TECHNICAL GUIDE · EDITION 1

Powder Coating Selection and Qualification Guide

A practical guide for engineers and buyers specifying thermosetting powder coatings from WANAN Powder Coatings. It brings the published TDS values of the E, EZ, P480, P720 and P1680 series together with the test conditions behind them, a six-step selection method, the application × series matrix, the rules for primer + topcoat systems, the scope of the QUALICOAT and UL 1332 approvals, and the five steps WANAN follows from enquiry to released batches.

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1. The five series at a glance

All series cure at 190–200 °C object temperature for 10–15 minutes at 80–120 µm. What changes between them is the tested durability.

Series	Chemistry	Salt spray ISO 9227	Humidity ISO 6270-1	Xenon-arc ISO 16474-2	Bend ISO 1519	Role
E	Epoxy	**1440 h**	—	—	≤ 3 mm	Indoor parts, primer
EZ	Zinc-rich epoxy primer	**≥ 2000 h**	—	—	≤ 3 mm	Primer for steel structures
P480	Weather-resistant polyester	**480 h**	240 h	500 h	≤ 2 mm	Outdoor topcoat
P720	Weather-resistant polyester	**720 h**	480 h	1000 h	≤ 3 mm	Outdoor topcoat
P1680	Weather-resistant polyester	**1000 h**	720 h	1000 h	≤ 4 mm	Outdoor topcoat, high exposure

2. Values common to all series

Application method	Electrostatic spray, 40–100 kV
Cure schedule	190–200 °C (374–392 °F) object temperature for 10–15 min
Film thickness	80–120 µm recommended; 80–180 µm working range
Impact (direct)	50 kg·cm, ISO 6272-2
Cross-cut adhesion	Class 0, ISO 2409
Gloss, 60°	As agreed, ISO 2813
Specific gravity	1.2–1.7 g/cm³ (EZ 1.5–2.2 g/cm³, depends on zinc content)
Packaging	25 kg carton; non-hazardous for road, sea and air transport
Storage	Cool, dry, below 35 °C (low-temperature-cure grades below 25 °C)
Shelf life	6 months from date of manufacture

Cure temperature is the object (metal) surface temperature, not the oven set-point. Oven settings must be adjusted to part mass, line speed and oven type so that the metal itself reaches 190–200 °C for 10–15 minutes.

3. Test conditions behind the numbers

Panels 70 × 150 × 0.6–0.8 mm phosphated steel (0.2–0.3 mm for flexibility, impact and cupping), cured under conditions agreed with the customer and conditioned 24 h before testing. Salt spray adhesion is checked 24 h after exposure ends. Xenon-arc weathering per ISO 16474-2 method 1: irradiance 0.51 W/m² at 340 nm, black-standard temperature 65 ± 2 °C, RH 40–60 %, spray cycle 18/102 min. Tests run in WANAN's CNAS-accredited laboratory (L15415, ISO/IEC 17025:2017). Values apply only to these methods and conditions; they are not a warranty of service life.

4. Choosing a series in six steps

1. **Define substrate and pretreatment.** Steel, galvanised steel or aluminium, and the conversion coating on your line. Every TDS value is generated on phosphated steel panels.
2. **Define the service environment.** Indoor or sheltered parts can use E epoxy. Outdoor exposure needs a weather-resistant polyester, because epoxy chalks under UV.
3. **Pick a single coat or a system.** For aggressive outdoor steel, consider E or EZ primer plus a P series topcoat, qualified as a system.
4. **Match the test target.** Compare the TDS values: salt spray 1440 h (E), ≥ 2000 h (EZ), 480 / 720 / 1000 h (P480 / P720 / P1680); xenon-arc 500 h (P480) or 1000 h (P720, P1680).
5. **Check labels the project requires.** QUALICOAT projects need the approved system on P-1436 or P-1982; outdoor electrical enclosures for North America may need UL 1332 model WA-DQ 001A.
6. **Confirm on your line.** Request sample powder and colour panels and run a line trial before final selection.

5. Application × series matrix

Application	E	EZ	P480	P720	P1680	Also relevant
Architectural aluminium & facades	—	—	●	●	●	QUALICOAT P-1436 / P-1982 approved systems
Home appliances	●	○	●	●	●	E for indoor parts; P series for outdoor AC units
Energy storage & electrical enclosures	●	●	●	●	●	UL 1332 model WA-DQ 001A for outdoor steel enclosures
Pipeline & heavy-duty corrosion	●	●	○	○	○	FBE / 3PE: dedicated grade qualified per project
Furniture & metal products	●	○	●	●	●	E indoors; P series outdoors; textures and metallics
Industrial equipment & machinery	●	●	●	●	●	E or EZ primer + P series topcoat for exposed parts
Automotive & transport components	●	●	○	○	○	IATF 16949:2016; P series where appearance matters

● candidate series · ○ as primer or topcoat within a two-coat system · — not a candidate. Final selection follows trial panels on your line.

