match Maker
Low Fusing Ceramic LF

Perfect shades straight from the bottle

Instruction Manual
Matchmaker LF Low Fusing Ceramic

Matchmaker LF Low Fusing Ceramic has been developed both for metal ceramic crowns and bridges and also as a veneering porcelain on top of Matchmaker Pressable Ceramic cores, inlays, onlays and veneers etc. It is compatible with all standard alloys whose coefficients of linear thermal expansion lie between 13.9 and 15.1 $10^{-6}$ K$^{-1}$. Matchmaker LF Ceramic’s special leucite and glass matrix imparts strength in excess of the requirements of EN ISO 9693 together with optical properties which blend seamlessly with the natural tooth. This special matrix is also less abrasive to the opposing dentition than traditional feldspathic porcelains. Matchmaker LF Low Fusing Ceramic is manufactured to faithfully match the shade range from A1 to D4 and yet the range of available shades is almost endless. Not only are opaque modifiers, opaques, and colour transluents provided, but a revolutionary range of fluorescent stains. Matchmaker Living Stains has been developed for application both internally and externally.

Index

- Product Selection Chart 1
- Preparation of Metalwork 2
- Paste Opaque 1st & 2nd Firing 3
- Opaque Powder 1st & 2nd Firing 5
- Shoulder Powder 1st & 2nd Firing 6
- Dentine & Enamel 1st Firing 8
- Building Translucency, Opalescence & Fluorescence into the Crown 9
- Dentine & Enamel 2nd Firing 10
- Application of Matchmaker Living Stains 11
- Glaze Firing & Application of Stains 13
- Physical Properties 14
- Overview of Firing Instructions 17
# Matchmaker LF Low Fusing Ceramic

## Product Selection Chart

<table>
<thead>
<tr>
<th>Shade</th>
<th>HA0</th>
<th>A1</th>
<th>A2</th>
<th>A3</th>
<th>A3.5</th>
<th>A4</th>
<th>HB0</th>
<th>HB00</th>
<th>B1</th>
<th>B2</th>
<th>B3</th>
<th>B4</th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>C4</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>E11</th>
<th>E12</th>
<th>E13</th>
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<tr>
<td>Matchmaker LF Shoulder</td>
<td>S32</td>
<td>S32</td>
<td>S32</td>
<td>S33</td>
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<td>S34</td>
<td>S34</td>
<td>S31</td>
<td>Neutral</td>
<td>S35</td>
<td>Neutral</td>
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<tr>
<td>Matchmaker LF Dentines</td>
<td>HAO</td>
<td>A1</td>
<td>A2</td>
<td>A3</td>
<td>A3.5</td>
<td>A4</td>
<td>HB0</td>
<td>HB0</td>
<td>B1</td>
<td>B2</td>
<td>B3</td>
<td>B4</td>
<td>C1</td>
<td>C2</td>
<td>C3</td>
<td>C4</td>
<td>D2</td>
<td>D3</td>
<td>D4</td>
<td>Neutral</td>
<td>Clear</td>
<td>Ultra</td>
<td>Clear</td>
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<tr>
<td>Matchmaker LF Enamels</td>
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<td>E8</td>
<td>E8</td>
<td>E9</td>
<td>E9</td>
<td>E10</td>
<td>E7</td>
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<td>E9</td>
<td>E10</td>
<td>E10</td>
<td>E9</td>
<td>E9</td>
<td>Neutral</td>
<td>Clear</td>
<td>Ultra</td>
<td>Clear</td>
<td></td>
</tr>
<tr>
<td>Matchmaker LF Opal Enamels</td>
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<td>OL8</td>
<td>OL8</td>
<td>OL9</td>
<td>OL9</td>
<td>OL10</td>
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<td>OL10</td>
<td>OL9</td>
<td>OL9</td>
<td>Blue</td>
<td>Orange</td>
<td>White</td>
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### Matchmaker LF Colour Translucents

<table>
<thead>
<tr>
<th>Shade</th>
<th>CT1</th>
<th>CT2</th>
<th>CT3</th>
<th>CT4</th>
<th>CT5</th>
<th>CT7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matchmaker LF Fluorescent</td>
<td>FN</td>
<td>Fluorescent Neutral (mix with dentines or enamels for increased fluorescence)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Matchmaker LF Opaques Dentines</td>
<td>O1</td>
<td>O2</td>
<td>O3</td>
<td>O4</td>
<td>O5</td>
<td>O6</td>
</tr>
<tr>
<td>Matchmaker LF Enamels</td>
<td>G1</td>
<td>G2</td>
<td>MM3</td>
<td>MM4</td>
<td>OT</td>
<td>GM1</td>
</tr>
<tr>
<td>Matchmaker Living Stains</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

| Shade       | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | A | B | C | D |
|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Matchmaker LF Opales Dentines | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | A | B | C | D |
| Matchmaker LF Opales Dentines | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | A | B | C | D |
Preparation of the metalwork

The alloy should be prepared and then oxidised according to the manufacturer’s instructions. If no specific instructions are given for preparation, the surface should be ground in one direction.

