

The slide features abstract geometric patterns in the corners, composed of various colored triangles (red, orange, yellow, teal, and dark blue) arranged in a complex, overlapping manner. The main title is centered and reads: 

# Application of Nano-sized Pigment Colorants for Coatings

Shanghai Xiyan Industrial Co., Ltd.

**Speaker: Jane Guo**

**Date: 2026-6-15**



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NEW DEVELOPED BLUISH BLAK

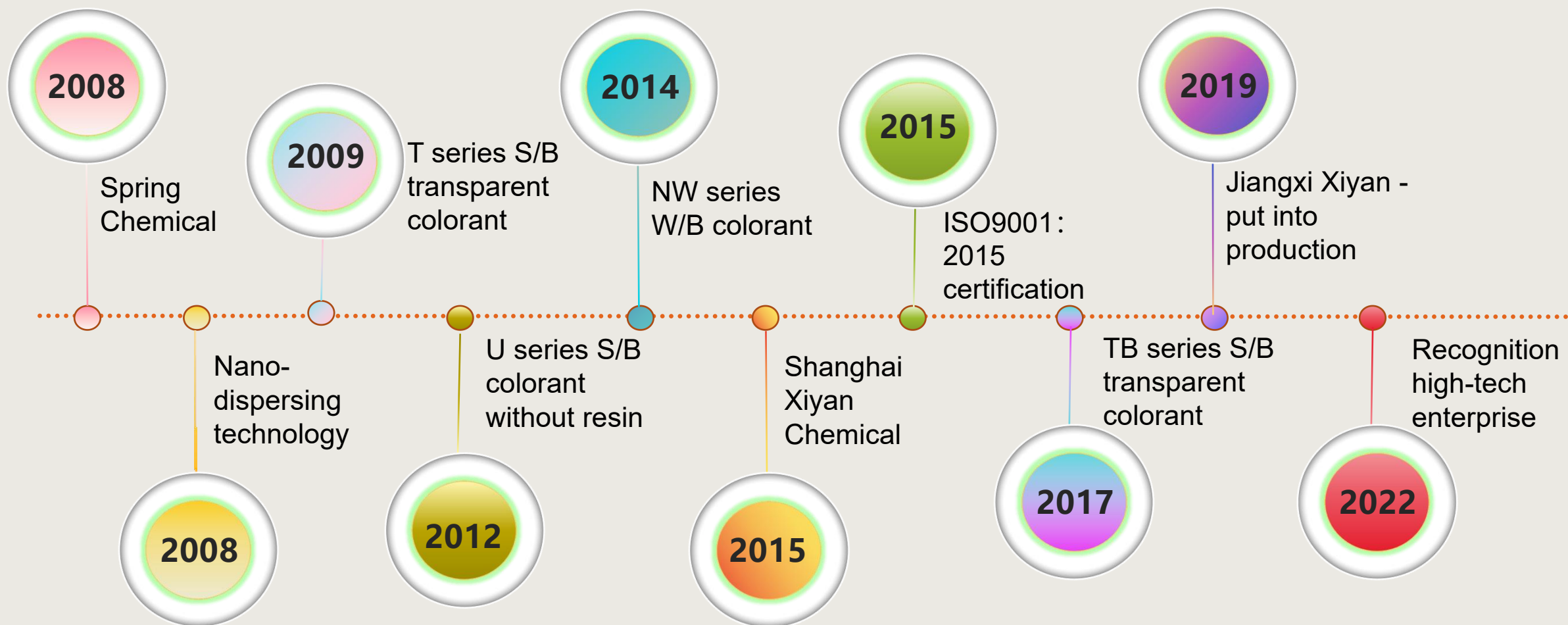


# PART 1

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## COMPANY INTRODUCTION

# Development process



# Company Philosophy

- Customer-centered
- Striver-oriented



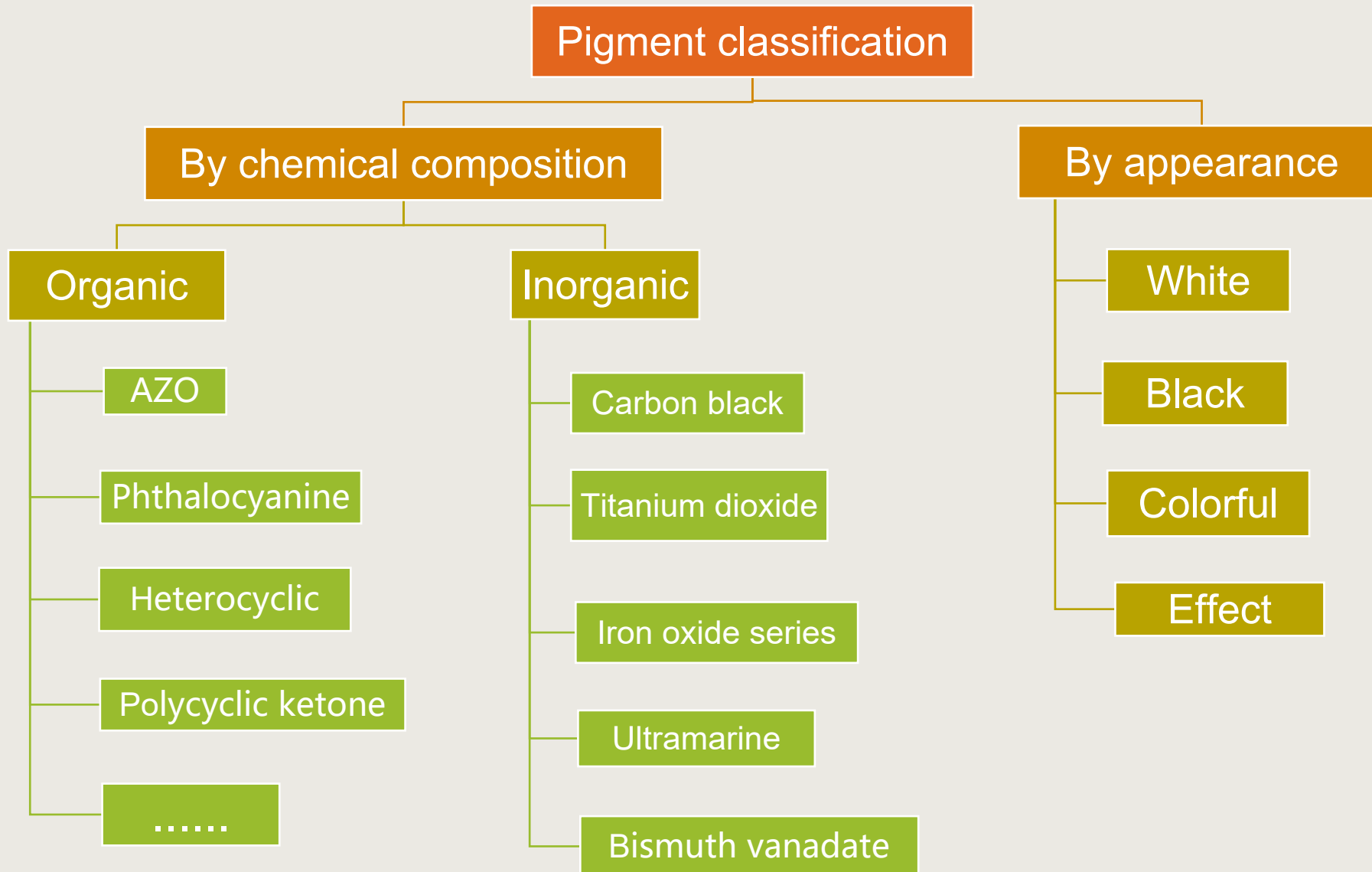


## PART 2

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# Colorant Overview

# Pigments Overview

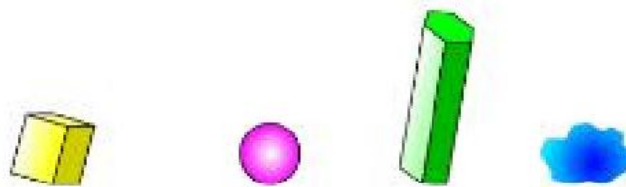


# Pigments Overview

- Pigment particles

**Original particles**

0 - 5 $\mu$ m