6. Primer + topcoat systems

For aggressive outdoor steel, structural parts, energy-storage cabinets and machinery, an E or EZ primer sits under a P480, P720 or P1680 topcoat. Single-coat TDS values cannot be added together: the system is tested as a system.

1. **Fix the system and the target.** Write down primer, topcoat, film thickness for each coat and the result the specification requires.
2. **Prepare panels on your line.** Use production pretreatment. TDS values come from phosphated steel; your line sets the real ceiling for adhesion and corrosion life.
3. **Apply and cure as in production.** Apply the primer, then the topcoat, using the cure schedule you will really run, and record the object-temperature profile.
4. **Test inter-coat adhesion first.** Cross-cut (ISO 2409), impact (ISO 6272-2) and bend (ISO 1519) on the two-coat film reveal cure mismatch early.
5. **Run humidity and salt spray on the system.** Test the combined system to ISO 6270-1 and ISO 9227. WANAN's CNAS-accredited laboratory can run these during qualification.
6. **Freeze the parameters.** Record film thicknesses, cure profile and batch numbers in the qualification file before release.

7. Project labels: QUALICOAT and UL 1332

QUALICOAT (architectural aluminium)

- WANAN is a QUALICOAT approved powder manufacturer: P-1436 (Class 1, gloss category 3, metallic extension) and P-1982 (Class 2, gloss category 2), both valid until 31 December 2026 and verifiable in the QUALICOAT approvals database at qualicoat.net.

- Class 1 is the standard architectural quality; Class 2 is super-durable, with stricter accelerated-weathering and three-year Florida gloss-retention requirements.
- P480, P720 and P1680 are characterised by their ISO test results and are not themselves the labelled systems. Ask for the approved system on P-1436 or P-1982 when a project requires the label.
- P-1436 lists RAL 7030 as a banned colour for its Class 1 system.
- The finished component carries the label only when coated by a QUALICOAT-licensed applicator; WANAN supplies the powder and approval documents.

UL 1332 (steel enclosures of outdoor electrical equipment)

- UL Certificate of Compliance UL-US-2582808-0 (report MH67657-20250827, issued 29 August 2025): model WA-DQ 001A evaluated under UL 1332 (Edition 5) as a recognized component in category DTOV2 — organic coatings for steel enclosures of outdoor-use electrical equipment.
- Scope: 1-coat system on pretreated SPCC cold-rolled steel. Other WANAN series (E, EZ, P480, P720, P1680) are specified by their own TDS values and are not covered by the UL recognition.
- A recognized component coating is one input to the enclosure manufacturer's own UL investigation; the coating certificate does not by itself authorise any UL Mark on the finished enclosure.

8. From enquiry to release

1. **Enquiry & part data.** Substrate, pretreatment, service environment, current system, oven profile and specification.
2. **Candidate series & samples.** Series proposal with TDS basis; colour-matched sample powder and panels.
3. **Line trial.** Trial panels or production parts sprayed on the customer's line; object-temperature profile recorded.
4. **Laboratory qualification.** Adhesion, impact, bend, humidity, salt spray, weathering in the CNAS-accredited laboratory or per the customer's programme.
5. **Release & batch control.** Production under ISO 9001 / IATF 16949; batch testing; certificate of analysis; 25 kg cartons.

9. Common mistakes

- Choosing by series name: P1680 is a designation, not 1680 h of salt spray (its result is 1000 h).
- Using epoxy E on parts exposed to sunlight.
- Adding primer and topcoat values together, or quoting the EZ primer's ≥ 2000 h as the system result.
- Assuming a P series is itself a QUALICOAT-labelled product.
- Reading the oven set-point as the cure temperature: the metal itself must reach 190–200 °C for 10–15 minutes.
- Checking film thickness only on flat panels: edges, welds and inside corners usually carry less film.
- Changing either powder after qualification without re-testing.

10. Compliance

Management systems certified to ISO 9001:2015, ISO 14001:2015 and ISO 45001:2018; design and manufacturing of thermosetting powder coatings certified to IATF 16949:2016. SGS reports (2026) on WANAN powder coating samples cover RoHS (EU) 2015/863, REACH SVHC screening, soluble heavy metals and California Proposition 65 (lead, cadmium, phthalates); results apply to the tested samples.

11. Standards referenced

ISO 9227	Neutral salt spray
ISO 6270-1	Humidity resistance
ISO 16474-2	Xenon-arc weathering
ISO 2813	Gloss, 60°
ISO 2409	Cross-cut adhesion
ISO 6272-2	Impact
ISO 1519	Mandrel bend
ISO 15184	Pencil hardness
UL 1332	Organic coatings for steel enclosures of outdoor-use electrical equipment
QUALICOAT	Quality label for coatings on architectural aluminium
ISO/IEC 17025:2017	Laboratory competence (CNAS L15415)

Performance data are valid only for the test methods, panels and cure conditions stated. They do not constitute a service-life warranty. Minimum order quantity, lead time and Incoterms are confirmed per project. Source: WANAN technical data sheets and wanancoat.com. Edition 1, 3 November 2026.

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