↳*TurnKey Technologies, Inc.*

Hot Air / Cold Stake Machines

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General Description

TurnKey Technology's HACS system is a process that forms a stud, which joins plastic to plastic or plastic to metal, producing a permanent, tight assembly. As each machine is custom built, it is an extremely versatile process. It can stake, fold, form or crimp virtually any application in thermo formed plastics. With proper planning the resultant stud shapes can be domed, rosette or knurled. This is accomplished through volume calculations of the pre-staked stud. This volume is then transferred into new geometry to the cold stake head. Studs having a hollow flare head can also be achieved. The HACS process can be safely used on application s with shielded, plated or metalized surface coatings.

Machine Sequence

1. The operator loads the primary part and its components into a holding nest.
2. The operator initiates the machine through contactless ergonomic palm buttons.
3. The parts are traversed under a heating manifold assembly.
4. The heating manifold assembly traverses down, clamping the parts.
5. Hot air is directed to the plastic studs and efficiently softens them.
6. The flow of hot air is halted and a cold stake traverses down reforming the softened studs with the new geometry.
7. All cylinders retract and the completed assembly is presented to the operator.

Advantages

Tight mechanical connections: After parts have been joined through our HACS process, a tight squeeze joint is formed, resulting in little or no movement of the joined parts. During the HACS process, the cold stake holds the individual parts together until the plastic stud is solidified and stabilized.

Low production costs: The HACS process can simultaneously stake multiple studs, in most cases, regardless of space limitations or orientation. This saves time and thus lowers production costs. Each stake achieves uniform high strength and consistent stud head quality.

High-speed production: Our HACS process can perform numerous high-speed operations simultaneously.

No damage to outside surfaces: The use of controlled hot air and a cold stake head eliminates damage to the surrounding areas and finishes.

Eliminates stringing: Some manufacturers of staking equipment make use of a heated stake to reform the head of a melted part, causing the melted head of the stud to stick and string as the heated stake is withdrawn. This can also result in loose components, as the plastic does not have the opportunity to solidify until after the stake is withdrawn. Our HACS process uses a cold stake, which quickly solidifies the stud upon contact, eliminating and stringing.

Controlled temperature and heat flow: Our HACS process incorporates a finely controlled flow of hot air; plastics studs are softened quickly and heat damage to surrounding areas of the part is eliminated.

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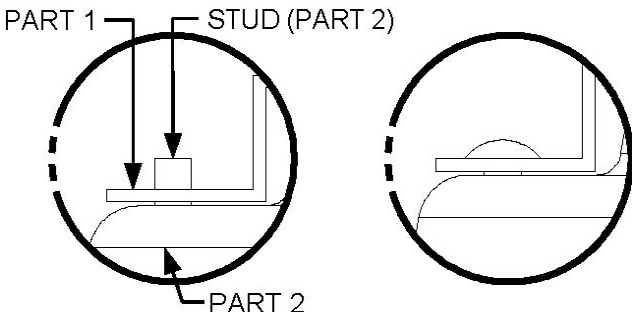
HOT AIR / COLD STAKE(HACS) MACHINE PROCESS OVERVIEW

TurnKey Technologies HACS system is a process that forms a stud, which joins plastic to plastic or plastic to metal, producing a permanent, tight assembly.

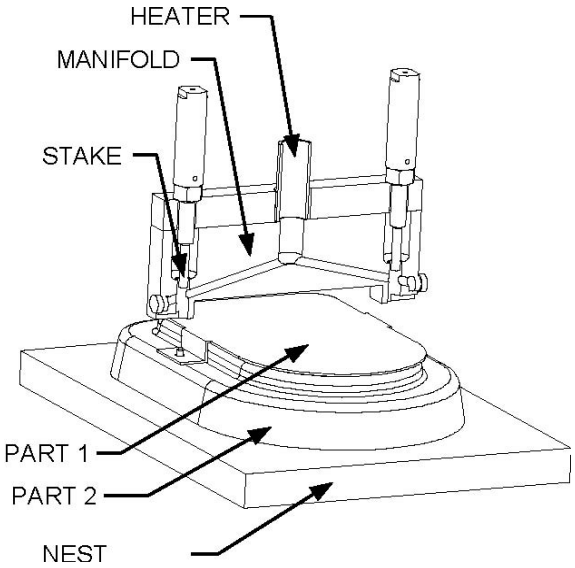
As each machine is custom built, it is an extremely versatile process. It can stake, fold, form or crimp virtually any application in thermo formed plastics. With proper planning the resultant stud shapes can be domed, rosette or knurled.

