

**EFEK PENAMBAHAN SERAT POLYPROPYLENE  
TERHADAP DAYA LEKAT DAN KUAT LENTUR PADA  
REHABILITASI STRUKTUR BETON  
DENGAN *SELF-COMPACTING REPAIR MORTAR (SCRM)***

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**ABSTRACT**

In the cases of repairing and rehabilitation work of existing concrete structures, interface bond strength between old (substrate layer), and new concrete (overlay) will be one of the main factors that will significantly affect the quality of the strengthened structures. Considering its unique fresh characteristics, self-compacting concrete offers more advantages in repairing and rehabilitation works. Effects of polypropylene fiber addition on interface shear bond strength, and the flexural strength of bi-layer concrete (substrate and overlay) were investigated in this experimental study.

In this research works, polypropylene fibers added at  $0 \text{ kg/m}^3$ ,  $1 \text{ kg/m}^3$ ,  $2 \text{ kg/m}^3$ , and  $3 \text{ kg/m}^3$  in the fresh mix of self compacting concrete that will be used as the overlay layer. The fresh characteristics of self-compacting concrete were investigated using slump-flow test. After 28 days of substrate layer (normal concrete) age, self-compacting concrete that utilized as overlay layer were casted on the substrate layer. Interface bond strength that tested using Bi-surface Direct Shear Method, and bi-layer (substrate and overlay) concrete flexural strength were investigated 28 days after the overlay layer casted. Each variant of the bond strength and flexural strength investigated using 3 standard specimens, therefore totally 36 specimens were tested.

Based on the tests results, it can be concluded several points as follows; (1) in the case of shear bond strength, polypropylene fiber addition lead the improvement of shear bond strength between new and old concrete. In the dosage of  $0 \text{ kg/m}^3$ ,  $1 \text{ kg/m}^3$ ,  $2 \text{ kg/m}^3$  and  $3 \text{ kg/m}^3$ , the resulted shear bond strength were 1,985 MPa, 1,704 MPa, 2,519 Mpa, dan 2,489 MPa, (2) Polypropylene fiber addition also has positive effect on the flexural strength of the strengthened concrete. Using  $0 \text{ Kg/m}^3$ ,  $1 \text{ kg/m}^3$ ,  $2 \text{ kg/m}^3$ , and  $3 \text{ kg/m}^3$  of polypropylene fiber addition, the observed flexural strength were 4,156 MPa , 4,988 MPa, 2,601 MPa, and 2,543 MPa, and (3) based on the tests results it can be suggested that  $1 \text{ kg/m}^3$  of polypropylene fiber addition is the optimum composition for the use of polypropylene fiber reinforced self-compacting concrete as a overlay layer for repairing, and rehabilitation of concrete structures.

Keywords: Polypropylene fiber, Interface Bond Strength, Flexural Strength