

Hybrid electronics:

SMD assembly on flexible substrates in mass production processes

For printed electronics many interconnect technologies from traditional electronics or microelectronics fabrication techniques can be used or adapted. Especially processes with low temperature or low mechanical impact are of interest, like assembly technologies based on thin wire bonding, but particularly conductive adhesives and nanoscale ink and paste formulations are applicable.

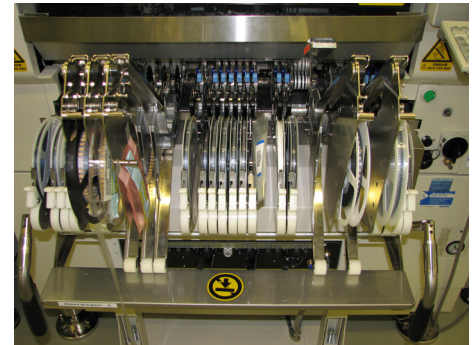
At Fraunhofer ISIT application labs are equipped for printing, assembling, packaging and connecting chips and SMD components. Although most machines are generally used for more traditional chip and wafer handling, they may as well be used for flexible substrates processing. A few examples are our flip chip die bonder with heated substrate carrier, several thermosonic wire bonders for Au, Al or Cu wires and ribbons from 17.5 μm to 400 μm , and full or half automated dispenser units.

The following list is an extract of processes for printed electronics production that are available in our lab:

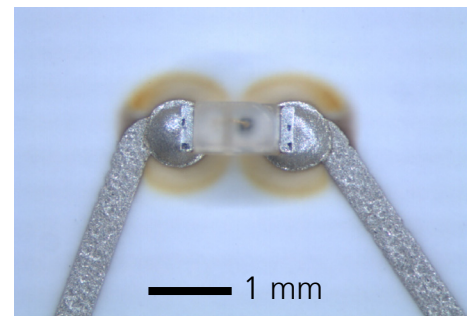
- Fully automated sheet-to sheet fabrication line: Screen or stencil printing, glue dispensing, SMD assembly (80 feeders), curing oven
- Inkjet printing (silver, copper) on flexible (paper, metal or plastic foil) and rigid substrates (e.g. silicon wafer, glass)
- Automated chip and die assembly, flip chip bonding
- Wire bonding (gold, aluminium, copper) on metalized or inkjet-printed surfaces
- Half-automated chip assembly and glue dispensing



ISIT application lab with soldering and assembly line.



Chip feeder in the assembly line with 80 different SMD reel positions.



Assembled SMD LED with conductive glue on flexible paper substrate with screen printed silver lines. The brown areas stem from glue residues and have no functional impact.

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