CAD / ZirCAD
The proven all-ceramic for CAD/CAM practices
IPS e.max® offers digital dental practices maximum flexibility. The portfolio comprises IPS e.max CAD, the reliable lithium disilicate glass-ceramic, and IPS e.max ZirCAD, the high-strength zirconia material. Both types of materials ideally complement each other. They open up a host of chairside treatment possibilities.

The universal IPS e.max CAD Crystall stains and glazing materials round off the IPS e.max assortment.

Unrivalled indication spectrum

in CAD/CAM glass-ceramics

High strength and esthetics

530 MPa¹ / 850²

Maximum flexibility

adhesive, self-adhesive or conventional cementation

Complete confidence

96 % survival rate³:
more than 10 years of long-term clinical evidence

¹ Mean biaxial flexural strength over a period of 10 years IPS e.max CAD, R&D Ivoclar Vivadent AG, Schaan, Liechtenstein
² Typical mean value of the biaxial flexural strength IPS e.max ZirCAD MT Multi, R&D Ivoclar Vivadent AG, Schaan, Liechtenstein
³ IPS e.max, Scientific Report, Ivoclar Vivadent AG, Schaan, Liechtenstein, Vol. 03/2001-2017
Made of the legendary blue block
IPS e.max® CAD
Maximum versatility

IPS e.max CAD is the top-selling glass-ceramic¹ in the world. Moreover, its clinical reliability has been more thoroughly documented than that of hardly any other dental material.² Among CAD/CAM glass-ceramics, IPS e.max CAD exhibits an unmatched high biaxial flexural strength of 530 MPa³. This is the outcome after more than 10 years of ongoing quality testing.

The material is suitable for the efficient fabrication of full-contour restorations showing excellent esthetic properties and high flexural strength. It covers an exceptionally wide indication spectrum. Depending on the indication at hand, the restorations can be placed using either the adhesive, self-adhesive or conventional luting technique.

The manufacturing options for “blue” restorations include:
• polishing and then crystallization
• glazing and crystallization in one step
• staining, glazing and crystallization in one step

Abutment Solutions
An innovative system

IPS e.max CAD blocks feature a prefabricated interface for the extraoral bonding with a titanium base, e.g. Ti-Base (Dentsply Sirona). Therefore, chairside implant-supported hybrid abutments and hybrid abutment crowns can be fabricated with clinically proven products.

The self-curing Multilink® Hybrid Abutment luting composite is used for extraoral bonding tasks.

The Implant Care products provide the dental team with additional support in the different phases of the implant treatment process including after care.

¹ Based on sales figures
² IPS e.max, Scientific Report, Ivoclar Vivadent AG, Schaan, Liechtenstein, Vol. 03/2001-2017
³ Mean biaxial flexural strength over a period of 10 years, R&D Ivoclar Vivadent, Schaan AG, Liechtenstein
Complete confidence in this innovative material
IPS e.max® CAD
Proven reliability

96% survival rate¹

less than

1% probability of fracture after 15 years²

“All-ceramic, high-strength lithium disilicate restorations in the daily clinical application for single tooth restorations form an alternative to the metal ceramic gold standard.”³

Department of Prosthodontics, Dusseldorf University Hospital, Germany
Unrivalled high flexural strength

More than 10 years of ongoing quality testing show that among CAD/CAM glass-ceramics, IPS e.max CAD exhibits an unrivalled high biaxial flexural strength of 530 MPa. The IPS e.max lithium disilicate also shows high fracture toughness. This combination of properties is particularly sought after in minimally invasive dentistry.

Long-lasting reliability

An in vitro study shows that the probability of fracture of a premolar crown made of IPS e.max CAD is less than 1% after 15 years, while that of a competitive product is more than 10%.

