DEPRAG E-NEWS July 2003

Multi-Function Assembly Station

The goal of this assembly system is to drive a screw into elastic handles, which will be attached to an electrical power-tool. The screws are only installed as a safety measure, in case the handle breaks. This machine was designed to feed and drive the longer M5 screw into a handle featuring an external M10 thread and also a shorter M6 screw into a handle with an external M14 thread.

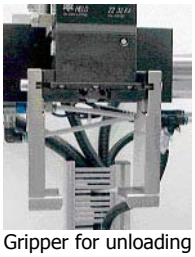
Prior to reaching the DEPRAG unit, the elastic handles come straight out of the injection-molding machine, still not fully dry and with the male-threaded bolts inserted on the bottom.

This interesting machine consists of a 4-position rotary index table with four distinct stations

1. loading and unloading of correct parts
2. screw assembly and thread-length verification
3. color-coding from underneath
4. automatic unloading of incorrect parts

Six handles are loaded vertically with the male thread down into a 6-fold part fixture on station 1). On station 2), we verify – from underneath - that the length of each male-threaded bolt is accurate in length and thereafter secure - from underneath as well - the male threaded bolts of the handle using a Lancer chuck. On the same axis – vertical from above - a DEPRAG SFM (Screwdriver Function Module) with an **EC-Electric** Screwdriver Spindle is ready to receive a hex-screw from the Screwfeeder. The Screwfeeder is designed to process both length of screws and it has a sorting device integrated, which positively identifies that the screw with the correct length is presented for the appropriate handle assembly. Each screw is automatically fed into a mouthpiece and the subsequent auto-locked split-jaws of a nosepiece.

2.5-liter capacity Screwfeeder with sorting device



Gripper for unloading

SFM with vacuum system

The pneumatic indexing system brings the SFM over the mouthpiece and a vacuum system is actuated. Once the EC-Spindle strokes down through the mouthpiece, the vacuum socket captures and retains the screw, a cylinder opens the auto-lock split-jaws and the EC-Spindle continues its travel into the tight and deep recess of the handle to assemble the screw until correctly seated at a preset torque. A dual depth-sensing system verifies that screw is seated correctly. To allow for sufficient clearance of the handles, the overall length of the vacuum socket is slightly over 300-mm (11.8-inches) and the depth of the screw location inside the handle is 110-mm (4.3-inches). All parts, which were assembled without an error indication, are subsequently color-coded from underneath at station 3). An auto-unload system is integrated in station 4, which removes a N.O.K. (not O.K.) handle from the part fixture and drops it – through a hole in the indexing table – onto a slide that leads to a reject bin. Once the table indexes to station 1), a signal light instructs the operator to unload the correct assembled handles.

The cycle time to drive six of the shorter screws into six handles is 45 seconds and to drive six long screws into six handles requires a cycle time of 60 seconds

Lori Logan - Marketing Manager
DEPRAG Inc.
(800) 433-7724
(972) 221-8163 Fax