The objectives of this research are to investigate factors affecting on drying rate of high moisture corn at high temperature with fluidisation technique and to develop a mathematical model for predicting drying rate. There were three following steps of drying process: 1) rapid drying using fluidised bed dryer at inlet drying air temperature of 130-170 °C, 2) corn tempered for period of 40-180 minutes under the same temperature as drying from the step 1 and 3) drying with ambient air. Drying kinetic shows the inlet air temperature and the specific airflow rate significantly affecting the drying rate. Amongst three semi-empirical drying equations (Wang and Singh, Page and Lewis), Page’s equation provides the best prediction. This study also aims to study the quality of corn dried in each step. Corn qualities in terms of aflatoxin content, percentages of breakage and stress crack, and colour change have been considered. Experimental results show that aflatoxin content in dried corn does not change. Breakage and cracking depend strongly on final moisture content and are relatively dependent to temperature. Tempering provides the improvement of colour while inlet air temperature has no effect.