

# VITA CAD-Temp<sup>®</sup>

Processing recommendation for CAD/CAM systems



VITA shade determination

VITA shade communication

VITA shade reproduction

VITA shade control

VITA – perfect match.

**VITA**

## Machining mode: Milling – Block & Disc

- Information and tips
- Tools
- Machining strategy
- Parameters

### Information

The information presented here, are intended as a recommendation.

Depending on the available CNC machines, CAM software, tools, etc. the information have to be adapted to your own production situation.

As a result, different results may obtained.

The development of the strategies and parameter was done with following system:

- imesicore CORITEC350i
- CAM Software: Hyperdent V8.1.3

According to this recommendation, a 3-unit posterior bridge can be finished in 35 min, with a good surface and fit.

### We recommend Tools from:

**ZECHA Hartmetall - Werkzeugfabrikation GmbH**

[www.zecha.de](http://www.zecha.de)

**FRANKEN GmbH & Co. KG - Fabrik für Präzisionswerkzeuge**

[www.emuge-franken.de](http://www.emuge-franken.de)

### Tips for VITA CAD-Temp<sup>®</sup>

- VITA CAD-Temp<sup>®</sup> can be milled dry with air cooling or wet.
- Plunge into the material with a ramp (10 degree) or helically and use a reduced plunge feed (feed Z)
- The diameter of the restoration holding pin should range from 1.0 –1,5 mm

### Strategy

- A two side machining and 3+2 strategies are sufficient in most cases.
- In order to maintain a good fit, even by restoration with undercuts, the last finishing of the cavity should be done with a 5 axis strategy.
- In order to maintain a good occlusal fit, the complete occlusal side should be finished with max. a  $\varnothing 1.2\text{mm}$  tool (or less). A special finishing of the fissures isn't necessary.
- If chipping occurs, the feed speed and step should be lowered. Also the Oversize should be checked. Too much or too less oversize will also lead to chipping.

### Recommended tools

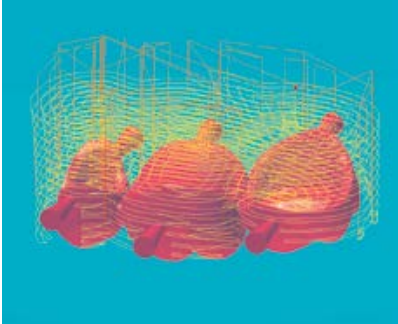
Diameter	Description	Manufacturer	Order-code
$\varnothing 2\text{ mm}$	Ball nose end mill, Diamond coated	Zecha	421.B2.200.100.200
$\varnothing 1\text{ mm}$	Ball nose end mill, Diamond coated	Zecha	421.B2.100.050.100
$\varnothing 2\text{ mm}$	Ball nose end mill, Diamond coated	Franken	2600E.200616
$\varnothing 1\text{ mm}$	Ball nose end mill, Diamond coated	Franken	2600E.100612

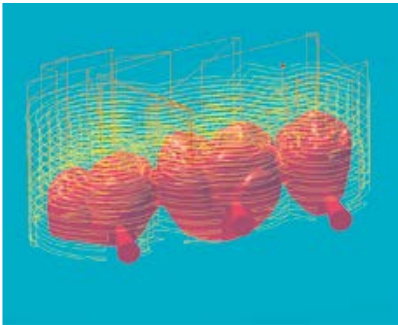
## Tool life


Tool	Units	Restoration
Ø 2 mm ball nose end mills	>150	Fully anatomical crown tooth 26
Ø 1 mm ball nose end mills	>150	Fully anatomical crown tooth 26

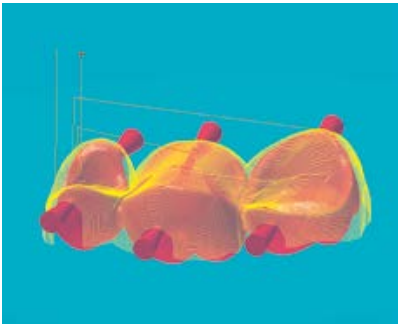
## Order of machining

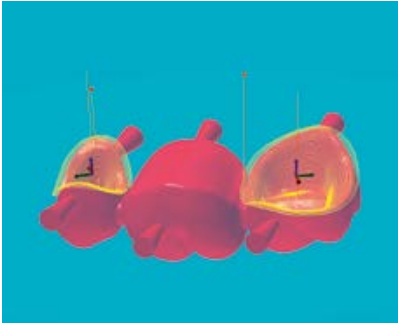
Step	Machining side	Machining	Tool
1	Cavity side	Roughing	Ø 2mm
2	Occlusal side	Roughing	Ø 2mm
3	Occlusal side	Pre-finishing	Ø 2mm
4	Cavity side	Finishing	Ø 2mm
5	Cavity	Pre-finishing	Ø 2mm
6	Cavity	Restmaterial	Ø 1mm
7	Cavity side	Restmaterial	Ø 1mm
8	Preparation margin	Finishing	Ø 1mm
9	Cavity	Finishing	Ø 1mm
10	Occlusal side	Finishing, Fissures	Ø 1mm

