HOW TIPPY TAPE & SPOT MACHINE

ADOPTING IN IC TRAY PACKING

Foreword:

Advanced device packaging has become a topic of worldwide attention as packaging engineers face growing pressures to reduce cost and enhance performance to achieve greater functionality within a smaller footprint. We Tay-Chian provide the best solution to ICs packaging, by our SPOT automatic strapping machine and selecting the appropriate packing material Tippy Tape.

Background:

The electronics industry utilizes strapping media to hold bundles of trays together for handling, packing and transportation. Since the packing process may seem remote and less important to specialists concerned with IC packaging, the logistics of packing and shipping are often not monitored as closely as the manufacturing operations within the assembly arena. The materials and equipment performance, as well as the monitoring processes utilized in this last step of the operation may not be closely scrutinized until catastrophe strikes.

"Dry Bake" (Note) is an important process for Chip Probing stage (C.P.). After engineer pack IC chip in the tray, it needs to be dry bake in the process. For saving time, engineer will bundle several IC tray by elastic band or fasten tape in together, then sends in the drying oven to dry bake. Due to "dry bake" stage temperature is high, elastic band will broken let the IC tray slide and damage IC cause lot of cost lost.

A consideration of "dry bake" and the temperatures employed in this process must be weighed against the strapping material and size selections. As the industry continues to migrate toward lower processing temperatures, the transition to thinner, more compliant band becomes plausible. Potential savings in tray material cost (and cycle time improvements through dry bake) may provide an extremely fast payback against any increases in cost associated with process improvement or capitalization in this area.

Product Selection:

Before embarking on material selection, a brief discussion of equipment capability is in order. For simplicity's sake, equipment considerations will be limited to semiautomatic and automatic strapping configurations, the types routinely used in the electronics industry.

Semiautomatic systems reduce the number of cycles by hand feeding the strap. These systems generally avoid the sharp, almost knee-jerk, and peak tension cycle. If not designed for small parcel handling, however, they are also limited in their ability to provide consistent final tension control.

Regarding automatic systems there are very few manufacturers of strapping systems designed for small parcel bundling. And these systems also could not handle packing IC tray well, most of them will impact a brick (stack of several trays) in their tension cycles.

Typical crush tensions in these application-specific systems were found to be in too powerful tension. Some banding equipment utilized within the industry is designed to achieve 600-pound tensions. These systems were initially designed for the lumber, not the semiconductor, industry and actually crushed the outer edges of boards in the stack.

Automated systems are available that can handle extremely pliable, very thin strapping, which makes for consistent performance. These systems may require the strap material to be annealed, so that it will feed through the looping tower, making this consumable item more expensive-but negligible in comparison to the value of the packaged item.

Preventing Breakage:

The ideal banding should conform to the brick at the corners to prevent breakage in these areas, while still achieving a snug loop around the bundle. Larger (wider and thicker) straps tend to create a "logging chain" effect, where the tendency is to crush the brick while still maintaining some slack in the center spans.

In a worst-case scenario, the corners and side rails may be broken. In a more controlled scenario, however, the extreme tension on the edges of the trays tends to cause the brick to bow-in the top two and bottom two trays.

This action changes the highly engineered pocket area that was so carefully designed for protecting the IC. The result may be catastrophic if that particular group of products is mishandled during its shipping life.

The material selection for the strapping equipment, as mentioned above, may be defined by the size and automated constraints of the equipment. In most cases, smaller is better.

Tray suppliers, who are under pressure to reduce costs, strive to create lightweight, tight tolerance designs utilizing engineering-grade plastics. Alternative material resins must continually be developed to achieve cost points driven by the market, with temperature capability and strength becoming the tradeoff.

Those assembly sites embracing the challenge and choosing to control the strapping area will be rewarded with the ability to employ lower-cost tray materials, especially in newer package designs, where recycle programs are unable to provide sufficient trays. Targets are attainable for form, fit and function, but the necessity to survive excessive strapping strengths without bowing or breakage is close to the greatest challenge for tray suppliers.

Critical Elements:

Focusing on material properties, which deserve consideration, include elasticity, tensile strength, heat resistance, surface resistivity, shrinkage, grade, thickness, width, length and ESD (Electro Static Discharge) characteristics for electric strapping conduction still leaves considerations for variations before purchasing.

Strap tension for machine and tape' s material are the two most critical elements involved in selection. Defining the significance and criticality of these elements provides the basis for material and process definition.

Generally, executing a completed strap subjects the brick to a multiple cycle process, which typically starts with take-up of free strap material. The second phase is commonly referred to as the "crush cycle" and occurs as either a mechanical clutch or electronic counter pulls the loop snug.

Conclusion:

The selection and development of the equipment, banding material and processes should be analyzed together as a system.

Selections vary from the least expensive hand ratchet metal-banding manual configurations through fully automatic systems. These systems are capable of handling highly pliable polypropylene and polyethylene banding materials.

Solution:

Our Tippy Tape and SPOT machine can solved the problem & serve customer in much efficiency way. Here is our TA SPECIFICATIONS

Machine Dimension: 514 X 300 X 406 mm

Net Weight: 20 kg

Power Supply: Single Phase 115V/220V; 50Hz/60Hz

Tension Strength: 7kgs

Sealing Method: Welding by hot plate

Min. Strapping Size: 2.5 cm

Standard Arch Size: W360 X H180 mm

Strapping Speed: 19 strapping per Minutes/ Automatic

Tape Used: 8mm Width X 750m Length

Right now our machine not only capable to Soft PP electric tape (Tippy Tape), but also Antistatic electric belt. Below is the belt's physical properties, we also pass SGS laboratory test acquire CE in January 2006.

Tensile test 43kgf (ASTM D882)

Width 7.5mm±0.5mm (Micrometer)
Thickness 350um (Micrometer)
Shrinkage 0.6% (Deformation of 1000mm belt in 100°C water after 60min)
Surface resistivity ?s=2.5x10^{11}O/cm^2 (ASTM7?D527)
ESD (Electro Static Discharge) characteristic 0.C01KV
Heat resistance Above 72 hrs in 150°C

Explanatory notes:

1. dry bake: In Chip Probing stage, IC tray have to dry bake in the process. Due to there are moisture may in IC chip. They have to take out the moisture by baking before come into to SMT stage. Or it may happen explosive due to moisture in fever heat. (Popcorn Effect)
2. SMT: Surface Mount Technology is a method for constructing electronic circuits in which the components are mounted directly onto the surface of printed circuit boards (PCBs). Electronic devices so made are called surface-mount devices or SMDs. In the industry it has largely replaced the previous construction method of fitting components with wire leads into holes in the circuit board (also called through-hole technology). An SMT component is usually smaller than its leaded counterpart because it has no leads or smaller leads. It may have short pins or leads of various styles, flat contacts, a matrix of balls (BGAs), or terminations on the body of the component (passives).

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