

**Boschman Technologies offers distinct process and equipment solutions for the semiconductor industry and related markets.**

Boschman focuses on specific market segments offering unique and superior solutions tailored to customer requirements and wishes. We dedicate our resources to deliver molding and sintering equipment for the following market segments:

Mems and Sensor packages

Powers/Discretes

Smartcards

Leadless packages

Pre-molded packages

LED



### Mold and Sintering tools

All our molds and sintering tools are developed, engineered, manufactured and tested at our mold tooling center in the Netherlands - all under one roof. Our design specialists and experienced craftsmen form a formidable team with one goal in mind - meeting your requirements. Thanks to our long history of innovative design and precision manufacturing in the Netherlands, our molds comply with the highest standards. We only use powder metallurgy tool steels of the highest quality and deploy certified heat treatments and coating processes. Our molds and sintering tools offer unprecedented wear resistance, dimensional stability and field replaceable spare parts during their entire service life. Our sintering tools are designed and manufactured based on our long term experience on molding tools.

### Mold and Sintering systems

Our molding and sintering systems are developed at our systems R&D facility in the Netherlands. Mechanical, electrical, software, process and mold-design experts work in multidisciplinary teams to realize the best possible total system solution. Our semiautomatic and automatic systems are produced at Boschman Technologies Asia in Singapore. Aside from an experienced production staff, we have local mechanical, electrical, software and process engineers available to ensure and maintain the highest possible production quality.

### Packaging services

Our Advanced Packaging Center B.V. (APC) provides packaging services ranging from package technology research, package development, qualification, prototyping and small to medium volume manufacturing services. APC also assists customers to transfer from proto-typing to massproduction for mems, Sensors and advanced IC

# UNISTAR Auto-2-FF-L

Fully automatic 2-strip Film Assisted Molding system designed for advanced mems, sensor, power, qfn and bga packages. This system can work with lead frames, substrates and ceramic carriers as well as

individual modules. Standard equipped with Boschman's unique and patented double Film Assisted Molding technologies.



### Contacts:

**Europe**  
Boschman:  
Ton van Weelden  
Tonvanweelden@Boschman.nl  
Mobile: +31620634257

**USA**  
John Crane  
jhcrane@earthlink.net  
Mobile : +6023631978

**Asia-Pacific**  
Tng Thai Keng  
tng.thai.keng@boschman.com.sg  
Mobile: +6596714395  
Johan Hamelink  
JohanHamelink@boschman.nl  
Mobile : +31651231091

**China**  
Han Lei  
han.lei@boschman.com.sg  
Mobile: +8618600581820

# Double Film Assisted Molding Technologies

Boschman has developed unique and patented double film assisted molding technologies for molding advanced mems, sensor, power, qfn and bga packages.

Often mems and sensor packages need one sided or double sided open die area, or multiple open die areas, to sense light, pressure, gases, liquids, fingerprints, etc. Advanced power packages need single or dual sided clean exposed cooling areas. Double film technology in combination with our various insert technologies are very well suited to encapsulate these advanced devices with high quality, high yield and unsurpassed productivity.

Our double film assisted molding technologies ensure that the complete mold is covered by film, including plunger and cull areas, resulting in no mold wear (dramatic reduction of spares costs), no needed mold cleaning (higher productivity and no cleaning materials needed) and, you can improve package quality by using very sticky compounds without the negative impact of frequent mold cleaning and mold maintenance.

## Film Assisted Molding Insert Technologies

Boschman offers a wide range of insert technologies in combination with our double film assisted molding technology, to keep partially exposed die, glass lids, heatsinks or die pads clean during the Film Assisted Molding process. Selection of the needed insert technology depends on the technical requirements and the application.

One of our patented insert technologies is **individual dynamic insert technology**. Automatic and programmable real time force control on the exposed area is ensured from the moment mold closes until the curing phase is finished. The insert pressure is independently controlled from the clamp force control. This insert technology allows higher assembly tolerances for height and tilt prior to molding. Compensation control is automatically done for each individual exposed area. We also offer fixed inserts, pre-force inserts and map dynamic inserts.

