

ABSTRACT

The purpose of this study is to investigate the effects of the presence of foreign matter (FM) that appears during the die attach process of semiconductor device packaging on the functionality of semiconductor devices (devices). This study also covers the investigation on sources of FM, and suggests methods of reducing the presence of FM during the die attach process of devices. Actual in-process rejects were collected to categorize the different types of FM and to quantify the actual impact of the different FM categories on device manufacturing yield. Some of these rejects were sent for electrical testing to determine whether FM adversely affects the end-functionality of a device. This study concluded that the presence of FM did not adversely affect the end-functionality of a device. Some of the rejects were sent for elemental analysis to determine whether the FM types seen were of conductive material that would produce adverse effects on the end-functionality of a device. Analysis done showed that the FM consists of non-conductive Carbon elements. Simulations were also conducted to determine the sources of FM. FM sources identification allows us to suggest methods of reducing the presence of FM. With the results of this study, the reject criteria for FM in Motorola (M) Sdn. Bhd. had been revised and the preventive action taken has reduced the amount of FM found at the die attach process, thus improving the manufacturing yield of the semiconductor devices.