

- Super bluish undertone
- Outstanding dispersion
- Excellent opacity

*High-end plastic grade TiO<sub>2</sub>*  
*DR-2588*



泛华化学  
INTER-CHINA  
CHEMICAL



泽昌  
ZECHANG

*Joint manufacture*

*DR-2588 is titanium dioxide rutile specially designed for plastic applications. It has super bluish undertone, outstanding tinting strength and hiding power. DR-2588 particular surface treatment guarantees super low moisture absorption, volatile at high temperature and oil absorption as well as excellent dispersion and processibility.*

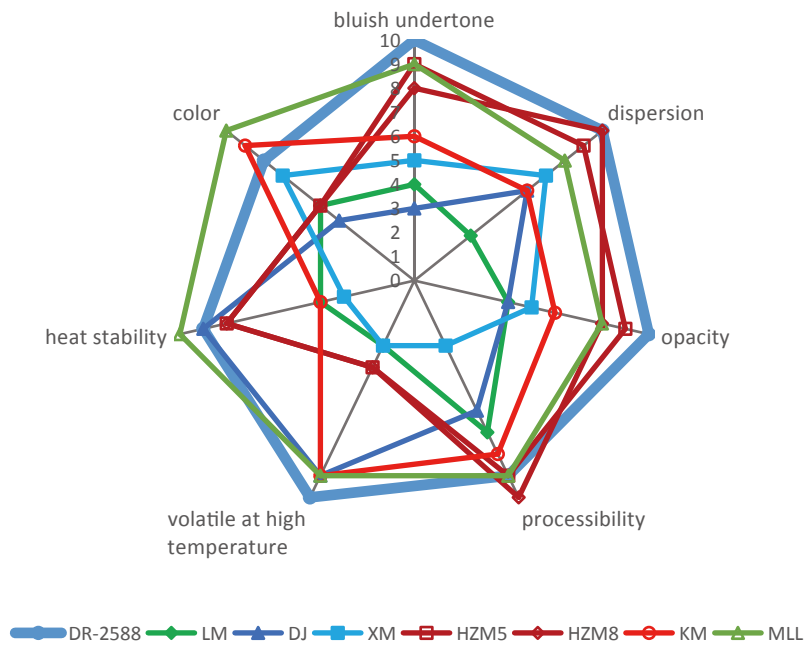
<i>Property</i>	<i>Typical value</i>
TiO <sub>2</sub> content, %	98.2
Inorganic treatment	Al <sub>2</sub> O <sub>3</sub> · nH <sub>2</sub> O
Organic treatment	Organic silicon
Oil absorption, g/100g pigment	13
Loss at 105 °C, %	0.15
<sup>1</sup> Color in white PVC-P(L*)	97.4
<sup>2</sup> Tinting strength in grey PVC-P(compared with STD)	103
<sup>2</sup> Carbon black tinting strength in grey PVC-P(compared with STD)	17
<sup>3</sup> Melt flow rate(MFR), g/10mins	23
<sup>4</sup> Filtration pressure value(FPV), bar/g	0.03
<sup>5</sup> Volatile at high temperature(300 °C), %	0.08
Specific gravity, g/cm <sup>3</sup>	4.1
International Standard Classification ISO 591	R1
USA MRS Standard Classification ASTM D476	II

**NOTE:**

1. Test in white PVC-P containing plasticizer. TiO<sub>2</sub> content is 4PHR.
2. Test in grey PVC-P containing plasticizer and carbon black. TiO<sub>2</sub> content is 2PHR.
3. Test in master batch made of TiO<sub>2</sub> and LLDPE (MFR is 25g/10mins) mixture. TiO<sub>2</sub> content is 70%.
4. Following the European Standard EN13900-5:2005, LDPE as the base resin, dilute the master batch TiO<sub>2</sub> content from 70% to 8% to test FPV (Filtration Pressure Value) .
5. After the test of loss at 105 °C , put it into constant temperature oven at 300 C for 2hrs and calculate the reduction.

