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## ***Protection of Herr Rewind Starter Springs with ‘War on Rust’ Dip Coating versus VpCI-133 Foam Square***

**Background:** Herr Manufacturing Co., Inc. is a producer of chainsaw parts and accessories, sprockets, rims, rewind springs and file guides. Herr is evaluating the current packaging methods of their rewind springs. Herr’s Rewind Starter Springs are currently dipped in ‘War on Rust’ before they are packaged. Herr would like to compare this protection to that afforded by VpCI-133 foam squares.

**Purpose:** Compare the corrosion-inhibiting ability of ‘War on Rust’ coating to that of VpCI-133 foam squares in protecting Herr Rewind Starter Springs.

**Method:** ASTM-D-1748

**Materials:** 5 - Herr Rewind Starter Springs with VpCI-133 foam square, packaged by Herr  
4 - Herr Rewind Starter Springs, dipped in ‘War on Rust’ coating, packaged by Herr  
Packaging tape, 1-7/8” wide

**Procedure:** The following procedure was followed.

- 1) The packages arrived and were inspected.
  - a. All springs were packaged on cardboard backing and the front of the package was covered in skin film prior to being received.
- 2) Packages were separated into two groups:
  - a. 2 packaged springs with VpCI-133 foam and 2 with ‘War on Rust’ were treated with packaging tape over the cardboard backing. This was done to slow the decay of the cardboard once placed in humidity.
  - b. The other 5 packages (3 with VpCI-133 foam, 2 with ‘War on Rust’) were left as received.
- 3) After treatment, all packages were placed into ASTM-D-1748 Humidity Chamber.
- 4) After 8 hours, all packages were removed and inspected.
- 5) The as received packages failed, and were removed from testing.
- 6) The failed packages were then inspected and photographed.
- 7) The remaining four packages were returned to ASTM-D-1748 Humidity Chamber.
- 8) The treated packages were removed from ASTM-D-1748 Humidity Chamber after a total of 80 hours.
- 9) The packages were inspected, photographed, and a report was written.

**Results:** The following results were found:

**Springs Dipped in ‘War on Rust’: 8 Hours in the ASTM-D-1748 Humidity Chamber.**

The dipped springs in the un-taped packages were removed from the ASTM-D-1748 Humidity Chamber and they were inspected. Corrosion was present on 20% of the total visible surface area, and was more substantial on the outside of the coils.



**Springs Dipped in ‘War on Rust’ in Treated Package: 80 Hours in the ASTM-D-Humidity Chamber.**

The dipped springs in the taped packages were removed from the ASTM-D-1748 Humidity Chamber and they were inspected. Corrosion was present on 70% of the total surface visible area of the first spring. Corrosion was present on 20% of the visible surface area of the second spring.

**Springs with 133 Foam Squares: 8 Hours in the ASTM-D-1748 Humidity Chamber.**

The springs in the as received packages were removed from the ASTM-D-1748 Humidity Chamber and they were inspected. Light staining was present on the outside of the coil, but no corrosion was present. The inside of the coil showed neither staining nor corrosion.

**Springs with 133 Foam Squares in Treated Package: 80 Hours in the ASTM-D-1748 Humidity Chamber.**

The springs in the taped packages were removed from the ASTM-D-1748 Humidity Chamber and they were inspected. Light staining was again present on the outside of the coil, but no corrosion was present. The inside of the coil showed neither staining nor corrosion.

**Conclusion:** In both cases, the VpCI-133 foam provided significantly better protection when compared to the ‘War on Rust’ method. The springs packaged with VpCI-133 foam showed no corrosion after 8 and 80 hours in the ASTM-D-1748 Humidity Chamber, while the dipped springs showed considerable corrosion after both tests. Testing this particular application was difficult due to the degeneration of the cardboard during testing. Nevertheless, consistent results were seen over the two scenarios. All springs were returned to the customer upon completion of testing.

**Project #: 06-087-1125**