

Shenzhen Zhongchuang 3D Technology Co., Ltd.

Add: Room 204, Building 1, Jiatai Health Industrial Park, No.1 Industrial Zone, Tangwei

Community, Fuhai Subdistrict, Bao'an District, Shenzhen City

Tel: +86 15959299121 | Web: www.ZonMedtech.com | E-mail: info@zonmedtech.com

## TECHNICAL DATA SHEET

### Ceramic & Glass-Ceramic Stain Kit (FULL VERSION)

Model: PRS-S-G Series (G01–G21) | 3g / 5g per bottle | Low-Fusing Nano Ceramic Paste

Rev: 2025-07-12

#### 1. Product Description & Indications

Polyfix PRS-S-G is a low-fusing ceramic stain and glaze paste designed for extraoral characterization of final zirconia and glass-ceramic restorations. The nano-formulated paste enables precise shade reproduction with excellent firing stability.

##### Indications:

- (1) Zirconia crown and bridge staining (full-contour and cut-back)
- (2) Lithium disilicate (e.max) staining and characterization
- (3) Gingiva porcelain characterization on implant-supported prostheses
- (4) 3D effect shading, fissure staining, and incisal halo effects

##### Contraindications:

Direct intraoral application. Not for use on uncured resin or metal substrates without appropriate opaque layer.

#### 2. Shade System — Overview

| Category              | Shade Codes                | Firing Temp | Primary Use                                            |
|-----------------------|----------------------------|-------------|--------------------------------------------------------|
| Cervical / Body       | G01–G04                    | 750–800°C   | Red zone at cervical region; body shade base           |
| Incisal Translucent   | G10–G14, G18               | 750–800°C   | Incisal edge translucency; halo effect                 |
| Gingiva / Soft Tissue | G08–G09                    | 750–800°C   | Gingiva pink characterization; vascular accents        |
| Fissure / Shadow      | G05–G07, G15–G17           | 750–800°C   | Occlusal fissure staining; shadow depth effects        |
| Glaze / Finish        | G19 Clear, G20 Fluorescent | 750–800°C   | High-gloss protective sealing; fluorescent enhancement |

#### 2.1 Ceramic Powder Shades — Individual Descriptions (SG01–SG18)

| Code | Shade Name | Usage & Application (Ceramic Stain)                                                                                                                                                                                                                     |
|------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SG01 | Red        | Engineered for replicating natural gingival highlights, root-surface warmth, and intense chromatic accents on zirconia and porcelain dental restorations. Optimized for high-temperature ceramic firing cycles with stable color retention up to 800°C. |
| SG02 | Dark Red   | Tailored for deepening cervical shades, mucosal transitions, and natural vascular simulations on multi-layer zirconia crowns and fixed dental prostheses. Maintains color depth after multiple firing cycles.                                           |
| SG03 | Pink       | Formulated for soft-tissue and gum contour characterization on hybrid ceramic and zirconia restorations, ensuring lifelike aesthetic blending with surrounding gingival tones.                                                                          |
| SG04 | Light Pink | Designed for subtle mucosal highlights, delicate papillary pink aesthetics, and natural gum tissue shading on aesthetic porcelain restorations.                                                                                                         |
| SG05 | Sepia      | Perfect for accentuating fissures, occlusal grooves, and deep dentin chroma transitions on posterior and anterior ceramic structures. Delivers warm brown depth for natural-looking occlusal anatomy.                                                   |
| SG06 | Bronze     | Ideal for replicating mature dentin undertones, cervical aging effects, and warm chromatic intensity within porcelain build-up workflows.                                                                                                               |
| SG07 | Khaki      | Utilized for neutralizing high brightness, mimicking natural age spots, and fine-tuning subtle brownish-green hue                                                                                                                                       |

|  |  |                                         |
|--|--|-----------------------------------------|
|  |  | shifts in complex ceramic restorations. |
|--|--|-----------------------------------------|

