



ZELLER+GMELIN

Research+Development INKS

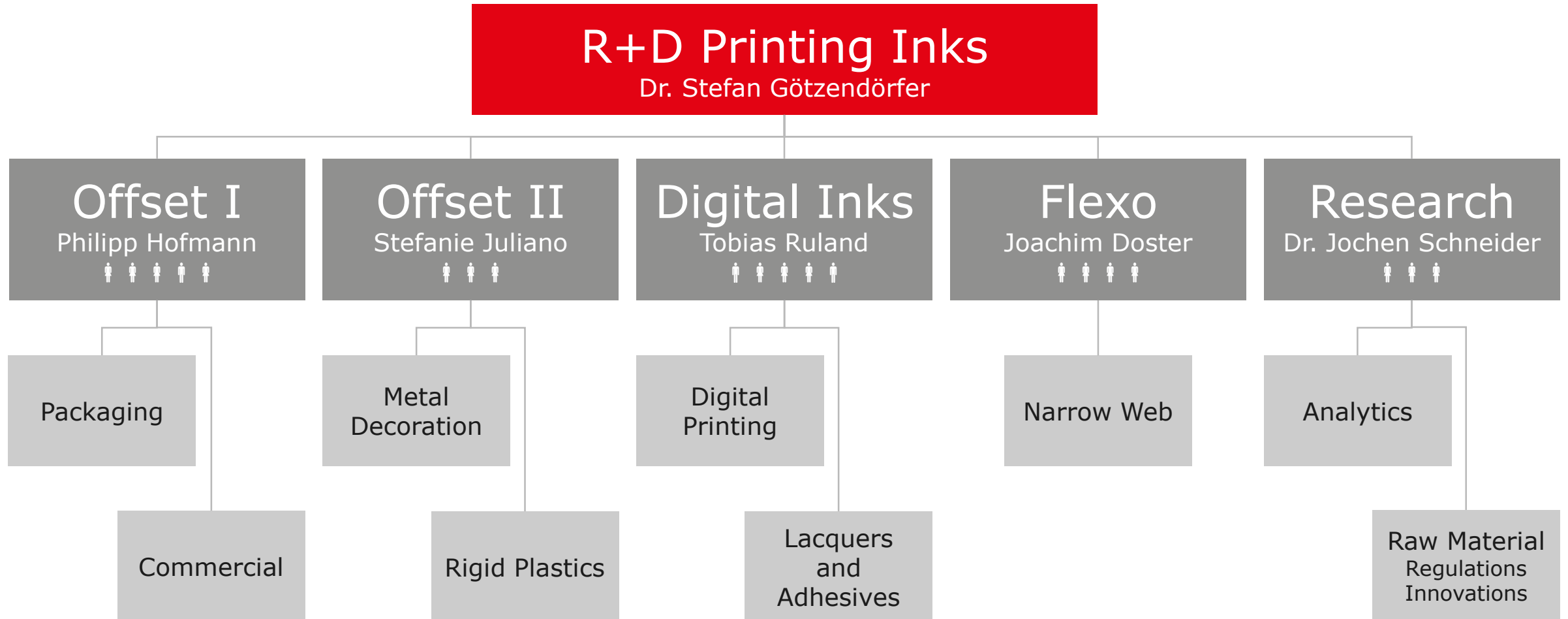
Structure and Projects

EXPERTLY DONE.



R+D Team

Team Structure



Business Segments



Packaging



Philipp Hofmann

Commercials



Metal Deco



Stefanie Juliano

Rigid Plastics



Digital Print



**Tobias
Ruland**

Narrow Web



**Joachim
Doster**

R+D Ink Globally



Intensified global interaction

- + Sharing development targets and strategy
- + Joint projects
- + Regular online meetings
- + Consultation in case of “daily” problems

Just like the colleague next door!



R+D Projects

Current and Future

EXPERTLY DONE.

Driving Forces for R+D



Current material issues

- + **Raw material purchasing**
Suppliers stop production due to high regulatory effort
- + **Raw material logistics**
Military conflicts disrupt established transport routes (red sea etc.)
- + **Volatile raw material quality**
- + **Price increase** of raw materials
- + **Permanent increase of regulatory material restrictions**
ECHA, EuPIA, GIO, customer preferences, country listings

Business as usual

R+D

- + **Permanently searches and qualifies alternative materials**
- + **Enables the use of low quality batches**

EXPERTLY DONE.

