ALPHABOND dental

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No respect for the status quo.

LisiFuse Connect

Diffusing LiSi to monolithic ZrO2

Final bonding with adhesive

What kind of problems can we solve applying LiSi Fuse Connect?

Connecting ZrO2 with other materials like f.e. ceramics today is possible but quite difficult and risky in sense of chipping as ZrO2 surface is very hard and it is very complicated to create a proper retention! Result – the risk of cracks and chipping is relatively high when ZrO2 is connected with other materials

- The bonding of ZrO2 which has been infused with LiSi Fuse Connect is having the highest possible value compared with other techniques! Reducing the risk of cracks and chipping almost to zero!

ZrO2 Ceramic	Vita VM 9	CZR Noritake	Tizian Schütz	Zirox Wieland	Lava 3M Espe	Hera Ceram Zirkonia Heraeus	Cercon Ceram Kiss Degudent	LiSiFuse HPdent
WAK (25-500 °C)	8,8 - 9,2	9,1	8,5	9,31	10,0	9,5	9,5	**9,8**
Vickers hardness	670 HV	539 HV	570 HV	400 HV	530 HV	570 HV	500-530 HV	**550-605 HV ***
Flexural strenght MpA	102	95	>70	120	100	85	80	**140**
Grain size µm	18	0,3 - 60	20-25	Glas	25	25	24	**Glas**
Burning temperature °C	930	930	980	930	810	860	970	**890-930**
Adhesiveness MpA	15,2	20,5	16,8	19,1	15,2	15,3	14,6	**> 30 ****
Chipping score	1,5	-	-	1,5	-	1	1,8	**< 0,1**
Abrasion (Volume loss on the antagonist)	yes	yes	yes	yes	yes	low	yes	**not measurable**

***) the respective lower values correspond to the glass-ceramic phase (= lithium disilicate) of LiSiFuse at a firing temperature of 890 ° C**

The upper values represent the preferred amorphous glass phase (= lithium silicate system glass) from Lisifuse at a firing temperature of 920 °C

****) the values for the adhesiveness were compared and documented in studies by Zöller (2013) at the University of Ulm with current commercially available ceramics**

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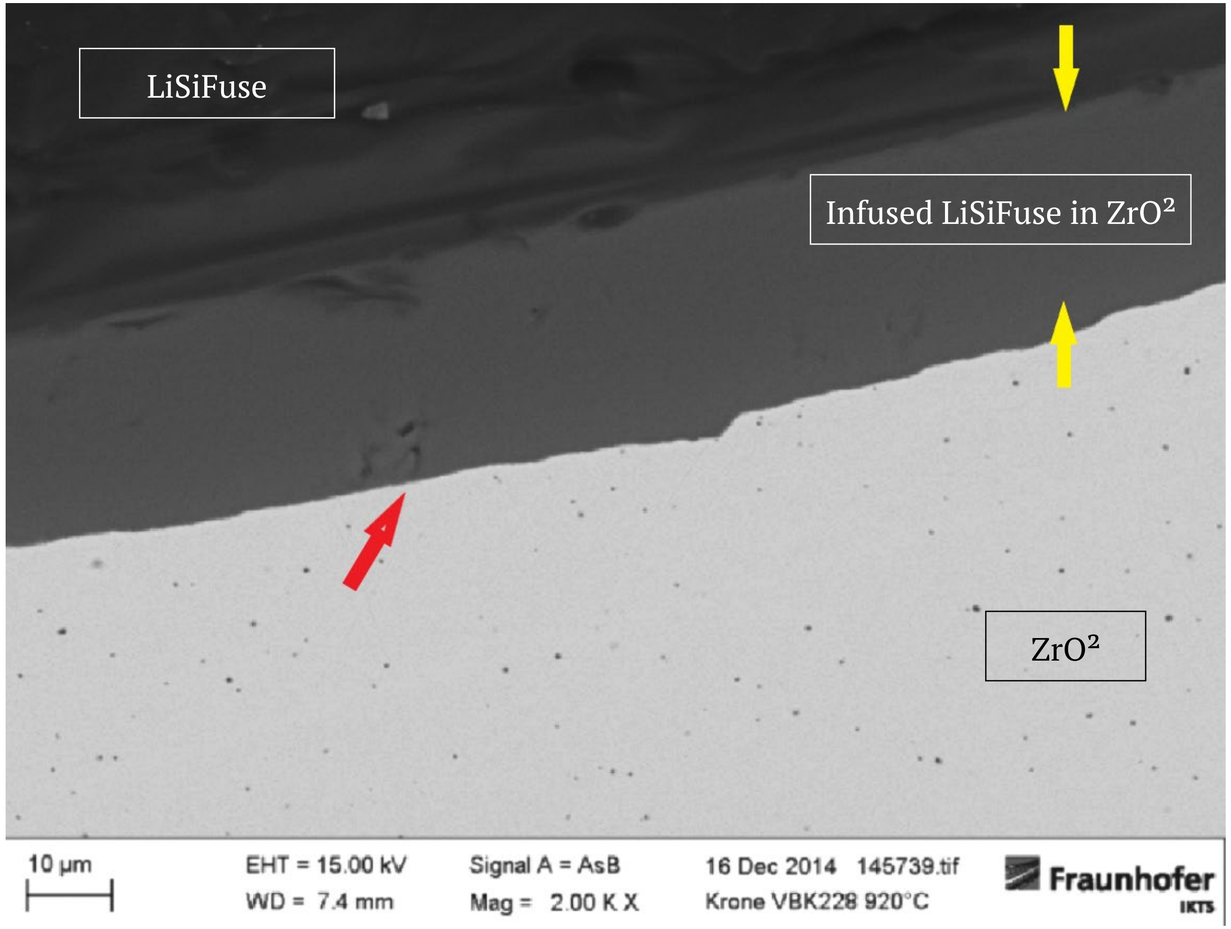

LisiFuse on ZrO2 as intermediary retention for further materials:

LisiFuse Connect infused into the ZrO2 surface and created a very solid and strong mechanical retention.

On this silicate layer now further materials can be bonded in a very safe and strong connection avoiding any risk of chipping or cracks.

The red arrow shows that no air bubbles are infiltrated and that the material infused perfectly with the ZrO2.

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firering

Final bonding with adhesive

- Micro thin (3µm) LiSi diffusing layer allows adhesive bonding of monolithic ZrO2 (sandblast intacoronal surface with 50 µm Ai2O3 at 1 bar)
- Reliable adhesive bond decreasing risk of chipping
- Allowing long time stable and durable adhesive bond
- Minimal invasive ZrO2 restaurations like veneers are now doable

LisiFuse Connect

Diffusing LiSi to monolithic ZrO2

– Chipping score < 0,1

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Adhesiveness MpA	15,2	20,5	16,8	19,1	15,2	15,3	14,8	> 30
Chipping score	1,5	-	-	1,5	-	1	1	< 0,1
Abrasion (Volume loss on the antagonist)	yes	yes	yes	yes	yes	low	yes	not measurable

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