### Special features

- Super bluish undertone and high tinting strength
- Outstanding dispersion
- Top-level opacity
- Excellent processibility
- Super low volatile at high temperature
- Good heat stability
- Good color performance



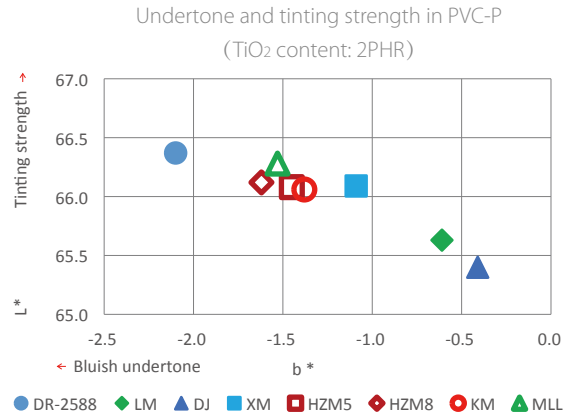
#### Main applications:

DR-2588 is recommended widely in various interior plastic applications, such as :

- Polyolefin master batch, especially high-loading master batch.
- Super-thin film & casting film.
- Engineering plastics.
- Various plastics which have high request on dispersion and volatile at high temperature.

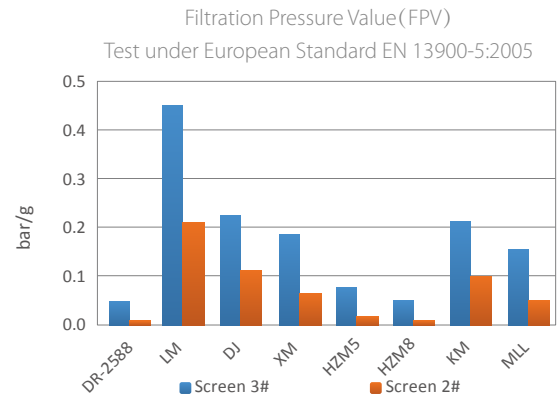
## Super bluish undertone and high tinting strength

- Test in grey PVC containing plasticizer.
- Thanks to the fine particle size and concentrated particle size distribution as well as good dispersion, DR-2588 is enabled to have a very good tinting strength and super bluish undertone.
- The good hiding power and super bluish undertone will eliminate the natural yellow color of resin to get a more bright and pleasant color.
- It has more particles in a unit weight thanks to its tiny particle size. With the advantage of good dispersion, DR-2588 is easier to get a better hiding power.



## Outstanding dispersion

- Make DR-2588 and LLDPE mixture into master batch by twin screw extruder. DR-2588 content in MB is 70%. Following the European Standard EN13900-5:2005, LDPE as the base resin, dilute the master batch and lower the TiO<sub>2</sub> content to 8% to test FPV (Filtration Pressure Value).
- Data is collected when it is filtering through respectively standard screen 3# (10µm) and screen 2# (20µm).
- The contrast samples are all white master batch with good dispersion.
- DR-2588's efficiency removal of the coarse-grained, excellent surface treatment and depolymerization enable DR-2588 to have a good dispersion and very low coarse particle content.