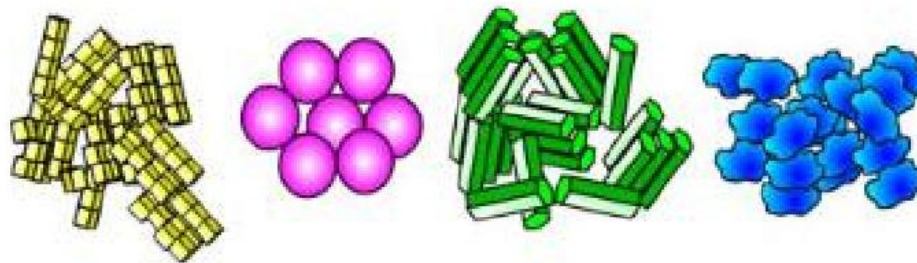
**Aggregation**

5 - 50 $\mu$ m

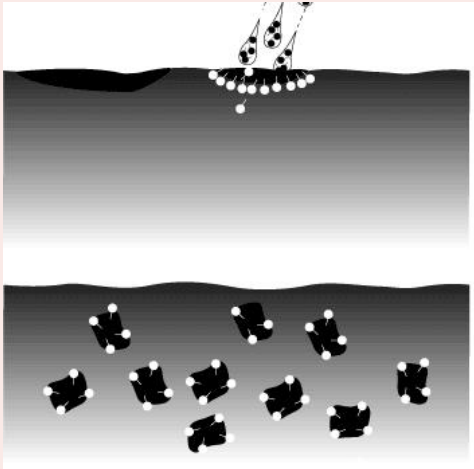


**Agglomeration**

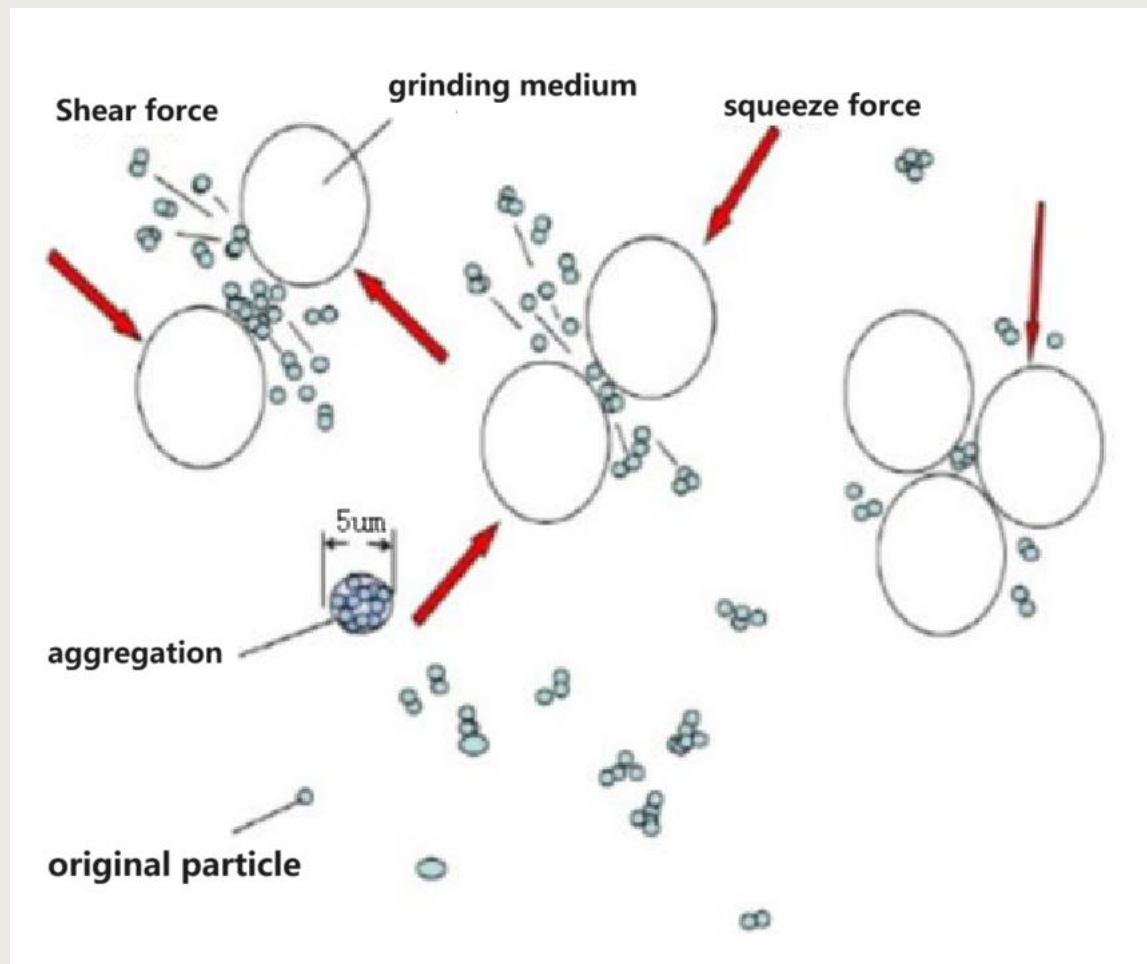
80 - 1000 $\mu$ m



# Colorant Overview

| Pigment                                                                            | Carrier                                                                             | Stabilizing additives                                                                | Other additives                                                                      |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Organic<br>Inorganic                                                               | Solvent<br>Water<br>Plasticizer<br>UV monomer                                       | Dispersant<br>Dispersing resin                                                       | Defoamer<br>Biocide<br>Humectant etc.                                                |
|  |  |  |  |