|      |            |                                                                                                                                                                                                      |
|------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SG08 | Orange     | Formulated to simulate internal warmth, mamelon highlights, and natural dentin chromatic brilliance for enhanced aesthetic depth in anterior restorations.                                           |
| SG09 | Yellow     | Tailored for youthful dentin characterization, occlusal fissure highlights, and bright shade matching on anterior and posterior ceramic teeth.                                                       |
| SG10 | Green      | Applied for specialized internal characterization, masking unwanted chromatic shifts, or simulating natural developmental anomalies on porcelain restorations. Acts as a complementary hue modifier. |
| SG11 | Dark Green | Designed for deep fissure staining, value modification, and creating precise natural contrast details within complex ceramic occlusal morphology.                                                    |
| SG12 | Dark Blue  | Formulated for neutralizing high chroma values, creating deep incisal halos, and simulating cool translucent depth variations on ceramic veneers and crowns.                                         |
| SG13 | Light Blue | Engineered for subtle incisal edge transparency, cool opalescent halo simulation, and value adjustment on high-aesthetic porcelain restorations.                                                     |
| SG14 | Lilac      | Ideal for fine-tuning reddish-blue undertones, adjusting high brightness values, and executing high-end aesthetic characterization on ceramic crowns.                                                |
| SG15 | Black      | Utilized for maximum value down-shifting, sharp fissure delineation, and high-contrast characterization in specialized ceramic restoration workflows.                                                |
| SG16 | Gray       | Formulated for mimicking wear facets, metallic masking accents, and age-related neutral gray/translucent effects on porcelain surfaces.                                                              |
| SG17 | Beige      | Designed for subtle cervical transitions, root exposure simulation, and soft chromatic blending on standard ceramic restoration margins.                                                             |
| SG18 | White      | Tailored for simulating enamel calcification spots, incisal halo effects, and high-value surface characterization on all-ceramic structures.                                                         |

## 2.2 Glaze Powder Shades — Individual Descriptions (SG19–SG20)

| Code | Shade Name | Usage & Application (Ceramic Glaze)                                                                                                                                                                                                                        |
|------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SG19 | Glaze (FP) | Specialized low-temperature glaze powder engineered for press and CAD glass-ceramic (730°C) as well as zirconia (800°C) substrates. Provides a smooth, high-gloss surface finish with excellent wear resistance and long-term intraoral stability.         |
| SG20 | Glaze      | Premium ceramic glazing formulation designed to lock in surface stains, enhance wear resistance, and deliver an optimal aesthetic gloss across diverse ceramic dental restoration types. Compatible with both zirconia and glass-ceramic firing protocols. |

## 2.3 Mixing Liquid — Individual Description (SG21)

| Code | Product Name | Usage & Application (Mixing Liquid)                                                                                                                                                                                                                                          |
|------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SG21 | Transparent  | Professional-grade transparent liquid medium formulated to adjust the consistency, viscosity, and brush-handling properties of CERAMIX stains without altering color hue or firing behavior. Essential for controlling stain opacity and achieving precise layering effects. |

## 3. Composition

| Component                                                                                                                                                   | Content | Function                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------------------------------------------|
| Low-fusing Glass Frit (SiO <sub>2</sub> -B <sub>2</sub> O <sub>3</sub> -Al <sub>2</sub> O <sub>3</sub> -K <sub>2</sub> O)                                   | 60–75%  | Matrix; CTE 9–11 ×10 <sup>-6</sup> /K     |
| Metal Oxide Pigments (Footnote 1)                                                                                                                           | 10–25%  | Colorants (Fe, Mn, Co, Ti, Ce oxides)     |
| Organic Carrier (Glycol-based)                                                                                                                              | 10–15%  | Paste former; burns out cleanly at 400°C  |
| Nano Additives                                                                                                                                              | < 2%    | Dispersion fineness; thixotropic rheology |
| <sup>1</sup> Iron Oxide (1309-37-1) · Manganese Oxide (1313-13-9) · Cobalt Aluminate (1345-16-0) · Titanium Dioxide (13463-67-7) · Cerium Oxide (1306-38-3) |         | -                                         |