Driving Forces for R+D



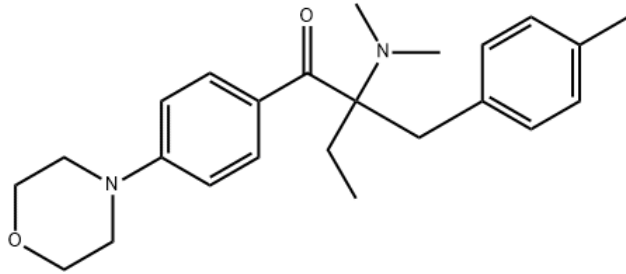
EXPERTLY DONE: Diversity

- + **Currently 3300 different articles** at Z+G Printing Inks (excluding subarticles)
- + **Individual modifications** may require reformulation of whole series
- + **400 different raw materials in use**

R+D

- + **Takes care about special customer requirements**
- + **Supports Technical Service Center and application technology**
- + **Works together with Process Technology for process optimization and simplification**

Key aspects 2024



Challenge No. 1: Elimination of Photoinitiator 379

- + Properties: Cheap, effective, versatile
- + Used in many ink series

January 2024: Classification as **SVHC** due to **reproductive toxicity 1B**

- ▶ EuPIA: Not to be used anymore by the **end of 2024**

(mandatory self-obligation, only limited temporary exemptions)

No 1:1 replacement existing

+ **Separate modifications in all affected ink series**

+ **Change of photoinitiator makes further composition adjustments necessary**

- ▶ Chance to eliminate other disagreeable components (e. g. PFAS)

Key aspects 2024



PMS Yellow	PMS Yellow 012	PMS Orange 021	PMS Bright Red	PMS Warm Red
PMS Red 032	PMS Rubine	PMS Rhodamine	PMS Pink	PMS Purple
PMS Med. Purple	PMS Violet	PMS Blue 072	PMS Dark Blue	PMS Reflex Blue
PMS Proc. Blue	PMS Green	PMS Mixing Black	Transparent White	

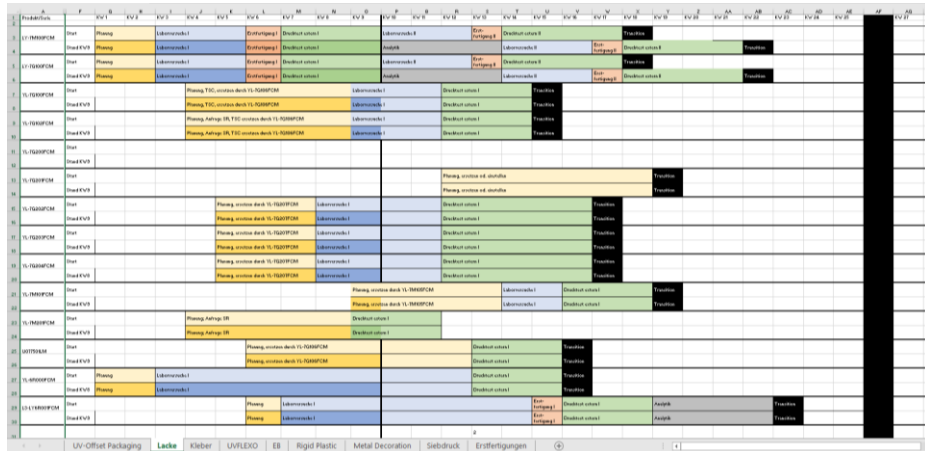
Challenge No. 2: Turbulences in Pigment Supply

- + Major issue: Lacking delivery reliability / shortfalls in supply
- + Moreover: Volatile batch qualities

Screening of more than 100 pigment alternatives from different suppliers

- ▶ Reduction of single source dependencies
- ▶ Synergies between ink series

In progress



Simultaneous wherever possible

+ Time savings in the lab

+ Single change for the customer

Compelled Substitution of Raw Materials

In 2025 **far beyond** "business as usual"