# Grinding and dispersing





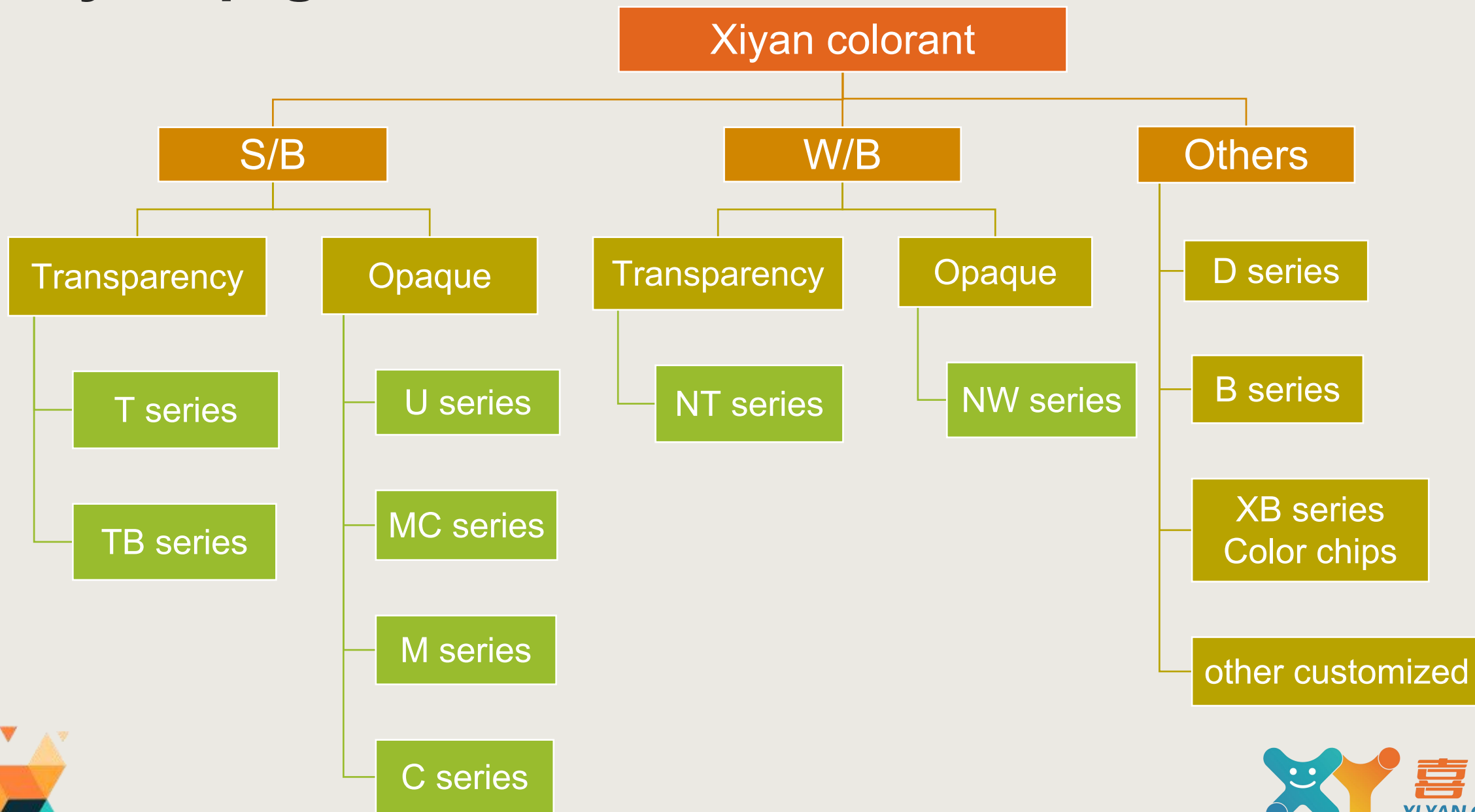
## PART 3

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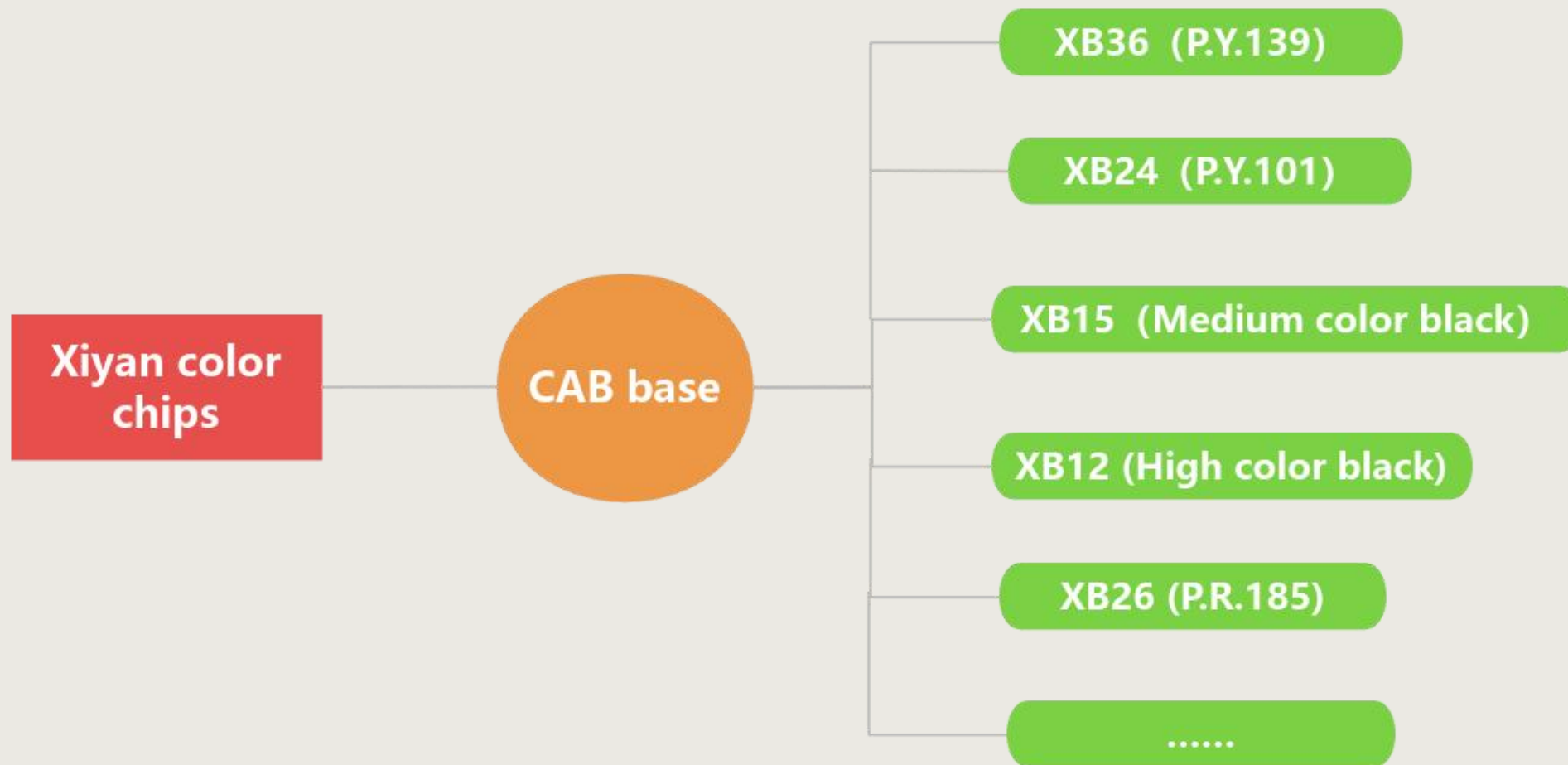
# Xiyan colorants and application



