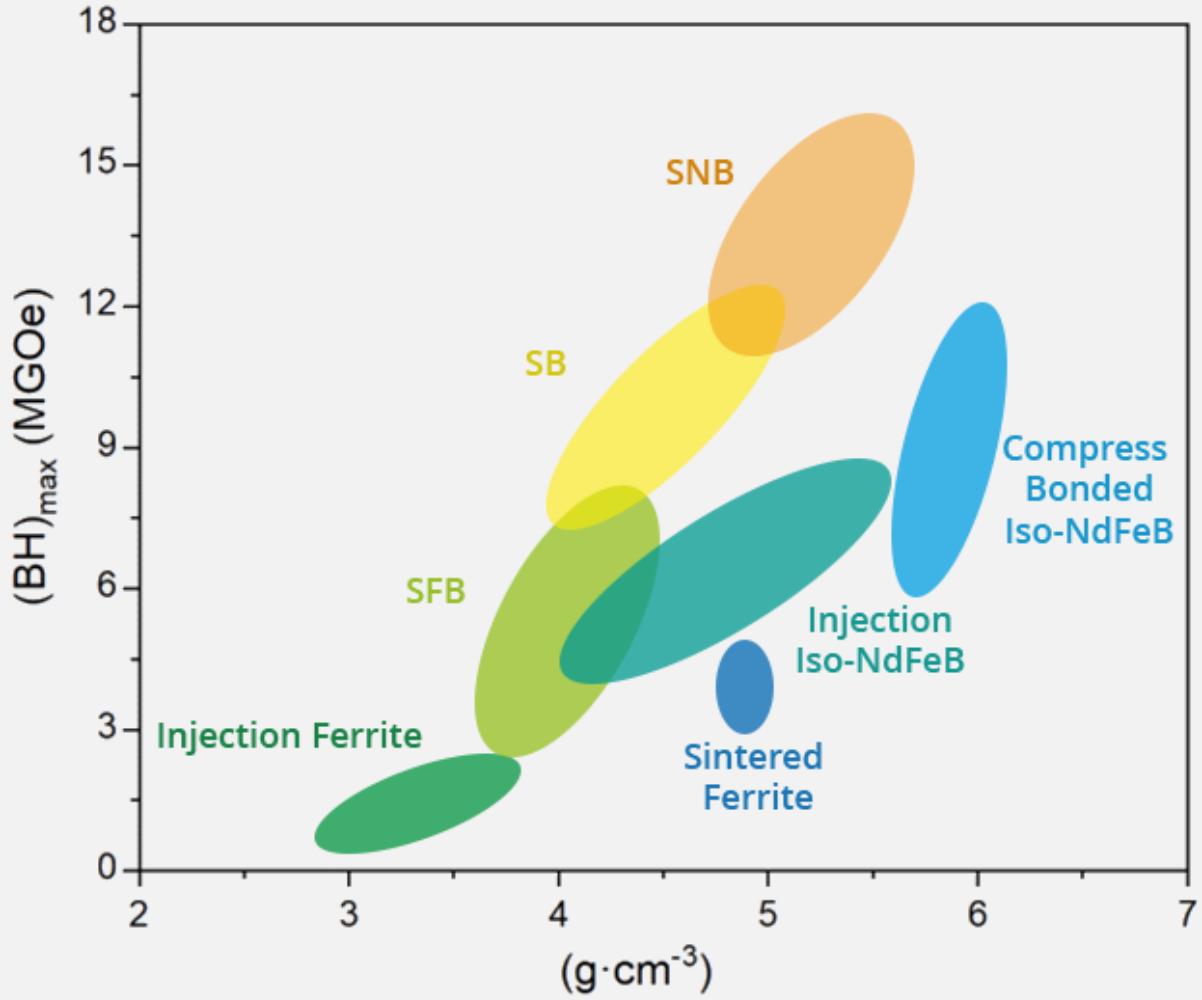
Different material compositions with SmFeN

The particle size of SmFeN powder is thinner (about 3 μm) with a magnetic energy value of about 24MGOe.

The operating l storage temperature range: **-40°C ~ 125°C**
Water absorption rate: **0.15%**



Performance Ranking



Density	Magnetic Properties
Molded NdFeB	Molded NdFeB = Injection SmFeN
Sintering Ferrite	
Injection NdFeB	Injection NdFeB
Injection SmFeN	Sintering Ferrite
Injection Ferrite	Injection Ferrite

Comparison corrosion

SmFeN Products*

No Rust

Injection NdFeB*

Rust

Molded NdFeB + Outer Surface Electrophoresis*

Rust

SmFeN has higher corrosion resistance than NdFeB

*Test Condition: Salt Spray at room temperature for 48h

Overall Comparison

Process Approach	Range of Bhmax (MGOe)	Thermal Deformation Temperature	Orientation	Magnetic Properties	Mechanical Strength	Antio xidati on	Cost Merits	Product Shape Diversity
Injection Ferrite	0.8~2.2	-40℃~+150℃	Anisotropic	++	+++	++++	++++	+++
Injection SmFeN	3.0~12.0	-40℃~+125℃	Anisotropic	++++	++++	+++	+++	+++
Injection NdFeB	3.0~8.0	-40℃~+150℃	Isotropic	+++	+++	++	+	+++
Compress Bonded NdFeB	3.0~12.0	-40℃~+160℃	Isotropic	++++	+	++	++	+

Application references

mobilverde

AGCO
Your Agriculture Company
FENDT

BMW

Audi

EIFFAGE

eNGie
Fabricom

Ford

STREETSCOOTER

ZIM
FLUGSITZ

EIFFAGE
YVAN PAQUE

Lexar™

Mercedes-Benz

PORSCHE

Contact

Please feel free to contact us for further discussions:

Roger Kröll
mobilverde technologies GmbH
Tel: +49 2451 914 82 68
Mobile: +49 171 220 6564
E-Mail: roger.kroell@mobilverde.com
Website: www.mobilverde.com