Powerfeed™ Stent Loaders
(Patent Pending)

Blockwise Engineering's Powerfeed™ stent loaders (patent pending) solve a challenging problem that burdens other self-expanding stent loading devices. Typically stents are compressed using a radial compression mechanism, then, with the delivery catheter secured on one side of the compression mechanism, the stent is pushed through the compression mechanism and into the catheter with a pushrod.

A problem is that the force required to translate the stent inside the compression mechanism and into the catheter can be quite high, especially with a long stent. Since the push force is concentrated primarily on the end of the stent, the stent can be easily damaged. In some cases, the inability to load stents into a sheath without damage may limit the length of stents that can be designed and marketed.

The Powerfeed™ stent loading mechanism is a Zero-G™ radial compression mechanism with extra features to eliminate the friction between the stent and the mechanism. The Zero-G mechanism is used to uniformly compress the stent to a small diameter. When the stent reaches the diameter at which it is to be loaded into the catheter, the dies of the compression mechanism are actuated in an axis that is parallel to the stent loading path in such a way to propel the stent through the radial compression mechanism. A basic sequence consists of the following steps:

1. Three of the dies are actuated in the direction opposite the stent loading direction. Since all the other dies remain in place the stent will tend to remain stationary with the other dies.
2. Groups of three dies are in turn actuated to a rear position while the stent remains in place.
3. When all of the dies have moved to the rear, all the dies move forward in unison, propelling the stent forward.
4. This procedure is repeated until the stent is conveyed entirely into the catheter.
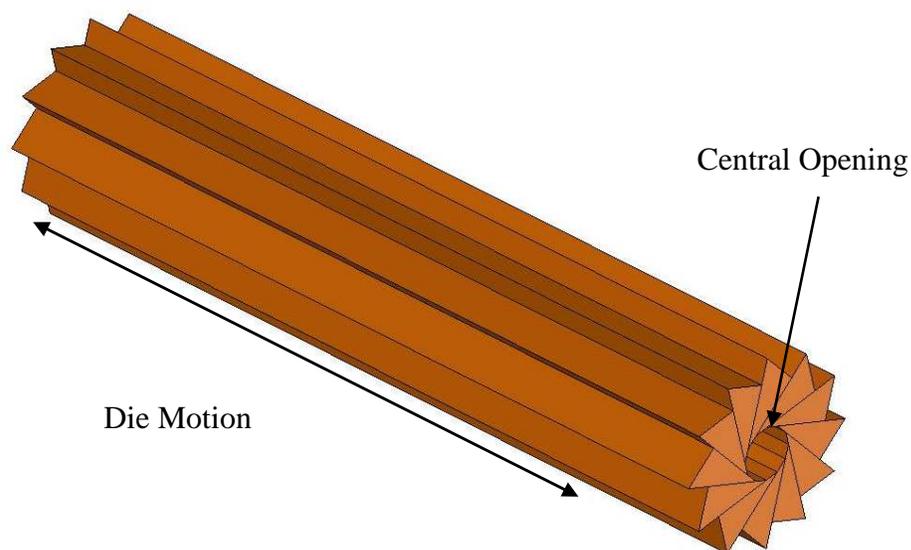

Central Opening

Die Motion

Figure 1 Dies move along stent axis to convey stent