# Xiyan pigment colorant overview

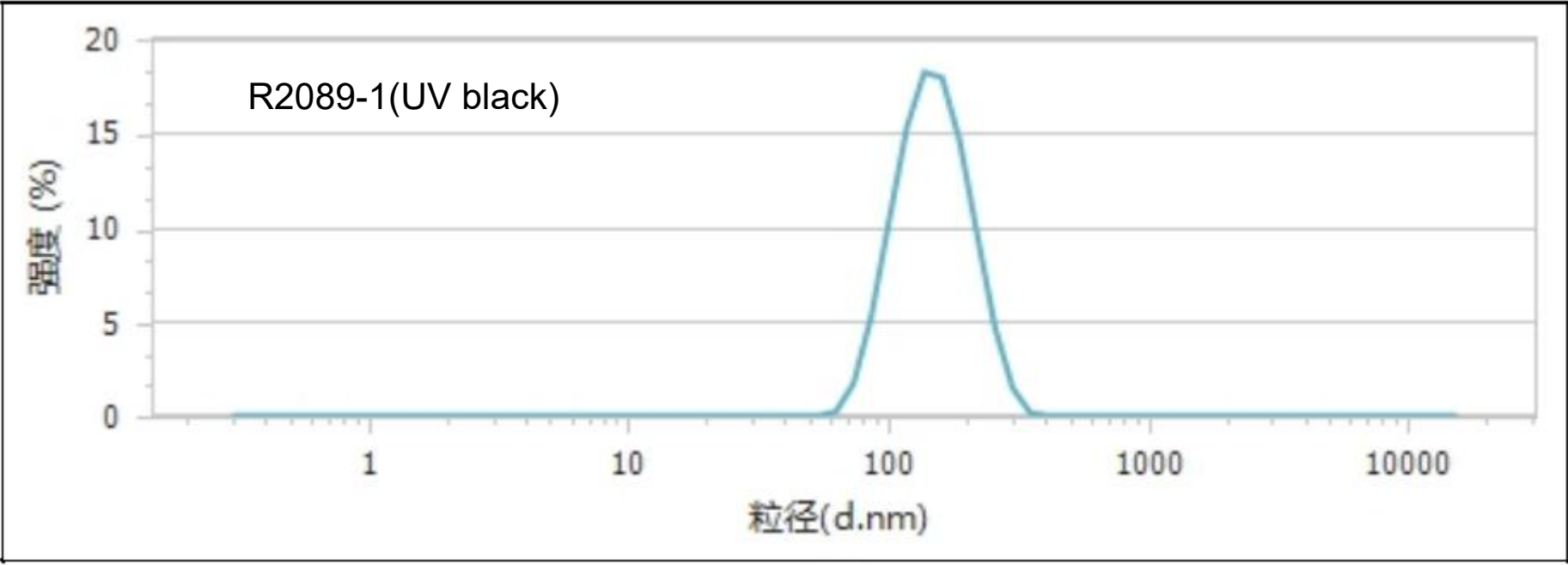


# Xiyan Color Chips





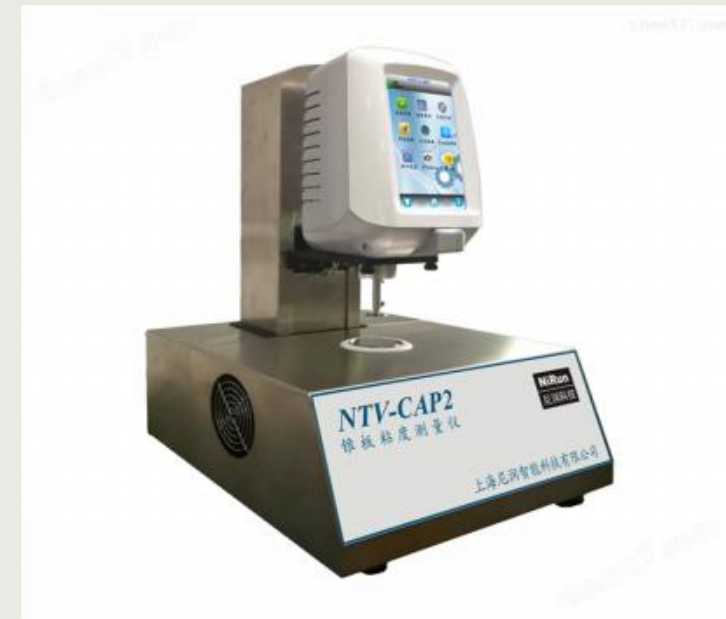
# Xiyan colorant R&D technology



| 典型值  | 粒径(d.nm) |
|------|----------|
| D10  | 88.75    |
| D20  | 101.92   |
| D30  | 112.89   |
| D40  | 123.71   |
| D50  | 134.46   |
| D60  | 146.97   |
| D70  | 160.10   |
| D80  | 178.46   |
| D90  | 205.42   |
| D100 | 348.07   |

