

FLEXURAL STRENGTH ANALYSIS OF DIFFERENT COMPLETE DENTURE RESIN-BASED MATERIALS

Objectives: to compare flexural strength of different complete denture resin-based materials obtained by analogic, 3d printed and milled protocols. To evaluate the effect of the post curing process on the Flexural strength in tinted resins.

Materials:

One hundred sixty rectangular specimens (64 mm x 10 mm x 3,3 mm) were fabricated according to ISO-20795-1:2013 and divided in different groups according to the resin based material used. The printed resin materials were post cured with two protocols 20' and 40', thus two subgroups (n=10)

All the specimens were finished, polished, and tested in a three-point bending test apparatus until failure at 24 hours from the rehalization. Flexural strength data were statistically analyzed. ANOVA on Ranks was applied, followed by Bonferroni test for post hoc comparisons (P= 0.05).

Results:

Flexural strength values (MPa) were measured (mean±standard deviation) And reported in table1.

Table 1:		
Resin	Mean (MPa)	SD
ACRYPOL R	89,15	14,31
ACRYSELF P	86,07	7,093
ACRYSELF	74,83	7,84
ACRYPOL HI	85,58	8,60
ACRYPOL LL	92,39	17,18
ACRYPOL FAST	98,86	10,66
IVOTION	91,88	4,43
AADVA DISC	107,87	7,56
NEXTDENT LABO LIGHT 20"	60,11	5,72
NEXTDENT BB 40"	83,32	8,38
SPRINTRAY LABO LIGHT 20"	54,07	3,55
SPRINTRAY BB 40"	85,44	5,3
TEMP PRINT LABO LIGHT 20"	75,58	9,36
TEMP PRINT BB 40"	96,87	6,27
TEMP PRINT MOD PINK BB 40"	102,96	9,37
TEMP PRINT BB 20"	90,87	7,44

Conclusions:

Within the limitations of this study, both CAD-CAM milled Ivotion and AADVA discs showed higher flexural strength than analogic resins and can therefore be a suitable alternative for denture base. Flexural strength of 3D-printed acrylic resins showed differences according to the polymerization method used. The optimal polymerization technique was 40' polymerization using the BB-cure machine.