

## Case History

### *Abrasive Cutting Attachment for Servo Feed and Cut System to Provide Deformation-Free Cut Condition*

**Product:**  
Steel Jacketed Coaxial Cable Lengths

**Objective:**  
Automate the feeding, straightening and accurate cut-to-length of stainless steel jacketed coaxial cable with repeatable lengths up to 40 feet. Cut condition must have minimal burr and no deformation of cable end ID or OD.

**Solution:**  
To satisfy the requirement for a deformation-free cut condition, it was not possible to utilize a standard quill-on-quill shear cutting process, as the pressure required to complete the shear resulted in an out-of-round condition on the cable ends. An automated abrasive wheel cutting station was designed to provide a ground cut condition that did not deform the cable ends. To achieve a non-deformed end cut with minimal burr, the cable was fed through a set of quills that were sized to be just slightly larger than the cable OD, with a space between them equal to the thickness of the cutoff wheel. The wheel was then brought down through the gap via a pneumatic cylinder with adjustable stops to limit the travel. The next feed cycle pushed the cut cable through the quills and knocked off any remaining burr.

Accuracy and repeatability of a roll type servo controlled feed process requires that the material being fed is of a consistent diameter. The accuracy of the feed length is a function of the working diameter of the feed rolls and consistency of the material OD. The servo control

drives the servo motor in pulses that are equal to a given amount of feed roll rotation. Thus, if the material varies in diameter, it in effect changes the feed roll working diameter. In this case, the density of the insulating material within the coaxial cable varied, which resulted in an inconsistent diameter when compressed between the feed rolls. This caused a condition in which a programmed feed length of 40' of cable could result in a feed variation of as much as 1/2". To eliminate this potential variation in a production environment, an additional encoder was added to the exit portion of the feed rolls. The shaft on this encoder was driven by the cable actually being pulled through it, and this data was checked against the feed length data programmed into the servo control. Constant cross checking between the servo drive and the encoder data ensured that the actual cable length fed matched the programmed length desired.

Various cable length requirements are saved to a menu as part numbers, and are called up by the operator on the touch screen interface. The coils of cable are fed to the servo system via a custom built non-motorized payoff that incorporates a pneumatic brake to stop the turntable from rotating as soon as the feed rolls stop, thus preventing free-wheeling of the coil bundle between feed cycles. The cable was straightened using a standard TAK Model #4 Quick Release Precision Wire Straightener. The cut cable lengths were fed onto the customers existing out-feed table for further processing.

**Servo Feed and Cutoff System for Jacketed Coaxial Cable Cut to Various Lengths**



**Automated Abrasive Wheel Cutting Station**  
(Guards removed for clarity)

For more information contact us at  
<http://www.novoprecision.com/>

To view an Abrasive Cut-to-Length System in operation, click on the following link:  
<http://www.novoprecision.com/video-gallery/abrasive-wheel-servo-controlled-feed-and-cut-to-length-system/>