+ German Ink Ordinance

Details see presentation of Jochen Schneider

Deadline for the **customers of our customers** 31.12.2025

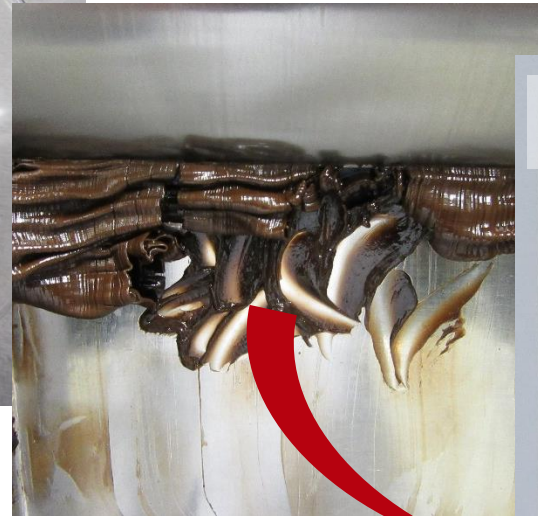
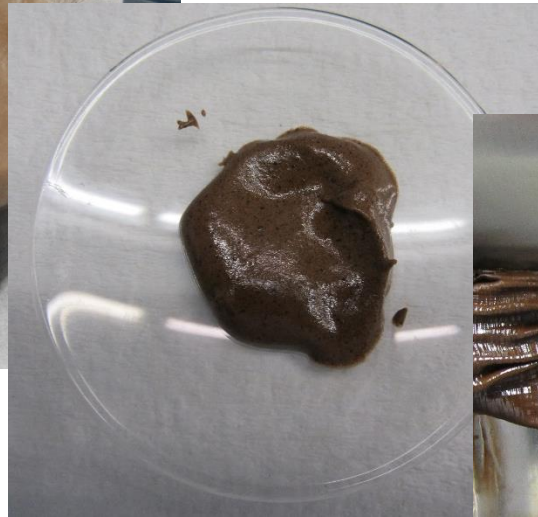
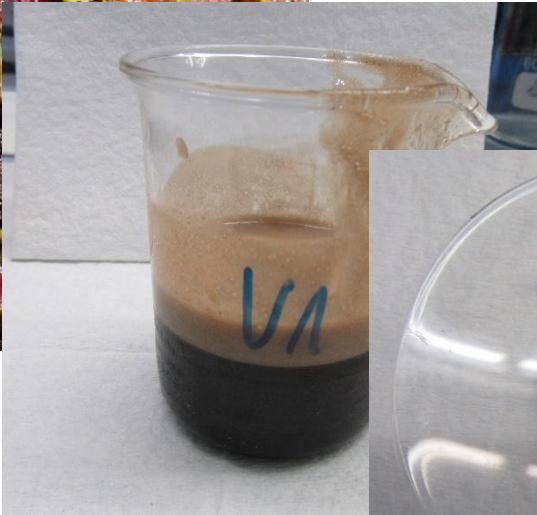
+ Discontinuation of the Production of Several Raw Materials

