

IPS **Classic®**

Instructions for Use



CE 0123

Table of Contents

3	IPS Classic
6	Zusammensetzung
7	IPS Classic – Shade Code
10	IPS Classic – Description of the assortments
10	IPS Classic Mini Kits
11	IPS Classic Opaquer / IPS Classic V Opaquer
12	IPS Lowpaque / IPS Lowpaque V
13	IPS Margin / IPS Margin V
14	IPS Opaque Dentin / IPS Opaque Dentin V
15	IPS Classic Dentin / IPS Classic V Dentin / IPS Classic Intensive Dentin
16	IPS Classic / IPS Classic V Incisal and Transparent materials
17	IPS Effect
18	IPS Impulse
19	IPS Gingiva
20	IPS Shade / IPS Shade V
20	IPS Stains P
21	IPS Classic Glaze Paste
21	IPS Classic Correction Powder
22	IPS Classic – Liquids
24	IPS Classic – Shade Selection
25	IPS Classic – Layering diagrams
26	IPS Classic – Framework design
27	Functional support of the veneering ceramic
28	Framework design for ceramic shoulders
28	Framework strength
29	Framework design for bridges
30	Design of bridge pontics
30	Interface between metal and ceramic
31	IPS Classic – Instructions for Use
31	Starting situation
31	Fabricating the framework
31	Oxide firing
32	1 st opaquer firing
33	2 nd opaquer firing
34	1 st margin shoulder firing
35	2 nd margin shoulder firing
35	1 st dentin and incisal firing
37	2 nd dentin and incisal firing
38	Preparing the restoration for glaze firing
38	Stain and characterization firing
39	Glaze firing
40	Corrective firings
42	IPS Classic – Firing parameters
44	IPS Classic – Materials combination tables
44	Chromascop
45	A–D
46	IPS Classic – A sound concept always reaps success!

IPS – Ivoclar Porcelain System

A high requirement is placed on ceramic restorations today. Therefore, every ceramist needs a program capable of reproducing top aesthetic results, while offering maximum possibilities for individual skills.

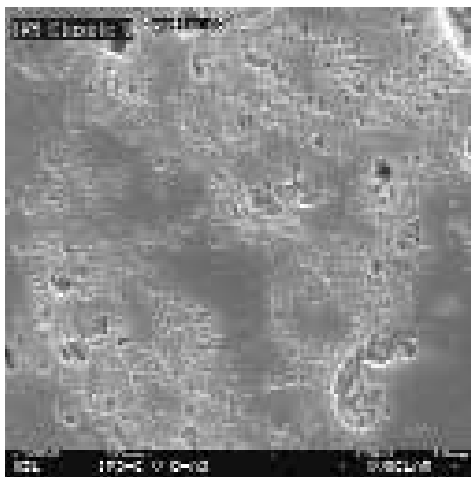
The Chromascop shade guide applies for the IPS Classic ceramic material. IPS Classic V is based on the A–D shade guide.

The Material

New methods of production and accent on innovation provided the impetus for developing this IPS Classic ceramic line.

Stringent quality control of materials and a special distribution system for particle size give IPS Classic its several advantages. For example, feldspar, the raw material, is subjected to chemical analysis prior to selection and checked for impurities.

Precise compounding of the components emphasizes properties such as the coefficient of thermal expansion, transformation range and crystal growth. That makes it possible to mix most the materials of IPS Classic and IPS Classic V and process them together.



Advantages of the IPS Classic Ceramic Line

- Clinically proven
- Efficient and economical use of the material
- Highly aesthetic restorations
- Easy handling
- Excellent matching of shade with the Chromascop and A–D shade guide
- Special materials for individual characterization effects
- Opalescent incisal and effect materials
- Coordinated equipment components: Programat® X1, Programat P200
- Compatible alloys
- Suitable cement Vivaglass® CEM

CTE – Coefficient of Thermal Expansion

There are over two thousand alloys available on the dental market worldwide. Because of this large number, it is not possible to test all these alloys with regard to their compatibility with IPS Classic and IPS Classic V. As a result, we are limiting our recommendations to the respective cooling phases of the different alloy types.

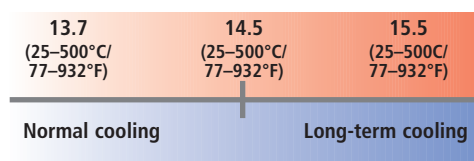
Generally, the specifications of the alloy manufacturer must be observed. An important factor is the coefficient of thermal expansion (CTE) following the casting procedure in the dental laboratory. The CTE should be measured in the same temperature range as that of ceramic materials. For the CTE of IPS Classic and IPS Classic V the temperature range is given at 25–500°C as stipulated by EN/ISO 9693.

Generally, IPS Classic and IPS Classic V are suitable for use with alloys with a CTE of approx 13.7 to $15.5 \times 10^{-6} \text{ K}^{-1}$ at 25–500°C. Depending on the type the composition of the alloy, the firing temperature and the cooling phase in particular have to be taken into consideration.

Alloys with a CTE in the lower range (e.g. approx 13.7 – 14.5 at 25–500°C) can be processed with standard cooling. That is, the fired object is removed from the ceramic furnace after the firing program with a cooling phase in the open furnace has come to an end. Ceramic furnaces from Ivoclar Vivadent announce the end of the firing program with an acoustic signal.

Long-term cooling depends on the type and the CTE of the alloy used. A longer cooling phase increases the CTE of IPS Classic and IPS Classic V. Repeated firings have a similar effect.

Rule of thumb: The higher the CTE of the alloy, the longer the long-term cooling. If long-term cooling is required, it should be carried out after every firing procedure, except when firing the opaquer or soldering.



Ceramic furnaces of other manufacturers often feature opening mechanisms different from that of Ivoclar Vivadent furnaces. Therefore, the firing conditions may also differ. Make sure to observe these varying firing conditions.

Alloys

The compatibility of the following alloys and IPS Classic and IPS Classic V have been thoroughly tested. Additionally, they are listed on the Ivoclar Vivadent Alloys Chart (Dental Alloys – Compositions and physical properties).

IPS d.SIGN® series	IPS Classic
IPS d.SIGN® 98	✓
IPS d.SIGN® 96	✓
IPS d.SIGN® 91	✓
IPS d.SIGN® 84	✓
IPS d.SIGN® 67	✓
IPS d.SIGN® 59	✓
IPS d.SIGN® 53	✓
Implant series	
IS®-85*	✓
IS®-64*	✓
High Gold content	
Aquarius Hard	✓
Aquarius	✓
Aquarius HPF	✓
Aquarius XH	✓
Y-2	✓
Y-Lite	✓
Sagittarius	✓
Reduced Gold content	
W	✓
Lodestar®	✓
W-3*	✓
Evolution®	✓
Pd based	
Capricorn 15	✓
Spartan® Plus*	✓
Cr or Ni base	
Pisces Plus	✓
4all®	✓
IPS d.SIGN® series	
IPS d.SIGN® 30	✓
IPS d.SIGN® 15	✓

* Large full coverage pontics and slow cooling should be avoided.

The product range may vary from country to country.

Indication

- Metal-ceramic veneers

Contraindication

- If patients are known to be allergic to any of the ingredients of IPS Classic or IPS Classic V, the material should not be used.

Important processing restrictions

- Combination with other metal-ceramic materials (e.g. IPS d. SIGN).
- Combination with metal-free veneering ceramics (e.g. IPS Empress).
- Use of IPS Shade, IPS Shade V and IPS Stains-P during the layering procedure (e.g. between the dentin and incisal layer)
- Firing of IPS Classic onto incompatible alloys
- Mixing of paste materials with materials in powder form

Important information

- Ceramic furnaces of other manufacturers often feature opening mechanisms different from that of Ivoclar Vivadent furnaces. Therefore, the firing conditions may also differ. Make sure that these varying firing conditions are taken into account when working with IPS Classic.

Warning

- Finishing ceramic restorations results in grinding dust. Avoid inhalation. Use suction equipment or protective masks.

Composition

The IPS Classic and IPS Classic V ceramic materials and liquids contain the following main components:

- Ceramic materials
SiO₂: 40–65 wt. %
Additional contents are: Al₂O₃, B₂O₃, BaO, CaO, CeO₂, K₂O, MgO, Na₂O, P₂O₅, SnO₂, TiO₂, ZrO₂ and pigments
- Opaquer pastes, Shades, Stains and glazing materials contain ceramic material and 25–40 % glycols
- IPS Classic Build-Up Liquids, N,S and L
Components: Water, butandiol and chloride
- IPS Classic Model Separator I
Components: Ethyl acetate, nitro-cellulose, softener
- IPS Classic Isolating Liquid
Component: Paraffin oil
- IPS Classic Glaze and Stain Liquid
Component: Ethylene glycol
- IPS Margin Build-Up Liquid
Components: Water and cellulose derivative
- IPS Margin Isolating Liquid
Components: Wax dissolved in hexane
- IPS Ceramic Separator
Components: Butylene acetate and pigments in nitro-cellulose

Storage

- Protect material in powder form from moisture
- Store material in paste form at room temperature (18-25°C/64-77°F)



Note:

Protect liquids from sunlight and heat!

Classic and Classic V – Shade code

For a better distinction of the individual materials labels have been selected for the different shades. This system enables a convenient classification of the different jars at work.

