



Smart plastics for CMF: Achieving individual and distinct product designs by using innovative plastic materials

Jonathan Germann
Business Development Manager - ALBIS



Agenda

- ALBIS
- CMF with plastic materials: Challenges and use cases
 - Design & esthetics through **color**
 - Realizing an outstanding **haptic impression**
 - Creating a distinct product via **illuminated design**

ALBIS - Facts & Figures

1961

Company foundation

>13,000

Customers

~500

Employees

€1.1 bn

Turnover

24

Locations

>40

Polymer types

3,500

Grades

>11,500

Grade/Color combinations



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UTEKSOL

MBA POLYMERS
REACTIVE POLYMERIZATION

CMF in product design

■ What is CMF?

- How a product looks, feels, and behaves influences its functional and perceived value
- In product development we speak about **Color, Material & Finish** – CMF

■ What needs to be considered?

- One aspect influences the other
- Planning CMF feasibility early on can shorten the release cycle
- A holistic and unbiased consultancy leads to exceptional results

■ What are current trends?

- Compressed design cycles are needed for *cost optimization*
- *Sustainability* is becoming a key selling point
- *Lighting design* elements as a differentiating factor



Design & esthetics through color

■ Challenge:

Need of distinct color esthetics to achieve wanted design

- Painting requires additional process steps
- Depended on paint adhesion and quality
- Sustainability problems (reduced recyclability, paint chemicals...)

■ Solution:

Color-compounded plastics materials

- Tailormade color according to reference
- Metallic aspect possible
- Sustainable products available
- Design freedom
- Cost efficient

Material Solutions

Individually matched colors against reference

- Altech®
- Altech® ECO – sustainability colored grades
- Novodur® (ABS)
- Alfater® XL (TPV)
- Solplast® (TPS)
- Evoprene® (TPS)

Effect color compounds

- ALCOM® CFX

Wood like appearance

- Arboform®

Color batch solutions

- Alcolor®
- Ampacet®

MOCOM

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TECNARO
GESELLSCHAFT FÜR INDUSTRIELLEN ANWENDUNG
NACHWACHSENDE ROHSTOFFE mbH

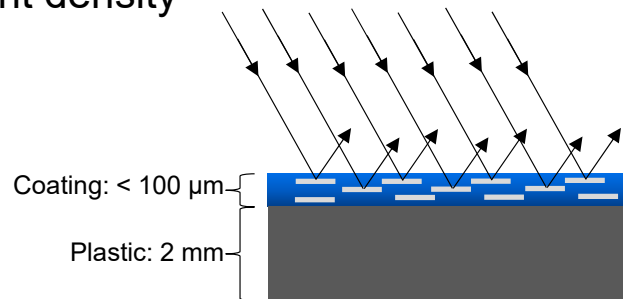
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Comparison metallic coating vs. Alcom CFX

Metal coating

- thin layer: $< 100 \mu\text{m}$
- light refraction in one direction
- increased brightness through total reflection
- low need of substrate (varnish)
- high pigment density



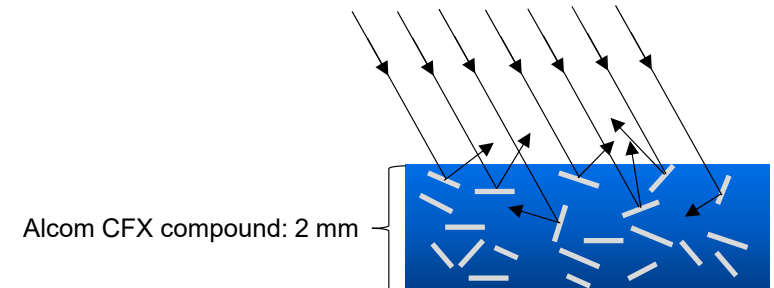
Disadvantages:



- high visibility of **scratches**
- **high process costs** – finishing process!

Alcom® CFX compound

- material thickness of part: 1-2mm
- light and shadow creation through random flitters
- reduced brightness
- high need of pigments (compound)
- low pigment density



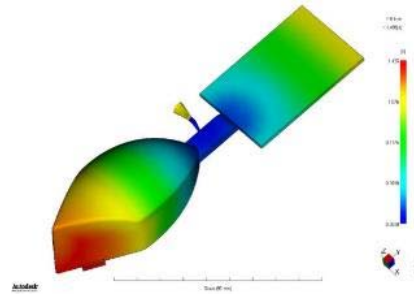
Benefits:



- **low visibility** of scratches
- **low costs** – only one process step!

