

Squeezing Ophthalmic Bottles Just the Right Way

► In evaluating a medication, ease of use is nearly as important a factor as its effectiveness. Along with determining the correct dosage, medication developers need to determine whether or not its packaging will break or leak under normal usage and if too much finger strength is required by either the patient or care giver in administering it. Difficulty in administering a medication can lead to poor compliance which, in turn, can result in poor treatment results or further disease progression.



Challenge

When testing plastic bottles used for medication, such factors as the rigidity of the plastic, length of the nib, viscosity of the medication, and the dimensions of the bottle are all influencers on the amount of force needed to properly administer the medication.

An Indian manufacturer of ophthalmic bottles wanted to determine the force required to deliver the first drop from single dose plastic bottles as well as the force required to deliver subsequent drops.

Solution

Hemetek Techno Instruments Pvt Ltd., a leading supplier of Chatillon force gauges and material test machines based in India, developed a squeeze force tester specifically for testing plastic ophthalmic bottles.

Using the Chatillon squeeze force tester, the manufacturer was able to determine the finger strength needed to squeeze different bottle designs made from a variety of plastic materials.

The tests were performed at 90 degrees to simulate assisted administration of the drop and at 45 degrees to simulate self-administration by the patient.



At the heart of the squeeze force testing system was the digital Chatillon DFS II force gauge that features a simple user interface, large full color display and offers accuracy better than 0.1% of full scale. Loads are displayed in ozf, gf, lbf, kgf and N units.

The digital DFS II force gauge was used with a mounting plate along with universal fixtures to accommodate testing of ophthalmic bottles of various sizes.

The Chatillon squeeze force tester incorporated proprietary NEXYGEN DF testing software, which offers pre- and post-test analysis of test results displayed as easy-to-read graphs in a Windows-based environment. Test results are presented in a spreadsheet format for analysis. Units of measure, fonts and titles are easily customized. Bluetooth connectivity allows for the wireless transfer of test results directly to a personal, laptop or handheld computer.