Colouring of labels of the materials

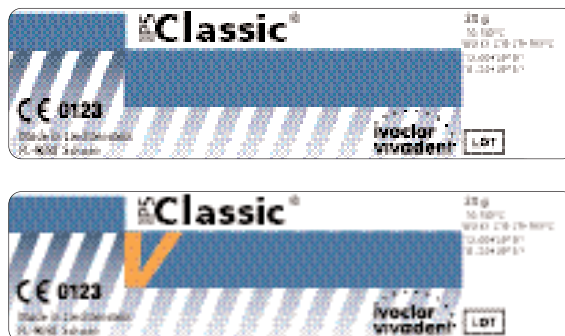
IPS Classic Opaquer
IPS Classic V Opaquer
IPS Classic Intensive Opaquer
IPS Classic Intensive Opaquer V



IPS Classic Dentin
IPS Classic V Dentin
IPS Classic Intensive Dentin



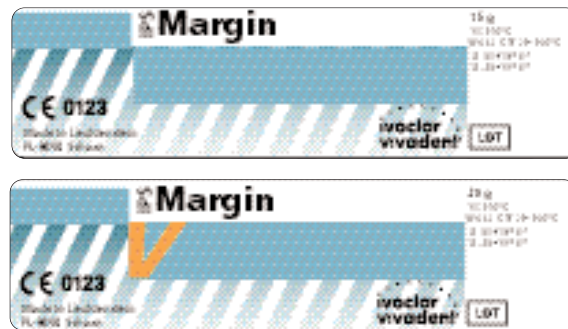
IPS Classic Incisal
IPS Classic V Incisal
IPS Classic Transparent



IPS Classic Opal Incisal



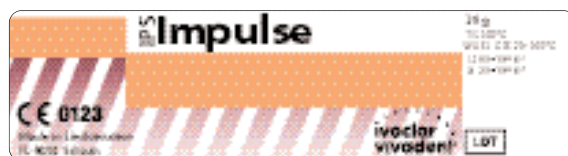
IPS Margin
IPS Margin V



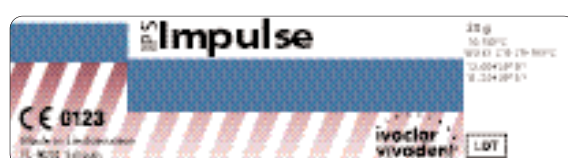
IPS Opaque Dentin
IPS Opaque Dentin V



IPS Impulse



IPS Impulse Incisal



IPS Effect



IPS Lowpaque
IPS Lowpaque V



IPS Stains-P



IPS Classic Glazing



IPS Classic and IPS Classic V – Description of the assortments

IPS Classic Mini Kits



IPS Classic Mini Kit



IPS Classic V Mini Kit

Delivery form

IPS Classic Mini Kit (Chromascop)

- 6 IPS Classic Opaquer, 3 g each (130, 140, 210, 230, 310, 410)
- 6 IPS Classic Dentin materials, 20 g each (130, 140, 210, 310, 410, 230)
- 4 IPS Classic Opal Incisal materials, 20 g each (1, 2, 4, 5)
- 2 IPS Classic Transparent material, 20 g each (T-2, T-4)
- 1 IPS Classic Glaze Paste, 3 g
- 1 IPS Classic Glaze and Stain Liquid, 15 ml
- 3 IPS Classic Build-Up Liquids, 60 ml each (L, N, S)

IPS Classic V Mini Kit

- 6 IPS Classic V Opaquer, 3 g each (A2, A3, A3.5, B3, C2, D3)
- 6 IPS Classic V Dentin materials, 20 g each (A2, A3, A3.5, B3, C2, D3)
- 4 IPS Classic V Incisal materials, 20 g each (1, 2, 3, 4)
- 2 IPS Classic V materials, 20 g each (Clear, Neutral)
- 1 IPS Classic Glaze Paste, 3 g
- 1 IPS Classic Glaze and Stain Liquid, 15 ml
- 3 IPS Classic Build-Up Liquids, 60 ml each (L, N, S)

IPS Classic Opaquer / IPS Classic V Opaquer



Opaquer pastes have an ideal consistency and excellent stability that ensures an outstanding masking capability even when applied in thin layers. The opaquer pastes are distinguished by their easy and economic processing.

Delivery form

IPS Classic Opaquer

- 3 IPS Classic Opaquer, 3 g each;
Shades: 110, 120, 130, 140, 210, 220, 230, 240, 310, 320, 330, 340, 410, 420, 430, 440, 510, 520, 530, 540

IPS Classic V Opaquer

- 3 x IPS Classic V Opaquer, 3 g each;
Shades: A1, A2, A3, A3.5, A4, B1, B2, B3, B4, C1, C2, C3, C4, D2, D3, D4

IPS Classic Intensive Opaquer / IPS Classic V Intensive Opaquer



Specially shaded intensive opaquer material pastes for individual characterizations in the opaquer area.

Delivery form

IPS Classic Intensive Opaquer

- 3 IPS Classic Opaquer, 3 g each;
Shades: white, orange, brown, violet, grey

IPS Classic V Intensive Opaquer

- 3 x IPS Classic V Opaquer, 3 g each;
Shades: A, B, C, white, violet

IPS Lowpaque / IPS Lowpaque V



IPS Lowpaque has been especially developed for use with bio-alloys, most of which demonstrate a low melting point. Given their thermal stability these bio-alloys require a low-firing opaquer. It goes without saying, however, that IPS Lowpaque is suitable for other ceramic alloys, in addition to bio-alloys.

Delivery form

IPS Lowpaque

- 3 IPS Lowpaque, 3 g each;
Shades: 110, 120, 130, 140, 210, 220, 230, 240, 310, 320, 330, 340, 410, 420, 430, 440, 510, 520, 530, 540

IPS Lowpaque V

- 3 x IPS Lowpaque V, 3 g each;
Shades: A1, A2, A3, A3.5, A4, B1, B2, B3, B4, C1, C2, C3, C4, D2, D3, D4

IPS Lowpaque Intensive / IPS Lowpaque V Intensive



Specially shaded intensive opaquer pastes for individual characterizations in the opaquer area.

Delivery form

IPS Lowpaque Intensive

- 3 IPS Lowpaque Intensive, 3 g each;
Shades: IO-1 white, IO-2 orange, IO-3 brown, IO-4 violet, IO-5 grey

IPS Lowpaque V Intensive

- 3 x IPS Lowpaque V Intensive, 3 g each;
Shades: IO A, IO B, IO C, IO white, IO violet

The product range may vary from country to country.

IPS Margin / IPS Margin V



The IPS Margin shoulder materials are distinguished for their stability of shape and low shrinkage. They permit the fabrication of aesthetic crown margins that demonstrate optimum accuracy of fit. In addition, intensive margin materials are available for the application of special effects in the cervical area. Since the ceramic shoulder is often located supra-gingivally, particularly in patients suffering from periodontal diseases, utmost shade match is required in this area. Therefore, these materials are intended for individual characterizations and can be mixed with ceramic shoulder materials to imitate the typically bony effect of the root. In addition, the shoulder materials can be mixed with each other and also with the intensive materials (M10–M14) to achieve a wide range of shades in the cervical area.

Delivery form

IPS Margin

- IPS Margin, 15 g each;
Shades: M1 (110), M2 (120, 130), M3 (140, 210, 220), M4 (230, 240), M5 (330, 340) M6 (310, 320), M7 (520, 530), M8 (540), M9 (410, 420, 430, 440, 510)

IPS Margin Intensive

- IPS Margin Intensive, 15 g each;
M10 (neutral), M11 (yellow), M12 (orange), M13 (brown), M14 (pink)

IPS Margin V

- IPS Margin V, 20 g each;
Shades: A1, A2, A3, A3.5, A4, B1, B2, B3, B4, C1, C2, C3, C4, D2, D3, D4
brown, yellow, orange



IPS Opaque Dentin / IPS Opaque Dentin V



Considering the variety of different layer thicknesses when processing a crown or bridge and the limited space available, a dentin material with a higher level of opacity and a more intensive shade effect can be very helpful. These materials can be used on their own when space is limited, and they can be mixed with the regular dentin material. They can be used as a substitute for dentin materials when space is limited, as secondary dentin material in the incisal area and the cervical, interdental and lingual area, for bridge pontics and for mixing with the IPS Classic dentin materials.

Delivery form

IPS Opaque Dentin

- IPS Opaque Dentin materials, 20 g each;
Shades: 120, 130, 140, 210, 220, 230, 240, 310, 320, 410, 420, 430, 440, 510

IPS Opaque Dentin V

- IPS Opaque Dentin V materials, 20 g each;
Shades: A1, A2, A3, A3.5, A4, B1, B2, B3, B4, C1, C2, C3, C4, D2, D3, D4,
brown, yellow, orange

IPS Classic Dentin / IPS Classic V Dentin



These dentin materials owe their vitality and shade brilliance to the coordinated distribution of grain sizes.

Delivery form

IPS Classic Dentin

- IPS Classic Dentin materials, 20 g or 100 g;
Shades: 110, 120, 130, 140, 210, 220, 230, 240, 310, 320, 330, 340, 410, 420, 430, 440, 510, 520, 530, 540

IPS Classic V Dentin

- IPS Classic Dentin V materials, 20 g or 100 g;
Shades: A1, A2, A3, A3.5, A4, B1, B2, B3, B4, C1, C2, C3, C4, D2, D3, D4

IPS Classic Intensive Dentin



This material is used for individualized shading of ceramic restorations and can be mixed with any IPS Classic material.

Delivery form

IPS Classic Intensive Dentin

- IPS Classic Dentin materials, 10 g;
Shades: ID 1 (neutral), ID 2 (white), ID 3 (yellow), ID 4 (honey), ID 5 (light brown), ID 6 (dark brown), ID 7 (pink), ID 8 (grey), ID 9 (blue), ID 10 (clear pink), ID 11 (red pink)

IPS Classic and IPS Classic V Incisal and Transparent Materials



The shade gradation of the incisal materials complement the Chromascop and the A–D shade guides as well as the natural incisal material. They owe their vitality and shade brilliance to the coordinated distribution of grain sizes and the opal effect.

The Transparent materials (T1–T4) demonstrate a shade gradation similar to that of natural incisal areas. Additionally, the material is available in clear and neutral.

