

# match *Maker*

Ceramic for Zirconium Frameworks

# Zr

Perfect shades straight from the bottle



Instruction Manual



matchMaker  
Ceramic for  
Zirconium Frameworks  
Zr



Perfect shades  
straight from the bottle



Matchmaker Zr Ceramic for Zirconium Frameworks

Matchmaker Zr has been specially developed for layering on top of zirconium bridges and copings<sup>1</sup>. Coefficient of expansion, shades and light handling properties have been carefully developed to give superb results over the whole range of such frameworks. The dentine fires at 810°C and shows remarkable vitality and colour veracity in the whole of the shade range A1 to D4 and the latest bleach shades HA0, HB0 and HB00.

Index

Product Selection Chart & Firing Instruction Overview	1
Frame Liner Firing	2
Shoulder Firing	3
Neck Dentine, Dentine & Enamel 1st Firing	4
Building Translucency, Opalescence & Fluorescence into the Crown	5
Dentine & Enamel 2nd Firing	6
Glaze Firing & Application of Stains	7
Physical Properties	8



<sup>1</sup> Matchmaker Zr is unsuitable for aluminium oxide copings.

## Matchmaker Zr Ceramic for Zirconium Frameworks

### Product Selection Chart

Shade	HA0	A1	A2	A3	A3.5	A4	HB0	HB00	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	D4		
Matchmaker Zr Frame Liners	FL1	FL1	FL1	FL1	FL1	FL3	FL2	FL2	FL2	FL1	FL1	FL3	FL3	FL3	FL3	FL3	FL3	FL3	FL3		
Matchmaker Zr Neck Dentines	ND1	ND1	ND2	ND2	ND3	ND4	ND1	ND1	ND1	ND2	ND3	ND3	ND1	ND1	ND3	ND4	ND3	ND3	ND2		
Matchmaker Zr Shoulders	S32	S32	S32	S32	S33	S33	S32	S32	S32	S32	S33	S33	S34	S34	S34	S34	S34	S34	S34	S31 Neutral	S35 Neutral Opaque
Matchmaker Zr Dentines	HA0	A1	A2	A3	A3.5	A4	HB0	HB00	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	D4		
Matchmaker Zr Enamels	E7	E8	E8	E9	E9	E10	E7	E7	E7	E9	E9	E9	E10	E9	E9	E10	E10	E9	E9		

Matchmaker Zr Colour Transluents	CT1 Blue	CT2 White	CT3 Red	CT4 Yellow	CT5 Orange	CT7 Grey						
Matchmaker Zr Transluents	C Clear	N Neutral	OT Opal Translucent									
Matchmaker Zr Fluorescent	FN Fluorescent Neutral (mix with dentines or enamels for increased fluorescence)											
Matchmaker Zr Opacious Dentines	SD1 Buttermilk	SD2 Ivory	SD3 Honey	SD4 Sand	SD5 Buff							
Matchmaker Zr Gingivals	G1 Light Pink	G2 Dark Pink										
Matchmaker Zr Glaze Powder												
Matchmaker CTE Stains	1 White	2 Yellow	3 Peach	4 Orange Brown	5 Dark Brown	6 Pink	7 Blue	8 Grey	A	B	C	D

### Firing Temperatures

	Start temp °C	Min dry time	Temp rise °C /min	Vacuum	High temp °C	Hold time without vacuum	Appearance
Frame Liner firing	450	2 min	55	Yes	800	1 min	Slight sheen
Shoulder firing	450	4 min	45	Yes	830	1 min	Slight sheen
Neck & 1st Dentine firing	450	6 min	45	Yes	810	1 min	Slight sheen
2nd Dentine firing	450	6 min	45	Yes	800	1 min	Slight sheen
Glaze without glaze powder	480	2 min	45	-	820	-	Glaze depending on requirements
Glaze with glaze powder	480	2 min	45	-	790	1 min	Glaze

All temperatures given are based on an accurately calibrated vertical muffle furnace. Individual furnaces and operating conditions vary. If furnace has previously been used with metal alloys, decontaminate before use. Shake all powder bottles before use.

## Frame Liner Firing

Matchmaker Zr Frame Liner may be used to reduce the optical brightness of zirconium copings. It will not normally be required when the coping is pre-shaded or where the depth of the Matchmaker Zr ceramic is greater than 1.0mm.



Choose the shade of Frame Liner to suit the case concerned. Suggestions are shown in the product selection chart. It is more often required with mid to dark shades and where space is limited.