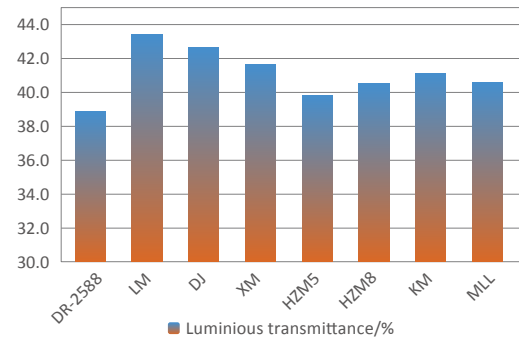




## Top-level opacity

- Make DR-2588 and LLDPE mixture into master batch by twin screw extruder. DR-2588 content in MB is 70%. Using LDPE as the base resin, dilute the master batch and lower the TiO<sub>2</sub> content to 8% and make into 20 μm plastic film in blowing machine. Test the transmittance under the USA MRS ASTM D1003-13.
- High luminous transmittance (low opacity) means that the plastic film's covering ability is poor. In this case, it needs more TiO<sub>2</sub> to reach the ideal opacity.
- Thanks to good surface treatment, dispersion, small particle size as well as concentrated particle size distribution, DR-2588 is enabled to have outstanding opacity.
- TiO<sub>2</sub> with good opacity can cut the production cost by reducing the TiO<sub>2</sub> dosage. What is more, it can lower the TiO<sub>2</sub> impact on the mechanic performance of final plastic products.

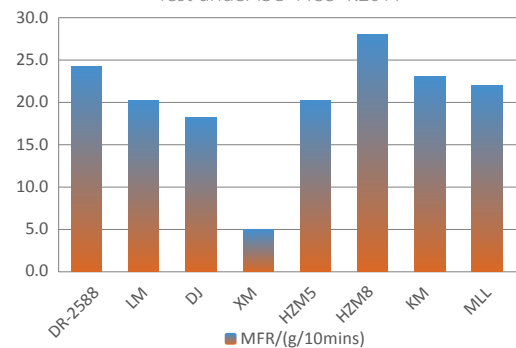
The transmittance in plastic film  
Test under ASTM D1003-13



## Excellent processibility

- Make 70% content master batch by twin screw extruder out of DR-2588 and LLDPE (MFR=25g/10mins). Test the melt flow rate under the ISO 1133-1:2011. Temperature is 190 C, load is set as 2.16kgs.
- TiO<sub>2</sub> with high MFR has a good processibility. When mixed with resin, it can efficiently low the machine torque to save energy and increase the productivity.
- Thanks to good surface treatment, super low oil absorption, outstanding dispersion and concentrated particle size distribution, DR-2588 MFR is excellent and makes DR-2588 very competitive.

Melting flow rate(MFR)  
Test under ISO 1133-1:2011



## Super low volatile at high temperature

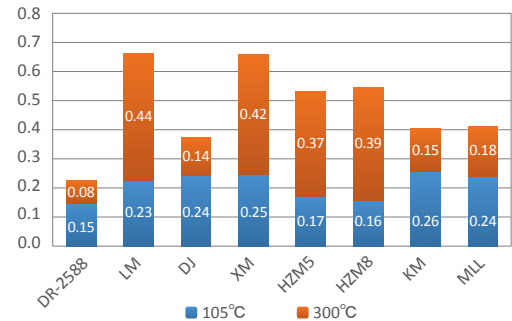
- Loss at 105 °C depends on the air humidity and storage time, data here is only for reference.
- DR-2588 surface treatment guarantees the outstanding dispersion and the super low volatile at high temperature.
- The low volatile component is a request in high temperature plastic processing.
- The low volatile component can help effectively eliminate the cracks, holes etc. defects in high temperature processing plastic products.

## Good heat stability

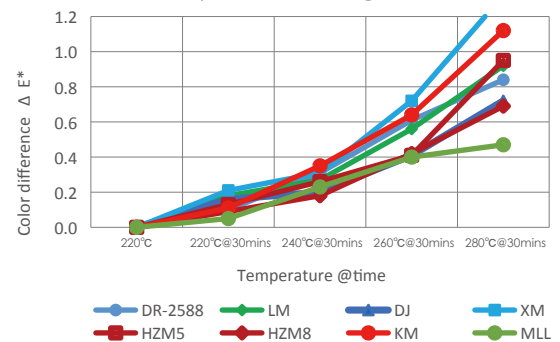
- TiO<sub>2</sub> powder heat stability: In room temperature, put TiO<sub>2</sub> into oven which has set the temperature for 30mins. Then pressed the powder into a shape of cake and test the color by colorimeter and calculate the color difference.
- Mix 70%(TiO<sub>2</sub> content) master batch and polypropylene, inject at 220 °C and test the injected panel color by a spectrophotometer. And then stay at 220 °C, 240 °C, 260 °C and 280 °C for 30mins respectively and inject, test the panel color, and calculate the color difference.
- The good surface treatment and good control on impurity enable DR-2588 to have excellent heat stability.
- DR-2588 excellent heat stability and low moisture absorption can satisfy the injection processing at high temperature.



