The bonding of resin composites to tooth structure can be achieved with different bonding techniques. Classic three step total-etch systems have a great bonding efficiency especially on enamel, but are time-consuming and have a higher risk of postoperative sensitivity. The single step self-etch adhesives have increased in popularity due to their simplified technique and lower incidence of postoperative sensitivity. But their bonding performance to enamel is slightly lower.

The recent introduced class of universal adhesives allows the dentist to select most appropriate bonding technique for all individual clinical situations. So, in deep cavities a self-etch approach minimises the risk of post-operative sensitivities, whereas the total-etch technique optimises the bonding to enamel. iBOND® Universal can be used with a self-etch, selective enamel etching and total-etch technique and can be bonded to all restoration materials available.

Giving a hand to oral health.

Objective
The aim of this study is to compare the microtensile bond strengths of iBOND® Universal (Kulzer), G-Premio BOND™ Universal (GC), All-Bond Universal® (Bisco), Clearfil Universal Bond® (Kuraray) and Single Bond™ Universal (3M). They were applied in self-etch and etch & rinse techniques. OptiBond™ FL (Kerr) and Clearfil® SE Bond (Kuraray) were taken as a gold standard reference for respectively etch & rinse and self-etch system.

Materials & Methods
36 non-carious human third molars were divided into 12 groups. Each group was tested with 3 teeth. The occlusal enamel was removed and dentine surfaces were standardised. Universal bonding agents were applied either in self-etch or etch & rinse mode according to their manufacturer’s instructions. After composite build-up with Filtek® Z250, they were stored in water for 24 hours at 37 °C and sectioned into 1mm² sticks. Microtensile bonding strength was measured using a universal testing machine. Data was analysed with two way ANOVA and post-hoc Tukey’s test.

Results

Significant higher microtensile bonding strengths were found in the etch & rinse than in the self-etch modes for iBOND® Universal, G-Premio BOND™ Universal and All-Bond Universal®. Clearfil® SE Bond (36.08 ± 3.39 MPa) and Single Bond™ Universal showed highest microtensile bonding strength among the other tested adhesives regarding the self-etch mode. OptiBond™ FL yielded significantly the highest microtensile (45.45 ± 6.47 MPa) bonding strength, whereas iBOND® Universal, G-Premio BOND™ Universal and Single Bond™ Universal showed significantly higher microtensile bonding strengths than All-Bond Universal® and Clearfil Universal Bond® in the total-etch mode.

Conclusion
Immediate bonding performance of universal adhesives were dependent on application mode, resulting mostly in higher microtensile bonding strength when used in etch & rinse mode. The gold standard three-step etch & rinse adhesive showed the highest microtensile bonding strength overall.

Comment
Time-consuming classic three bottle bonding systems are still the gold standard. But the study demonstrates a good bonding performance of the universal adhesives regardless their etching strategy. iBOND® Universal shows good bonding values within both etching techniques.

Source

The study was abbreviated, summarised and commented and all diagrams and titles have been established by Kulzer.