# Xiyan main internal controls

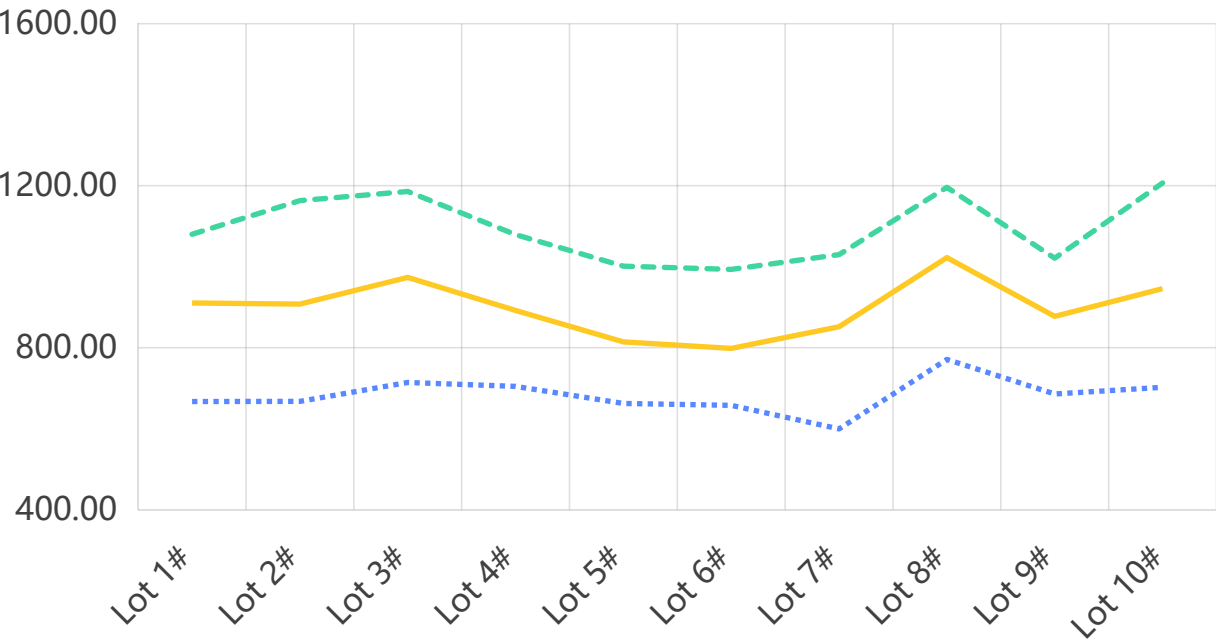
- Fineness
  - Fineness board (0-25um)
  - Particle size distribution ( $D_{50}$ ,  $D_{90}$ , Average)
- Color difference
  - Colorimeter:  $\Delta E \leq 0.8$
- Viscosity
  - NTV-CAP1 Cone plate



# Xiyan colorant stability — particle size

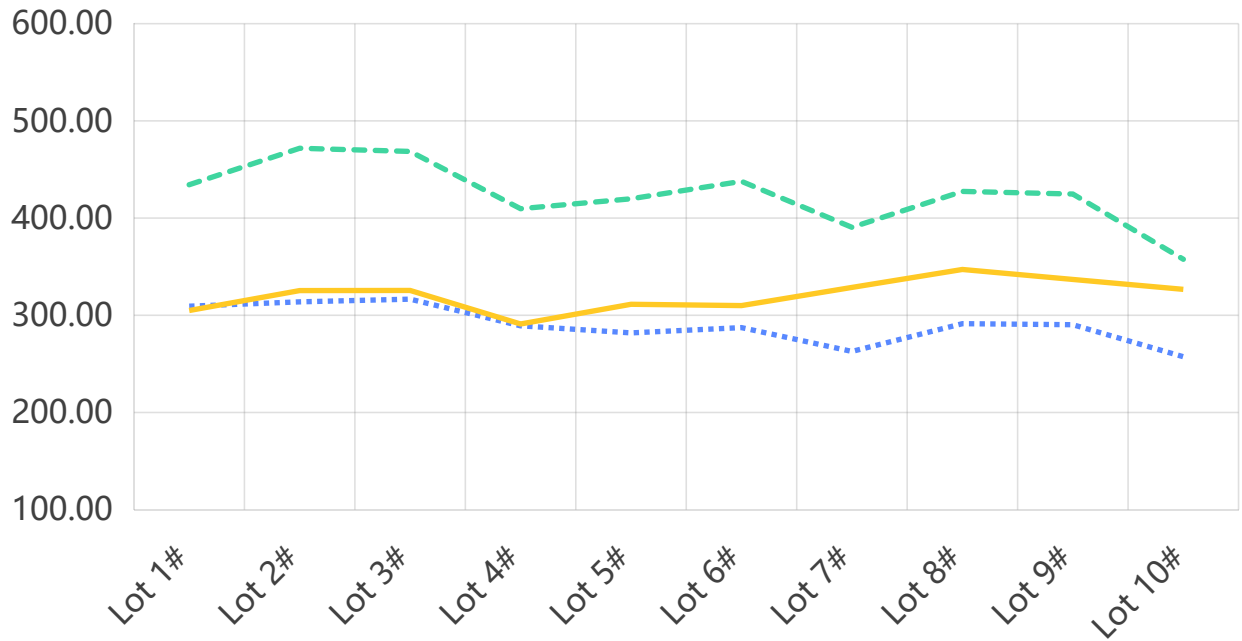
U4241 particle size change by lot.

..... D50/nm    - - - D90/nm    — Average/nm



T5241 particle size change by lot.

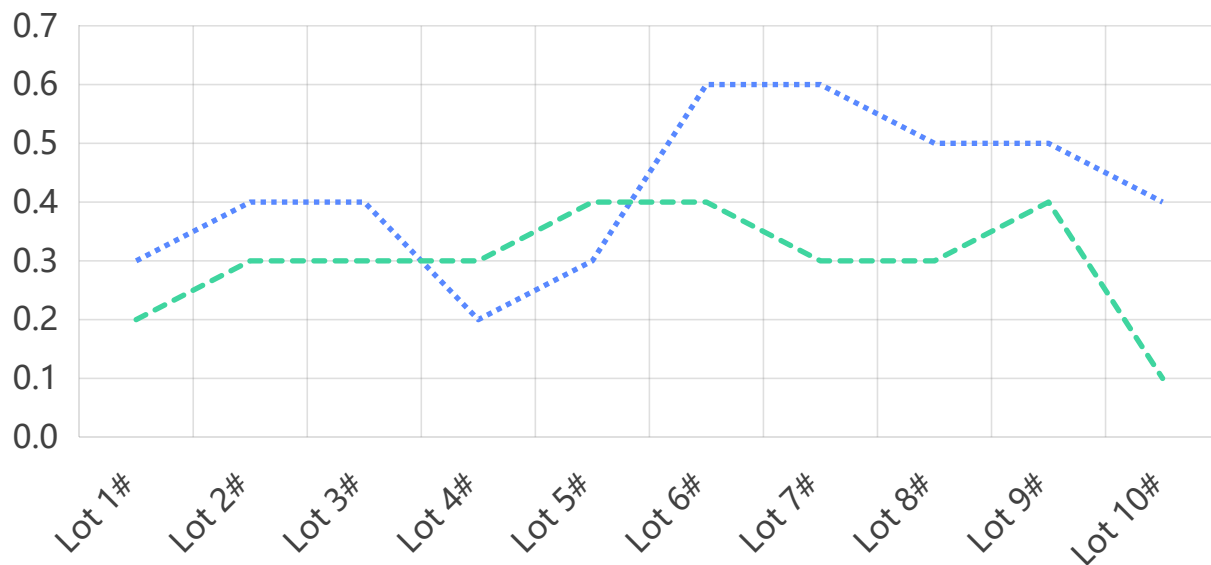
..... D50/nm    - - - D90/nm    — Average/nm