Delivery form

IPS Classic Incisal

- IPS Classic Incisal, 20 g or 100 g;
Shades: S1, S2, S3, S4, S5

IPS Classic V Incisal

- IPS Classic Incisal, 20 g, 100 g or 250 g;
Shades: S1, S2, S3, S4

IPS Classic Opal Incisal

- IPS Classic Opal Incisal, 20 g or 100 g;
Shades: OS1, OS2, OS3, OS4, OS5

IPS Classic Transparent

- IPS Classic Transparent material 20 g or 100 g;
Shades: T1 (neutral), T2 (reddish), T3 (greyish),
T4 (transparent)

IPS Classic V Transparent

- IPS Classic Transparent material, 20 g or 100 g;
Shades: T neutral, T (clear)



IPS Effect



These ready-mixed individual ceramic materials enable the quick and easy reproduction of opalescent effects in the incisal area. Users may choose between five shade gradations of the Effect material. Starting with Effect 1, which demonstrates true-to-nature opalescence in conjunction with high translucency, the brightness value gradually increases from Effect 2 to Effect 5.

Delivery form

IPS Effect

- IPS Effect, 20 g;
- Shades:
 - E1 super opal
 - E2 opal
 - E3 whitish opal
 - E4 white-opal
 - E5 red-brown-opal

Different possibilities of application with IPS Effect materials



IPS Effect 1



IPS Effect 2



IPS Effect 3

IPS Impulse



Delivery form

IPS Impulse

- IPS Impulse Mamelon materials, 20 g;
Shades: MM1, MM2, MM3, MM4, MM orange
- IPS Impulse Incisal Edge materials, 20 g;
Shades: yellow, light-yellow
- IPS Impulse Incisal materials, 20 g;
Shades: yellow-grey, grey
- IPS Impulse Transparent materials, 20 g;
Shades: blue, yellow-grey, grey
- IPS Impulse Occlusal Dentin materials, 20 g;
Shades: brown, yellow, orange
- IPS Impulse Molar Incisal material, 20 g;
Shade: MS

The ready-mixed individual ceramic materials facilitate the application of true-to-nature effects.

Mamelon materials

They are available in five different shade gradations and demonstrate high opacity and optimum masking capabilities even when applied in very thin layers. Depending on the working habits of the user, the material is applied in thin stripes on reduced dentin. In this way, an individualized appearance of the incisal third can be achieved.

Incisal Edge materials

This material is used to achieve what is known as the 'halo effect', which is caused in natural teeth by light refraction at the incisal edge.

Incisal materials

They are available in two shade nuances and are suitable to modify or intensify any incisal material or can be applied directly.

Transparent materials

The Transparent materials are available in three shade nuances. They are suitable to imitate shaded, transparent areas, particularly in the incisal third.

Occlusal Dentin materials

They are available in two different shades and are used to provide the basic shade for occlusal surfaces and to intensify the chroma.

Molar Incisal material

It is used to reproduce the whitish incisal areas especially in posterior teeth. However, it can also be mixed with any incisal material to imitate the whitish incisal areas in anterior teeth.

IPS Gingiva



The IPS Gingiva materials are suitable for aesthetic solutions that require true-to-nature reproduction of the gingival area for metal-ceramic restorations or implant superstructures in accordance with natural gingival shades and characteristics. The ready-mixed ceramic materials are used to

- reproduce natural gingiva
- mask long cervicals in bridge restorations
- fill large interdental spaces and
- to mask those areas of implant superstructures facing the gingiva

The pink opaquer paste is used to mask the marginal areas in metal frameworks or implant superstructures. The four Gingiva modifiers can be used alone or mixed with the five Gingiva materials depending on the patient's situation. The shade gradations range from orange to reddish to bluish.

Delivery form

IPS Gingiva Opaquer

- IPS Gingiva Opaquer, 3 g;
Shade: pink

IPS Lowpaque Gingiva

- IPS Lowpaque Gingiva, 3 g;
Shade: pink

IPS Gingiva

- IPS Gingiva, 20 g;
Shades: G1, G2, G3, G4, G5

IPS Gingiva Modifier

- IPS Gingiva Modifier, 20 g;
Shades: GM 1, GM2, GM3, GM4

IPS Shade / IPS Shade V



The ready-mixed dentin stains in paste form permit subsequent modification of shades on the fired ceramic restoration.

Delivery form

IPS Shade

- IPS Shade, 3 g;
Shades: 110/120, 130, 140/210, 220/230, 240, 310, 320, 330, 340, 410/420, 430/440, 510, 520, 530, 540

IPS Shade V

- IPS Shade V, 3 g;
Shades: A1, A2/A3/A3.5, A4, B1, B2/B3/B4, C1/C2, C3/C4, D2/D3, D4

IPS Stains-P



These stains in paste form permit easy, individualized characterization of the restorations. The countless possibilities of mixing the shades ensure virtually unlimited creativity.

Delivery form

IPS Stains-P

- IPS Stains-P, 3 g;
Shades: white, bamboo, caramel, copper, cork, mahogany, azure, black, orange, basic yellow, basic red, basic blue

IPS Classic Glazing Paste



Easy-to-use glazing material in paste form for a true-to-nature gloss on ceramic restorations.

Delivery form

IPS Classic Glaze

– 5 x 3 g IPS Glazing paste

IPS Classic Correction Powder



The low-fusing correction powder for IPS Classic and IPS Classic V ceramics is particularly suitable for small corrections and shape adjustments of completely fired restorations.

Delivery form

IPS Classic Correction Powder

– IPS Correction Powder, 20 g; shade: neutral

IPS Classic – Liquids

IPS Classic Glaze and Stain Liquid, 15ml



This liquid is used to adjust the consistency of IPS Shades, IPS Shades V, IPS Stains P and IPS Classic Glaze.



IPS Classic Glaze and Stain Liquid contains ethylene glycol and is hazardous to health. Do not inhale vapours. Avoid skin and eye contact.

IPS Classic Build-Up Liquid N (Normal), 60 ml, 250 ml and 500 ml

This build-up liquid is particularly suitable for technicians who apply small amounts of ceramic material using the brush. It provides enhanced stability and has excellent modelling properties. The Build-up Liquid N is particularly suitable for those who prefer a moist working consistency without constantly rewetting the ceramic material. As indicated by the description 'N' (normal liquid) this build-



up liquid is intended for daily use and for most layering techniques.

IPS Margin Build-Up Liquid, 60 ml



This special build-up liquid facilitates the build-up of ceramic shoulders. Due to a subsequent setting the use of this liquid enables an easy removal of the contoured crown from the working die.

IPS Classic Build-Up Liquid L (Long Term), 60 ml, 250 ml and 500 ml

This liquid has been developed for technicians who desire a longer working time and for markets in warmer regions. A component has been added to the Build-up Liquid 'L' which increases the boiling point and enables the liquid to evaporate at a slower pace. This results in a prolonged working time while preserving the excellent modelling properties.



IPS Classic Build-Up Liquid S (Spatula Technique), 60 ml, 250 ml and 500 ml

This liquid is particularly suitable for technicians who tend to strongly condense the materials, use blotting material and subsequently reduce the restorations using an instrument. The liquid is easily blotted from the contoured crown. This results in a relatively solid material which can be shaped with a suitable instrument.



IPS Build-up Liquids N, L and S can be diluted with distilled water.

IPS Margin Isolating Liquid, 20 ml



This isolating liquid has been developed to ensure easy removal of the contoured shoulder from the die. It forms a water-repellent film on the surface, thus preventing liquids from seeping into the stone die.



IPS Margin Isolating Liquid contains hexane. Hexane is highly flammable and detrimental to health. Avoid contact of the material with skin and eyes. Do not inhale the vapours. Keep the material away from the open fire.

IPS Classic Ceramic Isolating Liquid, 50 ml



The Ceramic Isolating Liquid ensures reliable separation of the ceramic material and stone model. The liquid is used once the stone has been sealed using the Model Separator or the IPS Margin Isolating Liquid.

IPS Classic Ceramic Separator, 10 ml



Ceramic Separator is used in situations where two ceramic layers need to be separated. Furthermore, it is excellently suitable to isolate the ceramic material during soldering (to protect the ceramic surface from flux). The Ceramic Separator varnish fires without leaving residue. It is important, particularly with overlapping teeth, to first complete and fire one tooth and subsequently to cover it with the Ceramic Separator. Then, contour the adjacent

overlapping tooth onto the fired one. In this way, a clean separation between the two ceramic layers is achieved after firing.

IPS Classic Model Separator I, 50 ml



This separator is ideally used for sealing the stone models used for ceramic work. The Model Separator keeps the ceramic materials moist. Within approx. 2 minutes the applied liquid has dried and the pores of the stone are sealed.

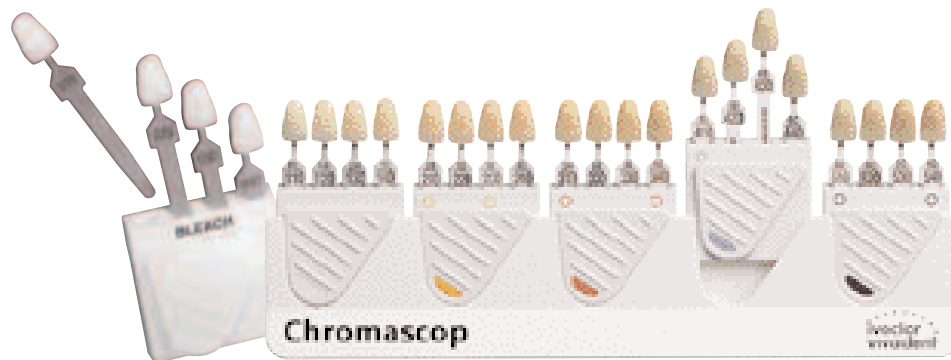


IPS Classic Model Separator contains ethyl acetate. Ethyl acetate is highly flammable. Do not inhale the vapours. Keep material away from open fire.



