CASE STUDY

Fast and Accurate Fuel Testing at the Race

North West 200 Motorcycle Road Race

The International North West 200 motorcycle road race is Ireland's largest outdoor sporting event. Nearly 150,000 spectators flock to the coast of Northern Ireland every May to experience the thrill of this race held on closed public roads. Riders can be seen flying through towns, manoeuvring around corners and roundabouts, and over bridges. The 8.97 mile road course, known as the Triangle, is one of the fastest in the world, with average speeds of 120 mph (190 km/h) and top speeds in excess of 200 mph (320 km/h).[1]

The riders ride high-tech bikes around the course at lap times as fast as 4 minutes 22 seconds.[1] Each rider's skill and each bike's performance are pushed to their limits during the intense 4 – 6 lap race. Determination of each team's fuel compliance must be as fast and accurate as the race itself so the race outcome can be confirmed in real-time.

Keeping It Real

To keep the focus on the riders and the bikes, the NW 200 requires each team to use a race-supplied control fuel. This ensures the race results are not influenced by differences in fuel performance, but truly demonstrate rider skill and bike performance. The NW 200 relies on Euro M-Sport to supply the official control fuel for all race classes. Euro M-Sport is one of the largest suppliers of motorsport fuels, equipment, and parts in Ireland and the UK[2], so they are no stranger to meeting stringent specifications required by race regulations.

An authenticity precaution undertaken by the NW 200 organizers is real-time confirmation that the competitors are using the control fuel and it has not been doctored in an attempt to improve performance. The race organizers require that after each qualifying session, fuel samples are analyzed from three race bikes chosen at random by the race organizers. The fuel samples are collected from the chosen race bikes immediately following each session. If a sample is found to contain anything other than the control fuel, that team's qualifying times are deleted. On race day, fuel samples are also collected from the bikes of the top three riders in each race and analyzed. If a sample is found to be noncompliant, the rider is disqualified.

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For the Better

The race organizers need the testing to be highly accurate and the results available within 10 minutes of sample collection so they can confirm immediate decisions about the race results. To this end, Euro M-Sport conducted exhaustive research on the available analytical options and instrumentation that would meet the specifications of the NW 200 fuel testing requirements. As described by Mick McCullagh, Managing Director of Euro M-Sport, "After much research we arrived at one obvious choice – PerkinElmer and their Spectrum Two™ FT-IR spectrometer."

Skilled Analytics for Skilled Racing

Euro M-Sport found the Spectrum Two FT-IR met their criteria with its fast sample turnaround time, compact footprint, low-maintenance design, ease of use, and robust capabilities. PerkinElmer assisted with installation of the Spectrum Two FT-IR inside the Euro M-Sport Race Analysis Vehicle and provided an analytical chemist to run the system and help with interpretation of the data. The Spectrum Two's compact design allowed it to be mounted in the vehicle without the need for vehicle or instrument modifications.

Figure 1. Compact and portable, the Spectrum Two™ FT-IR is easy to install and use within a mobile analytical vehicle.

At the NW 200, the vehicle is stationed within the parc fermé where all bikes return after each qualifying session and race. This makes it easy for Euro M-Sport to oversee the collection of fuel samples from the specified bikes and immediately provide them to the chemist. Thanks to the proximity of the analytical van with the Spectrum Two, analytical results are ready less than two minutes after sample collection. "Within minutes of use at the very first practice sessions, we knew we had made the correct decision," McCullagh reports. "The machine proved to be exceptionally quick and reliable with its results, allowing us to lodge our findings with the race organizers comfortably within the specified time frame."

Photography by: Graham Service
www.grahamservice.com/2019-northwest200

During its first implementation at the NW 200, the Spectrum FT-IR confirmed the fuel compliance of all samples except that from one Superstock bike in the first qualifying session. Iterative testing confirmed the initial results and the rider's qualifying time was deleted, meaning he was then under pressure to deliver a good time in the one remaining qualifying session. The analytical data was valuable to the rider's team in that they were able to pinpoint the cause of the adulteration: residual fuel from previous tank testing on the bike.[3]

Figure 2. The Race Analysis Vehicle housing the Spectrum Two FT-IR is conveniently staged in the parc fermé, enabling rapid sampling-to-data turnaround time.

It is the perfect machine for everyday on-site analysis and is an invaluable piece of equipment," says McCullagh, "so much so that it is now a standardized component in our fuel testing process."

The PerkinElmer Spectrum Two FT-IR: a powerful and versatile instrument for accurate, fast testing of a wide range of materials. Its compact footprint, ease of use, and portability make it ideal for everyday use in the laboratory or in the field.[4]

Reference

1. The International North West 200. https://www.northwest200.org/. Accessed on June 20, 2019.
2. Euro M-Sport. http://www.eurom-sport.com/. Accessed on June 20, 2019.
3. Autosport. https://www.autosport.com/tt/news/143399/. Accessed on June 24, 2019.
4. Spectrum Two FT-IR Spectrometer. https://www.perkinelmer.com/product/spectrum-two-ft-ir-sp10-software-l160000a. Accessed on June 24, 2019.

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