Differences

Applications & use cases



- Distinct product coloration with ALBIS design support

- Excellent Surface Quality with metal effect on decorative shaver housing, while reducing cost



- Stone or dark metal effect for sink drains to match rest of kitchen assembly.

Realizing an outstanding haptic impression

■ Challenges:

Different haptics in the same product

- Perceived value depends on haptics
- Multiple materials require different processing methods
- Cost reduction leads to design compromises

■ Solution:

Pleasant haptics through soft- and cool-touch compounds

- One material class facilitates design process
- Specialized compounds increase usability and perceived value
- Cost reduction without drawbacks in design

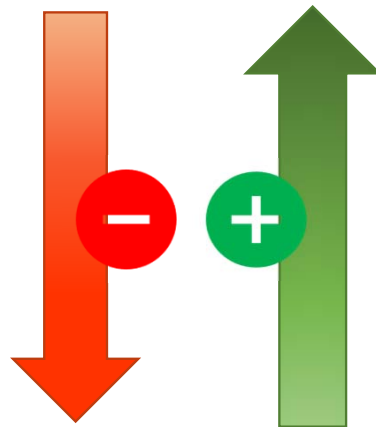
Technical advantages for soft-touch application

Multi material solutions:

- Use of soft touch-varnish or EPDM
- Metal design parts

Disadvantages

- Additional processing steps
- Decreased design freedom
 - Color, hardness, adhesion to other materials
 - Control of shape
- Sustainability issues
 - Energy consumption in vulcanisation of EPDM and metal processing
 - Paint chemicals



Thermoplastic solution:

- Use of specialized compounds

Benefits

- Cost reduction possibilities
 - Metal replacement
 - Less assembly due to 2 component molding
 - Significant cycle time reduction
- Metal-like impression due to thermal conductivity
- Recyclability vs EPDM
- Lighter products
- Reduced post processing

Material Solutions

Soft Touch effect – ALBIS TPE Portfolio

- Solplast® (TPS)
- Evoprene® (TPS)
- Alfater® XL (TPV)
- Alfater® XL ECO (Sustainable TPV)
- Desmopan® (TPU)
- Sipolprene® (TPC)

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Cool-touch effect - effect by increased thermal conductivity compared to standard plastic

- ALCOM® TC (thermal conductive)
- Makrolon® TC (thermally conductive)



Applications & use cases



- Grip for kitchen tools enhancing haptics and usability

- High end appearance through defined haptics (soft and metal-like), while eliminating processing steps and reducing material mix



Creating a distinct product via illuminated design

■ Challenges:

Design accentuation with light

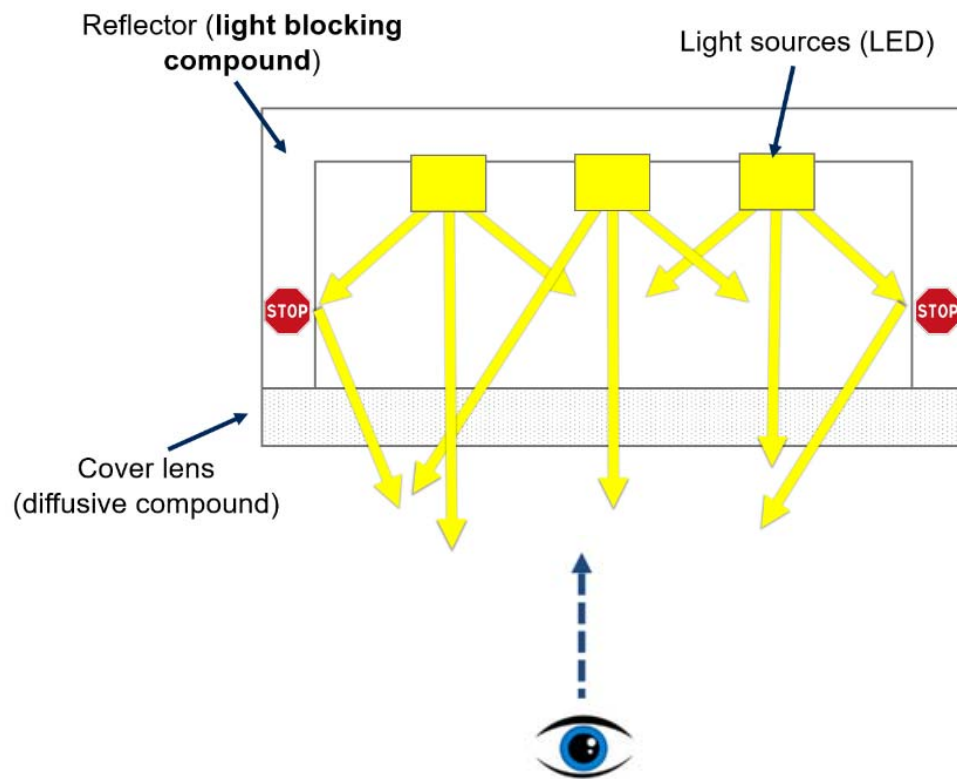
- Hotspots can disturb desired look
- Light bleed needs to be avoided
- Unilluminated appearance needs to be considered