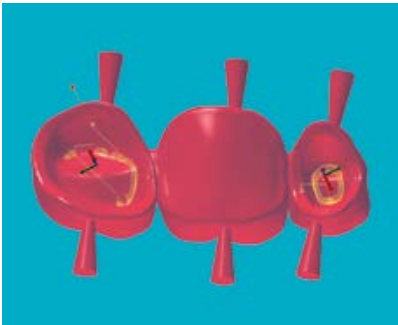
Step 1	Cavity side - Roughing			3+2 axis	
	Tool	Ø 2mm		notes:	
	Tolerance	0,01	0,01		
	Spindel speed	[n]	36000		rpm
	Feed speed XY	[Vf]	2000		mm/min
	Feed speed Z	[Vf]	1000		mm/min
	Width of cut XY	[ae]	1,0		mm
	Depth of cut Z	[ap]	1,0		mm
	Oversize		0,15		mm

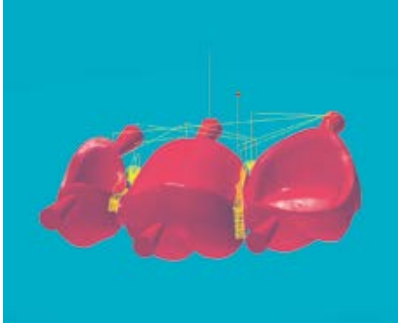
Step 2	Occlusal side - Roughing			3+2 axis	
	Tool	Ø 2mm		notes:	
	Tolerance	0,01	0,01		
	Spindel speed	[n]	36000		rpm
	Feed speed XY	[Vf]	2000		mm/min
	Feed speed Z	[Vf]	1000		mm/min
	Width of cut XY	[ae]	1,0		mm
	Depth of cut Z	[ap]	1,0		mm
	Oversize		0,15		mm

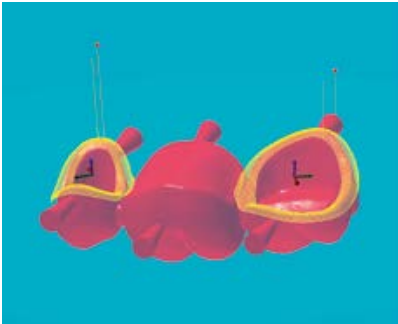
Step 3	Occlusal side – Pre-finishing			3+2 axis	
	Tool	Ø 2mm		notes:	
	Tolerance	0,01	0,01		
	Spindel speed	[n]	36000		rpm
	Feed speed XY	[Vf]	1500		mm/min
	Feed speed Z	[Vf]	1000		mm/min
	Width of cut XY	[ae]	0,5		mm
	Depth of cut Z	[ap]	-		mm
	Oversize		0,1		mm

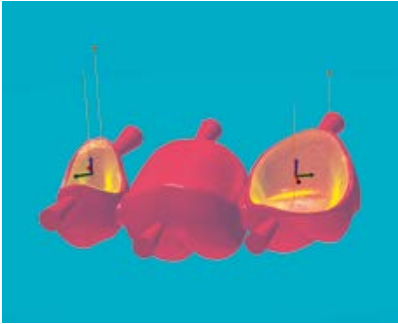
Step 4	Cavity side - Finishing			3+2 axis	
	Tool	Ø 2mm		notes:	
	Tolerance	0,01	0,01		
	Spindel speed	[n]	36000		rpm
	Feed speed XY	[Vf]	1500		mm/min
	Feed speed Z	[Vf]	1000		mm/min
	Width of cut XY	[ae]	0,15		mm
	Depth of cut Z	[ap]	-		mm
	Oversize		0,0		mm

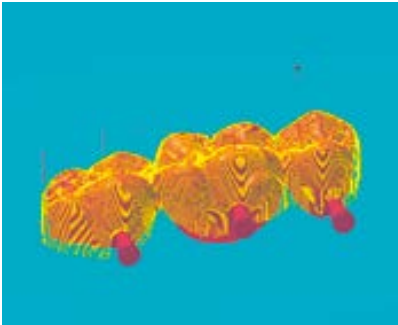
Step 5	Cavity – Pre-finishing			3+2 axis	
	Tool	Ø 2mm		notes:	
	Tolerance	0,01	0,01		
	Spindel speed	[n]	36000		rpm
	Feed speed XY	[Vf]	1300		mm/min
	Feed speed Z	[Vf]	1000		mm/min
	Width of cut XY	[ae]	0,2		mm
	Depth of cut Z	[ap]	-		mm
	Oversize		0,05		mm

