Caucho Moderno – Equilibro y Sostenibilidad

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D.O.G. Deutsche Oelfabrik

Introduction: Who is D.O.G.? →

D.O.G. Deutsche Oelfabrik

Customer-focused additive manufacturer

A family-owned company with a focus on R&D and quality

Producing rubber additives since 1902

80 employees

Production in Hamburg and Marschacht, Germany

D.O.GUM PERFECT PROCESSING

D.O.LUBE OPTIMIZING PERFORMANCE

D.O.COAT IMPROVING SURFACES

D.O.TACK ENFORCING CONNECTIONS

D.O.PLAST ENHANCING PROPERTIES

Introduction: What is Factice →

Origin of the Term “Factice”

French „Caoutchouc Factice“ = Artificial Rubber

AKA Vulcanized Vegetable Oils (VVO)

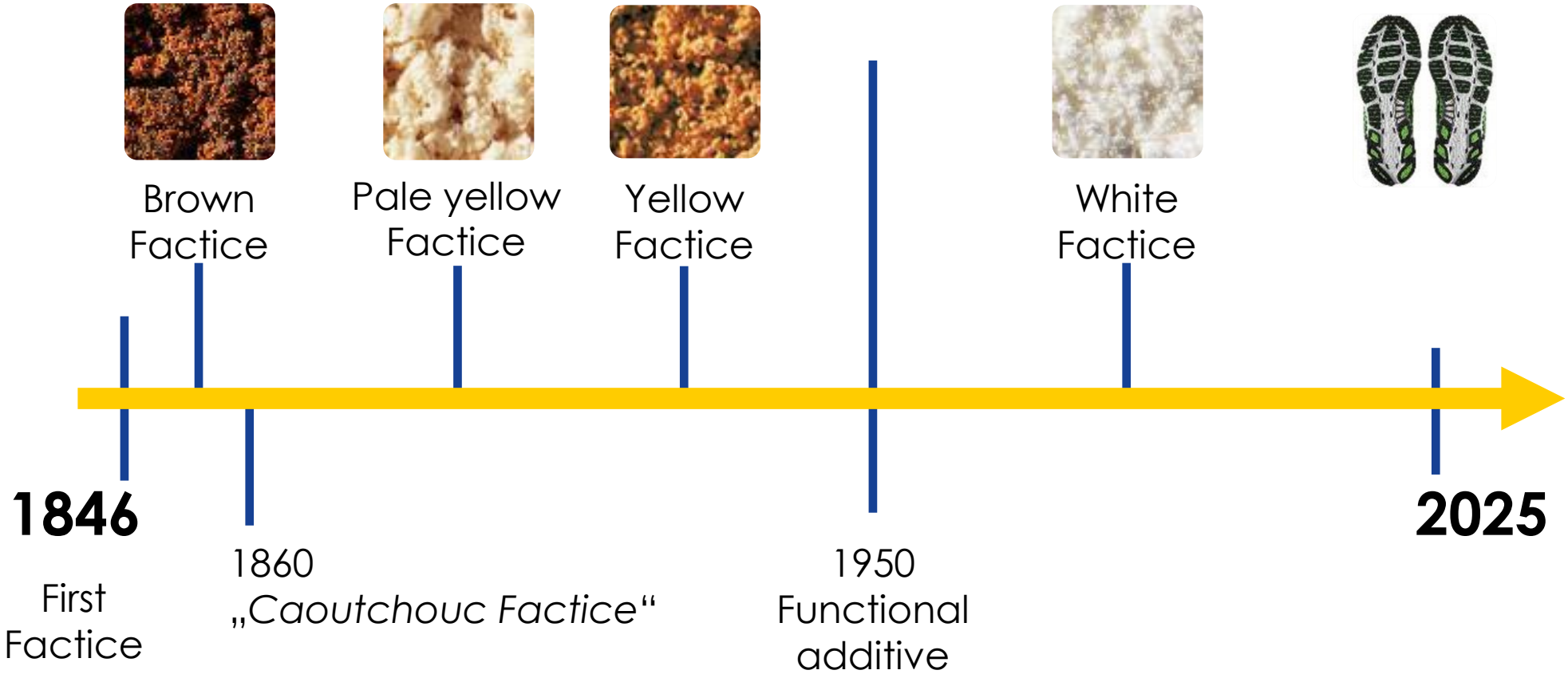
Appearance of Factice

4 Colours

- Brown
- Yellow
- Pale yellow
- White / transparent in product

History of Factice →

History


Brown Factice
Pale yellow Factice
Yellow Factice
White Factice
1846
First Factice
1860
„*Caoutchouc Factice*“
1950
Functional additive
2025

