INTISARI

E glass fiber dental adalah salah satu *fiber dental* yang paling banyak digunakan pada beberapa aplikasi di bidang kedokteran gigi salah satunya digunakan pada aplikasi gigi tiruan cekat. *E glass fiber* khususnya di Indonesia masih sangat terbatas ketersediannya dengan harga yang relatif tinggi. Berbagai jenis bahan *glass fiber non dental* banyak ditemukan dipasaran sebagai *engineering material* dengan harga yang relatif rendah. Komposisi *glass fiber non dental* hampir sama dengan *E glass fiber dental*, sehingga diharapkan mampu menjadi alternatif untuk menggantikan *E glass fiber dental* sebagai bahan pada pembuatan FRC. Tujuan dari penelitian ini adalah mempelajari pengaruh komposisi dan volume *glass fiber non dental* terhadap kelarutan komponen dan kekuatan diametral *fiber reinforced composites* (FRC).

Bahan yang digunakan dalam penelitian ini adalah *E glass fiber dental* (Fiber-splint, Polydentia SA, Switzerland), *glass fiber non dental* komposisi A (LT, China), komposisi B (CMAX, China), komposisi C (HJ, China), *flowable* komposit (CharmFill Flow, Denkist, Korea) dan *silane coupling agent* (Monobond S, Ivoclar Vivadent, Liechtenstein). Subyek FRC dibagi dalam 16 kelompok, masing–masing 8 kelompok untuk uji kelarutan komponen dan kekuatan diametral. Setiap kelompok terdiri dari 4 sampel. Uji kelarutan komponen dan kekuatan diametral masing-masing terdiri dari *glass fiber dental*: 1,3 vol%, 2,6 vol%, *glass fiber non dental* A:1,3 vol%, 2,6 ol%, *glass fiber non dental* B: 1,3 vol%, 2,6 vol%, *glass fiber non dental* C: 1,3 vol%, 2,6 vol%. Uji kelarutan komponen berdasarkan ISO 4049 dan kekuatan diametral berdasarkan ISO 10477. Hasil yang diperoleh dianalisis menggunakan ANAVA dua jalur ($\alpha = 0,05$).

Hasil penelitian menunjukkan rerata persentasi kelarutan komponen yang terendah pada kelompok 2,6 vol% *glass fiber non dental* B (0,390±0,03 %) dan hasil tertinggi pada 1,3 vol% *glass fiber non dental* C (0,600±0,01%). Hasil kekuatan diametral terendah pada kelompok 1,3 vol% *glass fiber non dental* B (37,11±1,94 MPa) dan tertinggi pada kelompok 2,6 vol% *glass fiber non dental* C (48,37±1,42 MPa). Hasil uji Anava dua jalur menunjukkan perbedaan yang bermakna antara komposisi dan volume *fiber* baik pada kelarutan komponen dan kekuatan diametral, interaksi antara komposisi dan volume pada kelarutan komponen ($p<0,05$), kecuali pada interaksi antara komposisi dan volume pada kekuatan diametral ($p>0,05$). Kesimpulan adalah komposisi Na_2O dan K_2O yang rendah berpengaruh terhadap penurunan kelarutan komponen dan komposisi SiO_2 dan Al_2O_3 berpengaruh terhadap peningkatan kekuatan diametral. G*lass fiber non dental* B mempunyai kesamaan sifat dengan *E glass fiber dental* dalam sifat kelarutan dan kekuatan diametral, sehingga *glass fiber non dental* B berpotensi menjadi alternatif sebagai pengganti E *glass fiber dental*.

Kata kunci: *glass fiber non dental*, komposisi *fiber*, volume, kelarutan komponen, kekuatan diametral

ABSTRACT

E glass dental fiber was one of dental fibers mostly used in several applications in the dental field, such as fixed denture. The availability of E glass fiber in Indonesia was very limited with a relatively costly price. A variety types of non dental glass fiber material was easily found as a lasing material in the automotive industry or in the building industry and the price was relatively low. The composition of non dental glass fiber was almost similar to E glass dental fiber. It was therefore hoped to replace E glass dental fiber as the material of FRC making. The purpose of this was to study the influence of the composition and volume of non dental glass fiber to the component solubility and the diametral strength of FRC.

The material used in the research was E glass dental fiber (Fiber-splint, Polydentia SA, Switzerland), composition A non dental glass fiber (LT, China), compisition B (CMAX, China), composition C (HJ, China), flowable composite (CharmFill Flow, Denkist, Korea) and silane coupling agent (Monobond S, IvoclarVivadent, Liechtenstein). The subject was divided into 16 groups that consisted of 8 groups to the component solubility test and 8 other groups to the diametral strength test. Each component solubility test and the diametral strength test consisted of glass dental fiber: 1.3 vol%, 2.6 vol%, non dental glass fiber A: 1.3 vol%, 2.6 vol%, non dental glass fiber B: 1.3 vol%, 2.6 vol%, non dental glass fiber C: 1.3 vol%, 2.6 vol%. Component solubility test was based on the ISO 4049 and the diametral strength test was based on the ISO 10477. The result was then analyzed with two ways ANOVA ($\alpha = 0.05$).

The result of the research showed that on the average percentage of the solubility, the lowest was in the group of 2.6 vol% non dental B (0.390±0.03%) and the highest was on the 1.3 vol% non dental glass fiber composition C (0.600±0.01%). In the result of diametral strength , the lowest was on the group of 1.3 vol% non dental glass fiber B (37.11±1.94 MPa) and the higest was on the group of 2.6 vol% non dental glass fiber C (48.37±1.42 MPa).The result of two ways Anova test showed a significant difference between the composition and the fiber volumetric in term of component solubility and diametral strength, interaction between composition and volumetric in the component solubility of ($p<0.05$), except for the interaction between composition and volumetric in the diametral stregth ($p>0.05$). The conclusion of the research was that low content of Na_2O, K_2O decreased the solubility and high content SiO_2, Al_2O_3 increased diametral strength. The non dental glass fiber B showed property similarity to the dental glass fiber, hence the non dental glass fiber B is potensial as an alternatife dental glass fiber.

Keywords: non dental glass fiber, fiber composition, volumetric, component solubility, diametral strength.