This is accomplished through volume calculations of the pre-staked stud. This volume is then transferred into new geometry to the cold stake head. Studs having a hollow flare head can also be achieved. The HACS process can be safely used on applications with shielded, plated or metalized surface coatings.

DESIGN IS SIMPLE AND EFFICIENT



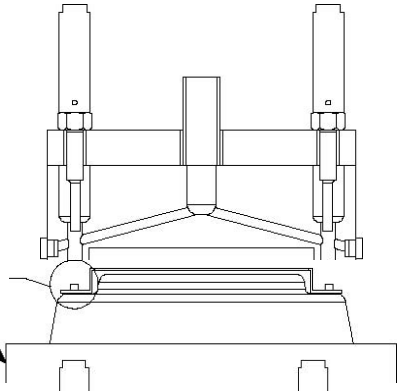
BEFORE **AFTER**



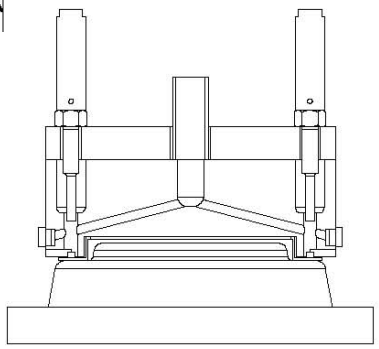
KEY COMPONENTS OF HACS

TYPICAL HACS PROCESS

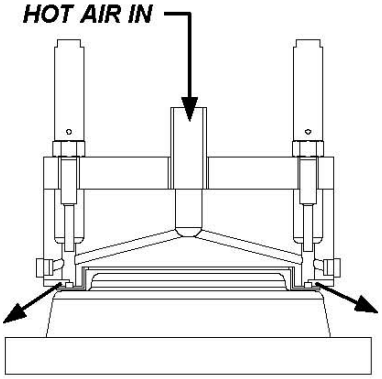
1. PARTS 1 & 2 ARE NESTED AND THEN SHUTTLED INTO POSITION UNDER THE MANIFOLD.



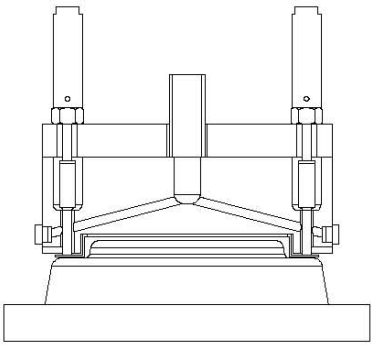
2. THE MANIFOLD IS THEN LOWERED TO ENGAGE THE NESTED PARTS.



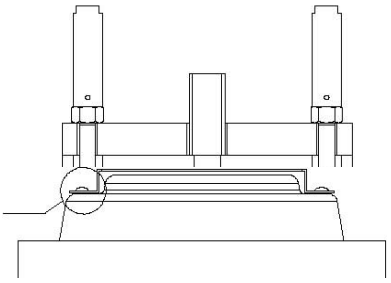
3. HEATED AIR ENTERS THE MANIFOLD AND IS DIRECTED OVER THE PLASTIC STUDS ON PART 2, THUS SOFTENING THE STUDS.



4. THE STAKES ARE THEN LOWERED TO THE SOFTENED STUDS, AND ARE HELD IN PLACE UNTIL THE STUDS HAVE COOLED ENOUGH TO RETAIN THEIR NEW SHAPE.



5. THE MANIFOLD AND STAKES ARE THEN LIFTED TO ALLOW THE PARTS, WHICH ARE NOW PERMANENTLY FASTENED, TO BE SHUTTLED BACK OUT TOWARD THE OPERATOR.



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