

C-06: Economical carburising mixture

S R Ekanayake² A J G S Dahanayake² S V M Fernando¹, N Abeysekera¹

(¹Dept of Civil Engineering & ²Dept of Mechanical Engineering, Univ of Peradeniya)

The common machine components such as gear wheels, crank shafts, cams, etc. must have a hard surface to resist wear and a tough core to resist shock loads. The

surface hardness is usually achieved by carburising the component. Although there are many ways of carburising available, the most commonly used method is pack carburising because of the simplicity and the economy of the process.

The carburising compounds available in the market are very expensive and the main aim of this study was to find low cost substitute by using mainly local ingredients.

Carburising mixtures were prepared using finely powdered coconut charcoal and mixing in different proportions of dolomite, barium carbonate, sodium carbonate or with any of their combinations. Mild steel specimens were placed inside the case hardening boxes filled with carburising compounds at a temperature of 900°C. By varying the carburising time upto 18 hours in steps of 3 hours, the depth of carbon penetration was measured. Results were compared with a commercially available carburising mixture.

A mixture of finely powered coconut charcoal with the addition of 7% barium carbonate and 3% sodium carbonate showed the optimum performance. The cost of the process with the selected compound was found to be approximately 87.5% lower than that with the commercially available compound.