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1. IPS e.max, Scientific Report, Ivoclar Vivadent AG, Schaan, Liechtenstein, Vol. 03/2001-2017
2. “Ring on Ring Test” according to ASTM (American Society for Testing and Materials) C1499, Jülich Forschungszentrum [Institut für Energie- und Klimaforschung (IEK), Abteilung: Werkstoffstruktur und -eigenschaften (IEK-2)], 2018
4. Mean biaxial flexural strength over a period of 10 years, R&D Ivoclar Vivadent AG, Schaan, Liechtenstein
5. Information provided by the manufacturer
6. Information provided by the manufacturer, three-point flexural test
8. * These brands are not registered trademarks of Ivoclar Vivadent AG.
IPS e.max® CAD
You can rely on the original all-ceramic

Initial situation  |  IPS e.max CAD LT veneer after three years in situ  |  IPS e.max CAD LT veneer after 8.5 years in situ

Dr Hidetaka Sasaki, Japan
The esthetic result was unsatisfactory for the patient. Therefore, another restoration was planned and the teeth were correspondingly prepared according to minimally invasive principles.

Tooth 11 and 21 of the patient were damaged in an accident. They were restored with a composite resin.
120 million restorations¹ fabricated with IPS e.max materials: A good feeling for dentists and their patients.

¹ Based on sales figures
120 million restorations fabricated with IPS e.max materials: a good feeling for dentists and their patients.
IPS e.max® ZirCAD MT Multi: Innovative zirconia

IPS e.max ZirCAD allows you to efficiently produce esthetic, monolithic zirconia restorations in your dental practice with the help of efficient speed sintering programs. Due to the material’s high flexural strength and fracture toughness, it can be used to fabricate restorations with very thin walls. As a result, the teeth can be prepared according to minimally invasive principles and then conventionally cemented.

Zirconia can be used for a wide variety of indications:

- Crowns
- Three-unit bridge

The manufacturing options available after sintering include:
- polishing
- glazing and firing
- optional staining, glazing and firing

IPS e.max CAD Crystall/Glaze, with or without fluorescent properties, is available for glazing purposes.

IPS e.max ZirCAD MT Multi cleverly combines the properties of two types of materials. The class 5Y-TZP zirconia imparts a high level of translucency to the incisal region. The more opaque class 4Y-TZP zirconia is responsible for reinforcing the stability of the dentin region (850 MPa)\(^1\).

The realistic progression of shade and translucency from the opaque dentin region to the translucent incisal region and the corresponding colour effect is ensured by IPS e.max ZirCAD MT Multi without any additional characterization for maximum lifelike results.

Exceptional zirconia for digital dentists

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\(^1\) Typical mean value of the biaxial flexural strength of IPS e.max ZirCAD MT Multi, R&D Ivoclar Vivadent AG, Schaan, Liechtenstein
Two raw materials for a realistic, natural progression of translucency

- 20% incisal zone
  - 5Y-TZP

- 20% transition zone
  - 4Y TZP & 5Y-TZP

- 60% dentin zone
  - 4Y-TZP
IPS e.max® ZirCAD MT Multi
Superb quality

high strength of 850 MPa
	naturally reliable
Realistic, natural progression of translucency

A natural progression of translucency means there is a high degree of translucency in the incisal area and high opacity in the dentin area – an appearance resembling that of natural dentition. Due to the multiple raw material mixture, the difference in translucency between the dentin and incisal region of IPS e.max ZirCAD MT Multi is more pronounced than that of KATANA Zirconia STML*. 

Superior strength

In comparison to other multi zirconia materials, IPS e.max ZirCAD MT Multi exhibits a much higher flexural strength. The 3Y-TZP materials have a high level of flexural strength, but a lower level of opacity, which affects their esthetic appearance.

