Characteristic properties of parboiled rice in a superheated-steam fluidized-bed dryer have been investigated. The operating conditions were carried out at the initial moisture contents of 41-42.5% dry basis, three beds heights of 10, 12.5 and 15 cm, superheated steam temperatures of 150 and 170 °C with a constant pressure of 106.1 kPa and a fixed superficial velocity of 3.1 m/s. The experimental results were shown that the inlet temperature had much more effect on removal of moisture content than the bed height. For the paddy quality, the head rice yield after reducing moisture content to 18% dry basis was higher than 60% (average reference value of 52%) whereas the color of rice whiteness become darker and white belly is significantly affected by the inlet temperature. The lipid contents of samples were dependent upon the temperatures and the bed depths. Higher temperature and lower bed depth provided the slightly high lipid content. In addition, the lower values of peak viscosity, breakdown viscosity and setback viscosity were also found under high temperature.