ZIRMAX

Directions for Use

ALPHADENT

Device Name

Proprietary Name	ZIRMAX®
Common Name	Dental Ceramic
Classification Name	Porcelain powder for clinical use

Indication for Use

ZIRMAX is indicated for veneering of zirconia framework and copings for the preparation of crowns and bridges.

Contraindication

The application of ZIRMAX is contraindicated if

- the coping of artificial teeth is not made of zirconia materials.
- a crack occurred by compression or tension.
- a patient is likely to be allergic to any ingredients of dental ceramic.

Characteristics

- Crack-free Porcelain for Zirconia Coping
- Enhanced the Bonding Strength with Primer
- Improved Esthetic Nature and Shade Stability
- Easy Build-up and Economic Porcelain

Contents

Description

ZIRMAX is a dental material product composed of feldspar, quartz, oxides, carbonates and color pigments including fluorescent pigment. It consists of Base Opaque, Dentine(including Dentine modifier), Enamel, Translucent, Cervical, Margin, Glaze and Stain. They are used by dental technicians for the preparation of all-ceramic crowns and bridges. It is used in prosthetic dentistry by heating the powder mixture to a high temperature in a furnace to produce a hard prosthesis with a glass-like finish.

Standard and Classification

(1) Applicable standard;

ISO6872:2008 Dentistry - Ceramic materials

(2) Classification by ISO6872:2008; Type I, Class 1

According to clause 4 of ISO6872, Type I includes ceramic products which are provided as powders, pastes and aerosols, and Type II includes all other forms of ceramic products. All components of ZIRMAX are included in ceramic products as powder. Therefore, only Type I can apply to classify all components by ISO6872:2008. And ZIRMAX belongs to Class 1 since it is the aesthetic ceramic for coverage of a ceramic substructure.

Color Combination Chart (Shade Table)

Shade (Vita Lumin)	A1	A2	A3	A3.5	A4	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	D4
BASE DENTINE	BDA1	BDA2	BDA3	BDA3.5	BDA4	BDB1	BDB2	BDB3	BDB4	BDC1	BDC2	BDC3	BDC4	BDD2	BDD3	BDD4
DENTINE	A1D	A2D	A3D	A3.5D	A4D	B1D	B2D	B3D	B4D	C1D	C2D	C3D	C4D	D2D	D3D	D4D
CERVICAL	AC1+ A1D	AC1+ A2D	AC1	AC2+ A3.5D	AC2	BC+ B1D	BC+ B2D	BC+ B3D	BC	CC+ C1D	CC+ C2D	CC+ C3D	CC	DC+ D2D	DC+ D3D	DC
ENAMEL	E2	E2	E3	E3	E4	E1	E3	E3	E3	E2	E3	E3	E4	E2	E3	E3

TRANSLUCENT	T1	T2	T3	TC	TO	TP	TB	TG	TM
	TP1	TP2	TP3	Clear	Orange	Pink	Blue	Grey	Milky

DENTINE MODIFIER	DM-Y	DM-O	DM-P	DM-DB	DM-G	DM-W	DM-B
	Yellow	Orange	Pink	Dark Brown	Grey	White	Blue