Application Areas and Composition →

Application of Factice

Extruded parts

Foamed rubber

Calandared sheets

Shoe soles

Roller covers

Erasers

Composition

Type	Brown	Yellow	Pale Yellow	White
				
Renewables	**75–90 %**	**82–90 %**	**75–93 %**	**>85 %**
Sulfur	10–25 %	10–18 %	3–13 %	0 %
Appearance	brown	lighter	very light	colorless
Applications	roller coverings microcellular rubber profiles	printing blankets BfR/FDA articles	eraser textile coating calendered sheets	light compounds shoe soles

Advantages of Factice

Enables **faster extrusion**

Reduced die swell

Higher uniformity of pores

Dimensional stability of uncured compounds

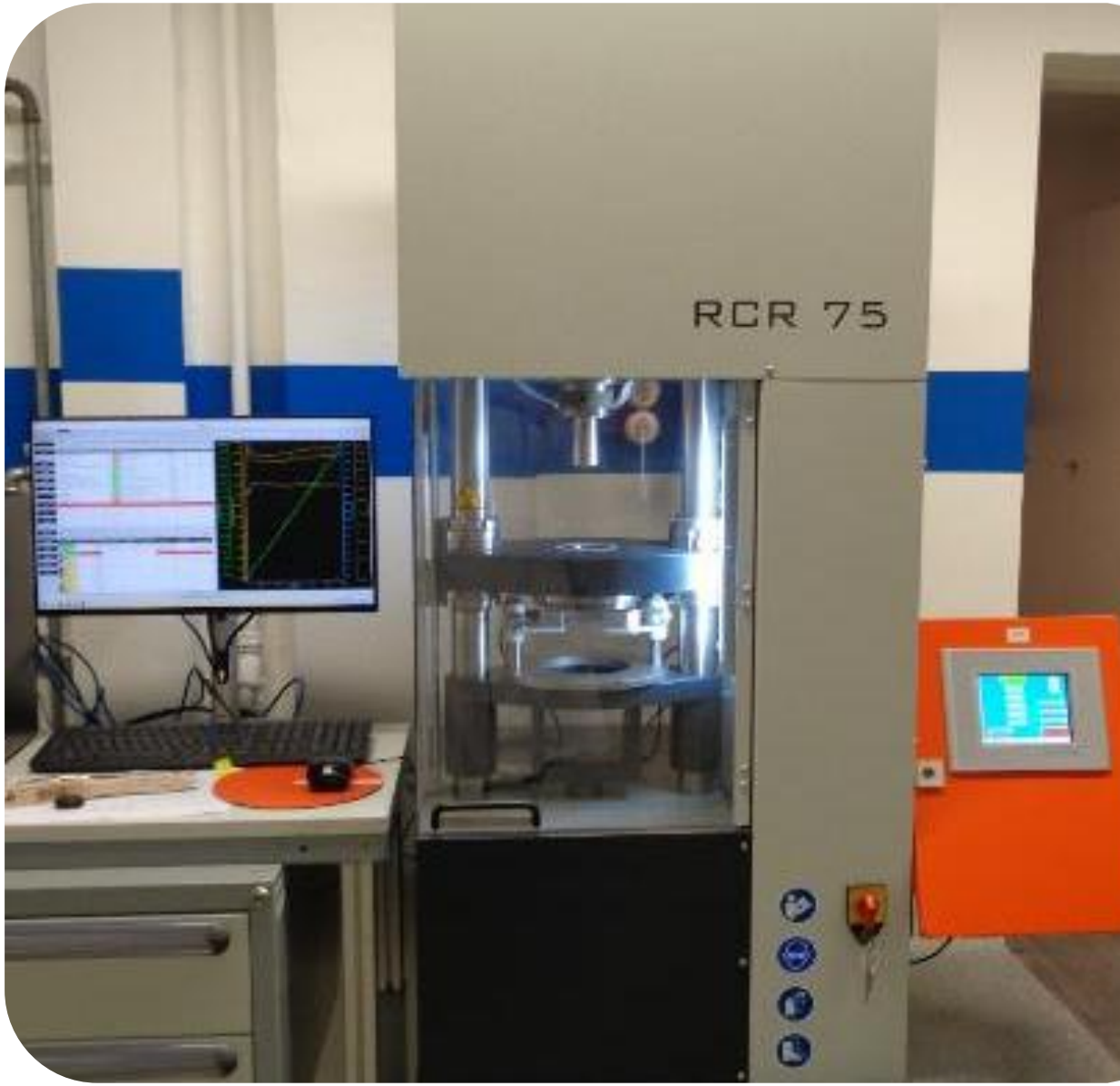
Modified surface: Smooth and matt

Excellent **processability and compatibility**

Degassing for non-porous articles

No blooming makes it suitable for sensitive areas like rubber-metal bonding

Plasticizer absorption and **retention**



Example for Utilizing Factice

Raw batch prior to vulcanization

Component	phr
NR-Batch	162
Accelerator blend (EG 3 MF)	2.5
Sulfur	1.5
Factice	**0–10**