# Xiyan colorant stability — $\Delta E$ control

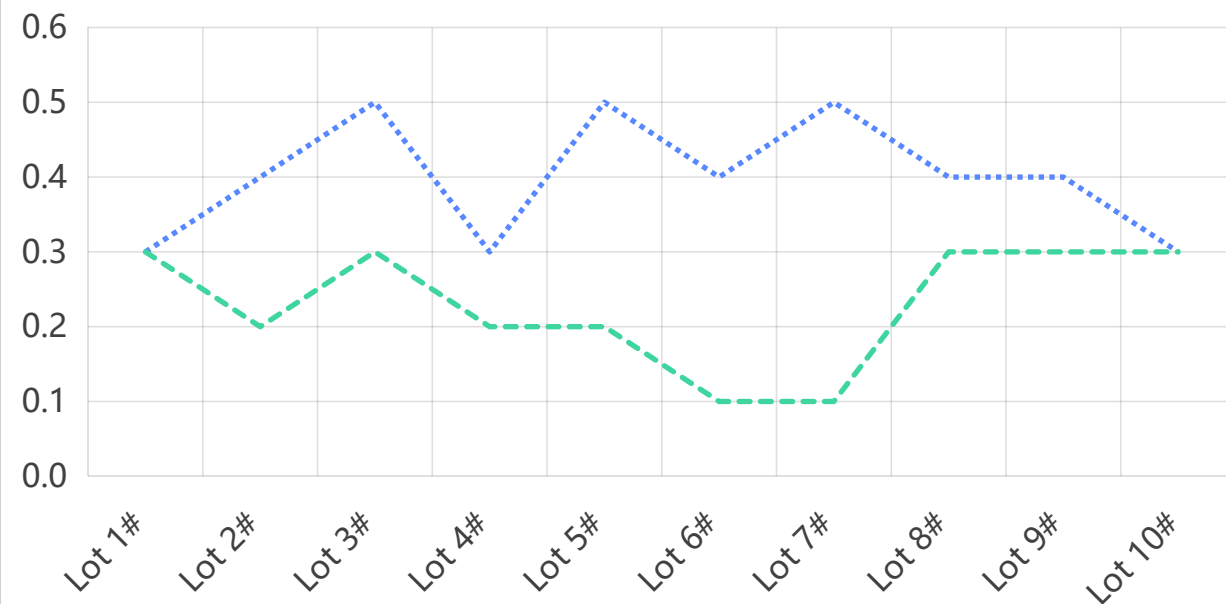
## U4241 $\Delta E$ change by lot.

..... Base  $\Delta E$     - - - - Redution  $\Delta E$



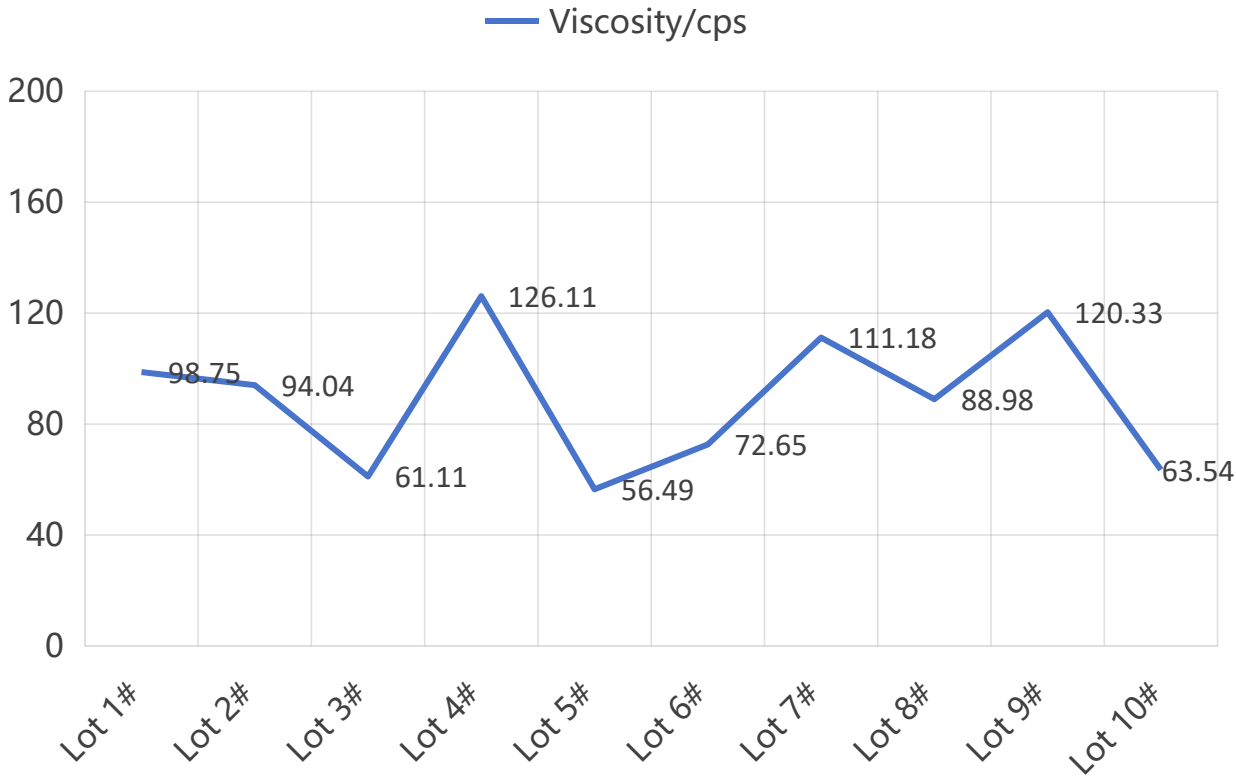
## T5241 $\Delta E$ change by lot.

