An industrial-scale prototype of spouted bed paddy dryer with a capacity of 3,000 kg/h was constructed and tested. The prototype was shown to be a desirable feature of spouted bed as well as capability of continuous drying and offering consistent results through the testing period. Experimental results showed that the prototype performed well on moisture reduction and milling quality. Head rice yield and whiteness were not significantly changed regardless of using inlet air temperature up to 146 °C. At present, feed rate is limited to not exceed 1,000 kg/h and thermal energy consumption is relatively high, i.e. in range of 5.9-8.6 MJ/kg water evaporated. This could be attributed to using of improper blower. The relative results of increasing air velocity and pressure should be studied.