MARGIN	MG1	MG2	MG3	MG4	MG5
	A1, B1	A2, B2, C1, D2	A3, B3, B4	C2, D3, D4	A3.5, A4, C3, C4

GLAZE & STAIN							
GLAZE	YELLOW	ORANGE	OCHER	BROWN	RED BROWN	DARK BROWN	
PINK	LILAC	BLUE	BLACK	GREY	WHITE		

Bleaching Shade of ZIRMAX

BASE DENTINE	BDAo		BDBo	
DENTINE	AooD	AoD	BooD	BoD

PRIMER
ZL

Colors of ZIRMAX

Porcelain	Colors	Packing Unit	Name
BASE DENTINE	18	10g 50g	BDA1/ BDA2/ BDA3/ BDA3.5/ BDA4/ BDB1/ BDB2/ BDB3/ BDB4/ BDC1/ BDC2/ BDC3/ BDC4/ BDD2/ BDD3/ BDD4/ BDAo/ BDBo
DENTINE	20	10g 50g	A1D/ A2D/ A3D/ A3.5D/ A4D/ B1D/ B2D/ B3D/ B4D/ C1D/ C2D/ C3D/ C4D/ D2D/ D3D/ D4D/ AooD/ AoD/ BooD/ BoD
DENTINE MODIFIER	7	10g 50g	DM-Y/ DM-O/ DM-P/ DM-DB/ DM-G/ DM-W/ DM-B
ENAMEL	4	10g 50g	E1/ E2/ E3/ E4
TRANSLUCENT	9	10g 50g	TP1/ TP2/ TP3/ TC/ TO/ TP/ TB/ TG/ TM
CERVICAL	5	10g 50g	AC1/ AC2/ BC/ CC/ DC
MARGIN	5	10g 50g	MG1/ MG2/ MG3/ MG4/ MG5
GLAZE & STAIN	13	3g	**GLAZE/ STAIN** Yellow, Orange, Ocher, Brown, Red Brown, Dark Brown, Pink, Lilac, Blue, Black, Grey, White
PRIMER	1	3g	ZL

Kit of ZIRMAX

MASTER KIT

BASE DENTINE (10g) BDA2/ BDA3/ BDB2/ BDB3
DENTINE (10g) A2D/ A3D/ B2D/ B3D
ENAMEL (10g) E2/ E3
TRANSLUCENT (10g) T1/ T2/ TC/ TM
CERVICAL & MARGIN (10g) AC1/ BC/ MG2/ MG3
GLAZE (3g), PRIMER (3g)
LIQUIDS Build-up(15ml)/ Glazing(10ml)

COMPLETE KIT

All porcelains of ZIRMAX

TRIAL KIT

BASE DENTINE (10g) BDA2/ BDA3
DENTINE (10g) A2D/ A3D
ENAMEL & TRANSLUCENT (10g) E2/ E3/ T1/ TC/ TM
GLAZE (3g), PRIMER (3g)
LIQUIDS Glazing(10ml)

Firing Schedule

Condition / Bake		PreDry		Firing			Vacuum (㎜Hg)
		Start Temp.	Time	Heating Rate	Final Temp.	Holding Time	
PRIMER		500℃	3 min	60℃/min	980℃	10 min	full
MARGIN		500℃	3 min	60℃/min	910℃	1 min	full
BASE DENTINE		500℃	5 min	60℃/min	890℃	1 min	full
1st BUILD-UP(Body)		500℃	5 min	60℃/min	880℃	1 min	full
2nd BUILD-UP(Body)		500℃	3 min	60℃/min	870℃	1 min	full
GLAZING	Self-	500℃	3 min	60℃/min	880℃	1 min	-
	Powder	500℃	5 min	60℃/min	860℃	1 min	-

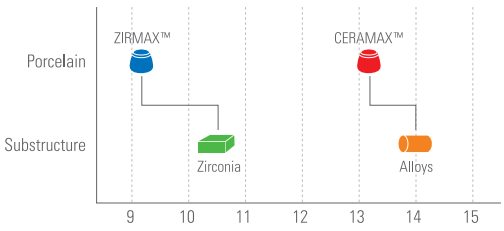
- This firing schedule is just recommended conditions for your good firing results.
- You should change the firing temperature according to your porcelain furnace, and control the holding time within 1min on the number of bridges.

Thermal Expansion and Firing

In porcelain-substructure system the coefficient of thermal expansion(CTE) is a key property of dental porcelain powder. It must be consistent with the CTE of the zirconia so as to manufacture a excellent artificial teeth of high coherency with zirconia substructure.

Leucite crystal is used for the CTE of dental porcelain powder which should be controlled down 1×10^{-6}/℃ less than the CTE (10.5×10^{-6}/℃) of zirconia.

Comparison of CTE



Physical and Chemical Properties

The result of physical and chemical properties of dental porcelain powder measured in accordance with KFDA, ISO standard is as follows.

These results are adaptable to KFDA, ISO and other international standards.

Properties	Results
Coefficient of Thermal Expansion ($\times10^{-6}$/℃)	9.2
Glass Transition Temperature (℃)	570
Chemical Solubility [1] (loss-in-mass, ㎍/㎠)	12.0
Flexural Strength [2] (MPa)	88
Bond Strength [3] (MPa)	58

