ABSTRACT

DESIGNING A FURNACE PACK CARBURIZING WITH DIRECT COOLING

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Designing a furnace pack carburizing with direct cooling aims at designing a furnace that can do pack carburizing process with a one-time heating that has a strong and sturdy construction, the temperature of the casing is safe and ergonomic working drawings are easy to work.

Furnace pack carburizing consisted of several main components in it, those were: frame, hopper, lid on furnace, carburizing box, space heater, shut down the furnace, strainers, bath tub quenching and remainder tub charcoal. With the major components above the furnace can serve pack carburizing and cooling process with a one-time direct heating. The materials used in low carbon steel frame was ST37, on the casing and the filter using eyser plate, and stainless steel 304 used to carburizing box. Analysis techniques include analysis of frame construction.

The design result to produce a furnace with a length specification of 650 mm, width 650 mm and 1210 mm hight. Analysis order to produce maximum deflection of 0.004 mm and maximum working voltage of 0.47 MPa. Reference allowable deflection of 2 mm and the stress of 92.5 MPa permits so that construction overall is safe. In one process pack carburizing, there is ± 50 specimens with dimensions of 20x20x10 mm with 1.2 to 1.5 kg of charcoal media. The estimated cost of pack carburizing furnace with direct cooling is Rp.15,741,000,-.

Keywords: pack carburizing, low carbon steel, deflection