泛华化学 INTER-CHINA CHEMICAL

TITANIUM DIOXIDE FOR PLASTICS | TECHNICAL GUIDE

DR-2588 / R-F9156 / CR-83
Plastics Grade Selection Guide

Value-oriented plastics · blue-shade dispersion · chloride-route brightness

Industrial plastics application image (for illustration only)

BLUE UNDERTONE	VALUE FOR STANDARD USE	CHLORIDE BRIGHTNESS
DR-2588 · dispersion	R-F9156 · cost/performance	CR-83 · high whiteness

Evidence: ICC application guide · historical application testing · 2025 TDS

Version 2 | 2026

Selection Summary and Grade Positioning

Choose by required performance and project economics - not by an unqualified ranking of TiO_2 grades

Three ICC plastics grades address different buying priorities. R-F9156 is the value-oriented choice for standard plastics when the finished product meets specification. DR-2588 focuses on blue undertone and dispersion where colour and filtration are demanding. CR-83 is a chloride-process option positioned for high whiteness, brightness and hiding performance. These are selection priorities, not universal experimental rankings.

Grade	Primary commercial positioning	Best initial buyer fit
DR-2588	Blue undertone and good dispersion for colour- and processing-sensitive formulations	Customers with demanding shade, dispersion or filtration needs
R-F9156	Value-oriented general-purpose grade; economics matter once specifications are met	Cost-sensitive standard plastics and masterbatch processors
CR-83	Chloride-process grade positioned for high whiteness, brightness, hiding and tinting	Customers prioritising white appearance or chloride-route selection

Differentiated commercial positioning

Grade	Selection distinction	What the customer should validate
DR-2588	Blue undertone / dispersion; not an automatic first choice for all plastics	Target shade, FPV, coarse particles and finished defects
R-F9156	Value is conditional on meeting finished-product quality, not a guaranteed lowest price	Acceptance limits, yield and total cost
CR-83	Chloride brightness/whiteness positioning; not universally highest CIE whiteness	Matched L*, CIE whiteness, hiding and colour difference
Rule	Historical tests and TDS data are not a single three-grade trial	Match resin, formulation, loading and test methods

Value means acceptable finished-product performance at a suitable total cost, not a claim of the lowest purchase price in every project.

Evidence hierarchy and limits

Page 3 extracts selected general-plastics applications for these three grades from the ICC recommendation chart. Ratings help shortlist trial candidates; historical tests and TDS values span different lots and conditions and do not form a matched three-way experiment.

Application Recommendations from the ICC Guide

Source ratings, restricted to DR-2588, R-F9156 and CR-83; they are not technical performance scores

Figure 1. Extracted application guidance: solid circle = highly recommended; open circle = suitable; dash = not indicated in the source. Not a ranking of colour, dispersion or price.

Selection Notes: What Makes Each Grade Different

R-F9156 | VALUE FOR STANDARD PLASTICS

A practical first candidate for cost-conscious masterbatch and conventional plastic products when requirements are moderate. Confirm that colour, dispersion and processing stability meet the customer's acceptance criteria.

DR-2588 | BLUE UNDERTONE & DISPERSION

Prioritise where target shade, pigment dispersion, coarse-particle control or filtration performance is important. Confirm L*a*b*, FPV and finished-article quality under matched processing conditions.

CR-83 | CHLORIDE-ROUTE BRIGHTNESS & WHITENESS

Include when high brightness, whiteness, hiding power or chloride-process preference drives the decision. Validate optical performance at equal loading, using a consistent formulation and specimen preparation.

Share your polymer, target appearance, processing conditions and acceptance limits with ICC for a focused sample shortlist. Final selection should be confirmed in your actual formulation.

How to Choose: Three Different Strengths

Grade positioning answers the first commercial question; matched trials answer the final technical one.

Figure 2. Selection priorities - commercial positioning rather than an across-grade laboratory ranking.

Grade positioning	Traceable reference data	Appropriate external interpretation
DR-2588: blue shade / dispersion	2019 matched PVC whiteness 88.74; 70% MB MFR 32	Valid for that DR-2588/R-F9156 campaign, not universal ranking
R-F9156: cost-to-performance	Same 2019 campaign: PVC whiteness 84.84; MFR 29	Confirm economics through yield and quotation; do not rank on MFR alone
CR-83: chloride brightness	Separate 4.0 PHR white PVC test: L* 97.95, CIE whiteness 88.58	Independent test; validate brightness and whiteness in customer recipe
Evidence boundary	Public specs, independent tests and matched comparisons have different scopes	Do not graph cross-campaign data as a three-grade ranking

Published specifications are acceptance references, and the 2019 DR-2588/R-F9156 test is a valid same-campaign comparison only for those samples. CR-83 has separate laboratory records, not a matched three-way trial. Do not infer that chloride production alone guarantees the highest CIE whiteness in every PVC formulation.