Requirements of ISO Standard

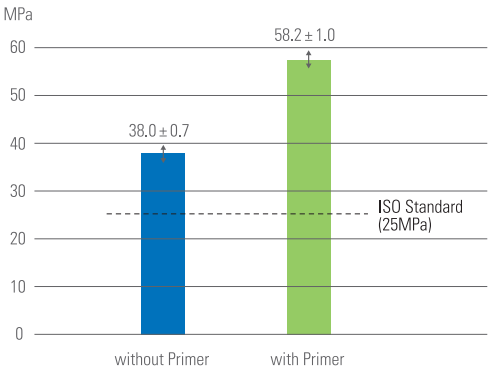
1) Chemical Solubility < 100 ㎍/㎠
2) Flexural Strength > 50 MPa
3) Bond Strength > 25 MPa in case of PFM

Comparison of Bond Strength

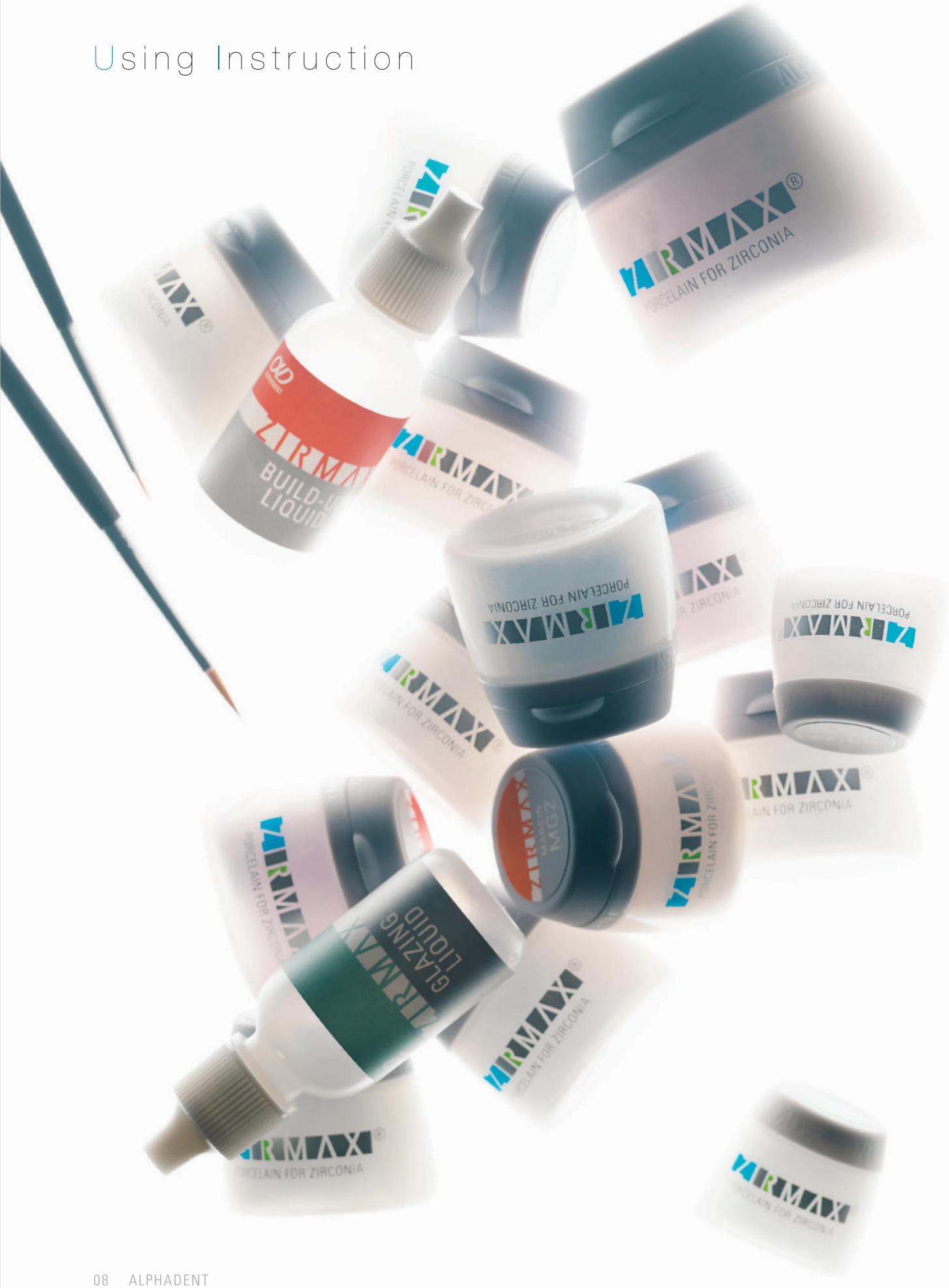
ZIRMAX Primer is a bonder which used to increase the bond strength of porcelain to zirconia.

