



THE FUNCTION OF A SHIM

A shim is a thin piece of metal or composite used to fill in space between components, for adjustment of fit, in a mechanical assembly. It is a valuable design and assembly tool that replaces machining and grinding of component parts to achieve the required accuracy.

DIMENSIONAL ADJUSTMENTS

The primary function of a shim is to provide dimensional adjustment within a mechanical assembly. This can be broken down into three basic areas:

Tolerance Compensation: The shim use is initiated in the design stage to eliminate the high cost of precision tolerances of the mating components or to compensate for accumulated tolerances during assembly.

Precision Alignment: Where interfacing elements must be coupled, shims are often designed into the assembly to align parallel and angular surfaces.

Wear Compensation: One of the most effective and economical functions of a shim. Shims are used to compensate for wear in the original assembly and are often designed to absorb wear so the basic equipment retains its original accuracy.

THE FEATURES OF A LAMINATED SHIM

Laminated shims are designed from metals or composites and have the property of peelable layers which are removed until the desired thickness is achieved. They are constructed using layers of precision gauge metal foil or composite that are bonded, under pressure, to create a rigid structure that appears and functions as solid sheet or plate. This multipurpose shim was developed to overcome the disadvantages of solid and loose-leaf shims. The bonded layers respond well to reasonable handling, including shearing and machining, with adjustment as easy as peeling off the laminations with a knife, or in the case of Spirol composite material, using no tool at all.

HOW A LAMINATED SHIM IS MANUFACTURED

Laminated shim material is produced by surface-bonding with a resin adhesive, individual layers of precision metal foil (.002" or .003") or composite film (.002" or .003") into sheets whose total thickness can range from .006 to .250. The bond is made by heat and pressure. An optimal hardening of resin is obtained and the bonding agent is reduced to such proportions that it can no longer be measured.

ADVANTAGES OF A LAMINATED SHIM

- Reduce assembly time
- Dimensional accuracy without expensive machining of components
- Quick production line adjustments and field repairs
- Eliminate need for grinding
- Minimize costs and maximize precision with fewer items to inventory

WHERE LAMINATED SHIMS ARE APPLIED

- Where rotating shafts, sliding surfaces, or stationary surfaces must be parallel
- Where end play is unacceptable
- Where stacked or accumulated tolerances are difficult to control
- Where rotating wear, sliding wear, or crushed forces change dimensions of an assembly or component part

TYPICAL LAMINATED SHIMS APPLICATIONS

- Pumps & motors, motor support struts, thrust reversers, fuselage, landing gears, gas turbines
- Hydraulic controls, refrigeration, and industrial ventilation machines
- Injection molding, extrusion, printing, paper machinery
- Machine tools
- Automotive, Aircraft, Aerospace markets
- Agriculture and civil engineering equipment

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