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Pengaruh besaran energi inisiasi bridge wire detonator terhadap karakteristik perambatan gelombang detonasi dari pembakaran hidrogen-oksigen dan hidrogen-udara = The influence of initial energy value of bridge wire detonator for propagation characteristics of detonation waves generated from combustions of hydrogen-oxygen and hydrogen-air

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Abstrak

[ABSTRAK
Penelitian tentang Bridge-Wire Detonator merupakan hal yang penting karena detonator jenis ini paling sering digunakan pada industri militer dan pertambangan. Pengaruh dari besaran energi inisiasi yang diberikan oleh Bridge-Wire Detonator dapat diamati melalui karakteristik dari perambatan gelombang detonasi dari hasil pembakaran campuran bahan bakar-oksidator di dalam Pipa Uji Detonasi. Penelitian perambatan gelombang detonasi dilakukan dengan Pipa Uji Detonasi yang dilengkapi dengan pressure transducer, ion probe sensor dan soottrack record. Variasi tegangan listrik pada Bridge-Wire Detonator dari 90 volt hingga 120 volt dengan interval 10 volt, tekanan awal campuran bahan bakar-udara dari 30 kPa hingga 50 kPa dengan interval 10 kPa, sedangkan campuran bahan bakar-oksidator yang digunakan ada 2 macam yaitu hidrogen-oksigen dan hidrogen-udara. Hasil yang diperoleh berupa tekanan yang dihasilkan dari proses pembakaran serta visualisasi gelombang detonasi yang terekam pada soottrack record akan dapat menggambarkan pengaruh besaran energi inisiasi yang diberikan oleh Bridge-Wire Detonator terhadap karakteristik perambatan gelombang detonasi dari hasil pembakaran campuran bahan bakar-udara sehingga dapat digunakan sebagai dasar rancangan Bridge-Wire Detonator yang lebih efisien.
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ABSTRACT
Research on Bridge-Wire Detonator is important because this detonator is the most commonly used in the military and mining industries. The influence of the initial energy given by Bridge-Wire Detonator can be observed through the characteristics of the detonation wave propagation from the combustion of the fuel-oxydizer mixtures in the Detonation Test Tube. Experiment of detonation wave propagation is done by using the Detonation Test Tube equipped with arrays of pressure transducers, ion probe sensors and soottrack record. The variations in power supply voltage at Bridge-Wire Detonator are from 90 volts to 120 volts with 10 volt intervals, the variations for initial pressure of the fuel-oxydizer mixture are from 30kPa to 50 kPa with an interval of 10 kPa, while the fuel-oxydizer mixture used on this experiment are hydrogen-oxygen and hydrogen-air. Results obtained in the form of pressure generated by the combustion process and the visualization of the detonation wave recorded on soottrack record will be able to describe the effect of the amount of initial energy given by Bridge-Wire Detonator for detonation wave propagation characteristics from the combustion of the fuel-oxydizer mixture that can be used as basic design of more efficient Bridge-Wire Detonator.
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