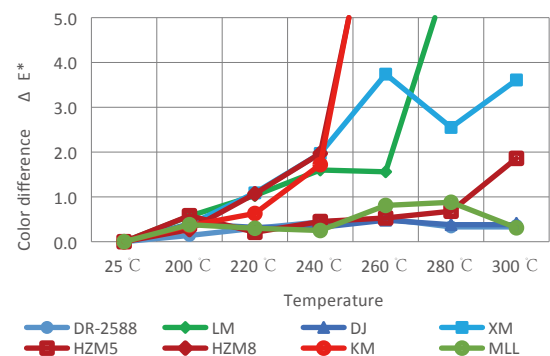
Volatile at high temperature  
(105 °C and 300 °C stay for 2hrs)



Heat stability in PP injection  
(stay for 30mins in single screw)



Heat stability of TiO<sub>2</sub> powder  
(stay for 30mins respectively)

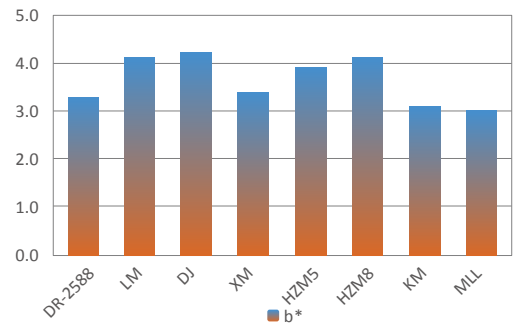


## Color in plastics

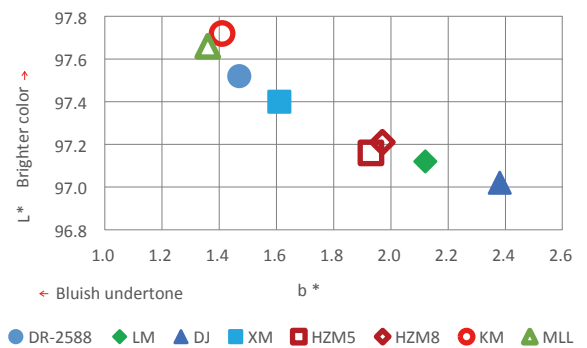
- Thanks to the excellent control on impurity and surface treatment, DR-2588 is now far beyond other sulphate process TiO<sub>2</sub> with its super bluish undertone, opacity and outstanding dispersion. DR-2588 now has similar performance as western chloride TiO<sub>2</sub>.
- When used in plastic, DR-2588 whiteness has a bright bluish undertone.



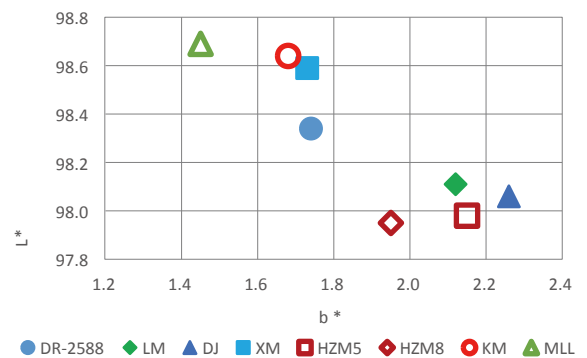
Color in ABS injection  
(TiO<sub>2</sub> content: 5PHR, injection temperature 280 °C)



Color in PVC-P  
(TiO<sub>2</sub> content: 4PHR)



Color in PP injection  
(TiO<sub>2</sub> content: 3PHR)



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