Mix the Matchmaker Zr Frame Liner powder with the Matchmaker Zr Modelling Liquid and apply one thin even layer and fire before Matchmaker Zr Shoulder or Dentine Porcelains.



The fired Frame Liner has a slight sheen appearance.

**Notes:** If furnace has previously been used with metal alloys, decontaminate before use.

Only a very thin layer is required.



Matchmaker Zr Frame Liner	Start Temp °C	Minimum Drying Time	Temp Rise °C / Min	Vacuum	High Temp °C	Hold Time Without Vacuum
Firing	450	2 minutes	55	Yes	800	1 minute

## Shoulder Firing

Seal the model with at least two applications of Matchmaker Model Sealant. This has minimal thickness. Then lubricate the edges of the die using the Matchmaker Ceramic Separating Pen. Place the coping back onto the model ensuring that it is fully seated.

Choose the shade of Matchmaker Zr Shoulder Powder for the shade concerned and mix to a creamy consistency with Matchmaker MC/LF/ALX/Zr Shoulder Liquid and apply to the neck of the coping, pushing the material into the margin area.

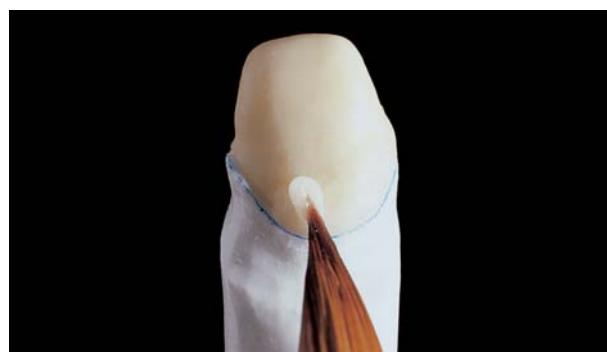
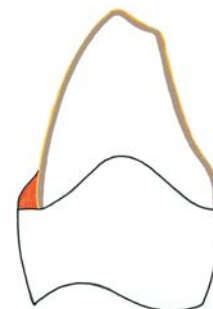
To reduce the chroma mix with S31 Neutral. To increase the opacity mix with S35 Neutral Opaque.

Vibrate porcelain into place.  
Remove excess moisture with a tissue.  
Allow to partially dry until the powder begins to lighten in colour. This can be accelerated by the application of gentle heat or warm air by means of a hair dryer.  
The finished and fired porcelain margin should be convex, have a slight sheen and fit precisely to the model.  
When the coping has cooled the die should once more be lubricated using the Matchmaker Ceramic Separating Pen and the coping placed on it.  
Add additional shoulder material to compensate for any firing shrinkage and re-fire at same temperatures.

**Notes:** A minimum 0.5mm around the whole circumference of the shoulder is required for support.

**Care:** Always ensure the die and inside of the coping are clean before replacement of coping on die.

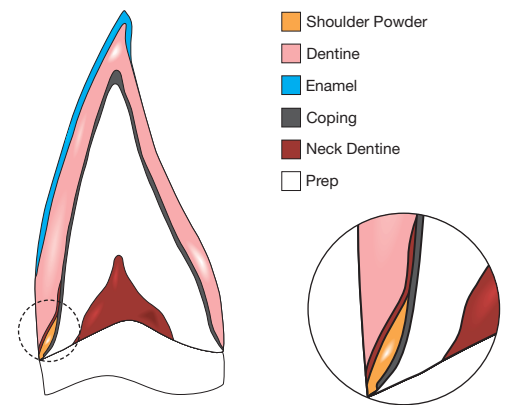
Do not overbuild initial shoulder application.



Matchmaker Zr Shoulder Powder	Start Temp °C	Minimum Drying Time	Temp Rise °C / Min	Vacuum	High Temp °C	Hold Time Without Vacuum
All Firings	450	4 minutes	45	Yes	830	1 minute

## Neck Dentine, Dentine and Enamel 1st Firing

Moisten the coping with the Matchmaker Zr Modelling Liquid. Use Matchmaker Zr Neck Dentines to reduce the optical value in thin margin areas, making it possible to recreate natural emergence contour profiles. Mix the shades of Matchmaker Zr Dentine and Neck Dentine chosen from the product selection chart with Matchmaker Zr Modelling Liquid. Apply a thin layer over the fired Frame Liner around the cervical margin, blending up onto the liner approx. 1-2mm interstitially, mesially and distally. Continue to build up the dentine and enamel and fire together as firing instructions.