Comparison of bond strength of porcelain with Primer and without Primer is as follows.

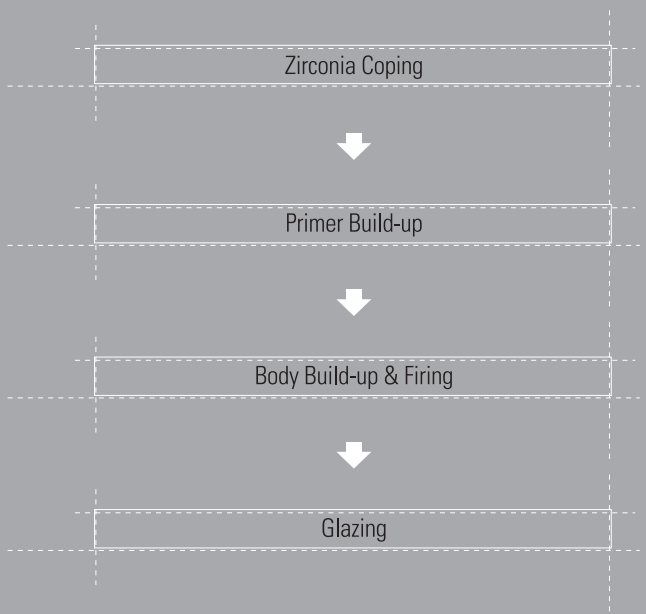
Bond Strength



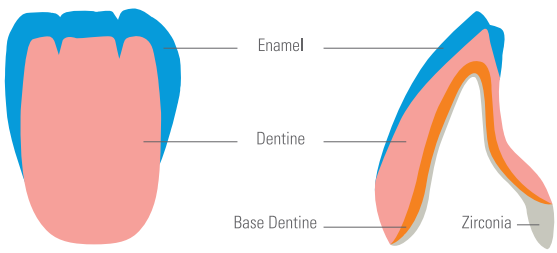
Using Instruction



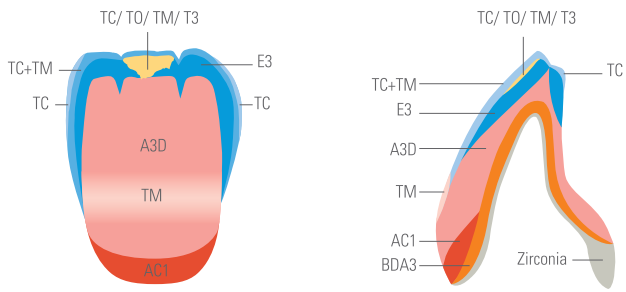
Basic Process

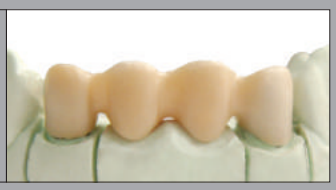


Basic Build-up



Multi-Layering Build-up

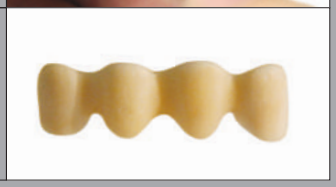


1 Fabrication of zirconia coping	

Zirconia Coping

Zirconia coping is fabricated from sintering after milling process of zirconia block according to the instruction of manufacturer.

A shaded zirconia coping is getting from dipping into a special coloring liquid before sintering process.

1 Primer ZL porcelain	
2 Build-up Primer	
3 Zirconia coping after firing Primer	
4 Sand-blasting the excess Primer	
5 Zirconia coping after removing the excess Primer	

Primer Build-up

Primer is used for increasing the bond strength of porcelain to zirconia coping.

Primer is infiltrated into the micropore of zirconia coping when build-up and firing, and it is reinforcing the zirconia coping and assisting the cohesion of porcelain onto zirconia coping.

The excess primer on the surface of zirconia coping should be removed carefully by sand-blasting in order to achieve the strengthening effect of primer.

Body Build-up

Common build-up technique of ZIRMAX porcelain is same as CERAMAX.

Base Dentine porcelain is applied firstly in case of non-shading of zirconia coping.

If zirconia coping is shaded with coloring liquid, you can build-up Dentine porcelain directly without using Base Dentine.

