Prima Digital is the only UK bur manufacturer with over 150 years of heritage in dental manufacturing, 90 of those in bur manufacture. We have the most advanced, efficient, flexible and accurate grinding machines in the dental bur business and sell our products in over 90 countries worldwide. We have 250 employees based at our headquarters in Gloucester in the UK, and over the past three years, we have invested over £15 million in technology. This has created a new factory, a research and innovation centre, and training facilities and generated our second Queen’s Award for Enterprise.

Dr Marilyn Goh was appointed Head of Research and Innovation and £1 million was allocated to our newest division, Prima Digital. From this, we have produced a range of select milling tools with unparalleled precision and performance, which save our customers money. Dr Goh’s background in aerospace was a perfect partnership for this division.

Robust testing pervaded the design phase and the tools were only released to market once they had passed all control checks. Further to submission of the patent, Dr Goh sits on the ISO/TC 106/SC 9 committee for dental CAD/CAM systems. Prima Digital is a driving force for change.

The process
We partnered with five European universities for the initial testing phase, including the UK’s leading university of medicine and dentistry, which will be releasing its full findings imminently. The testing included carbide grain size, carbide grade (lifetime of tool), analysis of coating types, crown accuracy and geometries (Table 1).

Independent testing
An independent report has shown that Prima Digital tools perform more precisely and more consistently than the market leader. This study was undertaken by the UK’s leading university of medicine and dentistry. The aim of the study was to evaluate the quality of milled crowns using topographic analysis.

Crows from a digital model were milled using three set of tools (Ø 2.0 mm, Ø 1.0 mm, Ø 0.6 mm) made by three manufacturers. The volumes of the outer and inner surfaces of the milled crowns were measured and compared with that of the digital model.

The results for the outer surface are summarised in Table 2. Prima tools were found to generate the least deviation from the digital model (Figs. 1–4). The results for the inner surface are summarised in Table 3. Prima tools were found to generate the least deviation from the digital model (Figs. 5–8). In conclusion, the Prima tools were proved to be able to produce a more accurate restoration compared with the tools used in this test.

Launch
Debuting at LMT LAB DAY Chicago in 2018, our current range offers both coated and uncoated tools which are compatible with

<table>
<thead>
<tr>
<th>University</th>
<th>What they tested</th>
<th>What they did</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK university (materials science)</td>
<td>Carbide grain size</td>
<td>Looked at different carbides and quality of substrate</td>
</tr>
<tr>
<td>UK university</td>
<td>Carbide grade (lifetime of tool)</td>
<td>Completed 18 months' testing of 600 zirconia blocks against two leading competitors</td>
</tr>
<tr>
<td>UK university</td>
<td>Analysis of coating types</td>
<td>No data</td>
</tr>
<tr>
<td>UK’s leading university of medicine and dentistry</td>
<td>Crown accuracy</td>
<td>Performed internal testing of deviation from digital model</td>
</tr>
<tr>
<td>European university</td>
<td>Geometries</td>
<td>Looked at zirconia cutting and lowest cutting forces</td>
</tr>
</tbody>
</table>

Table 1: Initial testing of Prima Digital tools.
Independent report shows that Prima Digital tools perform more precisely and more consistently than the market leader.

**The Report**

In partnership with a leading UK University of Medicine and Dentistry

**1.0 Aim of the study**

To evaluate the quality of milled crowns using topography analysis. Crowns from a Digital Model were milled using three sets of tools Ø2mm, Ø1mm, Ø0.6mm made by three manufacturers. Volume of the Outer Surface and the Inner Surface of milled crowns were measured and compared with the Digital Model.

**2.0 Results – The Outer Surface**

![Fig. 1 - Outer Surface of the Digital Model](image1.png)

![Fig. 2 - Scan of Prima Digital milled Crown](image2.png)

![Fig. 3 - Scan of Competitor 1 milled Crown](image3.png)

![Fig. 4 - Scan of Competitor 2 milled Crown](image4.png)

This table summarises the results for the Outer Surface. Prima tools have found to generate the least deviation from the digital model.

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Outer Mean Surface Volume (mm³)</th>
<th>Total Volume Deviation (mm³)</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prima Digital</td>
<td>0.067</td>
<td>0.01</td>
<td>Deviation of milled crown volume from the digital model remains consistent throughout the life of the tools.</td>
</tr>
<tr>
<td>Competitor 1</td>
<td>0.020</td>
<td>0.13</td>
<td>Deviation of milled crown volume from the digital model increases when tools wear out.</td>
</tr>
<tr>
<td>Competitor 2</td>
<td>-0.140</td>
<td>0.16</td>
<td>Milled crown volume tends to be smaller than that of the digital model. Even though a small deviation of 0.02 is observed at Disc 7 chipped margins at crowns will still cause crowns to be rejected.</td>
</tr>
</tbody>
</table>

Deviation of milled crown volume from the digital model remains consistent throughout the life of the tools.

Deviation of milled crown volume from the digital model increases when tools wear out.

Milled crown volume tends to be smaller than that of the digital model. Even though a small deviation of 0.02 is observed at Disc 7 chipped margins at crowns will still cause crowns to be rejected.

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**Fig. 5:** Inner surface of the digital model. **Fig. 6:** Scan of Prima Digital milled crown. **Fig. 7:** Scan of Competitor 1 milled crown. **Fig. 8:** Scan of Competitor 2 milled crown. **Table 3:** Summary of results for the inner surface.
Roland DGA, Amann Girrbach, vhf camfacture and Wieland Dental machines. Manufactured in-house, partnering with one of the world’s leading chemical vapour deposition (CVD) coating companies, Prima Digital’s premium tools are surpassing market-leading competitors. Our uncoated tools excel with a 30 per cent harder carbide and our coated tools provide a cost-saving of up to 40 per cent per restoration compared with market leaders.