Build in areas of greater depth of colour with Matchmaker Zr Opacious Dentine and complete the labial anatomical form of the crown with the chosen shade of dentine material.

Once the anatomical form has been contoured, over build slightly in length to allow for minimal shrinkage during firing. Reduce the dentine incisally, mesially and distally to allow for the enamel.

**Hint:** For even greater vitality, a thin layer of Matchmaker Zr Clear may be laid down in between the dentine and enamel layers.

Either use the Matchmaker Zr Enamels shown for the individual shades or for more natural effects use Matchmaker Zr Opalescent Colour Transluents or mix with between 25% and 50% Opal Translucent (see page 5).



Apply the enamel labially to the dentine and blend towards the cervical margin (as shown in the diagram). Note that it is unnecessary to remove large amounts of dentine from the incisal area.

Continue the palatal build-up of enamels and opacious dentines over the already applied Matchmaker Zr Dentine.

Remove the restoration from the model and build up the contact points with the appropriate Matchmaker Zr Dentine or Enamel.

Complete the interstitial and incisal build-up by overlaying with enamel, allowing for any shrink back during firing.



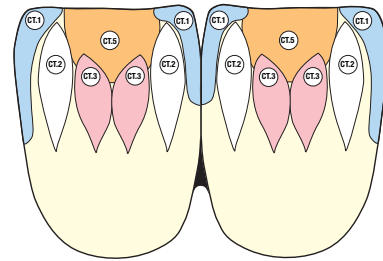
After firing the surface should appear textured with a slight sheen.

Matchmaker Zr Neck Dentine, Dentine & Enamel	Start Temp °C	Minimum Drying Time	Temp Rise °C / Min	Vacuum	High Temp °C	Hold Time Without Vacuum
1st Firing	450	6 minutes	45	Yes	810	1 minute

## Building Translucency, Opalescence and Fluorescence into the Crown

The natural enamel layer is made up of many soft and subtle colours. Many of these may be built up using the Colour Transluents and Neutral within the Matchmaker Zr system.

Their power comes when they are laid alongside complementary colours - see diagram opposite.



Lay down the Matchmaker Zr Colour Translucent powders using a lateral segmental build up technique. Commonly used Matchmaker Zr Colour Translucent powders are CT1 Opal Blue, CT2 Opal White, CT4 Opal Yellow and CT5 Opal Orange.

Overlay with the regular Matchmaker Zr Enamel or mix 50/50 with Zr Neutral. The resultant crown or bridge will reflect the harmonic variations of natural teeth.



Other natural effects may be achieved by careful use of Opacious Dentine SD1 Buttermilk and SD2 Ivory.

For an opalescent effect mix Matchmaker Zr Opal Translucent between 25% and 50% with the relevant enamel, depending upon the degree of opalescence required.

To give the crown increased fluorescence mix one part (20%) Matchmaker Zr Fluorescent Neutral with four parts of the relevant dentine shade.

In the example opposite opacious dentines are used to highlight variations in mamelon colour.



Matchmaker Zr Dentine & Enamel	Start Temp °C	Minimum Drying Time	Temp Rise °C / Min	Vacuum	High Temp °C	Hold Time Without Vacuum
1st Firing	450	6 minutes	45	Yes	810	1 minute

## Dentine and Enamel 2nd Firing

After the first firing, the restoration should appear textured with a slight sheen. Trim to the required shape using Schottlander Super V diamonds or K+M Green abrasives. If any small additions or corrections are required (see opposite), the surface should be lightly ground and thoroughly cleaned prior to porcelain application using a steam or ultrasonic cleaner.



Because of the low shrinkage of Matchmaker Zr, additions at this stage should be minimal.

Keep powders moist during build up to avoid drying out. If material on the glass slab or mixing dish dries out during use, only re-wet with distilled water and not modelling liquid.

After firing, the surface should have a slight sheen and be smooth with the desired shape ready for any final adjustments and characterisation.



Matchmaker Zr Dentine & Enamel	Start Temp °C	Minimum Drying Time	Temp Rise °C / Min	Vacuum	High Temp °C	Hold Time Without Vacuum
2nd Firing	450	6 minutes	45	Yes	800	1 minute



## Glaze Firing

### Glaze firing without glaze powder (preferred method)

Make any final adjustments and characterise the surface. The unit must then be thoroughly cleaned using an ultrasonic or steam cleaner.