IPS Classic Ceramic Separator contains butylene acetate. Do not inhale the vapours. Butylene acetate is highly flammable. Keep material away from open fire.

IPS Classic – Shade selection



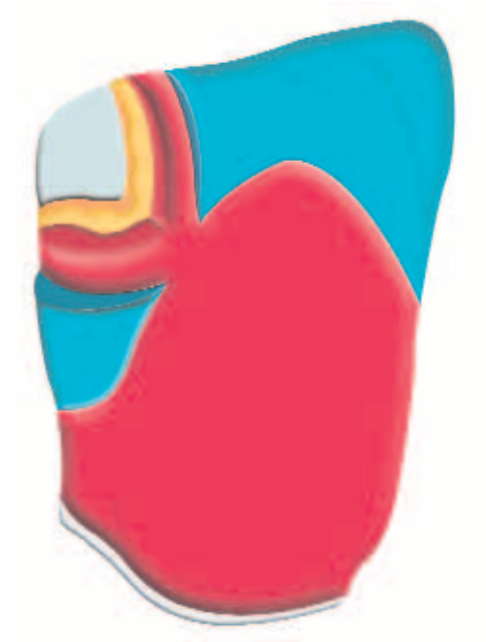
The Chromascop shade guide represents the shade standard for Ivoclar Vivadent products. With the logical arrangement of the individual shades, the Chromascop permits exact and efficient shade determination. The 20 shades are divided into five detachable shade groups. Once the basic shade has been selected, the correct shade within the shade group can be determined. Ignoring any superfluous effects (e.g. cervicals, transparent areas, intensive discolouration in the incisal and dentin

areas, as well as surface characterizations) makes it much easier to determine the correct shade. The following Ivoclar Vivadent products are coordinated with the Chromascop shade guide:

- IPS d.SIGN
- IPS Empress
- IPS Empress 2
- IPS Eris for E2
- SR Ivocron
- SR Antaris/SR Postaris tooth line
- Tetric Ceram restorative materials

Classic – Layering diagram

Chromascope



Classic – Framework design

When designing frameworks to be veneered with ceramic materials, the following parameters have to be observed:

1. Functional support of the veneering ceramic
2. Framework design for ceramic shoulders
3. Framework stability
4. Framework design for bridges
5. Design of bridge pontics
6. Interface between metal and ceramic

1. Functional support of the veneering ceramic

The framework should reflect the shape of the tooth in a reduced form. Therefore, the framework should be designed in such a way that it supports the cusps so that an even layer of the veneering ceramic can be used in the cusp/ fissure area. In this way, the masticatory forces are exerted on the framework rather than on the veneering ceramic. Furthermore, the framework should not have any sharp angles or edges (see diagram), so that the masticatory forces

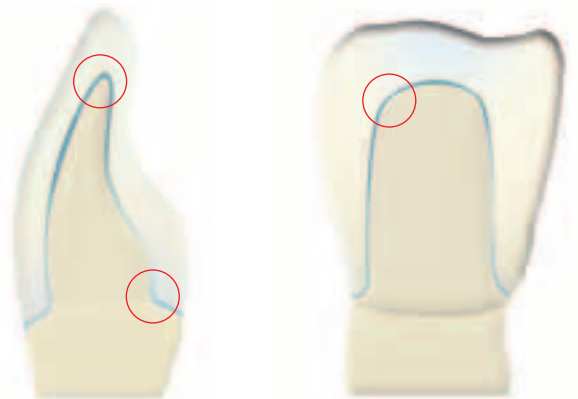
do not cause delamination or cracks. Sharp angles or edges should be rounded out in the wax-up so that the minimum framework thickness is not compromised. The wall thickness of the metal framework for single crowns after finishing should be at least 0.3 mm and 0.5 mm for bridge abutments (see diagram). For further information, please refer to the Instructions for Use of the alloy being used.

Anterior crowns

correct



incorrect

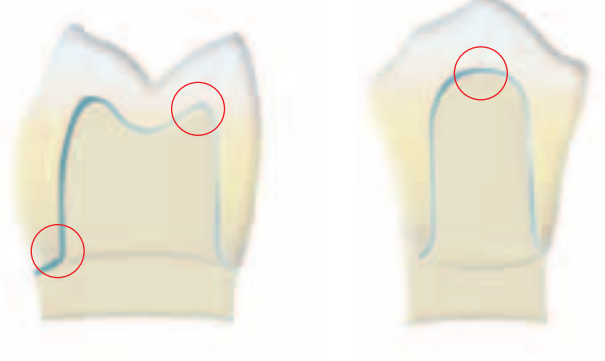


Premolar crowns

correct



incorrect

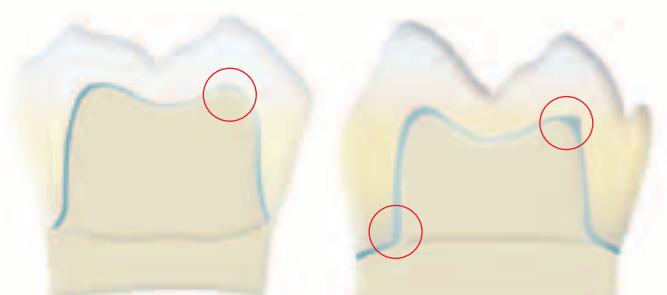


Molar crowns

correct

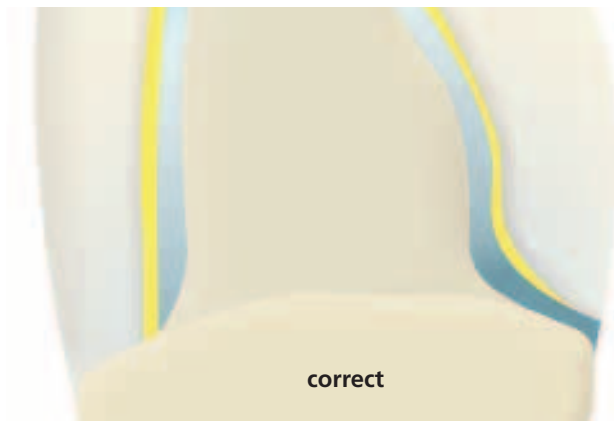


incorrect



2. Framework design for porcelain shoulders

When fabricating porcelain shoulders, make sure that the framework is supported by the prepared tooth rather than by the veneer. To achieve this, the framework is reduced to the inner edge of the chamfer or shoulder preparation. In this way, functional support of the framework by the tooth is achieved. A framework that accurately fits on the prepared tooth is essential in order to keep the ceramic material from getting on the inner surface of the framework.



3. Framework stability

The dimensions of the interproximal connector greatly influences the stability of the restoration during the laboratory procedure, as well as the clinical long-term success after cementation. Therefore, the dimensions of the connector areas must be adequate for the alloy being used. (This is especially important if a bio-alloy or high-gold alloy is to be used.) Additionally, the thermal behaviour of the alloy chosen has to be observed when applying the material during laboratory procedures.



4. Framework design for bridges

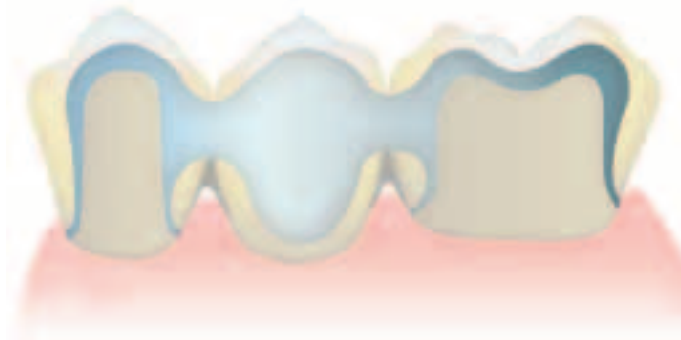
Frameworks veneered with ceramic materials are subject to thermal stress during the firing procedures and to masticatory stress after cementation. Therefore, the corresponding forces must be transferred to the framework rather than the veneer. In particular, adequate framework thickness must be ensured in the connector area between the abutment and the pontic.

The design of the framework must meet the visual, functional and periodontal hygiene requirements of the patient. A functional wax-up reduced to allow space for the ceramic material is the optimum prerequisite. During the ensuing laboratory procedures, the framework is repeatedly exposed to high temperatures. These firing temperatures may cause the framework to distort and compromise the accuracy of fit if it has not been properly designed and the required thickness observed. A scallop-type design with

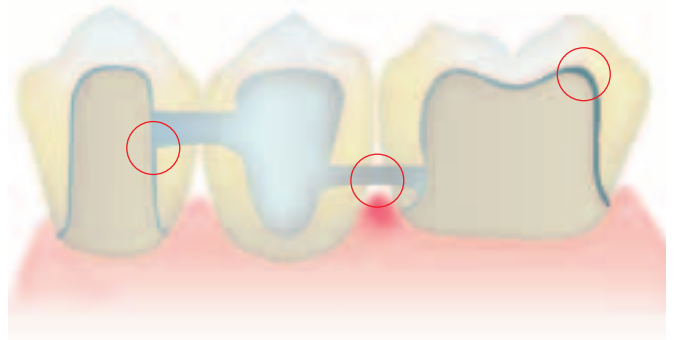
interproximal reinforcements will provide the necessary strength needed to avoid deformation of the framework. Also, this type of framework design (e.g. with cooling vents) will ensure even cooling of the restoration once it is removed from the ceramic furnace after firing. This is particularly important if bio-alloys or high-gold alloys are used. The corresponding failures can be prevented as described under point 1.