..... Base  $\Delta E$     - - - - Redution  $\Delta E$

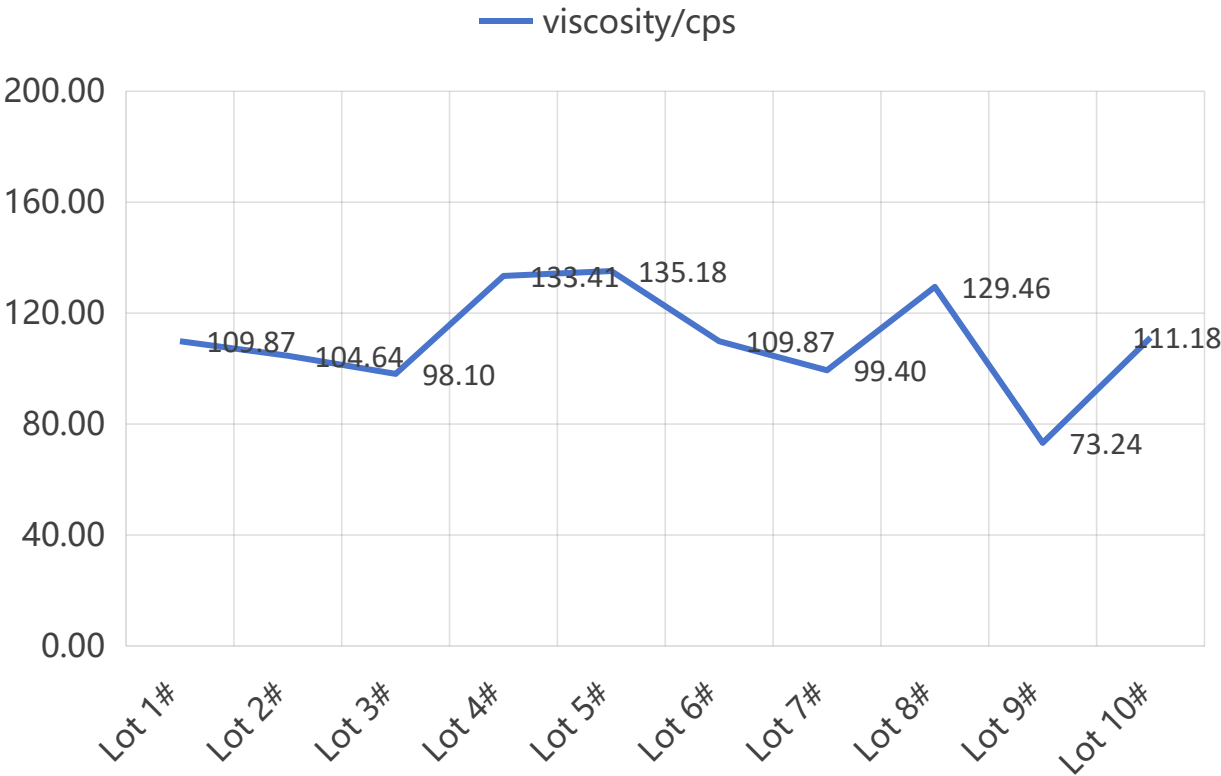


# 色浆产品一致性 — 粘度

U4241 viscosity change by lot.



T5241 viscosity change by lot.



# Different effect by different product

| P.R.254                                                                                                | XB 27<br>color chips | T 5241<br>colorant | T524<br>colorant | U4241<br>colorant |
|--------------------------------------------------------------------------------------------------------|----------------------|--------------------|------------------|-------------------|
| Transparency                                                                                           | 1 <sup>st</sup>      | 2 <sup>nd</sup>    | 3 <sup>rd</sup>  | 4 <sup>th</sup>   |
| <b>System:</b> UV base coating; <b>Substrate:</b> silver plating, glass; <b>P.C%</b> =6.5 (in coating) |                      |                    |                  |                   |



# Different effect by different product

| P.Y.139                                                                                                | XB39<br>color chips | T5339C<br>colorant | U4349<br>colorant |
|--------------------------------------------------------------------------------------------------------|---------------------|--------------------|-------------------|
| Transparency                                                                                           | 1 <sup>st</sup>     | 2 <sup>nd</sup>    | 3 <sup>rd</sup>   |
| <b>System:</b> UV base coating; <b>Substrate:</b> silver plating, glass; <b>P.C%</b> =6.5 (in coating) |                     |                    |                   |



# Different effect by different product

| P.B. 60                                                                          | XB 48           | TB8460          | T5408           | T540B           |
|----------------------------------------------------------------------------------|-----------------|-----------------|-----------------|-----------------|
| Transparency                                                                     | 1 <sup>st</sup> | 2 <sup>nd</sup> | 3 <sup>rd</sup> | 4 <sup>th</sup> |
| System: UV base coating; Substrate: silver plating, glass; P.C%=6.5 (in coating) |                 |                 |                 |                 |





# Different effect by different product

| P.BK. 7                                                                          | XB 12           | EXP8002         | T510C           | EXP1160         |
|----------------------------------------------------------------------------------|-----------------|-----------------|-----------------|-----------------|
| Transparency                                                                     | 1 <sup>st</sup> | 2 <sup>nd</sup> | 3 <sup>rd</sup> | 4 <sup>th</sup> |
| System: UV base coating; Substrate: silver plating, glass; P.C%=6.5 (in coating) |                 |                 |                 |                 |



# Xiyan colorant application

- Car refinishing
- General industry
- Plastic paint
- PVC flooring
- Wood paint
- others





# PART 4

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## **Application of Nano Pigment Colorants and Chips for Car Refinishings**

# Car refinishing coating layer structure



Clear paint(45-55um)

Finishing paint (colored) (15-20um)

Sandable guide coating

HS primer surfacer(40-50um)

2K putty

Anti-corrosion primer(15-20um)

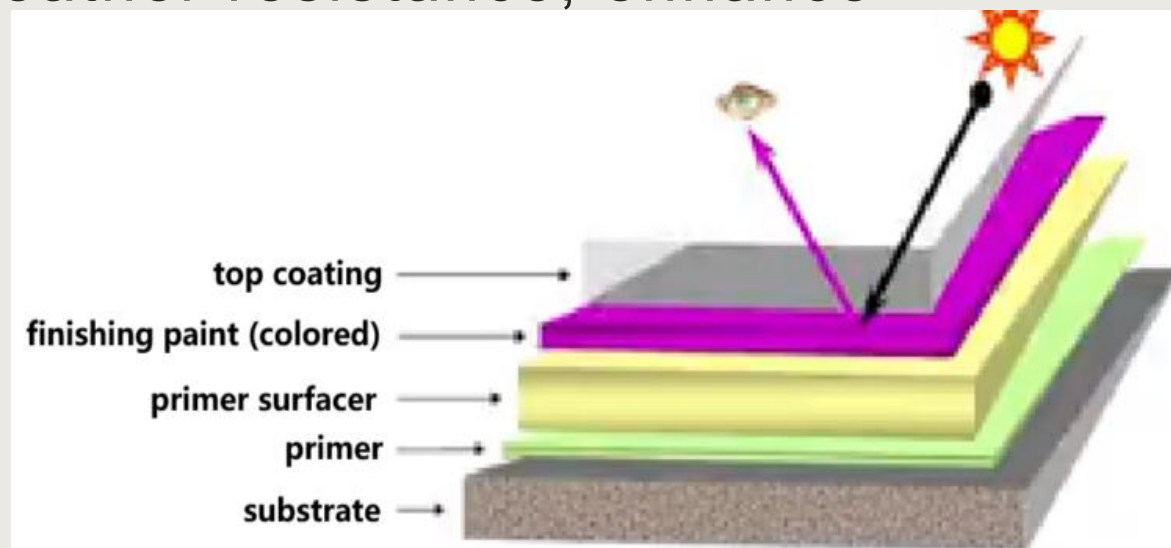
Zinc phosphate layer(4-5um)