Avoid overlapping the metal and use Schottlander K+M Brown or RAO Blue mounted points depending upon the type of alloy.

The surface should then be microblasted with 50 micron aluminium oxide (80-100 micron for non-precious alloys), 3-6 bar pressure.

Thoroughly clean the metal framework using a steam cleaner or in an ultrasonic cleaner. Then oxidise according to the manufacturer’s instructions. The appearance of the oxide must be the same on all surfaces. After oxidation, the metal framework should only be handled using clean instruments.

Non-precious alloys
When using non-precious alloys apply one even coat of Matchmaker CTE Buffer. Fire at 980ºC in accordance with the separate directions for use.

Decontamination of furnace
Furnace muffles, trays and pins often become contaminated. To avoid contaminates transferring to the ceramic, use the cycle below to burn out the muffle, trays and pins, both before first use and at one to two week intervals.

Care: Do not use carbon for decontamination.

<table>
<thead>
<tr>
<th>Decontamination Cycle</th>
<th>Start Temp ºC</th>
<th>Temp Rise without Vacuum ºC</th>
<th>Final Temp ºC / Min</th>
<th>Hold Time without Vacuum</th>
</tr>
</thead>
<tbody>
<tr>
<td>600</td>
<td>600</td>
<td>1200 or max furnace temp</td>
<td>10 minutes</td>
<td></td>
</tr>
</tbody>
</table>
Matchmaker LF Paste Opaque, 1st Firing

Two coats of Matchmaker LF Paste Opaque of equal thickness are recommended. The first to establish a bond to the alloy surface and the second to completely mask the alloy and oxide.

Moisten the brush in clean water and remove any excess from the bristles. Dispense the chosen shade of Matchmaker LF Paste Opaque into the appropriate well. Apply with even strokes in one direction.

Avoid over brushing and apply as thinly as possible to just mask the alloy.

Fire according to table below.

After firing, the surface should have a slight sheen.

Notes: The brush should only be damp. If it is wet, then control and coverage of Matchmaker LF Paste Opaque are lost.

Matchmaker LF Paste Opaque should be used as supplied. DO NOT thin with water.

Firing cycle below is for precious and semi-precious alloys. For non-precious alloys increase High Temperature by a minimum of 20ºC.

Excess Matchmaker LF Paste Opaque can be stored for several weeks in the covered wells. DO NOT use the material once it has dried out.

<table>
<thead>
<tr>
<th>Matchmaker LF Paste Opaque</th>
<th>Start Temp ºC</th>
<th>Minimum Drying Time</th>
<th>Temp Rise ºC / Min</th>
<th>Vacuum</th>
<th>High Temp ºC</th>
<th>Hold Time Without Vacuum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paste Opaque 1st Firing</td>
<td>450</td>
<td>6 minutes</td>
<td>55</td>
<td>Yes</td>
<td>830</td>
<td>1 minute</td>
</tr>
</tbody>
</table>
Matchmaker LF Paste Opaque, 2nd Firing

After allowing the coping to cool apply a second, thin coat of Matchmaker LF Paste Opaque.

Either use the shade concerned on its own or mix with Matchmaker LF modifiers or any other Matchmaker LF Paste Opaque shade.

Fire according to the table below.
Note: Firing cycle is for precious and semi-precious alloys. For non-precious alloys increase High Temperature by 20-30°C.

After firing, the surface should have a slight sheen.

Notes: The brush should only be damp. If it is wet, then control and coverage of Matchmaker LF Paste Opaque are lost.

Matchmaker LF Paste Opaque should be used as supplied.
DO NOT thin with water.

Excess Matchmaker LF Paste Opaque can be stored for several weeks in the covered wells. DO NOT use the material once it has dried out.