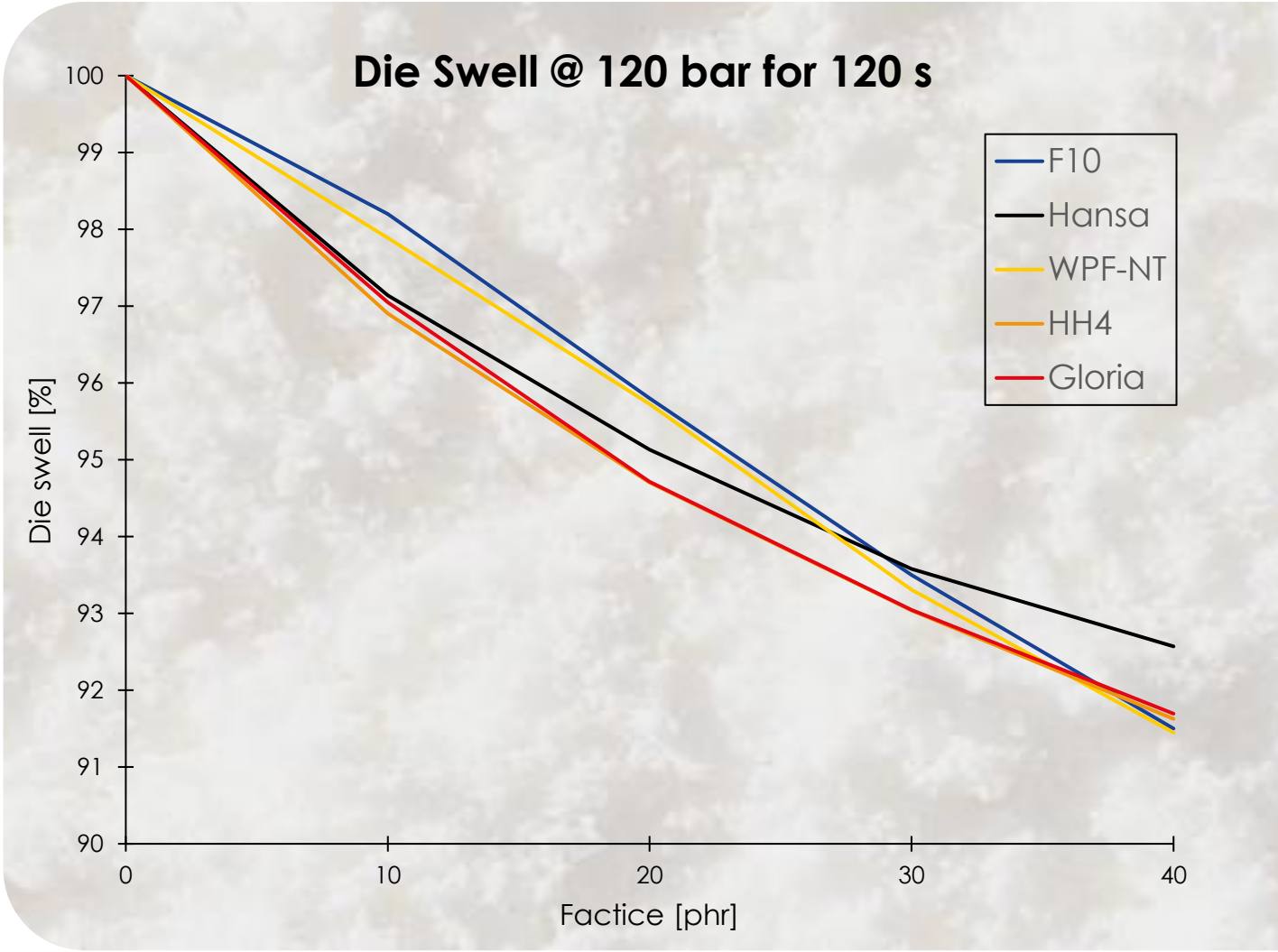
Control Compound without Factice →

Sample with Factice →

Effect of Factice

Component	phr
SBR 1502	60
NR SMR CV 60	40
CaCO3	65
SiO2	15
Carbon Black	1
Stearic acid	1
Factice	0-40