### Clamping mechanism

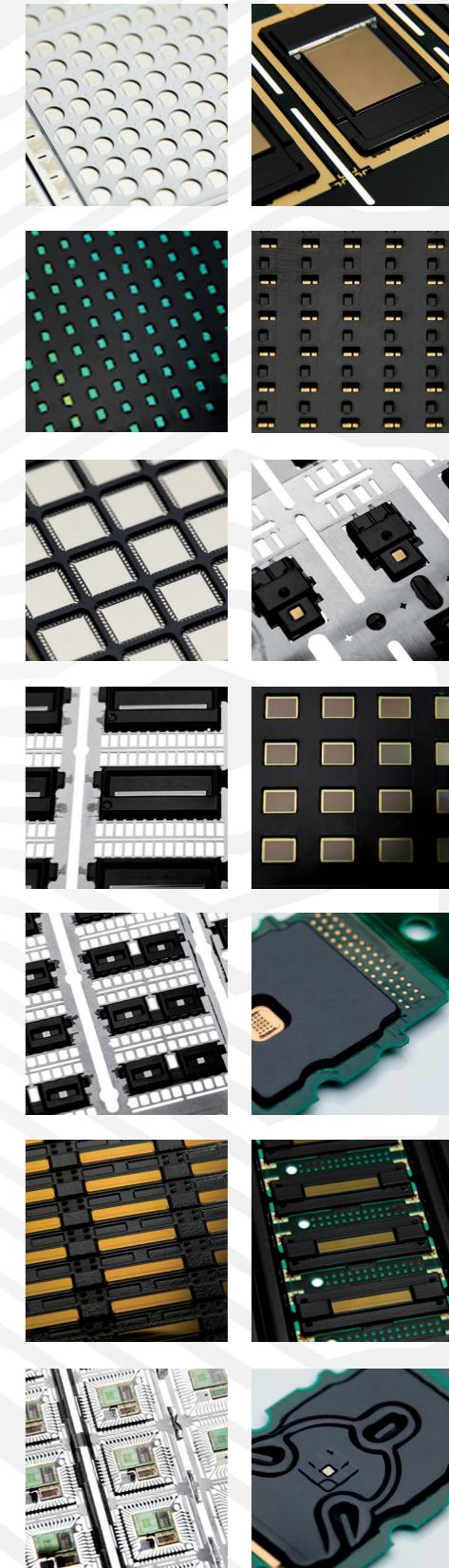
A highly accurate continuously variable, automatic clamping force mechanism from 20 to 100 tons per chase is used to enable control of mold clamping and film compression. Very effective and fast, six-point direct clamping on the mold set is used for each chase. This results in a finely balanced clamping force. Each clamping rod, 6 per chase, is pressure controlled and, therefore, compensates for any unbalance in the system. This clamping system is designed for lead frames and substrates. No conversion is needed to changeover from lead frames to substrates. For substrate clamping we use two rods to clamp directly on each individual substrate and two rods to clamp the cull area. Cull area- and substrate clamping are separately controlled and programmable. No conversion needed if different substrate thicknesses are used in the same mold. Substrate thickness compensation is automatically done.



UNISTAR AUTO-2-FF-L

### Transfer and Cure Process Control

Servo controlled with high precision custom made spindles provide for maximum accuracy and a long service life. The transfer unit is equipped with two highly accurate and calibrated force sensors to enable closed-loop control of pressure and speed. Boschman Technologies cure pressure control software is a unique feature of this system. This software was developed to avoid dangerous pressure peaks that can result in device failure and excessive bleed or flash. Any built up cure pressure can be freely programmed. Additional optional pressure sensors can be equipped in the runner for even more accurate process control.



### Data Collection and Process Monitoring

The system is equipped with internal hard disk and USB port enabling storage of all relevant process parameters and extracting this data freely and easily. All key process variables can be monitored real time with upper and lower limits. The process is displayed on a touch screen graphic for every shot. An I/O menu is available for easy monitoring. And, the status of each sensor can be monitored. Lot tracking is available as a standard feature. SECS/GEM is optional.

### Unistar-Auto-Clean-2-FF-L

Fully automatic 2-strip clean molding system, with class 100 clean room particle control. Designed for particle sensitive devices such as camera sensors, DVD chips and optical packages. The main press section and degating station are separate and equipped with individually controlled cleaning units to ensure clean operation. The system is equipped with double film technology to minimize pollution. The laminar flow units ensure that cured and uncured compound particles are removed and do not reach above the mold level. Boschman Double Film Assisted Molding Technology consisting of completely covered molds including plunger and cull area, results in significant contamination risk reduction since fresh film is used for each shot. Die down handling is used whenever possible. No ejectors are present or needed in the mold. Smooth package edge radii are designed to prevent small particles from polluting the exposed area.

Film cleaning prior to molding is optional