Step 6	Cavity - Restmaterial			5 axis	
	Tool	Ø 1mm		notes:	
	Tolerance	0,01			
	Spindel speed	[n]	45000		rpm
	Feed speed XY	[Vf]	1000		mm/min
	Feed speed Z	[Vf]	500		mm/min
	Width of cut XY	[ae]	0,2		mm
	Depth of cut Z	[ap]	0,1		mm
	Oversize		0,05		mm

Step 7	Cavity side - Restmaterial			5 axis	
	Tool	Ø 1mm		notes:	
	Tolerance	0,01			
	Spindel speed	[n]	45000		rpm
	Feed speed XY	[Vf]	1000		mm/min
	Feed speed Z	[Vf]	500		mm/min
	Width of cut XY	[ae]	0,2		mm
	Depth of cut Z	[ap]	0,1		mm
	Oversize		0,0		mm

Step 8	Preparation margin - Finishing			5 axis	
	Tool	Ø 1mm		notes:	
	Tolerance	0,01			
	Spindel speed	[n]	45000		rpm
	Feed speed XY	[Vf]	1000		mm/min
	Feed speed Z	[Vf]	1000		mm/min
	Width of cut XY	[ae]	0,1		mm
	Depth of cut Z	[ap]	-		mm
	Oversize		0		mm

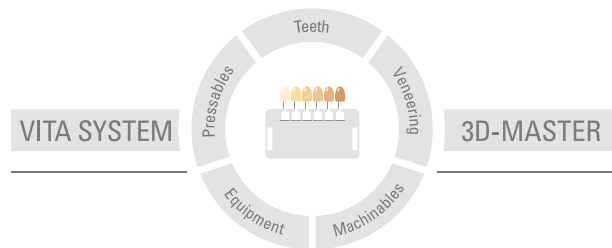
Step 9	Cavity - Finishing			5 axis	
	Tool	Ø 1mm		notes:	
	Tolerance	0,01			
	Spindel speed	[n]	45000		rpm
	Feed speed XY	[Vf]	1300		mm/min
	Feed speed Z	[Vf]	1000		mm/min
	Width of cut XY	[ae]	0,15		mm
	Depth of cut Z	[ap]	-		mm
	Oversize		0,0		mm

Step 10	Occlusal side - Finishing, Fissures			3+2 axis	
	Tool	Ø 1mm		notes:	
	Tolerance	0,01			
	Spindel speed	[n]	45000		rpm
	Feed speed XY	[Vf]	1300		mm/min
	Feed speed Z	[Vf]	1000		mm/min
	Width of cut XY	[ae]	0,1		mm
	Depth of cut Z	[ap]	-		mm
	Oversize		0,0		mm

### Formulas for cutting data calculation

Expression used in text	Term	Symbol	Formula
Feed speed XY Feed speed Z	Feed speed	Vf [mm/min]	$Vf = fz * z * n$
Spindle speed	Spindle speed	n [rpm]	$n = \frac{Vc * 1000}{\pi * d}$
Width of cut XY	Width of cut	ae [mm]	
Depth of cut Z	Depth of cut	ap [mm]	
	Feed per cutting edge	fz [mm]	$fz = \frac{Vf}{n * z}$
	Cutting speed	Vc [m/min]	$Vc = \frac{\pi * d * n}{1000}$

More information about **VITA CAD/CAM MATERIALS** is available at: [www.vita-zahnfabrik.com/cadcam](http://www.vita-zahnfabrik.com/cadcam)



**Please note:** Our products must be used in accordance with the instructions for use. We accept no liability for any damage resulting from incorrect handling or usage. The user is furthermore obliged to check the product before use with regard to its suitability for the intended area of applications. We cannot accept any liability if the product is used in conjunction with materials and equipment from other manufacturers that are not compatible or not authorized for use with our product and this results in damage. The VITA Modulbox is not necessarily a component of the product. Date of issue of this information:

After the publication of this information for use any previous versions become obsolete. The current version can be found at [www.vita-zahnfabrik.com](http://www.vita-zahnfabrik.com)

VITA Zahnfabrik has been certified and the following products bear the CE mark:  
**CE 1024**

# VITA

VITA Zahnfabrik H. Rauter GmbH & Co.KG  
Spitalgasse 3 · D-79713 Bad Säckingen · Germany  
Tel. +49(0)7761/562-0 · Fax +49(0)7761/562-299  
Hotline: Tel. +49(0)7761/562-222 · Fax +49(0)7761/562-446  
[www.vita-zahnfabrik.com](http://www.vita-zahnfabrik.com) · [info@vita-zahnfabrik.com](mailto:info@vita-zahnfabrik.com)  
 [facebook.com/vita.zahnfabrik](https://facebook.com/vita.zahnfabrik)