Various dates for last orders

+ Ban of BPA in FCM Materials

End of transition phase 01.07.2026

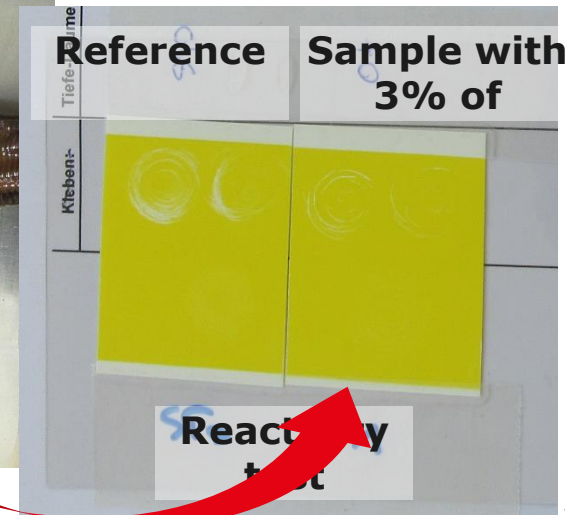
In progress



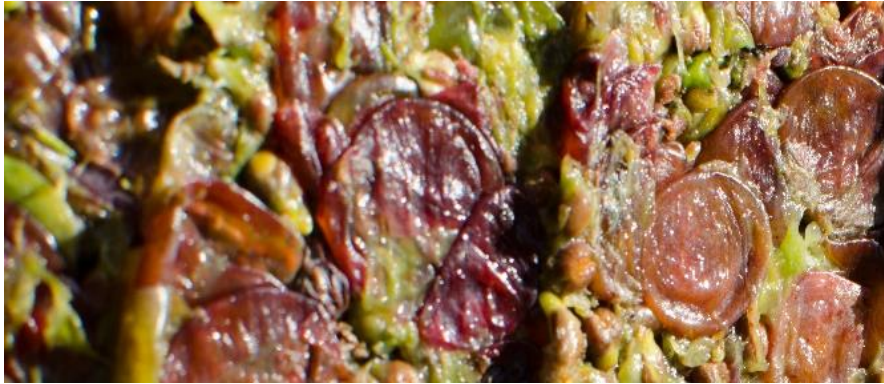
Sustainability

- + Utilization of bio-based raw materials: pomace

Potential, but still some way to go...



