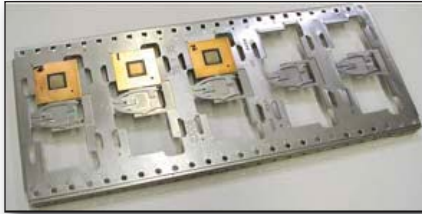


FCBGA Heat Spreader

Flip Chip Ball Grid Array

SUBSTRATE

FCBGA are presented to the system in a singulated form and are held in a customized carrier for transport. Each carrier has anywhere from 4 to 10 units depending on the substrate size and boat configuration. Substrate size varies from 27 mm to 45 mm, with the common sizes being 27, 35, 40, and 45 mm. FCBA Heat Spreaders are either a single piece or two piece construction. These Heat Spreaders vary from the PBGA process in that they are in direct contact with the die (flip chip).



PROCESS

The process begins with the substrate entering the first of two MicroMax® systems. The first MicroMax® will be used to dispense the required materials: adhesive and thermal grease. Fixturing in the first system consists of a simple vacuum fixture used to hold the unit in place while processing. The vision system locates each unit to obtain alignment accuracy during dispensing that uses auger valve technology. The adhesive is dispensed along the perimeter where the Heat Spreader will contact the substrate. The thermal grease is dispensed directly onto the underfilled die; this direct contact facilitates heat transfer.



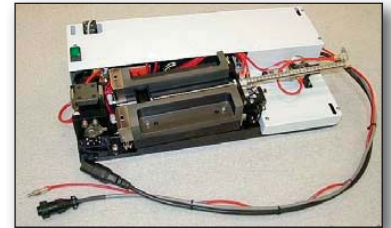
Once dispensing has been completed, the boat transfers to the second MicroMax® where Heat Spreader placement will take place. Fixturing in the

second MicroMax® varies from the first in that substrate alignment is done through active centering of the fixture. The Heat Spreader type used with FCBGA is very flat and they have a tendency to stick to each other.

A proprietary presentation method, called a Pull and Present Feeder, is required for consistent Heat Spreader presentation. This feeder works by removing a single Heat Spreader from a stack through vacuum and direct contact. Placement is done one spreader at a time, and is matched in time to the dispense processes.



After the placement process, the substrate may transfer to a Post Press and Cure station that may be mounted to the exit station of a MicroMax®. This station initiates curing and assures that all the lids are level and in the same plane.



SYSTEMS

The FCBGA lid attach process requires two MicroMax® units, the first for the dispense of two different materials, and the second for placement. Loader and Unloaders may be added for a magazine-to-magazine process.