What sets us apart?
The Prima Digital philosophy and three most important elements for exceptional tool-making:
– high-quality substrate;
– patent-pending precision geometry; and
– innovative CVD diamond coating.

We adhere to these principles unfailingly, utilising two separate substrates, optimised blade geometries for zirconia milling and only the highest quality coating. The multi-fluted design means less cutting force is required and, therefore, the tool life is extended.

The uniqueness of Prima coating
The question we found ourselves asking was: what coating is best for pre-sintered zirconia? We studied other industries that utilise coatings, such as aerospace (Boeing and Airbus), Formula One and nuclear engineering to find the best for use with zirconia. We then brought that technology back to dentistry, resulting in a partnership with a world-leading coating company.

Prima Digital uses tungsten carbide as our tool substrate. The inherent hardness of carbide gives good wear resistance, but paradoxically, it is also very delicate. In order to further improve the resistance attributes of a carbide tool, a coating harder than the carbide is needed. After researching methods, we elected to use CVD as opposed to physical vapour deposition. We carefully selected our tool substrate to have a high adhesion rate for coating, which ensures high wear resistance of tools, meaning a longer life.

The grading of our CVD coating is the highest possible, up to ten times the thickness of diamonds than our competitors and a low coefficient of friction. During extensive testing, our coating did not chip once. What does this mean? It means for the consumer that the lifespan of our coated tools is second to none. A long tool life equates to greater time in use and, more fundamentally, a reduction in unit cost.

Looking forward
At Prima Digital, we are always looking to the future. Our manufacturing capabilities mean that further ranges for additional milling machines will be released later in 2019. We are currently testing new tools suitable for milling materials other than zirconia.

To find out more about how Prima Digital can enhance your laboratory’s performance, please contact us at sales@primadigital.com or visit www.primadigital.com.
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- Endodontics
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- Periodontics
- Orthodontics
- Prosthodontics
- Practice management

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The new CONNECT

MIS introduces comprehensive abutment system for a screw-retained solution

Recently, MIS Implants Technologies released the CONNECT abutment system, a broad, comprehensive solution which offers dentists the ability to maximise the tissue level restorative concept, enabling the entire prosthetic procedure and restoration to occur far from the bone and at any level of the connective tissue. Because of its versatility, the CONNECT may be used in multiple- or single-unit restorations, for both digital and conventional procedures. It may also be used for provisional or final prosthetic restorations. The new abutment system is easy to use and convenient, and is supplied sterile with the tools necessary for a simple procedure, making it advantageous over other screw-retained systems available.

Tali Jacoby, Implants Product Manager at MIS, is excited about the new CONNECT system: “It is a one-time abutment, which enables a prosthetic procedure above the connective tissue level, distancing the micro-movements from the bone.” The CONNECT allows for a broader range of screw-retained prostheses in the aesthetic zone and may be used in one- or two-stage procedures. It supports long-term biological stability by increasing the distance from the bone and providing ultimate sealing. Additionally, in CAD/CAM restoration planning, the abutment may be scanned and is incorporated into a partial or fully digitally guided procedure.

Dr David Norre of Belgium has been using the CONNECT since its release. “I think the most important reason I use the CONNECT is because I can avoid repeated disruption of the soft tissue, which reduces the risk of bacteria entering the site,” he explained. Therefore, the new CONNECT provides Dr Norre and his patients with a safer, more predictable solution and an aesthetically pleasing result over time.

Awards for TRIOS 4 intraoral scanner and the TRIOS MOVE+

3Shape wins two Red Dot design awards

3Shape, a global leader in 3D scanners and CAD/CAM software solutions, has received two prestigious Red Dot awards for high-quality product design. The two design awards were presented to the just-released 3Shape TRIOS 4 intraoral scanner and the TRIOS MOVE+.

The 3Shape solutions were selected by the Red Dot global jury from more than 5,500 entries. The distinction marks the fifth and sixth 3Shape solution given a Red Dot product design award over the past three years.

Nikolaj Deichmann, 3Shape co-founder and co-CEO, said: “We are very proud to receive the Red Dot awards and appreciate the jury’s recognition. The awards not only highlight the value of our solutions, they also celebrate our company’s design philosophy. 3Shape creates solutions to enable dental professionals to better care for their patients. But an important part of that is making sure that the form and function of our solutions is equally outstanding. The Red Dot awards acknowledge this.”

3Shape TRIOS 4 is the world’s first intraoral scanner that allows for timely detection of both surface and interproximal caries with a single scanner. Now with the release of the brand-new TRIOS 4, intraoral scanners will no longer be used only for restorative and orthodontic applications. These are diagnostic applications that do not emit radiation. The wireless TRIOS 4 delivers its caries innovation without compromise to ergonomics or an increase in the size and weight of the scanner.

3Shape TRIOS MOVE+ is one of three hardware set-up options for the TRIOS intraoral scanner. TRIOS MOVE+ now features a larger 15.6 in. touch screen attached to an arm and an elegant, easy-to-move stand with a mounted PC. Dentists can easily move and position the TRIOS MOVE+, as well as use its touch screen as a canvas to design and discuss treatments with patients. TRIOS MOVE+ helps to drive patient involvement and case acceptance in conjunction with 3Shape patient excitement apps like TRIOS Treatment Simulator and TRIOS Smile Design.