

## Damage Detection Tool Design of Lightweight Concrete Using Optical Fiber Sensor and Phototransistor

<b>Title</b>	Damage Detection Tool Design of Lightweight Concrete Using Optical Fiber Sensor and Phototransistor
<b>Author Order</b>	2 of 4
<b>Accreditation</b>	
<b>Abstract</b>	<p>The developments in the construction of buildings, roads, and bridges commonly use concrete as the main material due to its strength and hardness. However, the quality of the concrete may decrease due to some factors namely the age of the concrete, temperature, pressure, tension, etc. Thus, it is important to monitor its condition to find out any small damage such as cracks. Utilizing optical fiber power loss, a sensor capable of detecting cracks on a concrete can be made. This research uses multimode fiber optic planted inside the concrete. Sensor variation model being planted is in the form of wave. The lightweight concrete is designed using plastic aggregate. A specific tool capable of responding the change of the laser power coming through the fiber optic using phototransistor is also made in this research. The concrete is tested using two testing equipment at a time namely pressure testing that uses UTM (Universal Test Machine) to assess mechanical loading. Testing out the concrete using designed result tool is done by shooting laser on one side of the optical fiber and read the output power. During the test, the concrete is loaded continually and gradually increases using the UTM. The source of the light is laser, 850 nm of length. The result of the experiment and tool testing show that when the quality of the concrete decreases, laser power output through optical fiber increases.</p>
<b>Publisher Name</b>	Department of Electrical Engineering and Information Technology, Faculty of Engineering UGM
<b>Publish Date</b>	2017-03-07
<b>Publish Year</b>	2017
<b>Doi</b>	DOI: 10.22146/ijitee.25153
<b>Citation</b>	1
<b>Source</b>	IJITEE (International Journal of Information Technology and Electrical Engineering)
<b>Source Issue</b>	Vol 1, No 1 (2017): March 2017
<b>Source Page</b>	8-12
<b>Url</b>	<a href="https://jurnal.ugm.ac.id/ijitee/article/view/25153/16142">https://jurnal.ugm.ac.id/ijitee/article/view/25153/16142</a>
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