In progress

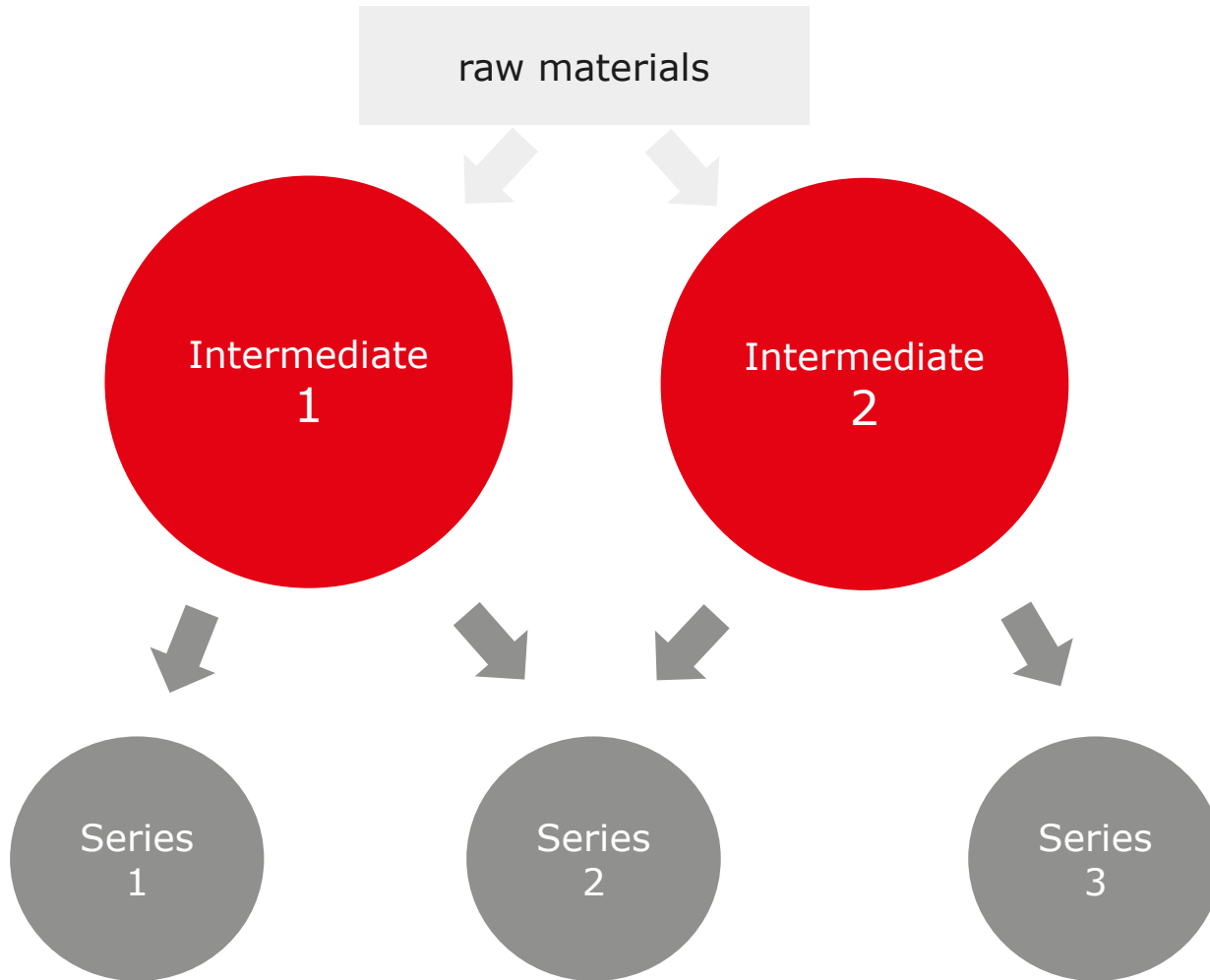


Sustainability

- + Utilization of bio-based raw materials
- + **Changeover of heat-set offset printing line to LED-curing**
 - ▶ Tremendous savings of gas and energy
- + **Deinking**
 - ▶ Prerequisite for recyclability
 - ▶ EU regulation 2025/40 on packaging and packaging waste

See also presentation of Jochen Schneider

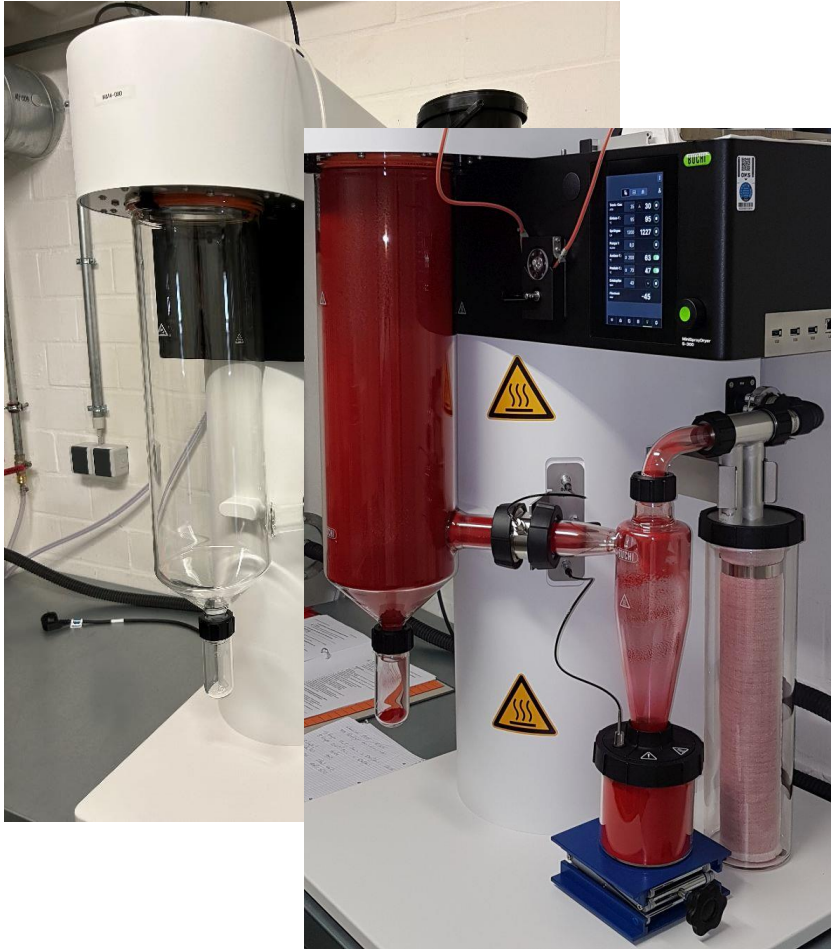
In progress



Long-term projects

- + **Simplification of ink series**
consolidation by shared intermediates
- + Cooperation with suppliers for development of ink dispersions