Substrate

**Total film thickness is  
about 120-150um**

# Car refinishing coating layers

- **Primer:** to protect substrate, anti-corrosion, to provide adhesion to upper coating
- **Primer surfacer:** further fill in subtle depressions to provide a smooth and even surface, in order to enhance the brightness and gloss of the topcoat
- **Finishing paint:** to provide color, the core and source of value for car refinishing paint
- **Clear paint:** to give cars with good weather resistance, enhance color clarity, abrasion resistance, etc



# Car refinishing coating examples

- Formula of pigment colorants by color chips
- Formula of colored paint

| R.M.                               | Dosage/% | Remark                                                                                                                |
|------------------------------------|----------|-----------------------------------------------------------------------------------------------------------------------|
| Color chips                        | 10       | XB48: P.B.60<br>XB46: P.B.15:6<br>XB291: P.R.179<br>XB217: P.R.177<br>XB34: P.Y.128<br>XB38: P.Y.129<br>XB105: P.BK.7 |
| Solwent MIBK                       | 90       |                                                                                                                       |
| Dispersing process: 3000rpm/1-3hrs |          |                                                                                                                       |

|                  | R.M.                          | Dosage%    |
|------------------|-------------------------------|------------|
| Base coating     | 1K Hydroxylated acrylic resin | 78         |
|                  | CAB381-2                      | 5          |
|                  | Aluminum powder               | 8          |
|                  | Butyl acetate                 | 7          |
|                  | Xylene                        | 2          |
| Pigment colorant |                               | By formula |
| Thinner          |                               | By formula |

# Car refinishing coating examples

|                  | XB217 - P.R.177                                                                    | XB291 - P.R.179                                                                      | R2679-2 - P.R.101                                                                    | T506 - P.W.6                                                                         |
|------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Base coating     | 83                                                                                 | 50                                                                                   | 93                                                                                   | 77                                                                                   |
| Pigment colorant | 17                                                                                 | 50                                                                                   | 7                                                                                    | 23                                                                                   |
| Thinner          | 120                                                                                | 120                                                                                  | 120                                                                                  | 120                                                                                  |
| Sample piece     |   |   |   |   |
| Base coating     |  |  |  |  |

# Car refinishing coating examples

|                  | R2735-2 P.Y.42                                                                      | XB38 - P.Y.129                                                                       | XB34 - P.Y.128                                                                       |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Base coating     | 82                                                                                  | 77                                                                                   | 77                                                                                   |
| Pigment colorant | 18                                                                                  | 23                                                                                   | 23                                                                                   |
| Thinner          | 120                                                                                 | 120                                                                                  | 120                                                                                  |
| Sample piece     |   |   |   |
|                  |  |  |  |

# Car refinishing coating examples

|                  | XB48 - P.B.60                                                                       | XB46 - P.B.15:6                                                                      | XB105 - P.BK.7                                                                       |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Base coating     | 77                                                                                  | 77                                                                                   | 77                                                                                   |
| Pigment colorant | 23                                                                                  | 23                                                                                   | 23                                                                                   |
| Thinner          | 120                                                                                 | 120                                                                                  | 120                                                                                  |
| Sample piece     |   |   |   |
|                  |  |  |  |



# PART 5

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**New developed bluish black**



# New developed bluish black

- **XY-AP-1000>>Super high jetness & bluish undertone:**
  - **Application:** automotive interior coating, 3C plastic coating etc.
  - **Character:** prepared by special technology, not suitable for testing fineness by fineness board
  - **Good compatibility with:** matte acrylic resin system like thermoplastic acrylic resins, low-hydroxyl acrylic resins, and CAB resins (CAB551 series, CAB531 series, CAB381 series).
  - **Regulation:** eco-friendly, comply with the RoHS standard, halogen-free.

# XY-AP-1000 black technical data



| Item                                          | Value (typical)      |
|-----------------------------------------------|----------------------|
| Pigment index no.                             | P.BK.7               |
| Pigment content (by weight)                   | 10.0%                |
| Solid content (by weight)                     | 23.5%                |
| Lightfastness<br>Mass tone/Redution(1/25 ISD) | 8 / 8                |
| Heat resistance(°C)                           | 200                  |
| Hiding performance                            | Opaque               |
| Halogen issue                                 | Halogen free         |
| Solvent                                       | PMA<br>Butyl acetate |



# XY-AP-1000

## • Glossy black:



|                    | EXP-1103                     |                                 | AP-1000                       |                                |
|--------------------|------------------------------|---------------------------------|-------------------------------|--------------------------------|
| Formula            | Paint:Hardener:Thinner=7:1:3 |                                 |                               |                                |
| Drying condition   | 8hrs/80°C                    |                                 |                               |                                |
| Dry film thickness | 25.5um                       |                                 | 23.5um                        |                                |
| Gloss /60°         | 39.4°                        |                                 | 39.3°                         |                                |
| CR-10 colormeter   | L: 23.6<br>a: -0.7<br>b: 0.3 |                                 | L: 22.7<br>a: -0.8<br>b: -0.2 |                                |
| BYK-Gardner        | My: 246<br>Mc: 248<br>dM: 2  | L: 3.12<br>a: -0.06<br>b: -0.25 | My: 244<br>Mc: 246<br>dM: 2   | L: 3.28<br>a: -0.03<br>b: -0.3 |

# XY-AP-1000

## • Matte black:



|                    | AP-1000                        |                                  | AP-1000+<br>blue pearlescent  |                                  |
|--------------------|--------------------------------|----------------------------------|-------------------------------|----------------------------------|
| Formula            | Paint:Hardener:Thinner=10:1:10 |                                  |                               |                                  |
| Drying condition   | 8hrs/80°C                      |                                  |                               |                                  |
| Dry film thickness | 22um                           |                                  | 24um                          |                                  |
| Gloss /60°         | 2.6°                           |                                  | 2.6°                          |                                  |
| CR-10 colormeter   | L: 21.3<br>a: -0.6<br>b: -0.4  |                                  | L: 22.6<br>a: -0.7<br>b: -1.2 |                                  |
| BYK-Gardner        | My: 150<br>Mc: 152<br>dM: 2    | L: 20.67<br>a: -0.39<br>b: -0.79 | My: 148<br>Mc: 151<br>dM: 2   | L: 21.15<br>a: -0.28<br>b: -0.98 |

# Thank you!

Contact information:

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