<table>
<thead>
<tr>
<th>Matchmaker LF Paste Opaque</th>
<th>Start Temp °C</th>
<th>Minimum Drying Time</th>
<th>Temp Rise °C / Min</th>
<th>Vacuum</th>
<th>High Temp °C</th>
<th>Hold Time Without Vacuum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paste Opaque 2nd Firing</td>
<td>450</td>
<td>6 minutes</td>
<td>55</td>
<td>Yes</td>
<td>820</td>
<td>1 minute</td>
</tr>
</tbody>
</table>
Powder Opaque 1st and 2nd Firing

Two applications of Matchmaker LF Powder Opaque are recommended. The first to establish a bond to the alloy surface and the second to fully mask the alloy and oxide.

Moisten the oxidised alloy with opaque liquid. This helps to "wet" the oxide layer and prevents the occurrence of minute voids between metal and fired opaque. The opaque of the chosen shade should be mixed with the Matchmaker LF Opaque Liquid to a thin, creamy consistency.

Apply a thin layer of mixed opaque with a brush or instrument and tap lightly - this will ensure close contact with the alloy.

After firing allow to cool. The opaque should exhibit a slight sheen and 70% mask the underlying alloy. Wet the fired opaque with opaque liquid. Matchmaker LF Opaque Blenders can be mixed with the opaque of the chosen shade and applied in suitable areas. Lilac is particularly useful if mixed 10-15% with the chosen opaque and applied in the area towards the incisal third. This will help to give a more natural transition between the opaque and dentine.

Apply a second covering layer of mixed opaque as before.

Both first and second fired opaques should have a textured surface with a slight sheen.

Notes: Increase the high temperature by a minimum of 20ºC when firing non-precious alloys.

The 1st opaque layer may also need to be applied slightly thicker than shown in order to mask the alloy and oxide.
Seal the model with at least two applications of Matchmaker MC Model Sealant. This has minimal thickness. Then lubricate the edges of the die using the Matchmaker MC Ceramic Separating Pen.

Place the opaqued and fired coping back onto the model ensuring that it is fully seated. Mix the Matchmaker LF Shoulder Porcelain powder to a creamy consistency with the Matchmaker LF Shoulder Porcelain liquid and apply to the shoulder area.

The surface of the shoulder porcelain should be convex to minimise the shrinkage during firing.

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 fired porcelain shoulder should have a slight sheen.

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

Metalwork can either be extended to the whole depth of the preparation or, in order to give greater light transmission, can be left up to 2mm from the edge of the shoulder.

<table>
<thead>
<tr>
<th>Matchmaker LF Shoulder</th>
<th>Start Temp ºC</th>
<th>Minimum Drying Time</th>
<th>Temp Rise ºC / Min</th>
<th>Vacuum</th>
<th>High Temp ºC</th>
<th>Hold Time Without Vacuum</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Firing</td>
<td>450</td>
<td>4 minutes</td>
<td>45</td>
<td>Yes</td>
<td>810</td>
<td>1 minute</td>
</tr>
</tbody>
</table>
2nd Shoulder Firing

When the coping has cooled the die should once more be lubricated using the Matchmaker MC Ceramic Separating Pen and the coping placed on it.

Firing shrinkage can be seen around the margins.

Add additional shoulder porcelain to compensate for any firing shrinkage.

Although two firings are normally sufficient, the stability of Matchmaker LF Shoulder Porcelain permits further firings to be carried out if required.

The finished and fired porcelain shoulder should be convex, have a slight sheen and fit precisely to the model.

**Hint:** Always re-lubricate the die using the Matchmaker MC Ceramic Separating Pen before the coping is replaced onto it.

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

<table>
<thead>
<tr>
<th>Matchmaker LF Shoulder</th>
<th>Start Temp °C</th>
<th>Minimum Drying Time</th>
<th>Temp Rise °C / Min</th>
<th>Vacuum</th>
<th>High Temp °C</th>
<th>Hold Time Without Vacuum</th>
</tr>
</thead>
<tbody>
<tr>
<td>2nd Firing</td>
<td>450</td>
<td>4 minutes</td>
<td>45</td>
<td>Yes</td>
<td>810</td>
<td>1 minute</td>
</tr>
</tbody>
</table>
Dentine and Enamel 1st Firing

Moisten the coping with one of the Matchmaker LF dentine liquids. Mix the Matchmaker LF Dentine Powder with Matchmaker LF Dentine Plus Liquid for normal condensing techniques or when greater working time is required use Matchmaker LF Modelling Liquid.

Build in areas of greater depth of colour with Matchmaker LF 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 LF Clear may be laid down in between the dentine and enamel layers.