Internal mixer 35 L, mixing time 5 min



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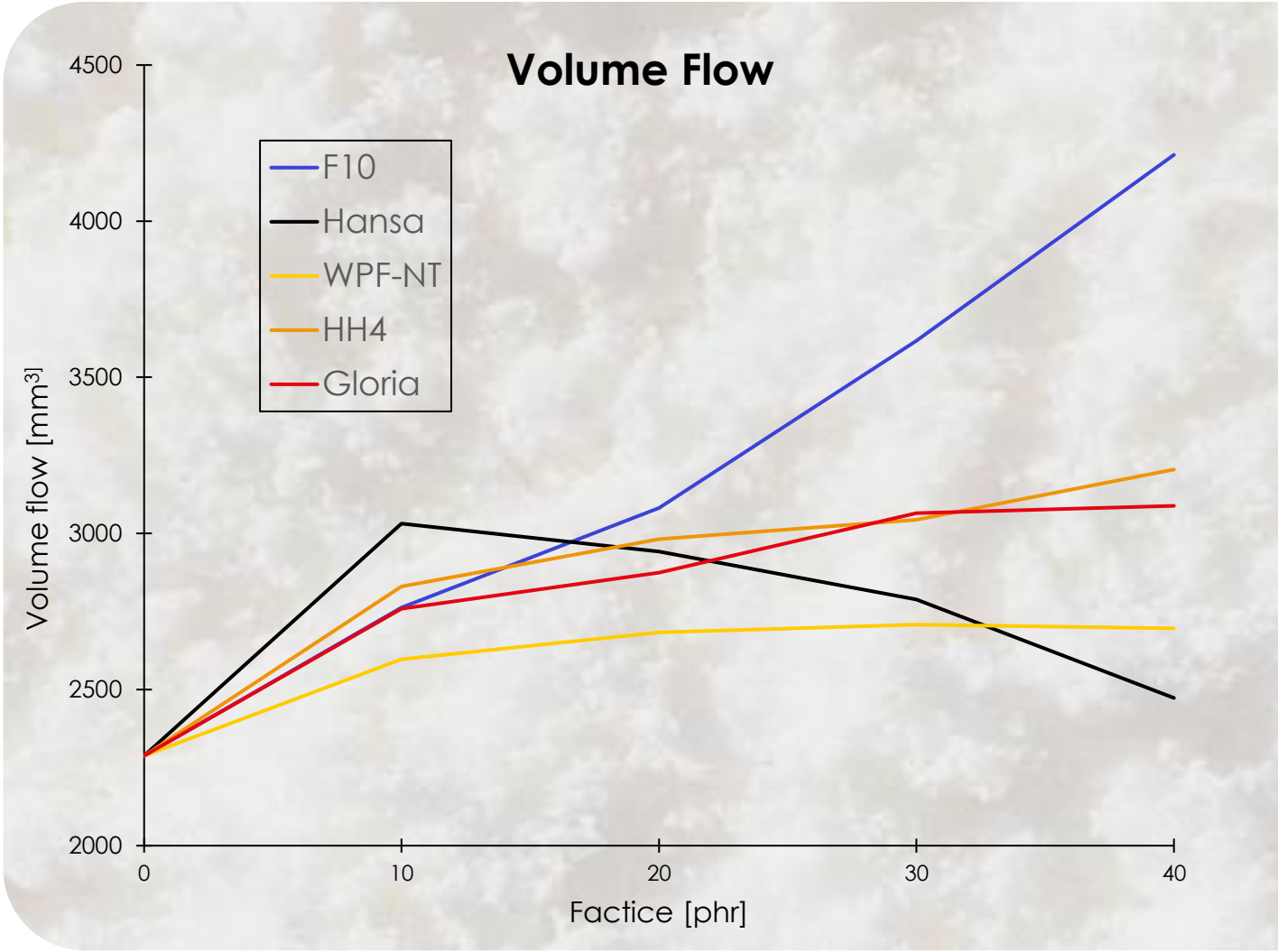
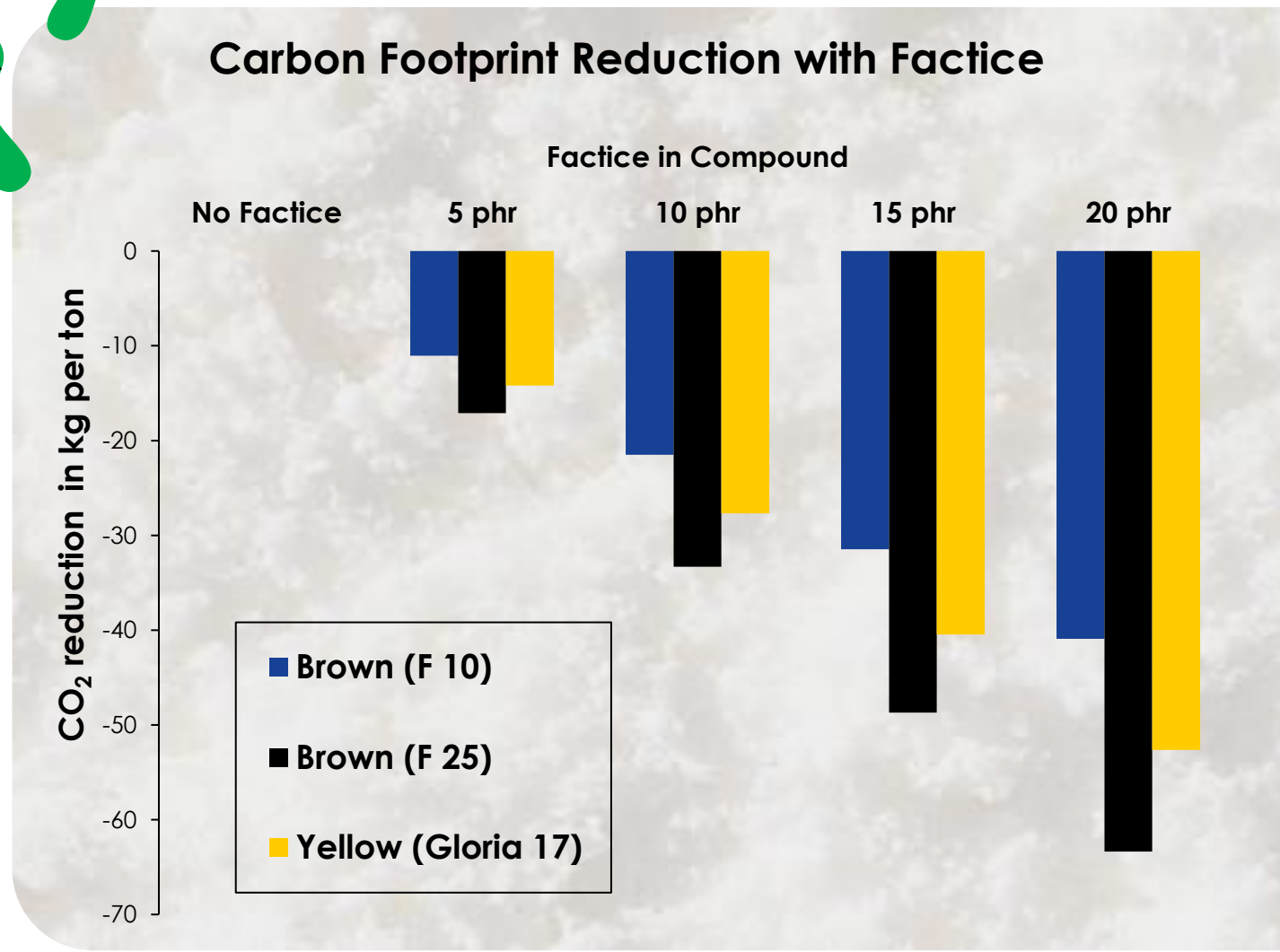