Flexural strength [MPa]

<table>
<thead>
<tr>
<th>Material</th>
<th>0</th>
<th>200</th>
<th>400</th>
<th>600</th>
<th>800</th>
<th>1000</th>
<th>1200</th>
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<tbody>
<tr>
<td>IPS e.max CAD ZirCAD LT1</td>
<td>3.6</td>
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<td></td>
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<td>IPS e.max CAD ZirCAD MT Multi*</td>
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<tr>
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</table>

Fracture toughness [MPa · m^{1/2}]

<table>
<thead>
<tr>
<th>Material</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<tr>
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<tr>
<td>IPS e.max CAD ZirCAD MT Multi*</td>
<td>3.6</td>
<td></td>
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</tbody>
</table>

A high fracture toughness is achieved due to the resistance to crack propagation. The higher the reading, the better the long-term clinical behaviour.

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1 Typical mean value of the biaxial flexural strength, R&D Ivoclar Vivadent AG, Schaan, Liechtenstein
2 Flexural strength according to the information of the manufacturer
3 Measurements of the fracture toughness according to the Vickers indentation test R&D Ivoclar Vivadent AG, Schaan, Liechtenstein (2017)
4 Thickness of the test specimens: 1 mm, R&D Ivoclar Vivadent AG, Schaan, Liechtenstein
5 These brands are not registered trademarks of Ivoclar Vivadent AG.
Comprehensive spectrum of shades and indications

The IPS e.max CAD and IPS e.max ZirCAD blocks are available in a wide variety of sizes, shades and translucency levels. This enhances the flexibility of the dental practice, since you always have a suitable block in the desired shade at your disposal.

IPS e.max blocks are equipped with a holder for the authorized CAD/CAM systems of PrograMill One (Ivoclar Digital), CEREC® (Dentsply Sirona) and Planmeca Fit (Planmeca).

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<table>
<thead>
<tr>
<th>Lithium disilicate glass-ceramic (LS₂)</th>
<th>IPS e.max CAD HT</th>
<th>IPS e.max CAD MT</th>
<th>IPS e.max CAD LT</th>
<th>IPS e.max CAD MO</th>
<th>IPS e.max CAD Impulse</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Block</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>IPS e.max CAD MT</td>
<td>IPS e.max CAD LT</td>
<td>IPS e.max CAD MO</td>
<td>IPS e.max CAD Impulse</td>
<td></td>
</tr>
<tr>
<td>IPS e.max CAD LT</td>
<td>IPS e.max CAD MO</td>
<td>IPS e.max CAD Impulse</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IPS e.max CAD Impulse</td>
<td>IPS e.max CAD MO</td>
<td>IPS e.max CAD Impulse</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Translucency**
- IPS e.max CAD HT: High translucency similar to that of natural enamel
- IPS e.max CAD MT: Medium translucency
- IPS e.max CAD LT: Low translucency similar to that of natural dentin
- IPS e.max CAD MO: Medium opacity
- IPS e.max CAD Impulse: Lifelike opalescent effect for the replacement of enamel

**Indications**
- IPS e.max CAD HT: Thin and occlusal veneers, veneers, inlays, onlays, partial crowns, crowns
- IPS e.max CAD MT: Thin and occlusal veneers, veneers, partial crowns, crowns
- IPS e.max CAD LT: Veneers, partial crowns, crowns, bridges, hybrid abutments and hybrid abutment crowns
- IPS e.max CAD MO: Frameworks on lightly stained dies, crowns and hybrid abutments
- IPS e.max CAD Impulse: Thin, occlusal veneers, veneers

**Shades**
- IPS e.max CAD HT: (4 Bleach BL, 16 A–D)
- IPS e.max CAD MT: (BL2, BL3, BL4, A1, A2, A3, B1)
- IPS e.max CAD LT: (4 Bleach BL, 16 A–D)
- IPS e.max CAD MO: (MO 0, MO 1, MO 2, MO 3, MO 4)
- IPS e.max CAD Impulse: (Opal 1, Opal 2)

**Sizes**
- IPS e.max CAD HT: I 12, C 14, B 40, B 40L
- IPS e.max CAD MT: C 14
- IPS e.max CAD LT: I 12, C 14, C 16, A 14, A 16, B 32
- IPS e.max CAD MO: C 14, A 14
- IPS e.max CAD Impulse: C 14