Either use the Matchmaker LF Enamels shown for the individual shades or for more natural effects use Matchmaker LF Opalescent Colour Translucents or mix with between 25% and 50% Opal Translucent (see page 9).

Apply the enamel labially to the dentine and blend towards the cervical margin. 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 LF Dentine.

Remove the restoration from the model and build-up the contact points with the appropriate Matchmaker LF 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.

<table>
<thead>
<tr>
<th>Matchmaker LF</th>
<th>Start Temp ºC</th>
<th>Minimum Drying Time</th>
<th>Temp Rise ºC / Min</th>
<th>Vacuum</th>
<th>High Temp ºC</th>
<th>Hold Time Without Vacuum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dentine &amp; Enamel 1st Firing</td>
<td>450</td>
<td>6 minutes</td>
<td>45</td>
<td>Yes</td>
<td>770</td>
<td>1 minute</td>
</tr>
</tbody>
</table>

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**Dentine & Enamel 1st Firing**

- **Start Temp:** 450 ºC
- **Minimum Drying Time:** 6 minutes
- **Temp Rise:** 45 ºC / Min
- **Vacuum:** Yes
- **High Temp:** 770 ºC
- **Hold Time Without Vacuum:** 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 Translucents and Neutral within the Matchmaker LF system.

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

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

Overlay with the regular Matchmaker LF Enamel or mix 50/50 with LF 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 LF 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 LF Fluorescent Neutral with four parts of the relevant dentine shade.

In the example opposite opacious dentines are used to highlight variations in mamelon colour.
Dentine and Enamel, 2nd Firing

Trim to the required shape using Schottlander Super V diamonds or K+M Green abrasives. If any small additions or corrections are required, the surface should be lightly ground and thoroughly cleaned using a steam or ultrasonic cleaner.

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

**Hint:** 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 dentine liquid.

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

<table>
<thead>
<tr>
<th>Matchmaker LF</th>
<th>Start Temp °C</th>
<th>Minimum Drying Time</th>
<th>Temp Rise °C / Min</th>
<th>Vacuum</th>
<th>High Temp °C</th>
<th>Hold Time Without Vacuum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dentine &amp; Enamel 2nd Firing</td>
<td>450</td>
<td>6 minutes</td>
<td>45</td>
<td>Yes</td>
<td>760</td>
<td>1 minute</td>
</tr>
</tbody>
</table>
Building Decalcification Points

Decalcification points are usually at or near the surface. Although they may be anywhere in the incisal third of the tooth, they are usually built near the edge.

Build-up the first dentine firing in the normal way including layering of enamels. When layering has been completed cut away a small area in the position required.

Mix Matchmaker Living Stain 1 White 50/50 with Matchmaker LF Opacious Dentine SD2 Ivory, lay into the depression formed and cover with enamel.

The resultant decalcification point is natural and breaks up the regularity of the crown.

**Note:** In the mouth these effects vary greatly. Patients usually prefer them to be subtle rather than obvious.

**Hint:** To reduce the strength of the decalcification points a proportion of Dentine B1 may replace either the Matchmaker Living Stain 1 White or the Matchmaker LF Opacious Dentine SD2.

Building Crack Lines

After completing the dentine and enamel build-up, use a sharp blade to cut a line into the surface, either:

a) With a fine brush apply wet stain to the cut line, ensure the build-up is damp as this allows the stain to be drawn through the cut by capillary action. Draw excess moisture from the palatal surface with a clean tissue and gently push the cut together with a flat instrument.

b) Remove a wedge of porcelain and apply the stain to the cut edge of the built up crown replacing the wedge and gently closing together.

c) Open up the cut and apply the stain to one side, push the cut together.

Mix the desired colour for the crack using Matchmaker Living Stains. Mix the stain with Matchmaker LF Modelling Liquid NOT Glaze & Stain Liquid. Mix 1 White and 2 Yellow Matchmaker Living Stains for light crack effects. For Brown cracks use 9 Red Brown or 10 Black.
Application of Matchmaker Living Stains (2)

Adjustment of Shade
If a shade needs to be adjusted, lightly grind the entire surface or microblast using fresh 50 micron aluminium oxide. Clean thoroughly using a steam cleaner or in an ultrasonic cleaner.

Choose the required shade of Matchmaker Living Stains. Shades A, B, C, & D intensify shades in their respective ranges. Mix with Matchmaker LF Glaze & Stain Liquid and apply over the area concerned. Fire as per glaze cycle on following page.

