



## DESIGNING FOR PLASTICS

TECH-2-No.101

### Innovative Plastic Design Vs. Metal Product Imitation

TECHNOLOGY UPDATE

It doesn't take a genius to understand that plastic valves, fittings, and piping system components do not handle stress in the same way as corresponding metal products. However, thermoplastic product designs are frequently based on imitation of traditional metal products. Unfortunately, improperly designed plastic "imitations" severely limit the potential of a plastic valve or fitting, often resulting in poor performance and even failure in service.

Spears product designs are developed for plastics. Our common sense approach, combined with studies such as computer generated Finite Element Analysis (FEA), have advanced understanding of stress in thermoplastic materials, simplified product operation, and improved performance and reliability. While competitors may be content with conventional design and performance, Spears design innovation has focused on genuine product improvement. Take our Stainless Steel Reinforced (SR) plastic thread fittings. Engineered for stress reduction and containment, this new technology virtually eliminates problems with split female plastic threads. Likewise, the unique sealing design of Spears high performance Butterfly Valve eliminates seat creep, lowers operating torque, and provides more uniform sealing than conventional plastic valve designs. Even consideration of basic design elements, such as use of a special Taper-Start instead of the conventional Blunt-Start on plastic threads to reduce cross threading, is all a part of Spears ongoing commitment to producing better products.

Resulting products frequently either operate or are assembled and serviced differently than their traditional "metal" counterparts. For example, Spears Swing Check Valves, larger Diaphragm Valves, and other products requiring a bolted bonnet or "flanged" type assembly incorporate more connecting bolts than typically found in both metal and plastic "metal imitation" valves. The reason is stress distribution. To illustrate, changing from a 4 to a 16-bolt assembly results in 1/4 as much stress at each bolt. Since additional bolts decrease the unsupported area between them, stress from internal pressure is distributed more evenly. O-ring and gasket compression is more uniform, material deformation over time is reduced, and long term product reliability improved. While maintenance and service personnel accustomed to metal product designs may have concern for the additional bolts, improved stress distribution reduces potential maintenance for premature leakage and product failure.

Spears Manufacturing Company leads the plastic industry in innovative product development and continuous product improvement. This leadership is based on the desire to provide the most dependable and reliable valves, fittings and system accessories for our customers. We accomplish this goal by creating designs which are simply "right" for thermoplastic product performance. Should you settle for less?



*Progressive Products From Spears Innovation & Technology*

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