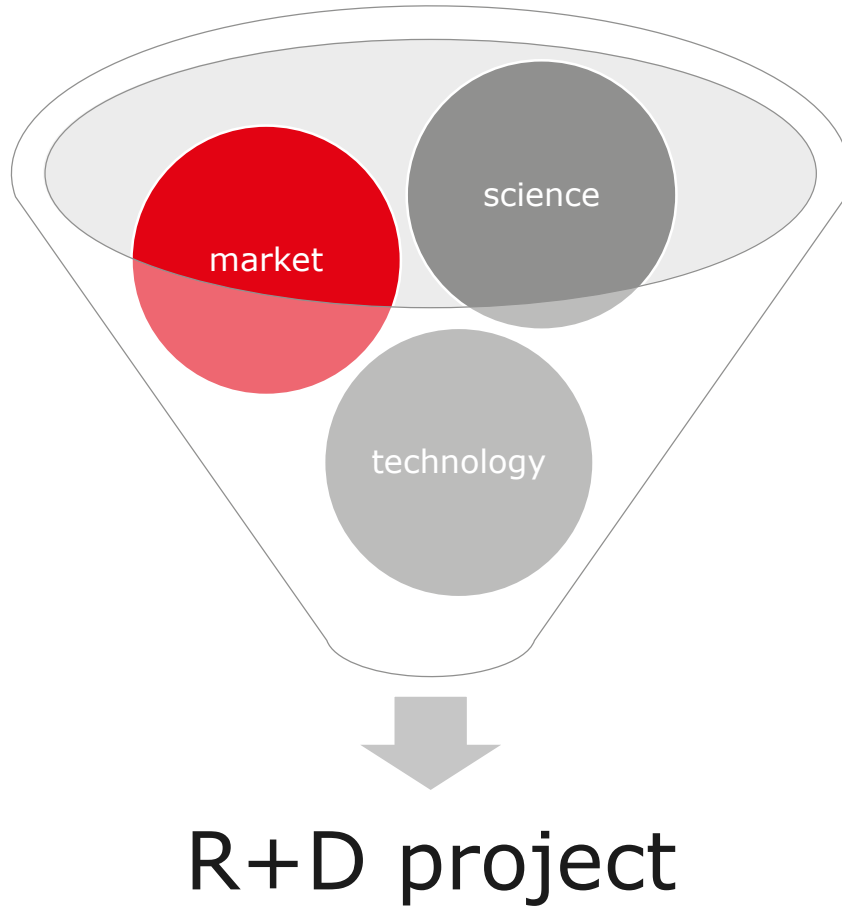
In progress



Long-term projects

- + **Simplification of ink series**
consolidation by shared intermediates
- + Cooperation with suppliers for development of ink dispersions
- + Modification of resin coated pigments
- + Cooperation with suppliers for development of tailor-made dispersants

