UNDERSTANDING THE NEED FOR PRODUCT MODIFICATIONS

TECH-2-No.108

TECHNOLOGY UPDATE

Continual Improvement - The Necessity for Change

The need for continual improvement is perhaps one of the most agreed upon concepts for all aspects of business and manufacturing. However, as a product design matures with use, genuine product improvement is less frequently achieved. Conventional designs of thermoplastic fittings and valves, along with their benefits and limitations, become “accepted”. As a result, improvements are often missed simply due to the resistance to change.

Angular Pipe Stops – A Case in Point

As noted in publication, TECH-2-No. 101, Designing for Plastics, 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. A good example of such is found in the angular pipe-stop design now incorporated into many Spears® industrial fittings.

Cyclic conditions of system operation can produce significant stress loads having an adverse affect on plastic pipe, valves and fittings. If not properly accommodated, these stresses can result in cyclic fatigue failures within the system. Managing stress is a fundamental principle of both system design and product design. Due to their geometry, change of direction fittings such as elbows or tees are particularly subject to hydraulic forces encountered in a fluid handling system. Engineering studies have shown that abrupt changes in wall thickness, such as from the socket wall to body wall at a fitting’s pipe-stop, forms a stress concentration point. The angular pipe stop design reduces this concentration by distributing stress loads over a broader portion of the fitting. While the benefit of this design will vary according to fitting configuration and should not be universally applied, the applicable result is increased fitting strength and resistance to cyclic fatigue.

The angular stop poses little difference in joint make-up as compared to conventional, right angle stop design. While breaking the sharp edge of the pipe O.D. or adding a chamfer (bevel) is necessary to prevent scraping cement from the socket wall, excessive beveling should be avoided to prevent over insertion during joint assembly. Over beveling can additionally create cement pockets that may result in excessive softening, regardless of pipe stop design. Simple attention to proper installation detail produces excellent joints in fittings utilizing the angular pipe stop improvement.

Progressive Products From Spears® Innovation & Technology

SPEARS® MANUFACTURING COMPANY

15853 Olden St., Sylmar, CA 91342

(818) 364-1611 • Visit our Web site: www.spearsmfg.com