ABSTRACT

THE EFFECT OF AIR PRESSURE AND NOZZLE BLASTING TYPE TO STEEL PLATE EROSION RATE DURING SANDBLASTING PROCESS

Sandblasting is a process where metal work is made of metal surfaces become rough and flat with a degree of roughness and erosion rate in accordance with the needs by firing abrasive perpendicular to the metal surface with high pressure. The process of sandblasting is used in many manufacturing industries as the process was easy and in accordance with workmanship of the workpiece with a large size such as steel plates, engine block, and plate surface ships. Sandblasting process aims to create a rough surface of the workpiece, so that if doing coating or painting can last along time and are not susceptible to corrosion. Things that determine the outcome of sandblasting, among others, human factors, air pressure, time of the shooting, and shooting distance, while the rate of erosion is influenced by the mechanical properties of metals and process of the workpiece itself.

At PT Dumas Tanjung Perak Shipyard, metal working process mostly done by sandblasting method. Sandblasting process used to clean rust, dirt, and cleaning the old paint coating on the surface of the plate. The thickness of the plate used in the sandblasting process is different, among others: plate with thickness 5 mm, 6 mm, 8 mm, and 10 mm, but all plates are similar, namely steel plate ST 37.

The sandblasting process usually uses two kinds of nozzle blasting, which is a venturi type nozzle and a straight bore nozzle. Venturi type of nozzle used to clean rust and dirt on the surface of the plate, while the straight bore nozzle type used to clean the old paint coating on the surface of the plate. Venturi nozzle and a straight bore nozzle used in the sandblasting process requires air mass flow rate of 6.290 kg / min. Abrasive discharge generated between the venturi nozzle and a straight bore nozzle is also different, when using a venturi nozzle for 19.411 kg / min, if using a straight bore nozzle at 18.65 kg / min for the same plate thickness. The rate of erosion of the plate during the sandblasting process tends to decrease when the plate thickness increases, ie if using a venturi nozzle erosion rates tend to be constant from 2.950 to 2.914 m2/min when plate thickness increases from 5 mm to 6 mm, when using a straight bore nozzle rate plate erosion also tend to be constant from 2.835 to 2.787 m2/min when thick plates increased from 5 mm to 6 mm.

Keywords: Sandblasting, Abrasive, Air Pressure