FAILURE ANALYSIS AND THE EFFECT OF PROCESS NORMALIZING AND HARDENING-TEMPERING ON MICROSTRUCTURE AND HARDNESS OF AISI 1020 AS STEP INCREASE QUALITY CHAINS DRAG-CONVEYOR 03-M-304 PT. PETROKIMIA

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Abstract
Chains drag-conveyor PT. Petrokimia Gresik produced by PT. Pindad has a relatively short shelf life that is ± 1 year, before the chain is produced by PT. Jenkins with a shelf life ± 4 year. From this analysis failure we can conclude of the chain of hardness is insufficient to receive dynamic load of the conveyor drive motor and the friction between the chain with the sprocket causes the chain wear surface. One solution to increase the chain hardness necessary to heat treatment in AISI 1020 material forgings PT. Pindad

From the test results, initial material hardness have 155.25 BHN, after normalizing at 915 °C temperature and holding time of 30 minutes the hardness of 168.5 BHN. The process of hardening the austenite temperature 925 °C and holding time of 60 minutes with the variation of water and oil cooling media has a hardness 360.3 BHN and 263 BHN, then in tempering at 250 °C temperature and holding time of 60 minutes gave hardness 327.5. BHN and 228 BHN Combination normalizing, hardening and tempering oil medium is best to tighten the chain parameters for the ideal in theory and approach the hardness of production chain PT Jenkins, the results need to be directly applied and unknown in order to increase shelf life drag-conveyor chain.

Keywords: Chains drag-conveyor, AISI 1020, Forging, Wear, Normalizing, Hardening, and Tempering.