In order to ensure proper oral hygiene with bridges, the design of the interdental areas should be given special attention. Adequate opening of the interdental area should be considered when designing the framework without creating black triangles. In this way, periodontal hygiene may be performed using interdental brushes and dental floss.

correct



incorrect



correct

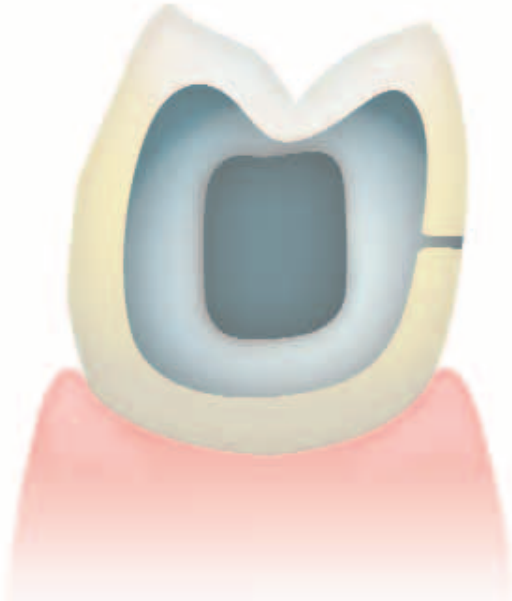


5. Design of bridge pontics

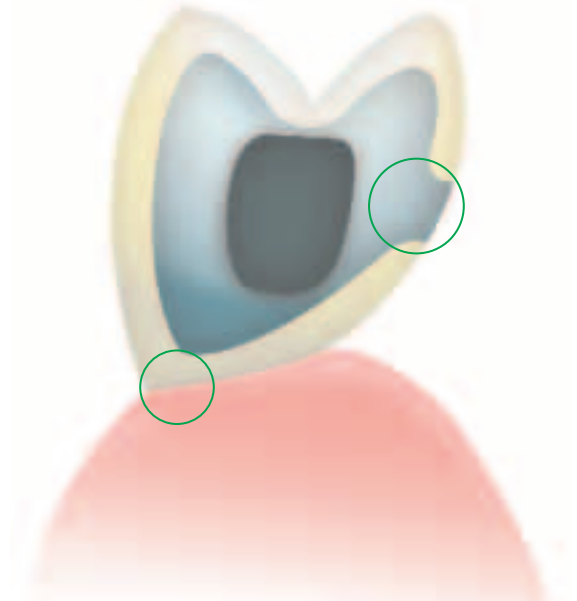
Bridge pontics are designed taking aesthetic and functional aspects into account as well as oral hygiene. The area of the pontic that contacts the alveolar ridge should be made of ceramic. In order to ensure adequate stability between

bridge pontic and the bridge abutments, a palatal and/or lingual scallop is recommended. Furthermore, to ensure even cooling of the bridge pontic that absorbs the most heat, cooling vents are advantageous.

Bridge pontic design - ovate pontics



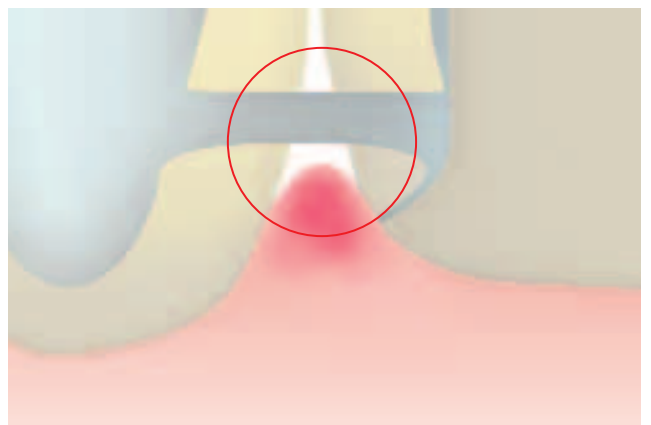
Bridge pontic design - saddle-type pontics



6. Interface between metal and ceramic

The interface between the metal framework and the veneering ceramic must be clearly defined and, if possible, incorporate a right angle finish line. The juncture between the metal framework and the veneering ceramic must not be located in the contact area, nor on surfaces involved in masticatory functions. Furthermore, make sure that the

interface in the marginal area does not come into contact with the gingiva, particularly if a tapered crown margin is designed (e.g. no metal margin and no ceramic shoulder). In this way, irritation of the gingiva can be prevented. The interface in the interdental area should be designed in such a way that cleaning of these areas is possible.



Classic – Instructions for Use

Starting situation

Fabricate a master model or a model with detachable segments on the basis of the impression in the usual manner. It is advisable to apply a sealer to harden the surface and to protect the die. The application of a sealer must not cause any changes in the dimensions of the die. After that, a spacer may be applied in the usual manner.

Fabricating the framework

Fabricating the framework

When fabricating the framework, make sure that the minimum wall thickness after finishing is 0.3 mm for single crowns and 0.5 mm for bridge abutments. These dimensions are the prerequisite for the stability of the metal framework and the durable bond between the metal and ceramic material. If the stipulated framework and connector dimensions are not observed, the resulting stress within the material will lead to delamination of the ceramic material and distortion of the framework.

Recommended procedure

1. Complete modelling of the anatomical tooth shape
2. Reduce to make room for the veneering materials
3. Waxing of the contact points and connector areas
4. Checking the occlusal and proximal contact points

Contouring

The framework reflects the reduced anatomical tooth shape (functional support of the veneering ceramic). In this way, the ceramic material may be applied in even layers and is adequately supported. For that purpose, the properties of the different alloys (e.g. firing stability) must be taken into consideration.

- Undersized metal frameworks result in increased shrinkage of the veneering ceramic and require additional corrective firings.
- If the metal framework is too small, the veneering ceramic is not adequately supported, which may lead to cracks and delamination, particularly in very thick ceramic layers.

Finishing the metal framework

The cast metal framework is finished using tungsten carbide metal burs or ceramic-bonded grinding instruments. The marginal area of the framework is reduced up to the inner edge of the chamfer or shoulder preparation (labial or circular) to make room for the ceramic shoulder.

- Use reduced pressure when working with softer alloys.
- Work in one direction only to avoid overlapping and inclusions in the metal surface.
- Do not use diamond grinding instruments. Diamond particles may be trapped in the alloy and cause bubbles in the ceramic material during firing.

Oxide firing

After grinding, carefully blast the framework with type 100 aluminium oxide Al_2O_3 (Ivoclar Vivadent special jet medium). The required pressure is 1.5–2.0 bar.

- Use only disposable, pure Al_2O_3 to blast the alloy surface.
- Observe the Instructions for Use of the alloy manufacturer.

Blasting improves the mechanical bond. It results in the object surface being roughened and considerably enlarged. In order to prevent inclusions of blasting medium residue in the ceramic, we recommend blasting the alloys with the indicated pressure while keeping the nozzle at a flat angle to the object surface. A contaminated metal surface may result in the formation of bubbles during ceramic firing. When finishing the frameworks, the instructions of the alloy manufacturer must be observed at all times. Oxidation is carried out according to the instructions of the alloy manufacturer.

Schematic diagram of the blasting direction

Correct angle for blasting the alloy surface



Before the oxidation firing, clean the metal framework using a brush under running water. Then, thoroughly clean it with steam or in the ultrasonic cleaner. Allow the framework to dry after cleaning. Oxidize the framework according to the instructions given by the alloy manufacturer. Provide ample support for the framework on the firing tray. This is particularly important for long-span bridges. After oxidation, carefully check the framework for porosity or irregular oxide layer. Refinish and reoxidize if necessary.





Some alloy types require pickling after oxide firing and/or blasting of the oxide layer (observe instructions of the alloy manufacturer). After that, thoroughly clean the framework with steam or in the ultrasonic bath. Oxidation can be considered a 'cleaning firing' and is also used to check the quality of the framework surface.

1st opaquer firing (wash firing)

Extrude the desired amount of the ready-to-use opaquer paste from the syringe and mix thoroughly.

Choose between the

IPS Classic Opaquer

or

IPS Lowpaque



The IPS Classic Glazing and Staining Liquid is used to adjust the consistency of the paste opaquer and to rewet dried opaquer that has been used several times. Do not dilute the material with water.

Apply the first opaquer layer (wash) thinly using a brush. Smooth out any roughness on the metal surface, since the wash is the most important connection between the metal oxide surface and the ceramic.



Apply the first opaquer layer (wash) thinly using a brush.

Firing parameters for the 1st opaquer firing (wash firing) – IPS Classic Opaquer

T	B	S	t ▼	H	V ₁	V ₂
980°C 1796°F	403°C 757°F	6 min. 6 min.	80°C 144°F	1 min. 1 min.	550°C 1022°F	979°C 1794°F

Firing parameters for the 1st opaquer firing (wash firing) –IPS Lowpaque

T	B	S	t ▼	H	V ₁	V ₂
920°C 1688°F	403°C 757°F	6 min. 6 min.	80°C 144°F	1 min. 1 min.	450°C 842°F	919°C 1686°F



Important

If furnaces from other manufacturers are used, these parameters have to be adjusted accordingly.

2nd opaquer firing

Apply the second opaquer layer in such a way that the metal framework is entirely covered with opaquer, i.e. as much as necessary and as little as possible.



Apply the 2nd opaquer layer so ...

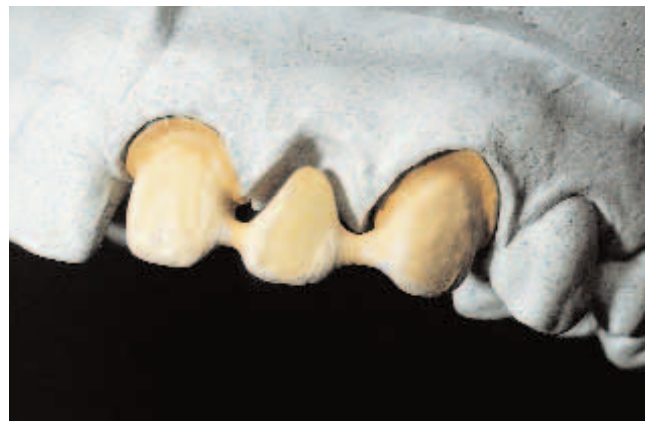


... that it covers the entire framework

For each individual situation, five ready-mixed Intensive Opaquers are available to meet exacting, aesthetic requirements. The Intensive Opaquers are applied before the second opaquer firing in the desired areas (e.g. in the cervical, incisal, occlusal, or palatal area).



