



Q: Most people don't associate hardness testing with heat treatment, but it's very relevant. You say there are a number of products that are really appropriate for use in hardness testing of heat-treated gears. What kinds of products does Proceq offer in that regard?

TO: With any instrument, you have to have access, of course, to the area you want to test for hardness. The space has to be large enough to accommodate the largeness of the instrument's probe. This can be a problem when you talk about measuring down inside the roots of gear teeth—you don't have a large space to work with.

To solve this problem, Proceq created a probe called the DL, which has a thin 1.5-inch long nose on it. This allows you to get down into the roots of gear teeth to test the hardness. It began as a separate probe that you hooked up to the Proceq instrument, which could prove fairly costly, and a little bit cumbersome. So a couple of years ago, Proceq took that probe tip and made it into our integrated tester, the Piccolo 2 and Bambino

2. Now, it's all one small handy contained unit that you can slip into your shirt pocket and carry around with you while you're walking the floor if you need to do some testing with it. The portability and ease-of-use has really proven itself. It's become very popular for us.

Q: Is there a specific testing method used with these kinds of probes?

TO: These instruments measure hardness using the rebound method. Inside the probe, there's a little metal body with a tungsten carbide tip; this body is loaded up against a spring. When you press a button, it releases the body, which gets propelled against the surface and bounces back. The rebound technique measures the ratio of rebound speed to impact speed (just before and just after impact).

The only limitation is this: A lot of gears are case-hardened, and the gear manufacturers need to get an accurate reading of that case hardening. The limit on the rebound-method to read is about 0.030 inches with the DL device. The case hardened layer has to be thicker than this. On some of the new, more modern heat treated gears, this could be a problem, because they're getting thinner and thinner.


This is where another product, the Equostat 3, can really come in handy. It's been around for a couple of years now, but it's still new enough that we're trying to get the word out. It uses a different test technique than the rebound testers. Instead of measuring the ratio of the rebound speed, you're measuring a depth of indentation. The probe applies force to a conical diamond,

pushing that diamond into the surface, and measuring how deep it goes. This type of test is not restricted to heavy mass, like the rebound testing technique. It's also a light-load tester, so it can measure effective cases down to 0.002 inch or 0.003 inch thickness, depending on the hardness. Usually, since it's a case hardening, it's very hard.

Q: What's the difference between the Piccolo 2 and the Bambino 2?

TO: The portable metal hardness test of the Equotip Piccolo 2 features the same advances as the Equotip Bambino 2, but also allows

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user-defined hardness conversions, free Piccolink software for download and export of stored readings, and full remote control of the Equotip Piccolo 2 settings. With this instrument for the portable metal hardness test, customers can enjoy full bi-directional communication via USB interface and free online firmware updates. 

FOR MORE INFORMATION: Proceq SA of Switzerland, founded in 1954, is a leading manufacturer of high quality portable instruments for non-destructive testing of materials such as concrete, metal, or paper. Visit www.proceq.com or call 1-724-512-0330