To increase the intensity apply a second coat as required and fire again.

After staining is complete apply Matchmaker LF Glaze over the whole surface - see following page.

Building Occlusal Tables and Natural Cusps
Occlusal tables and natural cusps not only make the crown look more natural but are appreciated by patients as giving life and vitality to the restoration. Matchmaker Living Stains enable both these effects to be built in without the need for additional porcelain powders.

Build-up the dentine for the first dentine application in the normal way and apply the required colour of the Matchmaker Living Stains to the occlusal area before continuing the build-up with the enamel layer. Suggested colours are 4 Orange Brown and 5 Dark Brown.

Alternatively Matchmaker Living Stains may be mixed with the dentines and enamels to produce occlusal variances.

Hint: When using the stains internally use the same liquid as in the build-up. When using them externally use Glaze & Stain Liquid.

Note: Do not mix stains for internal use with glaze liquid.

Where a whiter occlusal table or cusp is required mix a small amount of Matchmaker Living Stain 1 White with the enamel. Between 10%-30% is recommended depending upon the intensity required.

Apply regular enamels as required and fire as per the first dentine firing.

Hint: The depth of colour will be determined by the amount of Matchmaker Living Stain used and the thickness of overlaying enamel. For a stronger colour use a higher percentage of Matchmaker Living Stains. For a softer effect lay deeper into the crown.
Glaze Firing and Application of Stains

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 LF 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 Living 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.

<table>
<thead>
<tr>
<th>Shade Code</th>
<th>Shade</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>616-01</td>
<td>White</td>
<td></td>
</tr>
<tr>
<td>616-02</td>
<td>Yellow</td>
<td></td>
</tr>
<tr>
<td>616-03</td>
<td>Peach</td>
<td></td>
</tr>
<tr>
<td>616-04</td>
<td>Orange Brown</td>
<td></td>
</tr>
<tr>
<td>616-05</td>
<td>Dark Brown</td>
<td></td>
</tr>
<tr>
<td>616-06</td>
<td>Pink</td>
<td></td>
</tr>
<tr>
<td>616-07</td>
<td>Blue</td>
<td></td>
</tr>
<tr>
<td>616-08</td>
<td>Grey</td>
<td></td>
</tr>
<tr>
<td>616-09</td>
<td>Red Brown</td>
<td></td>
</tr>
<tr>
<td>616-10</td>
<td>Black</td>
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</tr>
<tr>
<td>616-A</td>
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<tr>
<td>616-B</td>
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<td>616-C</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>616-D</td>
<td>D</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shade Code</th>
<th>Shade</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>616-01</td>
<td>White</td>
<td>616-08</td>
</tr>
<tr>
<td>616-02</td>
<td>Yellow</td>
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<tr>
<td>616-03</td>
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<td>616-04</td>
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<td>Dark Brown</td>
<td>616-B</td>
</tr>
<tr>
<td>616-06</td>
<td>Pink</td>
<td>616-C</td>
</tr>
<tr>
<td>616-07</td>
<td>Blue</td>
<td>616-D</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Glaze without Glaze Powder</th>
<th>Start Temp °C</th>
<th>Minimum Drying Time</th>
<th>Temp Rise °C / Min</th>
<th>Vacuum</th>
<th>High Temp °C</th>
<th>Hold Time Without Vacuum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glaze with Glaze Powder</td>
<td>480</td>
<td>2 minutes</td>
<td>45</td>
<td>No</td>
<td>780</td>
<td>-</td>
</tr>
<tr>
<td>Glaze with Glaze Powder</td>
<td>450</td>
<td>4 minutes</td>
<td>45</td>
<td>No</td>
<td>750</td>
<td>1 minute</td>
</tr>
</tbody>
</table>
Perfect shades
straight from the bottle

Physical Properties
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. Matchmaker LF’s special leucite and glass matrix is less abrasive to the opposing dentition than traditional feldspathic porcelain.

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 LF 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 metal 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.

The range of alloys with which Matchmaker LF Ceramic is compatible, have coefficients of expansion between 25°C and 500°C between 13.9 and 15.1 at 10⁻⁶ K⁻¹. When applied to alloys near the upper limit of coefficient, slow cooling of the porcelain may be necessary.

