

3 Key Challenges of Cell-to-Cell Correlation Across Multiple Test Facilities

Today's vehicle test lab is more complex than ever. At the same time, the demand for quality data, produced as quickly as possible, continues to grow.

On top of the demand electrification is placing on the entire industry, new regulations are coming. As a result, OEMs, tiered suppliers, and regulators are taking a hard look at their network of testing processes and procedures to find as much efficiency as possible.

Here are the three main challenges the industry is talking about as it takes on the arduous task of large-scale correlation.



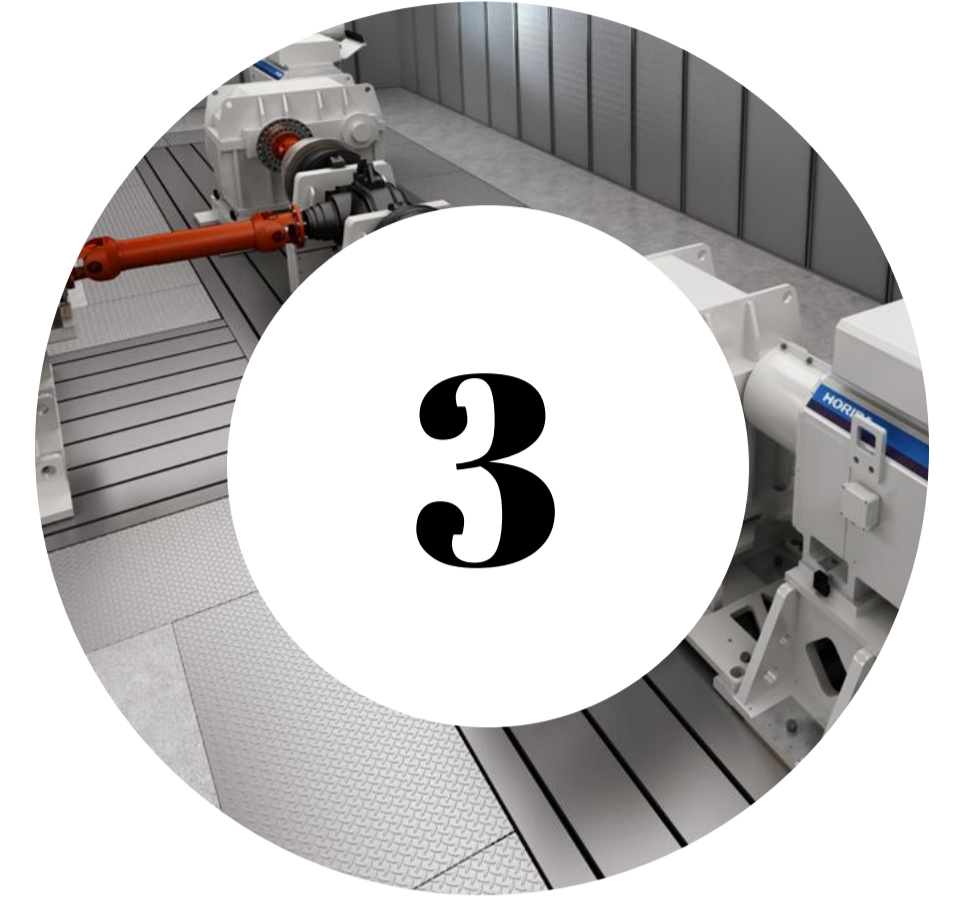
Accurate, consistent, repeatable measurement is more important than ever for successful correlation

- It all begins with measurement. Data integrity has always been important, but with new regulations driving down the scale of measurement, it has become absolutely critical.
- Very small differences have become even more meaningful. For example, just a 1 percent cell-to-cell variation in CO2 measurement has dramatic and direct impact on fuel economy calculations, and a difference of just 0.005 grams/mile in HC+NOx results now represents 25 percent of the standard for the lowest LEV III emissions bin (SULEV 20 bin = 0.02 g/mi HC + NOx).
- Test article variation is also a challenge, reinforcing the need for rock-solid testing devices. Recent round robin programs have shown that the variation in the unit under test (UUT) can be larger than the variation of test cell equipment itself.



Keeping up with changing regulations, industry standards, and software developments is not easy

- The U.S. alone has several proposed and pending regulation gamechangers, including: more stringent CO2 standards for both heavy- and light-duty vehicles; ultra-low NOx and evolving in-use regulations for heavy-duty engines proposed by both CARB and EPA; electrification/zero-emissions powertrain certification and sales mandates. Various government investigations are also underway driven by nanoparticle concerns, and changing industry standards for power train testing.
- Once your organization determines a plan to meet new directives, changes must be cascaded to the entire global team.
- Staying current on software developments, choosing where to invest limited funds in new tools, and keeping current software updated are major concerns in today's lab.



Legacy equipment and aging infrastructure can reduce efficiency

- Legacy equipment, outdated systems, and aging buildings present efficiency and consistency challenges. A variety of brands and equipment configurations typically fill today's evolving test cell and equipment variation from cell to cell is common, even within the same test lab. These variations demand creative problem solving and multiple test set-ups to fulfill requirements, often reducing efficiency.
- Ensuring equipment and software drivers are up-to-date and properly maintained may allow this patchwork to function, but underlying problems still must be addressed.