Apply Intensive Opaquer onto the desired areas...



... subsequently, the restoration is fired using the stipulated firing parameters for the second opaquer firing

The fired opaquer should have a silky-mat appearance (egg-shell gloss).

Firing parameters for the 2nd opaquer firing – IPS Classic Opaquer

T	B	S	t ▼	H	V ₁	V ₂
970°C 1778°F	403°C 757°F	6 min. 6 min.	80°C 144°F	1 min. 1 min.	550°C 1022°F	969°C 1776°F

Firing parameters for the 2nd opaquer firing – IPS Lowpaque

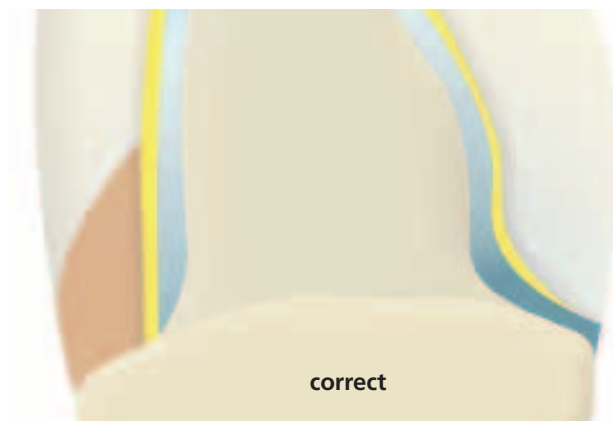
T	B	S	t ▼	H	V ₁	V ₂
910 °C 1670 °F	403°C 757°F	6 min. 6 min.	80°C 144°F	1 min. 1 min.	450°C 842°F	909°C 1668°F



Important
If furnaces of other manufacturers are used, these parameters have to be adjusted accordingly.

1st ceramic margin shoulder firing

A ceramic margin shoulder can be fabricated on the metal framework after the opaquer firing, if the necessary space has been provided during finishing. First, isolate the stone die with IPS Margin Isolating Liquid and then, after drying, with IPS Classic Ceramic Isolating Liquid. After that, generously apply the IPS Margin material in the desired tooth shade in the cervical area in the shape of a drop (i.e. the outer surface of the ceramic material is given a convex shape) and dry.



For aesthetically exacting work, eight Intensive Margin materials are available. They may either be mixed or applied alone. Subsequently, the framework with the applied and dried shoulder material is carefully removed from the die.

Firing parameters for the 1st margin shoulder firing – IPS Classic Opaquer

T	B	S	t ↗	H	V ₁	V ₂
950°C 1742°F	403°C 757°F	6 min. 6 min.	80°C 144°F	1 min. 1 min.	550°C 1022°F	949°C 1740°F

Firing parameters for the 1st margin shoulder firing – IPS Lowpaque

T	B	S	t ↗	H	V ₁	V ₂
930°C 1706°F	403°C 757°F	6 min. 6 min.	80°C 144°F	1 min. 1 min.	550°C 1022°F	929°C 1704°F



Important

If furnaces from other manufacturers are used, these parameters have to be adjusted accordingly.

Tip

When designing a ceramic shoulder (particularly for bridges), the Margin material may be applied slightly higher up in the proximal areas. This will reduce the interdental shrinkage during the subsequent dentin and incisal firings.



Important:

Please consider the different firing parameters of the margin shoulder firings when using IPS Classic Opaquer or IPS Lowpaque.

2nd margin shoulder firing

After the firing, the margin shoulder may have to be slightly adjusted by grinding. The accuracy of fit (sinter shrinkage) has to be reestablished by means of a 2nd margin shoulder firing. Use the same Margin materials as for the 1st margin shoulder firing for that purpose.

First, however, isolate the die again with IPS Classic Ceramic Isolating Liquid. Then, supplement the missing areas by carefully applying the margin material in the space resulting from the 1st margin shoulder firing, thus providing optimum accuracy of fit of the ceramic margin shoulder. After that, complete the margin shoulder, dry, carefully remove the framework from the die, and place it on the firing tray.



Important
Please do not forget to consider the different firing parameters of the 2nd margin shoulder firing as well when using IPS Classic Opaquer or IPS Lowpaque.

Firing parameters for the 2nd margin shoulder firing – IPS Classic Opaquer

T	B	S	t ↗	H	V ₁	V ₂
940°C 1724°F	403°C 757°F	4 min. 4 min.	80°C 144°F	1 min. 1 min.	550°C 1022°F	939°C 1722°F

Firing parameters for the 2nd margin shoulder firing – IPS Classic Lowpaque

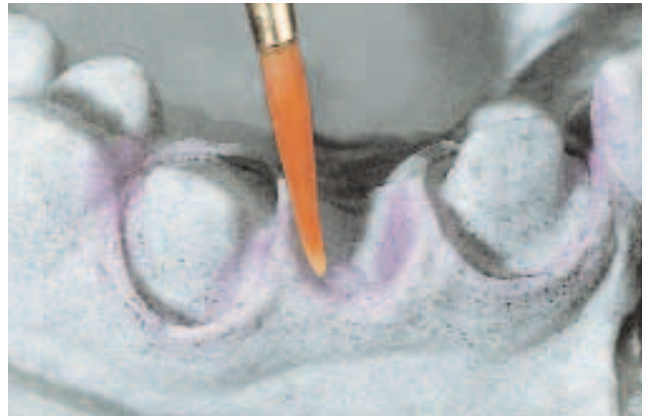
T	B	S	t ↗	H	V ₁	V ₂
930°C 1706°F	403°C 757°F	4 min. 4 min.	80°C 144°F	1 min. 1 min.	550°C 1022°F	929°C 1704°F



Important
If furnaces of other manufacturers are used, these parameters have to be adjusted accordingly.

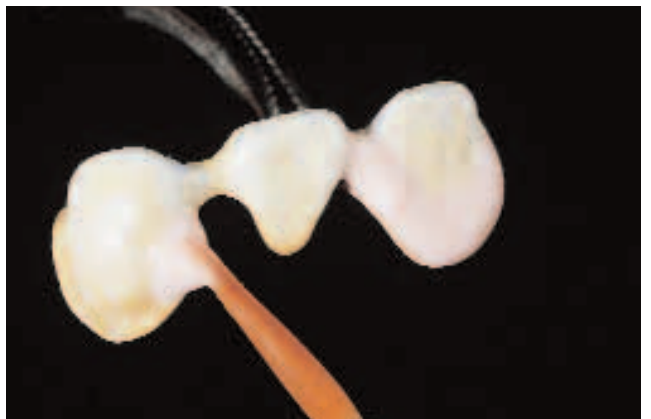
1st dentin and incisal firing

Before layering the dentin and incisal materials, sealing the model is a very important working step. In this way, the ceramic material is prevented from drying out or sticking to the model. Use the IPS Classic Model Separator I, followed by the IPS Classic Ceramic Isolating Liquid to seal the stone die and the adjoining areas of the model.



Isolating the model with the IPS Classic Model Separator I and the IPS Classic Ceramic Isolating Liquid.

To achieve an optimum bond between the ceramic materials and the opaquer surface, apply the IPS Opaque Dentin or Dentin material in small increments, particularly in the cervical and interdental areas (for bridges) and slightly roughen it. In this way, the adaption of the Deep Dentin or Dentin materials on the opaquer surface is enhanced.



A small quantity of IPS Opaque Dentin is applied in the cervical and interdental area.....



.....and is slightly roughened to reach a better adaption of the ceramic material on the opaquer surface.

For large restorations, such as multi-pontic bridges and implant superstructures, the number of subsequent firings can be reduced by conducting an intermediate firing using either IPS Opaque Dentin or dentin material.

Firing parameters for intermediate firing – IPS Opaque Dentin

T	B	S	t ↗	H	V ₁	V ₂
920°C 1688°F	403°C 757°F	4 min. 4 min.	60 °C 108°F	1 min. 1 min.	580°C 1076°F	919°C 1686°F



Important
If furnaces of other manufacturers are used, these parameters have to be adjusted accordingly.

In order to achieve true-to-nature shade effects in areas where space is limited, IPS Opaque Dentin materials are used. They are directly applied on the opaquer layer. For pontics and crowns margins thinning towards the metal, IPS Opaque Dentin material of the appropriate tooth shade is applied in the cervical or basal area to enhance the shade.



IPS Opaque Dentin layering to enhance the shade in the cervical area

Next, outline the mamelon area with a layer of Dentin material. Another option is to contour the full anatomical shape of the tooth. If this procedure is used, the contoured crown has to be reduced in the labial, incisal-mesial and distal areas. The mamelon shape is, once again, only outlined.

Irrespective of the method used, make sure to provide adequate space for the subsequent application of the Incisal and Transparent materials.



Layered IPS Classic Dentin material, where the mamelon shape is only outlined ...

Depending on the patient's situation, an individual and simple build-up using Mamelon, Effect and Transparent material in the incisal third can be made to achieve the best possible aesthetic result.

The palatal fossa of the restoration is covered with IPS Opaque Dentin orange, the marginal ridges are lined with Dentin material and finally, they are covered with Incisal and Transparent material.

Please make sure to overcontour the restoration, so that the actual tooth shape is achieved after the firing.



...then, Incisal and Transparent material is applied in small portions and the anatomical shape is completed by means of over-contouring.

