New Tag Assembly System Unveiled

IC and RFID tag assembly specialist Muehlbauer has launched a new system that divides tag assembly into two separate phases. The company believes the new system will give a range of companies, even ones that don’t have expertise in working with silicon, the ability to manufacture RFID tags and labels.

FCM 6000

Because of the complexity of handling silicon, Muehlbauer has sold its traditional tag assembly machines, such as its high-end Tag Assembly Lines (TAL) models, solely to semiconductor companies. These machines employ flip-chip technology, whereby the machine flips silicon chips, or “die,” by 180 degrees so that two tiny metal pads on each chip touch the ends of the antenna to make an electrical connection that is then bonded.

Muehlbauer’s new flip-chip mounter, the FCM 6000, performs only the first half of this process—mounting die to a roll of substrate tape—but it also each provides the die with larger metal pads to which the antenna can later be attached. The larger pads mean that chips and antennas can be joined more easily and more cheaply because the placement of the chip on the antenna does not have to be so precise. With the chip attached to the substrate, the resulting chip-substrate packages, or interposers, can be shipped on a roll to another company to finish the assembly process.

The significance of this, according to Muehlbauer, is that final assembly of tags can now be pushed further down the tag and smart label production chain to manufacturers that that don’t have expertise in handling silicon but are better suited than semiconductor companies are to delivering more specialized RFID-enabled labels. For example, in addition to providing conventional paper labels to their customers, paper manufacturers could also offer a range of smart labels.

“There is a bigger customer market for the FCM 6000 [than machines in the TAL line] as the package [it produces] can be easily handled. The interposer is not as gentle or fragile as

a bare die. That means the semiconductor industry no longer has to be the main producer of finished tags or labels," says a spokesman at Muehlbauer, which is based in Roding, Germany.

In this setup, the company's companion TMA 6000 machine carries out the second part of the assembly process to create finished tags and labels. Using flip-chip technology and a patented clinching process to connect the antenna to substrate-chip module, the TMA 6000 can produce up to 6,000 inlays (chip and antenna on a substrate) per hour, says Muehlbauer. A paper manufacturer could then integrate these inlays into labels.

According to Muehlbauer, the FCM 6000 will cut the cost of producing tags. While the TAL 5000 system can produce up to 5,000 labels per hour. The FCM 6000 can deliver 6,000 chip-substrate packages per hour for roughly half the price of the TAL 5000.

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