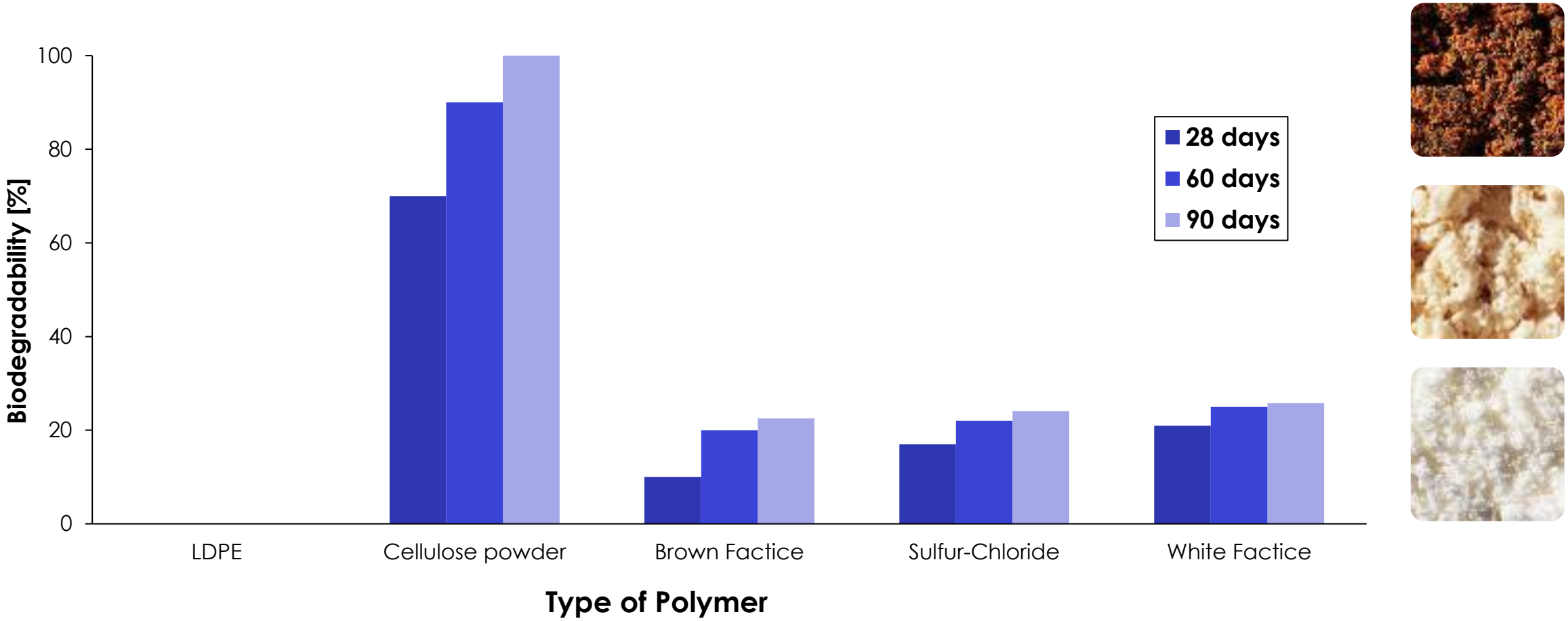
Sustainability of Factice →

Reduction of Product Carbon Footprint

Component	phr
EPDM	100
Carbon black	75
Zinc oxide	5
Stearic acid	1
Accelerator blend (EG 3 MF)	2.5
Sulfur	1.5
Factice	**0–20**