Condensing the ceramic surface (after contouring) using a large, dry brush, makes it more homogeneous, which prevents the ceramic from pulling away from the margin. After lifting the bridge from the model supplement the contact points with dentin and incisal materials. Before firing, the individual units must be separated using a thin blade and cutting through the ceramic down to the opaquer. Moreover, a visual check must be made to make sure that all areas are properly covered with ceramic prior to firing.



Once the contact points have been provided, the bridge restorations are separated in the interdental spaces down to the opaquer using a sharp instrument (e.g. thin scalpel, razor blade).



– Provide adequate support for bridges on the firing tray.

– Position the firing tray in the furnace only after the head has completed its opening sequence (once the buzzer has sounded).

The completed restoration is now placed on the firing tray. Please provide adequate support. The firing tray should be positioned in the firing chamber only after the head is completely open and the buzzer has sounded. Fire the restorations with the following parameters:

Firing parameters for the 1st dentin and incisal firing

T	B	S	t ↗	H	V ₁	V ₂
920°C 1688°F	403°C 757°F	4 min. 4 min.	60 °C 108°F	1 min. 1 min.	580°C 1076°F	919°C 1686°F



Important:
If furnaces of other manufacturers are used, these parameters have to be adjusted accordingly.

2nd dentin and incisal firing

After the first dentin firing, the restoration is finished and cleaned. After that, any deficient areas are supplemented with the same materials used for the 1st dentin and incisal firing. The interdental areas and proximal contact points must be given special attention. Subsequently, conduct the 2nd dentin and incisal firing following the firing parameters indicated below.



Clean the restoration thoroughly before the 2nd dentin and incisal firing. Polishing beads must not be used under any circumstances.



The proximal areas are supplemented with the same materials used for the 1st dentin and incisal firing and the restoration is adjusted using Incisal and Transparent materials.

Firing parameters for the 2nd dentin and incisal firing

T	B	S	t ↗	H	V ₁	V ₂
910°C 1670°F	403°C 757°F	4 min. 4 min.	60 °C 108°F	1 min. 1 min.	580°C 1076°F	909°C 1668°F



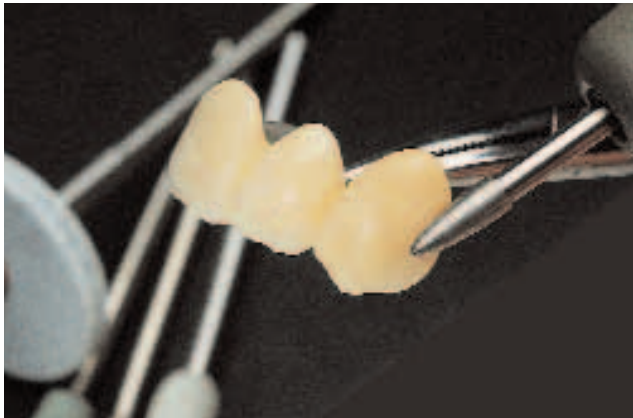
Important:
If furnaces of other manufacturers are used, these parameters have to be adjusted accordingly.

Tip:

Before completion of the restoration, the roughly fired restoration can be tried in to make sure that the shade, shape and function of the layered restoration corresponds with the patient's individual situation.

Preparing the restoration for glaze firing

Prepare the restoration for glaze firing by providing surface textures, such as growth lines and convex/concave areas.



Providing a true-to-nature surface texture including growth lines and convex/concave areas.

Depending on the working habits of the user, the prominent areas can be prepolished using silicone polishers.

Tip:

Natural surface textures may be made visible with the help of gold and/or silver dust. Subsequently, the restoration is cleaned with steam so that the surface is free of dirt and grease. Make sure that the entire gold/silver dust is removed.

Note:

Finishing ceramic restorations results in grinding dust. Avoid inhalation. Use an appropriate suction equipment or protective mask.

Stains and characterization firing

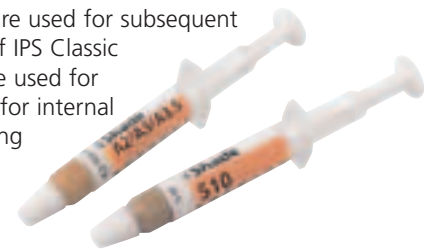
To apply shade corrections and individual characterizations, a wide shade range is available.

Shade corrections with IPS Shade, IPS Shade V and IPS Stains-P

These stains can be fired in a separate stains firing. Small shade adjustments and individualized characterizations can be fired in a glaze firing.

IPS Shade and IPS Shade V

These dentin stains are used for subsequent shade adjustments of IPS Classic restorations. They are used for surface staining and for internal shading of the layering materials.



Note

- If too much IPS Shade Material is added, the structure of the material can change (e. g. distribution of grain size), which has a negative effect on the ceramic construction.
- Clean the restoration thoroughly before the stains and characterization firing. Polishing beads must not be used under any circumstances.

Remove the desired amount of IPS Shade/ IPS Shade V from the syringe and mix with IPS Classic Glazing and Staining liquid to the desired consistency.

Apply IPS Shade/ IPS Shade V in the cervical area and the body of the restoration. Check the shade adjustment achieved with the help of the shade guide.

Avoid pooling or applying too thick of a layer. More intensive shades are achieved by several staining procedures, not by applying thicker layers. If the desired shade is not achieved, repeat the stain firing using the same firing parameters. If only minor shade adjustments are required, they may be done during the glaze firing.

Firing parameters for the stain and characterization firing – IPS Shade / IPS Shade V

T	B	S	t ↗	H	V ₁	V ₂
900°C 1652°F	403°C 757°F	4 min. 4 min.	60 °C 108°F	1 min. 1 min.	0°C 0°F	0°C 0°F



Important

If furnaces of other manufacturers are used, these parameters have to be adjusted accordingly.

IPS Stains-P

Remove the desired amount of IPS Stains from the syringe and mix with IPS Classic Glazing and Staining liquid to the desired consistency.

Apply individualized characterizations with IPS Stains-P on the ceramic surface, e. g. discoloration and enamel stains.



Note

If too much IPS Stains-P Material is added, the structure of the material can change (e. g. distribution of grain size), which has negative effects on the ceramic construction.

Firing parameters for the stains firing – IPS Stains-P

T	B	S	t ▼	H	V ₁	V ₂
900°C 1652°F	403°C 757°F	4 min. 4 min.	60 °C 108°F	1 min. 1 min.	0°C 0°F	0°C 0°F



Important

If furnaces of other manufacturers are used, these parameters have to be adjusted accordingly.

Glaze firing

For the glaze firing, you have several options, depending on the desired working procedure:

- Glaze firing without IPS Classic Glazing material for a true-to-nature, silky-mat gloss.
- Glaze firing with IPS Classic Glazing material for a high gloss.



The following basic rule applies:

The longer the holding time, the higher is the gloss.

Method 1

Glaze firing without glazing material

Slightly wet the restoration using IPS Classic Glazing and Staining liquid and apply shade adjustments and/or individualized characterizations. Position the restoration on the honey-combed firing try and fire. If the glaze firing is conducted without glazing materials, the stains should not cover too large an area. After firing, the gloss of the restoration may be adjusted to meet the patient's individual requirements by polishing with rubber polishers, felt wheels, and pumice.

Firing parameters for glaze firing without glazing material

T	B	S	t ▼	H	V ₁	V ₂
920°C 1688°F	403°C 757°F	4 min. 4 min.	60 °C 108°F	1 min. 1 min.	0°C 0°F	0°C 0°F



Important

If furnaces of other manufacturers are used, these parameters have to be adjusted accordingly.

Method 2

Glaze firing with glazing material

Remove IPS Classic Glazing material from its container and mix thoroughly. If another consistency is desired, the material can be slightly diluted with Classic Glazing and Staining liquid. After that, apply glazing material in the usual manner using a brush. Avoid pooling or applying too thick of a layer.



Apply minor shade adjustments on the applied glazing material using IPS Shade, IPS Shade V and IPS Stains-P.



Apply glazing material in the usual manner using a brush.

Firing parameters for glaze firing with glazing material

T	B	S	t ↗	H	V ₁	V ₂
900°C 1652°F	403°C 757°F	4 min. 4 min.	60 °C 108°F	1–2 min. 1–2 min.	0°C 0°F	0°C 0°F



Important
If furnaces of other manufacturers are used, these parameters have to be adjusted accordingly.

Finally, check the shade of the completed restoration with the help of the corresponding shade tab.



Corrective firings

After the try-in of a restoration, minor shape adjustments, e.g. contact points, pontic rests, margin shoulder adjustments, may be necessary. To meet these different requirements a low-fusing correction powder with medium incisal opacity is available.



Depending on the individual preference, the IPS Classic Correction Powder can be processed using two different methods.

Method 1 (dentin / incisal adjustments)

Mix IPS Classic Correction Powder with any dentin or incisal material in a 1:1 ratio and then mix with the desired build-up liquid. Make adjustments and fire.

Firing parameters for the corrective firing with IPS Classic Correction Powder (1:1)

T	B	S	t ↗	H	V ₁	V ₂
810°C 1490°F	403°C 757°F	4 min. 4 min.	60 °C 108°F	1 min. 1 min.	420°C 788°F	809°C 1488°F



Important
If furnaces of other manufacturers are used, these parameters have to be adjusted accordingly.

Method 2 (contact areas)

Mix IPS Classic Correction Powder alone with the desired build-up liquid. Make adjustments and fire.

Firing parameters for the corrective firing with IPS Classic Correction Powder (alone)

T	B	S	t ↗	H	V ₁	V ₂
690°C 1274°F	403°C 757°F	4 min. 4 min.	60 °C 108°F	0.5 min. 0.5 min.	420°C 788°F	689°C 1272.2°F



Important

If furnaces of other manufacturers are used, these parameters have to be adjusted accordingly.

The result:



Completely fired IPS Classic bridge on the model.