Glass Transition Temperature

The transition of a glass from an elastic to a viscoelastic phase is defined by T_g, the glass transition temperature. Above T_g 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_g. 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
Overview of Matchmaker LF Firing Instructions

<table>
<thead>
<tr>
<th></th>
<th>Start temp °C</th>
<th>Min dry time</th>
<th>Temp rise °C/min</th>
<th>Vacuum</th>
<th>High temp °C</th>
<th>Hold time without vacuum</th>
<th>Appearance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paste Opaque 1st firing</td>
<td>450</td>
<td>6 min</td>
<td>55</td>
<td>Yes</td>
<td>830</td>
<td>1 min</td>
<td>Slight Sheen</td>
</tr>
<tr>
<td>Paste Opaque 2nd firing</td>
<td>450</td>
<td>6 min</td>
<td>55</td>
<td>Yes</td>
<td>820</td>
<td>1 min</td>
<td>Slight Sheen</td>
</tr>
<tr>
<td>Powder Opaque 1st firing</td>
<td>450</td>
<td>4 min</td>
<td>55</td>
<td>Yes</td>
<td>830</td>
<td>1 min</td>
<td>Slight Sheen</td>
</tr>
<tr>
<td>Powder Opaque 2nd firing</td>
<td>450</td>
<td>4 min</td>
<td>55</td>
<td>Yes</td>
<td>820</td>
<td>1 min</td>
<td>Slight Sheen</td>
</tr>
<tr>
<td>Shoulder 1st firing</td>
<td>450</td>
<td>4 min</td>
<td>45</td>
<td>Yes</td>
<td>810</td>
<td>1 min</td>
<td>Slight Sheen</td>
</tr>
<tr>
<td>Shoulder 2nd firing</td>
<td>450</td>
<td>4 min</td>
<td>45</td>
<td>Yes</td>
<td>810</td>
<td>1 min</td>
<td>Slight Sheen</td>
</tr>
<tr>
<td>Dentine &amp; Enamel 1st firing</td>
<td>450</td>
<td>6 min</td>
<td>45</td>
<td>Yes</td>
<td>770</td>
<td>1 min</td>
<td>Slight Sheen</td>
</tr>
<tr>
<td>Dentine &amp; Enamel 2nd firing</td>
<td>450</td>
<td>6 min</td>
<td>45</td>
<td>Yes</td>
<td>760</td>
<td>1 min</td>
<td>Slight Sheen</td>
</tr>
<tr>
<td>Glaze without glaze powder</td>
<td>480</td>
<td>2 min</td>
<td>45</td>
<td>No</td>
<td>780</td>
<td>-</td>
<td>Glaze depending on requirements</td>
</tr>
<tr>
<td>Glaze with glaze powder</td>
<td>450</td>
<td>4 min</td>
<td>45</td>
<td>No</td>
<td>750</td>
<td>1 min</td>
<td>Glaze</td>
</tr>
</tbody>
</table>

All temperatures given are based on an accurately calibrated vertical muffle furnace. Individual furnaces and operating conditions vary. Temperatures are based upon precious and semi-precious alloys with good thermal conductivity. If non-precious alloys are used an increase in temperature may be necessary and Matchmaker CTE Buffer should be applied. Shake all powder bottles before use.

It is important to ensure that ceramics are fired at the correct temperatures in furnaces that are regularly calibrated, carefully following the instructions of the furnace manufacturer concerned. The following are some additional tips that customers have found helpful:

1. Silver calibration provides a visual indication at 961°C. However in many furnaces lower temperatures may still be inaccurate.
2. Adjust the high temperature until the visual appearance of the fired ceramic is in accordance with that shown in the manual, i.e. a correctly fired first opaque layer should exhibit a slight sheen. Adjustments of the same proportion should be made to other firing cycles.
3. In order to achieve the above appearance when using non precious alloys it is frequently necessary to increase the High Temperature of the first opaque firing by a minimum of 20°C. The second firing should be made at the normal temperature for precious alloys.
4. Select a firing tray that is routinely used, Schottlander honeycomb trays and pins absorb less heat and are recommended for all ceramic crowns.
5. Always use the firing tray when calibrating your furnace.
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 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 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.

Matchmaker Zr has been specially developed for layering on top of zirconia bridges and copings. 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.

Matchmaker PRESS to Zr is an amorphous glass/leucite ceramic that has been developed for pressing over zirconia frameworks. There are two translucencies of pellets to enable either a Full Layering or Press & Stain technique to be employed, depending on the clinical requirements. Extremely aesthetic results can be achieved when used in conjunction with Matchmaker Zr Layering Porcelain and Matchmaker CTE Fluorescent Stains.