■ Solution:

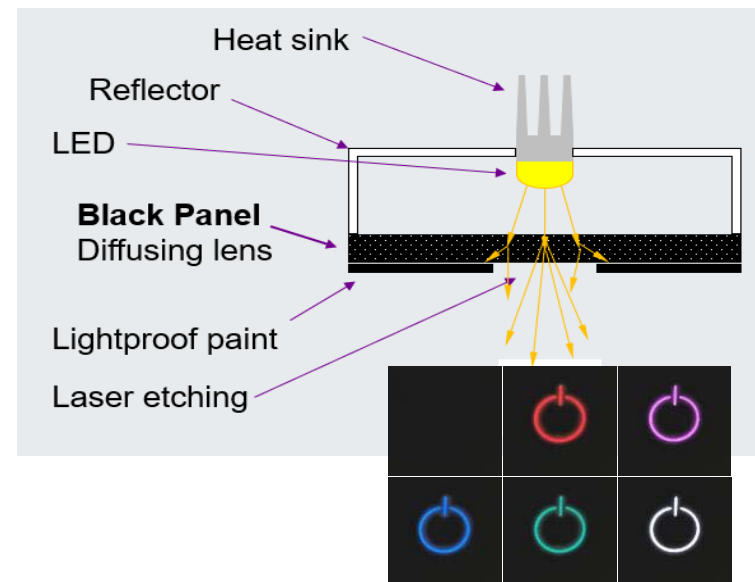
Tailormade combination of lighting compounds

- Support of the entire design project
- Diffusion and transmission properties fitted to the application
- Possibility of individual compounds and color shift development

Light design setup



- Several materials need to work together
- Clear specification of optical values and color is key to final design impression
- Simulation data available (i.e. Speos, LucidShape, LightTools)



Material Solutions - Lighting



■ Specialist in PC

- Makrolon® LED (transparent for LED)
- Makrolon® DQ (diffusion quality)
- Makrolon® RW (reflective white)
- Makrolon® Ai (automotive interior)
- Makrolon® Ai ST (sensor transparent)

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- ***Different polymers possible*** : PC, PMMA, HTC, MABS, PC+ABS, ABS, TPU, PP...
- ALCOM® LD/LD2 (light diffusion)
- ALCOM® LDX/LDM (light diffusion extrusion)
- ALCOM® LG (light guiding)
- ALCOM® LB (light blocking)
- ALCOM® LDDC (deep color effects)
- ALCOM® LIR (lighting infrared)

Applications & use cases



- Light design on high end coffee maker to create floating effect without hotspots

- Light blocking material to realize separated illuminated symbols in a confined space of a washing machine or dryer display



- Ambient light design project, co-developed with OEM. Different material thicknesses create “Topography” effect lit and unlit.

We are here to help

- ALBIS holistic approach can help you with your CMF projects
 - Wide portfolio variety is key to successful projects
 - Independent technical support and consultancy shorten the design cycle
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- For more info about products and our current Smart Plastics@home campaign **join us at our booth!**



Thank you!

ALBIS Distribution GmbH & Co.KG
Mühlenhagen 35
D-20539 Hamburg

ALBIS PLASTIC Italia S.r.l.
Via Marsala 2
IT-21013 Gallarate

Jonathan Germann
jonathan.germann@albis.com

T +39 0331 245445
it.albis@albis.com
www.albis.com