A Practical Three-Grade Qualification Program

Set technical thresholds first, then evaluate the cost per acceptable finished article.

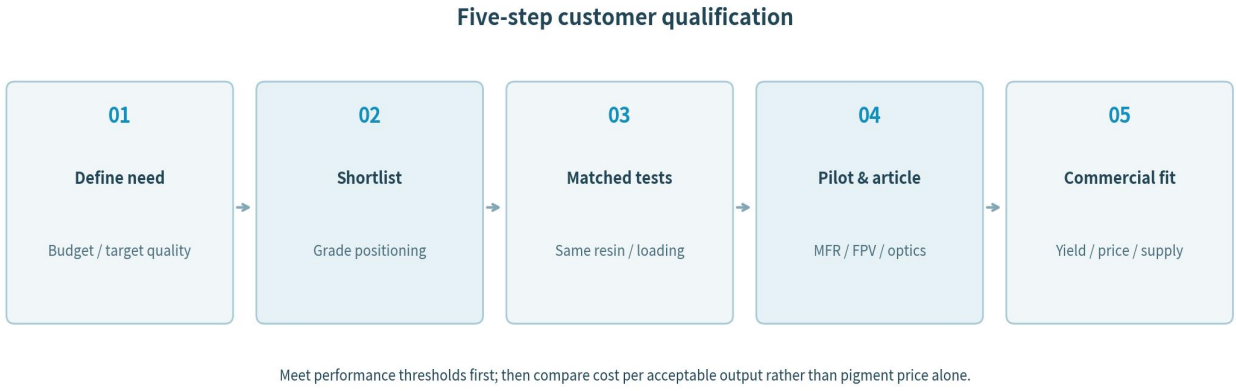

Figure 3. Customer evaluation from application fit and controlled trials through to commercial selection.

Stage	Purpose	Matched controls	What to measure	Output
1. Define needs	General vs demanding use	Polymer, target colour, budget	Acceptance limits	Test priorities
2. Shortlist	Use source ratings and positioning	Application fit + grade scope	Technical suitability	Sample choices
3. Matched trial	Remove formulation bias	Resin, loading, additives, drying	Colour, MFR, FPV	Technical screen
4. Pilot test	Prove finished quality	Equipment, screen and article	Pressure, defects, opacity	Qualified grade(s)
5. Commercial fit	Compare acceptable output cost	Quote, yield, lead time	Cost per passing unit	Purchase proposal

Use the same resin grade, pigment loading, additives, compounding settings and test methods in a head-to-head trial. Measure L*a*b*, CIE whiteness, opacity, dispersion, MFR/FPV, pressure rise and finished-article appearance as relevant. Source basis: ICC application guide, DR-2588/R-F9156 2019 tests, CR-83 independent PVC/masterbatch test and 2025 TDS.

Customer Selection and Next Steps

Start with the right grade for the requirement - then confirm the outcome in a matched test

Recommended decision rules

Customer priority	First evaluation path
Standard products / total cost	R-F9156 - prioritise value once final quality criteria are met
Blue undertone / dispersion / filtration	DR-2588 - validate target shade and processing limits
Chloride / brightness / whiteness / hiding	CR-83 - validate optics in the actual customer formulation

Commercial interpretation

For ordinary, price-sensitive plastic products, start with R-F9156 and confirm that colour, dispersion and operating performance meet acceptance limits. When blue undertone or dispersion is critical, prioritise DR-2588. When high brightness, whiteness, hiding or chloride-process preference drives the project, include CR-83. An application-guide rating is a suitability signal, not evidence that one grade always outperforms the others.

What ICC needs to recommend a test

Tell us your polymer, final application, TiO_2 loading, current pigment, formulation, target colour/opacity, processing limits and annual quantity. We can suggest suitable grade samples, provide the current TDS and discuss a focused comparison under your operating conditions.

Technical note: Application ratings follow the supplied ICC guide. Grade positioning and historical test data are indicative; no absolute whiteness, dispersion or cost ranking is claimed across unmatched campaigns. Product quality and supply are subject to agreed specifications and commercial terms.

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Product pages and sample requests: DR-2588 | R-F9156 | CR-83