Color Accuracy
颜色精度
Process Monitoring and Improvement by color measurement tools
颜色测量工具在工艺过程控制和改进中的应用

Dr. Nils Lessmann
Technical Center Manager
BASF Shanghai Coatings

雷斯曼 博士
技术中心经理
BASF上海涂料有限公司
The color of a body and, later on, the overall car plays one important role in automobile industry:

- Outer look of the car
- Individuality
- Image

How can the quality and accuracy of a color be guaranteed on a car?
Automotive Solutions    Performance  Passion  Success

**Actual Situation – process** 实际的过程

- **Paint Manuf.**
  - Check color
  - Feedback for process improvement
  - Check appearance

- **Prevention** 预防
  - *Lab. application simulating line condition
  - Define paint application parameters in lab
  - Color check against master
  - If necessary adjust mat. to line conditions
  - Check paint batches in line conditions and give feedback to Paint manufacturing plant

- **Body**
  - Check and feedback to synchronize process / result
  - Participation in joint action plans

- **Paint Manuf.**
  - Check Final result on finished car

- **Plastic parts**
  - Tier2-A
  - Tier2-B
  - Tier2-N

- **Assy to Body**
  - Tier1-A
  - Tier1-B
  - Tier1-N

- **Paint Manuf.**
  - Check color
  - Feedback for process improvement
  - Check appearance

- **Communication** 沟通
  - Paint Manuf.
Color as a Challenge 颜色挑战性

**Increasing standards caused by** 标准日益增加，因为：
- More care models with more individual colors 越来越多的成型，更多的独立而有特性的颜色
- Shorter product life cycles 颜色的使用周期缩短
- More complex 日益复杂的颜色品种

**Increasing impact of Add-On parts** 对附加件的挑战：

**Challenge:**

Color match and color harmony gets more and more important！颜色控制和颜色匹配变得更加重要
Process-Monitoring by ColorCARE® ToolBox. ColorCARE® ToolBox 软件解决方案
ColorCARE® - Basic Components

■ ColorCARE® Concept
  - Concept to use statistically significant color measurements to improve overall color match and minimize the color differences between car body and add-on parts
  - 运用技术测量统计的理念提供整体颜色匹配的准确性，最大限度减少车身和附加件的色差

■ ColorCARE® ToolBox
  - Software to monitor OEM Paint Shops and add-on suppliers as well as the production of paint
    - 运用软件监控OEM 车身和附加件同时对油漆生产过程加以监控
  - Powerful analysis tool
    - 强大的分析工具

ColorCARE® Paintshop Analysis
  - Service of BASF personnel to analyze and optimize Paint Shops by color measurements
    - 运用软件分析和优化油漆车间的颜色过程

BASF is realizing the concept in Europe by implementing the toolbox at different assembly plants, starting with Paintshop Analysis, and after that assuring a good color match by batch and production control
Color Matching - Measuring Points
Shift in Ligthness 明度的漂移

Left hand side – averaged over multiple cars
整车左侧分析－多辆整车统计的平均值

Front fender  Front door  Back fender
Color Harmony – Add-on Parts

Remark: Look fine

2 Master panels
Color Harmony – Add-on Parts

颜色匹配－附加件

Design Angle ≈ 0-2 °

Manufactured Angle ≈ 6-8 °
Color Harmony – Add-on Parts
颜色匹配 — 附加件
Conclusion

- ColorCARE® ToolBox is a powerful tool to analyze paint shops. ColorCARE® ToolBox 是一个分析，提高油漆车间颜色控制的强大工具。

- ColorCARE® ToolBox can be used to monitor OEM Paint Shops and add-on suppliers as well as the production of paint
  - Improve batch-to-batch consistency 增加批次稳定性
  - Improve color match between various off-line as well as online painted parts 提高离线和在线喷涂的不同部件的颜色匹配性
  - Necessary for strategic tinting 对于策略配色很有必要

- ColorCARE® ToolBox along with paint shop analysis can optimize paint application by color measurements ColorCARE® ToolBox 与油漆车间分析相结合，通过颜色测量能优化油漆的应用