Introduce into furnace and fire on cycle shown below without vacuum.

When coping has cooled to room temperature polish to desired sheen using pumice.



### Glaze firing with glaze powder

Prepare crown or bridge as for glazing without glaze powder.

Mix the Matchmaker Zr Glaze powder with the Glaze Liquid to a thin creamy consistency and apply as thinly as possible over the surface. Any excess should be removed with the brush.

Increase High Temperature when higher glaze required and vice versa.



## Application of stains

If surface staining is required, use Matchmaker CTE Stains. Mix the chosen stain powder with its matching Glaze & Stain Liquid and apply as required.

**Note:** If a smoother surface is required after glazing, then the surface before final glaze must also have been made smoother using very fine abrasives or rubbers.

### Internal application of stains

When using stains internally only mix your usual dentine build-up liquid. Never use Glaze & Stain Liquid.

**Matchmaker CTE Stains**

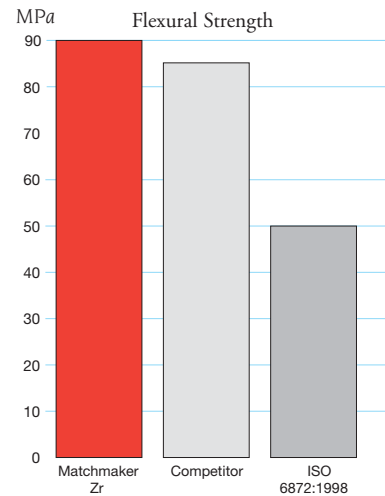
Shade	Code	Shade	Code
White	<b>729-01</b>	Blue	<b>729-07</b>
Yellow	<b>729-02</b>	Grey	<b>729-08</b>
Peach	<b>729-03</b>	A	<b>729-A</b>
Orange Brown	<b>729-04</b>	B	<b>729-B</b>
Dark Brown	<b>729-05</b>	C	<b>729-C</b>
Pink	<b>729-06</b>	D	<b>729-D</b>

	Start Temp °C	Minimum Drying Time	Temp Rise °C / Min	Vacuum	High Temp °C	Hold Time Without Vacuum
Glaze without Glaze Powder	480	2 minutes	45	No	820	-
Glaze with Glaze Powder	480	2 minutes	45	No	790	1 minute

## Physical Properties 1

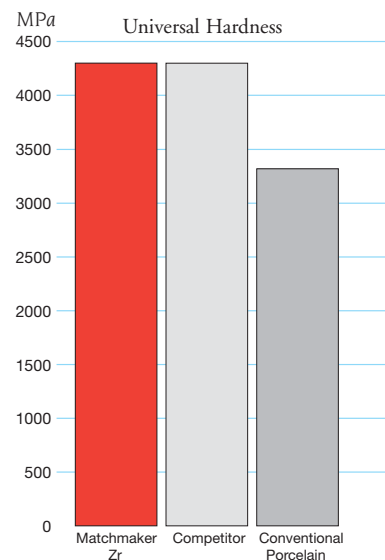
### Flexural Strength

Flexural strength is measured in accordance with EN ISO 6872:1998 and is carried out by subjecting the specimen to 3 - point bending. This test gives a measure of the ceramic material's resistance to fracture as well as its elastic and plastic properties. The results obtained are dependent on chemical composition, particle size analysis and firing cycle used.



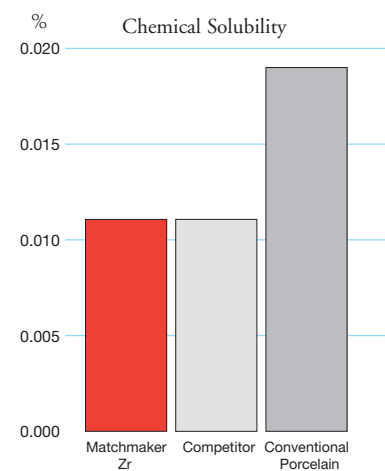
### Universal Hardness

The surface hardness of a ceramic is a measure of its resistance to deformation. Universal Hardness HU is measured using an instrument with a diamond tip. It is a function of applied force and indentation depth under effective load and allows the hardness of a wide variety of materials to be compared.