**Flexural strength**
- IPS e.max CAD HT: 330 MPa
- IPS e.max CAD MT: 850 MPa
- IPS e.max CAD LT: 1,200 MPa

**Fracture toughness**
- IPS e.max CAD HT: 2.11 MPa · m¹/²
- IPS e.max CAD MT: 3.6 MPa · m¹/²
- IPS e.max CAD LT: 5.1 MPa · m¹/²

**Wall thickness anterior**
1 mm | 1.2 mm | incisal crown third 1.5 mm

**Wall thickness posterior**
1 mm | 1.5 mm

**Cementation**
- IPS e.max CAD HT: adhesive, self-adhesive or conventional
- IPS e.max CAD MT: adhesive, self-adhesive or conventional
- IPS e.max CAD LT: adhesive, self-adhesive or conventional
- IPS e.max CAD MO: adhesive, self-adhesive or conventional
- IPS e.max CAD Impulse: adhesive, self-adhesive or conventional

**Blasting**
- IPS e.max CAD HT: e.g. Monobond Etch & Prime
- IPS e.max CAD MT: e.g. Variolink® Esthetic
- IPS e.max CAD LT: e.g. Monobond® Plus

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1 Thickness of test sample, 1 mm, R&D Ivoclar Vivadent AG, Schaan, Liechtenstein
2 For the IPS e.max CAD-on technique on zirconia frameworks
3 Only up to the second premolar as the distal abutment
4 Up to the second premolar
5 The range of products varies according to the different CAD/CAM systems
6 Mean biaxial flexural strength over a period of 10 years, R&D Ivoclar Vivadent AG, Schaan, Liechtenstein
7 Typical mean value of the flexural strength, R&D Ivoclar Vivadent AG, Schaan, Liechtenstein
8 Hill T, Tysowsky G. Fracture toughness, KIC, of Five CAD/CAM glass-ceramics. AADR/CADR Annual Meeting: 1672, 2016
10 If the adhesive technique is used
11 Adhesive, self-adhesive or conventional cementation
12 Crowns and bridges
13 Monobond® Plus, if Multilink Automix is used
IPS e.max®
Shade Navigation App

Five easy steps to finding the correct shade and translucency level
Everything for one-appointment treatments

Optimally complemented
IPs e.max CAD and IPs e.max ZirCAD are complemented by the highly esthetic IPS Empress® CAD block, the Tetric® CAD composite block and the Telio® CAD block for the fabrication of provisional restorations.

Appropriate cementation
Ivoclar Vivadent supplies a coordinated cementation system. Depending on the indication at hand, the restorations can be placed using either the adhesive, self-adhesive or conventional luting technique.
• Variolink® Esthetic – the esthetic light and dual-curing luting composite ensures excellent colour stability.
• SpeedCEM® Plus – the self-adhesive composite cement is particularly suitable for cementing zirconia restorations.

The CNS provides practical information regarding all questions related to the shade selection process.
www.cementation-navigation.com

Straightforward conditioning
IPS e.max CAD restorations are conditioned with the self-etching glass-ceramic primer Monobond Etch & Prime®.

Superior crystallization, sintering and glazing
In the compact multifunctional Programat® CS4
**Virtual smile consultations**

IvoSmile, an innovative dental app, transforms your iPad into a virtual mirror: The patient can preview their potential new smile during the consultation appointment.

**Intraoral scanning made easy**

The latex-free lip and cheek retractor OptraGate heightens the efficiency and comfort of the dental treatment.

**Effortless block selection**

The IPS e.max Navigation App (SNA) assists you in finding the most suitable shade and translucency – for reliable and relaxed working.

**Fast and precise machining**

In the PrograMill One, the world’s smallest smart 5-axis milling machine.

**Precision finishing**

With IPS e.max Crystall./Shades/Stains and Glaze materials or with the OptraFine polishers.

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1 IvoSmile was introduced in a few selected markets in November 2018.

2 Not a registered trademark of Ivoclar Vivadent AG