✓ Lead-free · Cadmium-free · MMA-free · Resin-free

## 4. Technical Data

| Property            | Specification                                                  | Standard / Method |
|---------------------|----------------------------------------------------------------|-------------------|
| Particle Size       | D90 < 8 µm                                                     | Laser Diffraction |
| Firing Temperature  | 790–800°C (Zirconia) / 700–760°C (e.max)                       | —                 |
| Holding Time        | 1.5–3 min at peak temperature                                  | —                 |
| CTE (25–500°C)      | 9.0 ×10 <sup>-6</sup> /K (matched to zirconia & glass-ceramic) | ISO 9693          |
| Flexural Strength   | ≥ 800 MPa (after glaze firing on zirconia)                     | ISO 6872          |
| Chemical Solubility | < 100 µg/cm <sup>2</sup>                                       | ISO 6872          |
| Color Stability     | ΔE < 1.5 after 3 firings                                       | —                 |
| Film Thickness      | 0.1–0.2 mm (single application)                                | —                 |
| Gloss (60°)         | ≥ 80 GU after glaze firing                                     | —                 |

## 5. Compatibility Matrix

| Category      | Compatible Brands / Types                                                       | Parameter                       |
|---------------|---------------------------------------------------------------------------------|---------------------------------|
| Zirconia      | Cercon ht/xt, 3M Lava Esthetic, Sagemax NexxZr, Aidite, Upcera, Katana, BruxZir | All 3Y/4Y/5Y zirconia           |
| Glass-Ceramic | IPS e.max CAD/MO, Celtra Duo, Suprinity, Vita Suprinity                         | LT / MT translucency grades     |
| Furnace       | Ivoclar Programat P310/CS2/CS4, Dekema Austromat 40T, Nabertherm, Vita Vacumat  | Vacuum firing recommended       |
| Cooling Rate  | < 60°C/min to 400°C                                                             | Avoid thermal shock / quenching |

## 6. Firing Curves

### Zirconia Standard Curve:

Start: 400°C → Hold 2 min (drying) → Heat 45°C/min to 790°C → Hold 1.5 min (with vacuum) → Cool 50°C/min to 400°C → End

### Glass-Ceramic Curve:

Start: 400°C → Hold 2 min (drying) → Heat 55°C/min to 740°C → Hold 1 min → Cool 50°C/min to 400°C → End

**⚠ Important:** Maximum 3 firings. If color appears too light, add an additional layer and re-fire. If color is too dark, grind surface and re-stain. Do NOT exceed 850°C at any stage.

## 7. Storage & Packaging

Storage Conditions: 5–30°C, sealed container. Protect from moisture and direct sunlight. Shelf life: 48 months from date of manufacture (unopened).

If Paste Dries Out: Add specialized ceramic diluent (oil-based carrier). Do NOT add water.

Packaging: 5g per bottle. Kit includes 20 stain bottles + glaze + application brushes.

Transport: Non-dangerous goods. Handle as fragile glass containers. Avoid impact and inversion during transit.

## 8. Regulatory & Compliance

ISO 6872: Dental Ceramic — Mechanical and chemical requirements passed.

ISO 6486: Lead and cadmium release — Compliant (lead-free, cadmium-free).

CTE Compatibility: Coefficient of thermal expansion matched to zirconia (10.5 ×10<sup>-6</sup>/K) and glass-ceramic (9.5–10.5 ×10<sup>-6</sup>/K) substrates.

Manufacturing Quality: ISO 13485 Medical Devices Quality Management System certified.

Intended Use: For professional dental laboratory use only. Not for direct intraoral application.