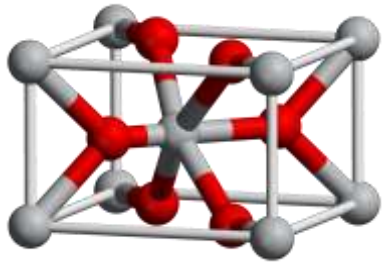
3. Principles to Plasma Surface Activation Treatment

3.2 Material properties for activation process (1/2)

Titaniumdioxide(TiO2)



Fixture material properties (Chemical Compositions)

Straumann : Titanium (Grade 4)

Titanium (Grade 5)

Commercially-pure titanium

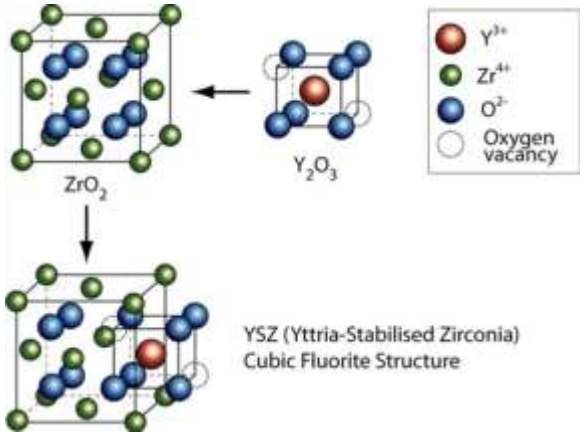
DAIDO BRAND	Typical corresponding standard	Chemical composition(wt%)								
		N	C	H	Fe	O	Al	V	Ti	Other elements
DT1	JIS Class 1	≦0.03	≦0.08	≦0.013	≦0.20	≦0.15	-	-	Bal	
	ASTM Grade 1	≦0.03	≦0.08	≦0.015	≦0.20	≦0.18	-	-	Bal	
	DIN3.7025	≦0.05	≦0.06	≦0.013	≦0.15	≦0.12	-	-	Bal	
DT2	JIS Class 2	≦0.03	≦0.08	≦0.013	≦0.25	≦0.20	-	-	Bal	
	ASTM Grade 2	≦0.03	≦0.08	≦0.015	≦0.30	≦0.25	-	-	Bal	
	DIN3.7035	≦0.05	≦0.06	≦0.013	≦0.20	≦0.18	-	-	Bal	
DT3	JIS Class 3	≦0.05	≦0.08	≦0.013	≦0.30	≦0.30	-	-	Bal	
	ASTM Grade 3	≦0.05	≦0.08	≦0.015	≦0.30	≦0.35	-	-	Bal	
	DIN3.7055	≦0.05	≦0.06	≦0.013	≦0.25	≦0.25	-	-	Bal	
DT4	JIS Class 4	≦0.05	≦0.08	≦0.013	≦0.50	≦0.40	-	-	Bal	
	ASTM Grade 4	≦0.05	≦0.08	≦0.015	≦0.50	≦0.40	-	-	Bal	
	DIN3.7065	≦0.05	≦0.06	≦0.013	≦0.30	≦0.35	-	-	Bal	

Titanium alloy

DAIDO BRAND	Typical corresponding standard	Chemical composition(wt%)								
		N	C	H	Fe	O	Al	V	Ti	Other elements
DAT5	JIS Class 60	≦0.05	≦0.08	≦0.015	≦0.40	≦0.20	5.50~6.75	3.50~4.50	Bal	
	ASTM Grade 5	≦0.05	≦0.08	≦0.015	≦0.40	≦0.20	5.5~6.75	3.5~4.5	Bal	
	DIN3.7164	≦0.05	≦0.08	≦0.0125	≦0.30	≦0.20	5.5~6.75	3.5~4.5	Bal	
	AMS 4928	≦0.05	≦0.08	≦0.0125	≦0.30	≦0.20	5.50~6.75	3.50~4.50	Bal	Y≦0.005
DAT5E	JIS Class 60E	≦0.03	≦0.08	≦0.0125	≦0.25	≦0.13	5.50~6.50	3.50~4.50	Bal	
	ASTM F136	≦0.05	≦0.08	≦0.012	≦0.25	≦0.13	5.5~6.50	3.5~4.5	Bal	
	AMS 4930	≦0.05	≦0.08	≦0.0125	≦0.25	≦0.13	5.50~6.50	3.50~4.50	Bal	Y≦0.005
DAT67	ASTM F1295	≦0.05	≦0.08	≦0.009	≦0.25	≦0.20	5.50~6.50	-	Bal	Nb 6.50~7.50 Ta≦0.50
DAT52	JIS Class 61	≦0.03	≦0.08	≦0.015	≦0.25	≦0.15	2.50~3.50	2.00~3.00	Bal	
	ASTM Grade 9	≦0.03	≦0.08	≦0.015	≦0.25	≦0.12	2.5~3.5	2.0~3.0	Bal	

3. Principles to Plasma Surface Activation Treatment

3.2 Material properties for activation process (2/2)



Zirconia material Properties (Chemical Compositions)

Yttrium-stabilized tetragonal zirconia (Y-TZP)

Table 1. The materials used in this study.

Materials	Commercial Names	Compositions	Manufacturers (Country)	Lot Number
Zirconia ceramic	Superfect Zir	ZrO_2 94%–95 wt%, Y_2O_3 4.5%–5.5 wt%	Aidite (China)	W200823NG-1

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The Effect of Surface Treatments on Zirconia Bond Strength and Durability

Dongni Shen [1,†], Huihua Wang [2,†], Ying Shi [1], Zhiwei Su [1], Matthias Hannig [3,*] and Baiping Fu [1,*]