IPS Classic – Firing parameters

Method A – IPS Classic Opaquer

Firing parameters for the 1st opaquer firing (wash firing) – IPS Classic Opaquer

T	B	S	t ↗	H	V ₁	V ₂
980°C 1796°F	403°C 757°F	6 min. 6 min.	80°C 144°F	1 min. 1 min.	550°C 1022°F	979°C 1794°F

Firing parameters for the 2nd opaquer firing – IPS Classic Opaquer

T	B	S	t ↗	H	V ₁	V ₂
970°C 1778°F	403°C 757°F	6 min. 6 min.	80°C 144°F	1 min. 1 min.	550°C 1022°F	969°C 1776°F

Firing parameters for the 1st margin shoulder firing – IPS Classic Opaquer

T	B	S	t ↗	H	V ₁	V ₂
950°C 1742°F	403°C 757°F	6 min. 6 min.	80°C 144°F	1 min. 1 min.	550°C 1022°F	949°C 1740°F

Firing parameters for the 2nd margin shoulder firing – IPS Classic Opaquer

T	B	S	t ↗	H	V ₁	V ₂
940°C 1724°F	403°C 757°F	4 min. 4 min.	80°C 144°F	1 min. 1 min.	550°C 1022°F	939°C 1722°F

Method B – IPS Lowpaque

Firing parameters for the 1st opaquer firing (wash firing) –IPS Lowpaque

T	B	S	t ↗	H	V ₁	V ₂
920°C 1688°F	403°C 757°F	6 min. 6 min.	80°C 144°F	1 min. 1 min.	450°C 842°F	919°C 1686°F

Firing parameters for the 2nd opaquer firing – IPS Lowpaque

T	B	S	t ↗	H	V ₁	V ₂
910 °C 1670 °F	403°C 757°F	6 min. 6 min.	80°C 144°F	1 min. 1 min.	450°C 842°F	909°C 1668°F

Firing parameters for the 1st margin shoulder firing – IPS Lowpaque

T	B	S	t ↗	H	V ₁	V ₂
930°C 1706°F	403°C 757°F	6 min. 6 min.	80°C 144°F	1 min. 1 min.	550°C 1022°F	929°C 1704°F

Firing parameters for the 2nd margin shoulder firing – IPS Classic Lowpaque

T	B	S	t ↗	H	V ₁	V ₂
930°C 1706°F	403°C 757°F	4 min. 4 min.	80°C 144°F	1 min. 1 min.	550°C 1022°F	929°C 1704°F

Firing parameters for IPS Opaque Dentin (intermediate firing)

T	B	S	t ↗	H	V ₁	V ₂
920°C 1688°F	403°C 757°F	4 min. 4 min.	60 °C 108°F	1 min. 1 min.	580°C 1076°F	919°C 1686°F

Firing parameters for glaze firing without glazing material

T	B	S	t ↗	H	V ₁	V ₂
920°C 1688°F	403°C 757°F	4 min. 4 min.	60 °C 108°F	1 min. 1 min.	0°C 0°F	0°C 0°F

Firing parameters for the 1st dentin and incisal firing

T	B	S	t ↗	H	V ₁	V ₂
920°C 1688°F	403°C 757°F	4 min. 4 min.	60 °C 108°F	1 min. 1 min.	580°C 1076°F	919°C 1686°F

Firing parameters for glaze firing with glazing material

T	B	S	t ↗	H	V ₁	V ₂
900°C 1652°F	403°C 757°F	4 min. 4 min.	60 °C 108°F	1–2 min. 1–2 min.	0°C 0°F	0°C 0°F

Firing parameters for the 2nd dentin and incisal firing

T	B	S	t ↗	H	V ₁	V ₂
910°C 1670°F	403°C 757°F	4 min. 4 min.	60 °C 108°F	1 min. 1 min.	580°C 1076°F	909°C 1668°F

Firing parameters for the corrective firing – IPS Classic Correction Powder (1:1)

T	B	S	t ↗	H	V ₁	V ₂
810°C 1490°F	403°C 757°F	4 min. 4 min.	60 °C 108°F	1 min. 1 min.	420°C 788°F	809°C 1488°F

Firing parameters for the stains and characterization firing – IPS Shade / IPS Shade V

T	B	S	t ↗	H	V ₁	V ₂
900°C 1652°F	403°C 757°F	4 min. 4 min.	60 °C 108°F	1 min. 1 min.	0°C 0°F	0°C 0°F

Firing parameters for the corrective firing – IPS Classic Correction Powder (alone)

T	B	S	t ↗	H	V ₁	V ₂
690°C 1274°F	403°C 757°F	4 min. 4 min.	60 °C 108°F	0.5 min. 0.5 min.	420°C 788°F	689°C 1272.2°F

Firing parameters for the stains firing – IPS Stains-P

T	B	S	t ↗	H	V ₁	V ₂
900°C 1652°F	403°C 757°F	4 min. 4 min.	60 °C 108°F	1 min. 1 min.	0°C 0°F	0°C 0°F



These firing parameters represent standard values applicable to the P100, P 200, PX 1 and EP 600 Combi furnaces from Ivoclar Vivadent. The temperatures indicated also apply to furnaces of older generations, such as the P20, P80, P90 and P95. If one of these furnaces is used, however, the temperatures may deviate by $\pm 10\text{ °C}/18\text{ °F}$, depending on the age and type of the heating muffle.

If a non-Ivoclar Vivadent furnace is used, temperature corrections may be necessary.

Regional differences in the power supply or the operation of several electronic devices on the same circuit may make adjustments of the firing temperatures necessary.

Ceramic furnaces of other manufacturers often feature opening mechanisms different from that of Ivoclar Vivadent furnaces. Therefore, the firing conditions may also differ. Make sure that these varying firing conditions are taken into account when working with IPS Classic.

Remember to calibrate your furnace regularly.

Materials combination table

Chromascop shades

Assortment	Materials / Shade groups		white		yellow		light brown		grey		dark brown		Special materials										
IPS Classic	Opaker (O)		110	120	130	140	210	220	230	240	310	320	330	340	410	420	430	440	510	520	530	540	
	Intensive Opaker (IO)		white, orange, brown, violet, grey																				
	Dentin (D)		110	120	130	140	210	220	230	240	310	320	330	340	410	420	430	440	510	520	530	540	
	Intensive Dentin (ID)		neutral, white, yellow honey, light brown, dark brown, pink, grey, blue, clear pink, red pink																				
	Incisal (S)		S3	S1	S1	S1	S2	S2	S2	S2	S5	S5	S5	S2	S4	S4	S1	S4	S4	S2	S5	S3	
IPS Opaque Dentin	Opal Incisal (OS)		OS3	OS1	OS1	OS1	OS2	OS2	OS2	OS2	OS5	OS5	OS5	OS2	OS4	OS4	OS1	OS4	OS4	OS2	OS5	OS3	
	Transparent (T)		neutral, reddish, greyish, transparent																				
	Opaque Dentin (Op.D.)		–	120	130	140	210	220	230	240	310	320	–	–	410	420	430	440	510	–	–	–	
	Margin (M)		M1	M2	M2	M3	M3	M3	M4	M4	M6	M6	M5	M5	M9	M9	M9	M9	M9	M7	M7	M8	
	Intensive Margin (M)		M10, M11, M12, M13, M14																				
IPS Impulse	Occlusal Dentin (Oc.D.)		brown, yellow, orange																				
	Mamelon material (MM)		MM1, MM2, MM3, MM4,MM orange																				
	Incisal (S)		yellow-grey, grey																				
	Transparent (T)		yellow-grey, grey, blue																				
	Molar Incisal (MS)		MS																				
IPS Shade	Incisal Edge material (IS)		light yellow, yellow																				
	Dentin Stains		110	120	130	140	210	220	230	240	310	320	330	340	410	420	430	440	510	520	530	540	
IPS Stains-P	Characterization Stains		white, orange, bamboo, caramel brown, copper brown, cork brown, mahogany, azure, black																				yellow, red, blue

A-D shades

Assortment	Materials / Shade groups	A	B	C	D	Special materials
IPS Classic V	Opaker (O)	A1 A2 A3 A3.5 A4	B1 B2 B3 B4	C1 C2 C3 C4	D2 D3 D4	
	Intensive Opaker (IO)	IO-A	IO-B	IO-C	IO-A/IO-B	IO-white, IO-violet
	Dentin (D)	A1 A2 A3 A3.5 A4	B1 B2 B3 B4	C1 C2 C3 C4	D2 D3 D4	
	Incisal (S)	S1 S2 S3 S4	S1 S2 S3 S4	S2 S2 S3 S4	S1 S2 S3	
	Transparent (T)	clear, neutral				
IPS Opaque Dentin V	Opaque Dentin (Op.D.)	A1 A2 A3 A3.5 A4	B1 B2 B3 B4	C1 C2 C3 C4	D2 D3 D4	
	Opaque Dentin (Op.D.)	yellow, orange, brown				
IPS Margin V	Margin Material (M)	A1 A2 A3 A3.5 A4	B1 B2 B3 B4	C1 C2 C3 C4	D2 D3 D4	
	Intensive (M)	yellow, orange, brown				
	Occlusal Dentin (Oc.D.)	orange	yellow	brown	orange, yellow	
IPS Impulse	Mamelon Material (MM)	MM1, MM2, MM3, MM4, MM orange				
	Incisal (S)	yellow-grey, grey				
	Transparent (T)	yellow-grey, grey, blue				
	Molar Incisal (MS)	MS				
	Incisal Edge material (IS)	light yellow, yellow				
IPS Shade V	Dentin Stains	A1 A2 A3 A3.5 A4	B1 B2 B3 B4	C1 C2 C3 C4	D2 D3 D4	
IPS Stains-P	Characterization Stains	white, orange, bamboo, caramel brown, copper brown, cork brown, mahogany, azure, black				basic yellow, basic red, basic blue

§ Classic – A sound concept always reaps success!



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Date information prepared:
05/2003

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Printed in Liechtenstein
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574376/0603/e/2/BVD