Biodegradability of Factices vs. Common Polymers



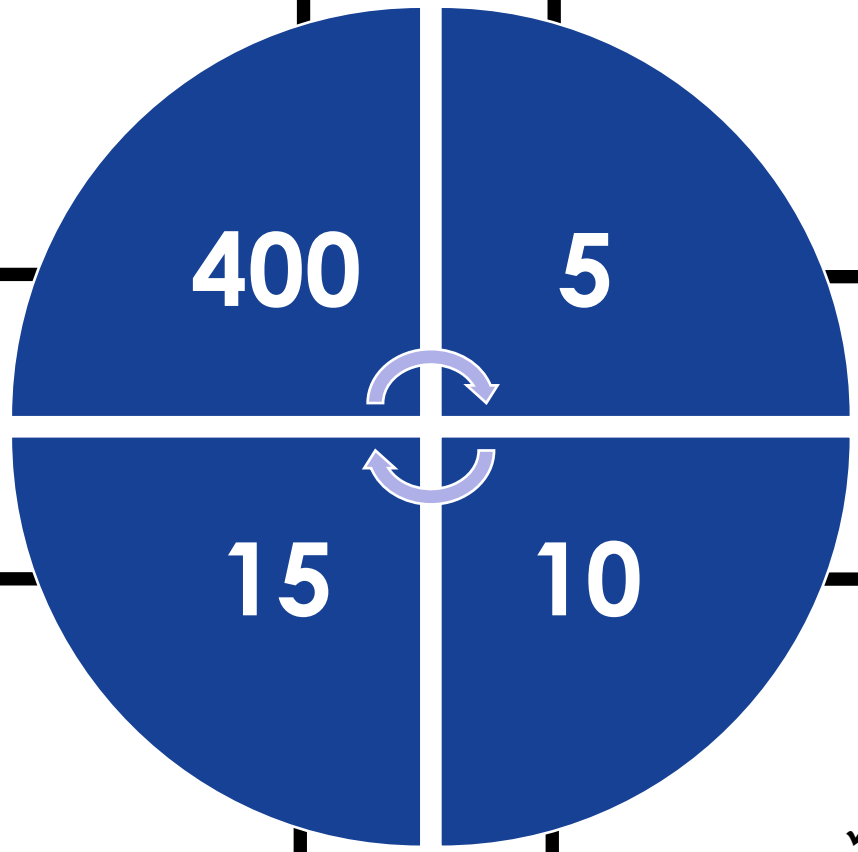
Burgstaller, M. *et al.* Gutachten zur Behandlung biologisch abbaubarer Kunststoffe. *Umweltbundesamt* **2018;** Erdal, N. B. *et al.* Degradation of Cellulose Derivatives in Laboratory, Man-Made, and Natural Environments. *Biomacromolecules* **2022**, *23* (7), 2713–2729; T. Becker *et al.*, unpublished results according to ongoing study ISO 14851 **2024;** In cooperation with LAUS

Summary and Perspective→

Use of Factice

Erasers
✓High abrasion

✓Neutral influence
✓Possible PCF reduction



✓Pore stabilization
✓Surface matting
✓Plasticiser absorption

Technical goods
✓Reduced die swell
✓ Flow improvement

Summary and Perspective

Factice changed: from substitute to **functional additive**

Composition: sulfur, sulfur chloride or peroxide cured oils

Renewable raw materials: vegetable oils

Low toxicity of raw materials + product

Many applications established in rubber: profiles, shoe soles, erasers, rollers, foamed goods and many more

Excellent compatibility in rubber

Potential **reduction of carbon footprint** in rubber products

Biodegradability of pure Factice in part

Further Possibilities

Some synthetic polymers like EPDM are already fully plant-based

Replacement products for toxic chemicals such as DBD (with the healthy Dispergum 36) or OTOS (better: Deovulc BG 223) for better worker safety

99 % plant-based process aids such as Deoflow 1055 show excellent performance in several polymers

Deostab N (76 % plant based) can replace a certain amount of accelerators in EPDM compounds

Stop by the Valex booth for more information

Thank you