### Chemical Solubility

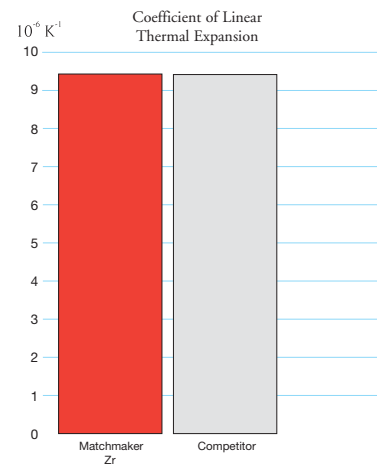
Chemical solubility is a measure of the durability of the ceramic and whether the surface of the restoration will degrade under the hostile conditions of the mouth. Matchmaker Zr was tested in accordance with EN ISO 6872:1998 together with a competitor product and a conventional bonding porcelain and was shown to have excellent properties.



## Physical Properties 2

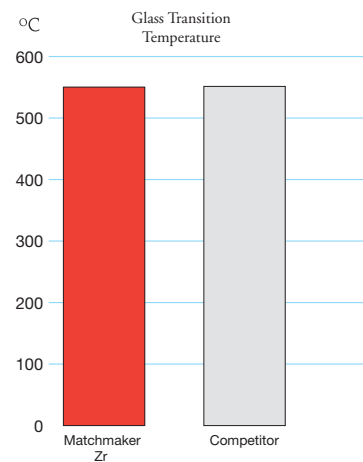
### Coefficient of Linear Thermal Expansion

Although it is always thermal expansion which is quoted, it is in fact primarily the contraction on cooling that this measure predicts. Ideally the veneering material should have a contraction slightly greater than that of the underlying zirconia coping which puts it under compression and thus giving greater stability to the composite structure. The coefficient of expansion is measured between 25 and 500 °C in accordance with EN ISO 9693:2000.



### Glass Transition Temperature

The transition of a glass from an elastic to a viscoelastic phase is defined by T<sub>G</sub> the glass transition temperature. Above T<sub>G</sub> stresses are relaxed as the material flows but beneath it considerable stresses can be built up within the material. Hence thermal expansion is always measured below T<sub>G</sub>. The glass transition temperature is measured in accordance with EN ISO 9693:2000.



### Other Physical Properties

Porosity of fired ceramic: complies with EN ISO 9693:2000  
Bond strength test of ceramic: complies with EN ISO 9693:2000



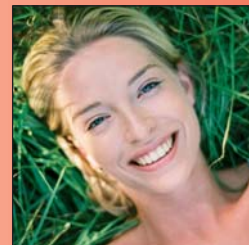
# matchMaker Metal Ceramic MC

Matchmaker MC is a complete bonded crown system, offering levels of quality and consistency that are greatly superior to those of any previous system. Matchmaker MC allows you to create beautiful, highly individual crowns that sparkle with vitality and natural fluorescence. Thanks to the systems components, a perfect match is guaranteed time after time.



# matchMaker Pressable Ceramic System PRESS

Matchmaker Press is designed for "all-ceramic" crowns as well as inlays, onlays and veneers. Its special leucite and glass matrix imparts strength in excess of the requirements of EN ISO 6872 together with optical properties which blend seamlessly with the natural tooth. Within the Matchmaker Press system are many ancillary products that help both dentists and technicians to obtain superb results time after time.



# matchMaker Low Fusing Ceramic LF

Matchmaker LF has been developed both for metal ceramic crowns and bridges and also as a veneering ceramic on top of Matchmaker Press ceramic cores, inlays, onlays and veneers.

Matchmaker LF is compatible with all standard coefficient alloys and with a special leucite and glass matrix imparts strength in excess of the requirements of EN ISO 9693. This special matrix is also less abrasive to the opposing dentition than traditional feldspathic porcelains.



# matchMaker Ceramic for Aluminium Oxide ALX

Matchmaker ALX is a leucite free veneering ceramic that has been specially formulated for bonding to aluminium oxide copings. The dentine fires at 980°C and shows remarkable vitality and colour veracity in the whole of the shade range A1 to D4 and the latest bleach shades HA0, HB0 and HB00.



Davis Schottlander & Davis Ltd  
Fifth Avenue, Letchworth Garden City  
Hertfordshire SG6 2WD  
England

Tel +44 (0)1462 480848  
Fax +44 (0)1462 482802  
e-mail: [export@schottlander.co.uk](mailto:export@schottlander.co.uk)  
[sales@schottlander.co.uk](mailto:sales@schottlander.co.uk)