Description

Process schematic

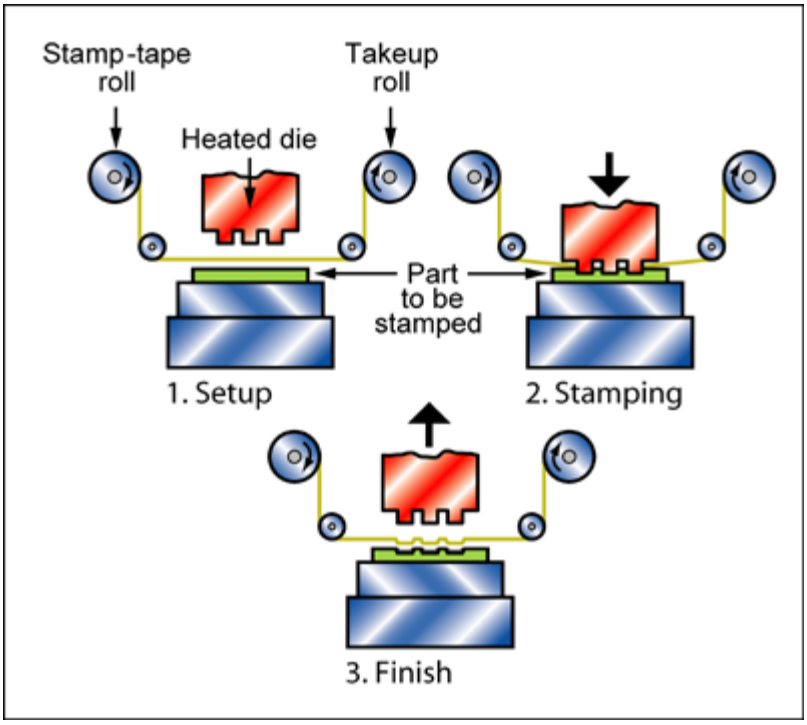

Figure caption

Hot stamping

The process

HOT STAMPING is a dry process for permanently applying a colored design, logo, text or image. It is best known as a method of applying metallic gold or silver lettering or decoration. A heated metal die (250-300 C) is pressed against a colored carrier foil and the component being printed. The hot stamp is created when the raised surface of the die contacts the foil and transfers the colored film on the face of the foil to the product being printed. The pressure from the die creates a recess for marking, which protects the stamped letter from abrasion, and heat makes the marking medium adhere to the product.

Material compatibility

Composites	✓
Natural materials	✓
Polymers - thermoplastics	✓
Polymers - thermosets	✓

Function of treatment

Decoration	✓
Color	✓
Reflectivity	✓
Surface texture	✓

Economic compatibility

Relative tooling cost	low

Relative equipment cost	low				
Labor intensity	medium				

Physical and quality attributes

Surface roughness (A=v. smooth)	C			
Curved surface coverage	Poor			
Coating thickness	0.0394	-	1.97	mil
Surface hardness	5	-	50	Vickers
Processing temperature	440	-	530	°F

Process characteristics

Discrete	✓

Supporting information

Design guidelines

Block lettering can be hot stamped on either raised or flat areas. For irregular surfaces, a silicone plate is used to transmit heat and pressure to the foil. A range of decorating finishes is available, including metallic foils, wood grain finishes and multi-colored graphics. The process can be applied to polymers, wood, leather, paper, vinyl, Mylar, and textiles such as polyester and acetates, and - less easily - to painted metal. Decoration is permanent and resists peeling, scratching and abrasion.

Technical notes

Hot stamping dies are made from magnesium, brass, or steel. Inexpensive photo-etched dies work well for prototype or short runs on flat areas; dies for long production runs are deep-cut from either brass or steel. Foils are made in four plies: a thin film carrier - generally polyester, a release coating, a decorative coating - pigment or metallic, and an adhesive - specific to the substrate material.

Typical uses

Retail and cosmetics packaging, book binding, automotive finishing, commercial printing, consumer goods, computers.

The economics

The equipment costs are low. Hot stamping with polymer or aluminum foil is inexpensive; gold foil can be expensive. Components can be handled and packed immediately. Minimal set-up time allows users to change graphics and colors as needed by simply changing a dry roll of foil or transfers.

The environment

No ink mixing or clean-up involving volatile organic solvents (VOCs) is required. The die is hot, but otherwise the process is pollutant-free.

Links

MaterialUniverse

Reference