HÄUSSERMANN

Cross-checking spring loads

or: What to do with test discrepancies?

Load testing of diaphragm and waved springs seems easy. But test discrepancies between our customers' results and our own show that in reality it is a very tricky job. The reason for this is a variety of different parameters that influence the test results on either side. What can we do to overcome problems of this sort?

First, it would be helpful for both parties if our customers were to rely on our load readings and refrain from carrying out their own tests. But before that, a quality agreement needs to be made containing the release of our testing methods.

However, if a problem occurs as a result of the test method, we recommend a cross-check. The following procedure should be observed:

1. Take 2 springs from the rejected lot and exercise them 20 times down to the end of the specified operating range. After exercising, release the springs to their free state and let them recover for at least 1 minute before load testing.
2. The contact areas for the load test fixture should be carefully oiled using any transmission fluid. With waved springs for measurment in near-flat condition, you should take care that the thickness of the oil film does not affect the test result.
3. Measure each spring ten times at the specified height in both directions, i.e. during the down-stroke and during the up-stroke, disregarding any print specs. The measuring length of every stroke should go down to the specified end of the operating range of the spring. If you apply the pass-through technique, the max. measuring speed should not exceed 1 mm/s (0.04 in. per second). Between each measurement, turn the spring slightly on its outer support in order to obtain even friction for each measurement.
   If you test an unslotted disc spring, you should provide an outlet for air trapped inside the spring. Otherwise the test result may be affected. The result of each measurement should be documented.
4. Determine the mean and the standard deviation for each set of test results and mail them to us together with the two samples. Please inform us also about the resolution of your test readings.
5. We will then repeat the whole test on our laboratory load tester and mail you our results together with one sample. This you may use as a reference later on.

The evaluation of all the test results may show differences in the mean, repeatability and hysteresis error of the two measuring methods, and will help to find an explanation for the reasons of the discrepancies.
You can find out even more about your load tester by taking part in our inter-laboratory test (see also "The HAUSSERMANN inter-laboratory test")