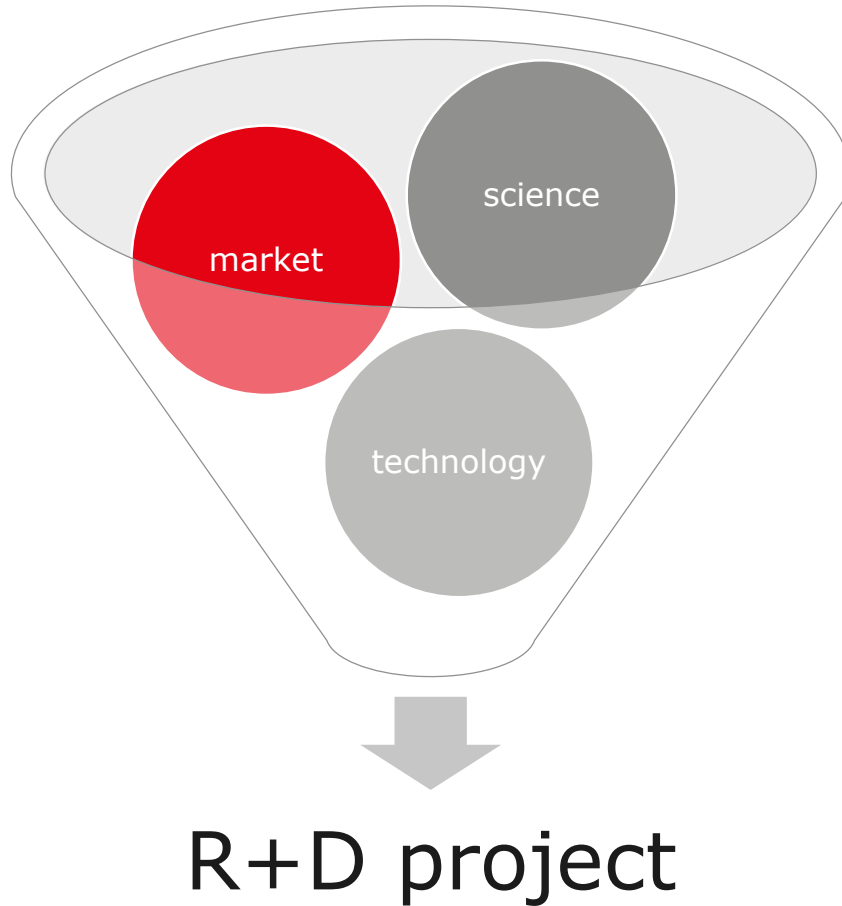
Future Projects



Input and inspiration for R+D

- + **Customer** requests and problems
- + New devices and technologies in **science**
- + Activities of our **competitors**
- + New products and offers of **suppliers**
- + **Legislation and associations**

Future Projects



Input and inspiration for R+D

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You are our link to the customer!

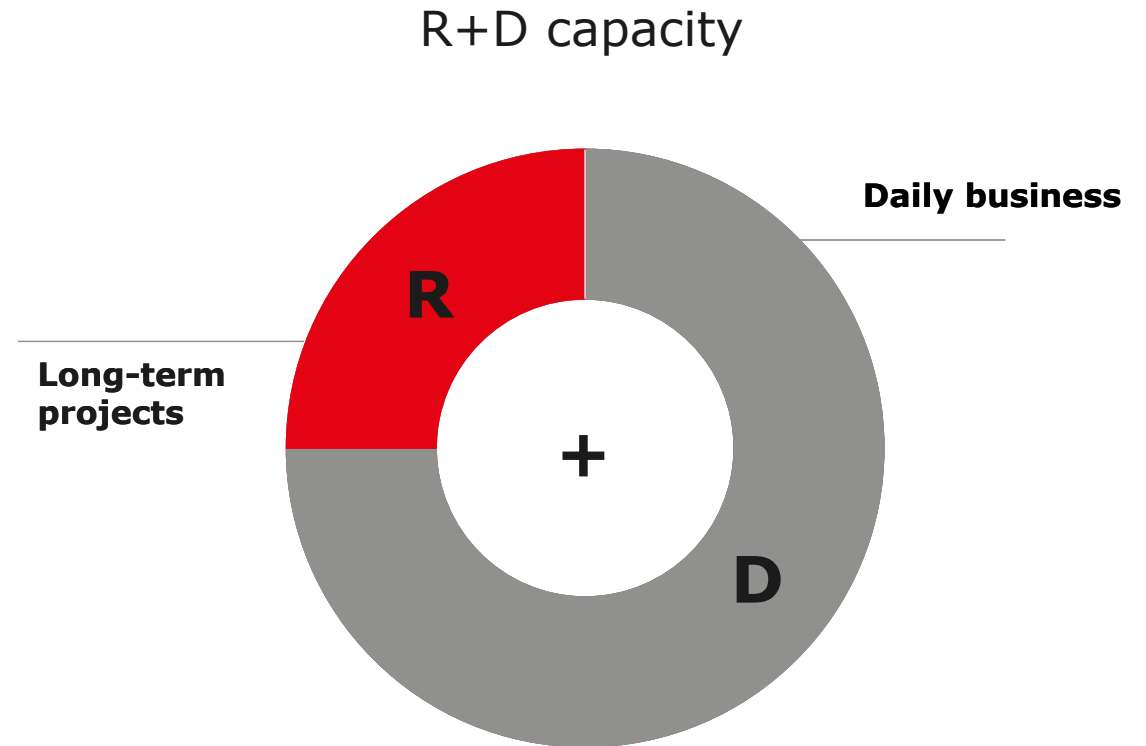
Both flights of fancy and serious market opportunities are welcome

Future Projects



Biggest challenge for R+D:

Not only being driven by external forces, but retaining resources for genuine research



Thinking outside the box is the way to achieve REAL USPs



Thank you for your attention