Dr. Eddy:

Fingerprints of Quality: How ibg Catches What Others Miss

In this interview, Dr. Eddy explains why component testing with eddy current is easiest when using ibg NDT Technology instrumentation.

Why do **users say** that component testing with **eddy current** is **easiest** and most reliable when using instrumentation from **ibg NDT Technology**?

Dr. Eddy: Based on our market interviews with machine builders, operators, and NDT professionals, the combination of an intuitive user interface and iPMFT technology makes the decisive difference for testing critical components across industries, from aerospace and automotive to wind energy.

What does **iPMFT** mean **for the user**?

Dr. Eddy: iPMFT stands for several key benefits. It means multi-frequency for microstructure testing, multi-filter for crack and grinding burn detection, and – above all – peace of mind. Furthermore, it is designed for prevention and automation, so that even users without specialized training can test effectively and reliably.

OK, so what does **iPMFT** mean for **testing microstructure**?

Dr. Eddy: Today, many companies claim to offer “multi-frequency” eddy current testing, but there are major differences. Allow me to explain briefly:

- First, two things fundamentally define the quality of a multi-frequency system: the number of frequencies and the range they cover. To reliably detect flaws and material mix-ups, you need to cover a broad frequency range with appropriate spacing between frequencies. In practice, fewer than eight base frequencies simply is enough for true multi-frequency testing.
  There is also another important factor, harmonics. These are multiples of the base frequencies (like 3rd, 5th, etc.). Just like in music, they play a crucial role. Some defects can only be detected through these harmonics. That’s why ibg systems use eight base frequencies plus - simultaneously - their harmonics (iSHA technology). That is truly unique of ibg. We call this the detailed “fingerprints” of the part and they provide a high level of confidence in the results.
  But there's a second factor that's equally critical and often overlooked: harmonics. These are multiples of the base frequencies — the 3rd, 5th, and beyond. Think of it like music: a single note is more than just its fundamental pitch; it's the full combination of harmonics that gives it its distinctive character. The same logic applies in eddy current testing — certain defects are simply invisible at the base frequencies and only reveal themselves through harmonics. That's why ibg systems simultaneously apply eight base frequencies and their harmonics, which we call iSHA technology. The result is what I'd describe as a detailed “fingerprint” of each part: a rich, multi-dimensional signal that delivers a much

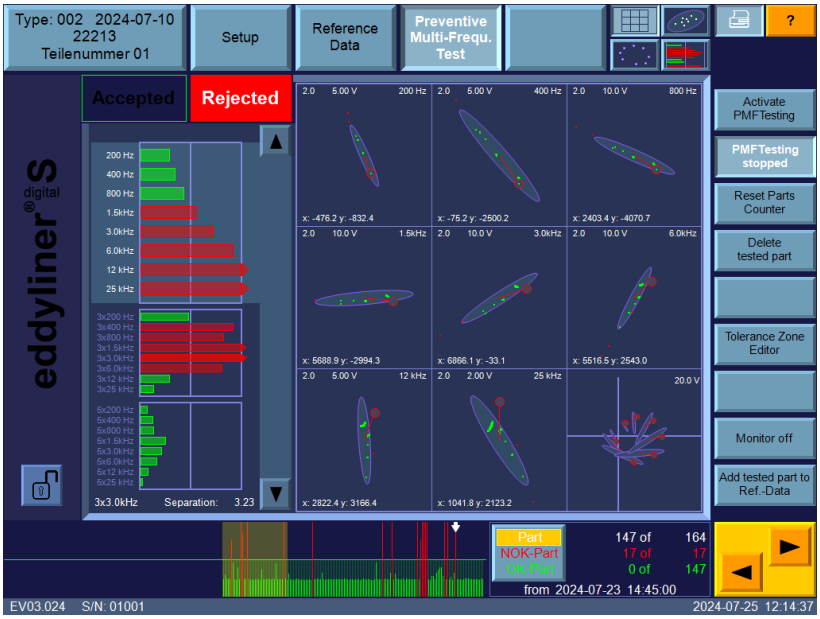

Figure 1: Interface of eddyliner S for structure testing (NOK part).

higher level of confidence in the results. No other system on the market does this. That's what makes ibg truly unique.

- Second, ease of use. The key here is what we call "good part" teaching. You take a small number of known good parts — typically somewhere between 8 and 13 — and the system learns from them to define an acceptable tolerance range. It's a form of deterministic machine learning, but in practice it feels effortless: the setup takes just a few minutes, and no NDT expertise is required. You can then validate the results using known defective parts or by checking outliers against conventional methods.

All of this is brought together by a well-designed user interface (cf. Figure 1), and a set of complementary features that, in the words of many users, make ibg a "well-rounded package."

OK, so what does **iPMFT** mean for **testing crack and grinder burn**?

Dr. Eddy: Well, almost the same as for structure testing, except that we use one frequency and cut the electromagnetic response in slices, using 30 bandpass filters. So again, we have a range of “fingerprints” on which we can compare OK parts/areas versus others. The process is simple. We take the “fingerprints” from one or several Ok surface(s). Based on that the integrated deterministic machine learning of an instrument calculates a tolerance zone by “slicing” the response. This allows a very fine separation between “noise and signal”. And yes, you can verify the test and the tolerance zone with master defect(s) or NOK master(s). And yes, you do not need to be an NDT expert to set up a test anymore. But experts could dissect the response from 30 different perspectives. That is unique. In addition, a C-scan visualizes the test result.

And it is, like the structure test, all arranged on a well-thought-out user interface with many additional features and advantages.

Can you summarize, please?

Dr. Eddy: ibg instruments are easy to use—even for non-experts—while still offering powerful tools for NDT specialists. The reliability of the test results stem from iPMFT technology, which is applied differently for crack / grinding burn detection (incl. iSHA te chnology), and for microstructure testing. The common benefit, it is “preventive” testing, therefore ibg instrumentation finds the master NOK and all other deviations from OK. The ibg approach enables fast and simple setup for new parts and applications, while maintaining a high level of confidence in the results of eddy current testing.

About ibg NDT

ibg NDT Technology is a German manufacturer of eddy current testing and NDT solutions, headquartered in Ebermannstadt. Founded in 1983 by Herbert Baumgartner, it's now a world leader in eddy current NDT. Its product line includes test controllers (eddyvisor, eddyliner, eddyguard, eddyQlab), automated inline systems, and AVIKO ball inspection machines—made in Ebermannstadt, with ball inspection systems built via Sorting Solutions s.r.o. in Bílina, Czech Republic. Key technologies: PMFT, iSHA, iTAS, and AI/ML evaluation via the ibg Ai Cube CDP.

ibg NDT serves aerospace, automotive supply, bearing manufacturing, renewable energy, and defense/ammunition sectors through 30+ global distribution partners. Services span consulting, integration, training, calibration, and repairs. ISO 9001 certified since 1995, with 45+ years of NDT expertise.