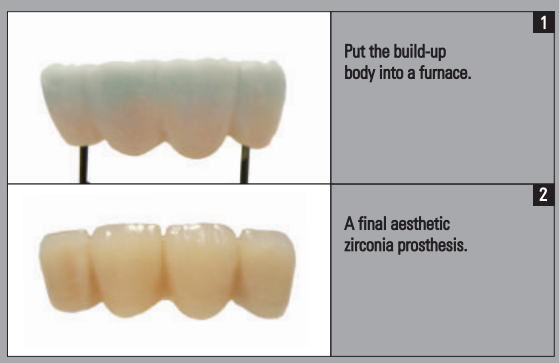
1 Base Dentine, Dentine, Enamel and Translucent porcelain

2 Build-up Dentine

3 Build-up Enamel & Translucent

Body Firing & Glazing

Body firing according to the firing schedule.
Contouring and glazing after firing.



1 Put the build-up body into a furnace.

2 A final aesthetic zirconia prosthesis.

Troubleshooting

Bubble of Porcelain

Bubbling on the surface after body-firing

Insufficient Condensation or excess water

- Mix powder with water to be creamy state without excess water. Condense and vibrate smoothly after build up porcelain, and be careful of water not concentrating at the parts of incisal or cervical. Remove excess water with tissue at lingual surface.

In case of gas expansion - Do not heat rapidly to dry porcelain after build-up.

In case of Gaze firing in vacuum - Fire Glaze surly at the atmosperic pressure.

Crack & Cleavage

Crack or Cleavage after firing porcelain

Over-firing of porcelain - Do not fire a porcelain at higher temperature than recommended. Follow the firing schedule of CERAMAX.

Thermal-shock - Cooling down a porcelain slowly after firing. Do not hold a hot porcelain-body with a cold instrument.

Crack occured on the surface of porcelain

Inadequate Build-up - Avoid too much shock or pressure when build-up.

Too fast dry - Dry porcelain fully in moderate rate.

Insufficient condensation - Remove water sufficiently by condensation, brushing and tissue.

Crack occurred on the side of pontic base

Too thick the porcelain layer. - Design the zirconia coping in consideration of porcelain layer. Too thick porcelain layer, induce compression on the surface and tension on the inner part during the cooling, and then crack occurs in the porcelain due to increase stress.

Color Change

Greening or Whitening after body-firing

GREETING: From a contaminated grinding instruments. Contaminated with dust or debris of instruments, amalgam and alloys.
- Devide the instruments for alloy or zirconia and for porcelain.
  Be careful of not contaminating porcelain with dust or debris of instruments, amalgam and alloys.

Fire at too high temperature or build-up Enamel porcelain excessively.
- Follow the recommended firing temperature. and apply Enamel on the 1/3 part of Incisal.

Not enough gloss after firing

Insufficient the 1st firing. - Fire porcelain up to getting glossy at the 1st firing

In case of repeated firing. - Do not fire many times if possible

Not enough translucency after glazing

The start temperature is too high. - Follow strictly the recommended firing schedule.

In case of washing porcelain with a contaminated solution after contouring.
- Use always a fresh cleaning solution. If use a contaminated solutions as alcohol or acetone, porcelain will be changed color turbidly after glazing by a foreign matters which attached on the porcelain surface.

Greyish after staining

Organic ingredients was deteriorated since stain is left alone for a long time after mixing with liquid
- Use a glaze mixed with liquid just as needed amounts, and store liquid bottle at room temperature and keep away from light.

Notice


ZIRMAX
PORCELAIN FOR ZIRCONIA
TRANSLUCENT
TM
Milky
A2D
CERVICAL
BC

Warnings

- For Dental Use Only
- If accidental contact with eyes or prolonged contact with inhalation of oral tissues occurs, flush immediately with large amounts of water.
- Protective device for the respiratory tract is highly recommended during using.
- Consulting with a doctor in case of toothache, allergy and crack on prosthesis are strongly recommended.

Storage

- Do store at proper temperature or keep out of the intense light.
- Don't keep with humidity.

Symbols Found in Labeling

Charting	Detail	Charting	Detail
Type I	Classification According to ISO6872		Date of Manufacturing
CTE	Coefficient of Thermal Expansion	EC REP	EU Representative
Tg	Glass Transition Temperature		Keep Dry
LOT	Lot Number	REF	Article Number
	Manufacturer		See User's Guide

Manufacturer

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UM 15 (2015.10, rev.1)

2009.10.13 designed by ***Imotion*** *+82 2 3482 0729*