Anton Paar

– CUSTOMER SUCCESS STORY –

Hiram Walker & Sons Limited, Windsor, Ontario, Canada

Canadian distillery Hiram Walker: “Measuring devices are best when they just run and run.”

Hiram Walker & Sons Limited is the well-known Canadian distillery with a 160-year tradition and the largest distilling capacity in North America. Around 180,000 liters of alcohol are distilled every 24 hours, five to seven days a week. To ensure the highest quality products, the distillery relies on a state-of-the-art production facility and the extensive know-how of a strong quality assurance team. In the quality control of liqueurs and to determine the whisky strength before blending and for tax purposes, Hiram Walker uses measuring technology from Anton Paar.

Relevant for: whisky, rum, vodka, liqueurs

Integral part of the quality routines

Dr. Jayna Paik is a member of the Quality Control team at the Hiram Walker production plant in Windsor, Ontario, and is responsible for managing the laboratory equipment. Every day the Quality Team is involved in the testing of about 20 different products, depending on the current production schedule. The team has a number of measuring devices at their disposal to ensure the consistent quality of ingredients and final products, ranging from basic spectrophotometers, density meters, and NIRs, to advanced chromatographic equipment such as HPLC, GC/FID, and GC/MS. To determine the alcohol content of the whiskies, rums, and vodkas, the team relies exclusively on density meters from Anton Paar. Dr. Paik looks back on her experience with the devices: “Hiram Walker has used Anton Paar density meters for a good 20 years, starting with the classic DMA density meters which have now almost all been replaced by the newer generation of DMA M density meters. We use them heavily in our distillery, blending, and bottling labs as part of our daily routines.”

There’s a lot going on at the production plant, producing Canadian whiskies such as J.P. Wiser’s, Pike Creek, Gooderham & Worts, and Lot No. 40, and also Lamb’s rum and Polar Ice vodka, to name just a few of the well-known brands. The quality of the spirits has to be spot on and Hiram Walker has invested heavily in first-class technology to ensure that nothing is left to chance. In a busy production environment everything has to run smoothly and deliver reliable results.

Dr. Jayna Paik’s job includes managing the measuring equipment used in the distillery, blending, and bottling laboratories.

The DMA M density meters are generally regarded as excellent tools for the measuring tasks at hand. As Dr. Paik explains: “What we appreciate about the DMA M density meters are their accuracy and ease of use. The density meters are used often by our operators so they need to be simple and robust. We can’t afford to question any of the results. Measuring devices are best when they just run and run.” To ensure easy operation and reproducible results, operators follow the SOP and filling is simplified by the attached Xsample sample changers, which fill the sample using a peristaltic pump.

Approved by Excise Canada

At any one time Hiram Walker has around 1.6 million barrels of spirits maturing in the fourteen warehouses at its Pike Creek facility located in the forest some 20 km outside Windsor. A large part of these spirits is destined for the Canadian market where Hiram Walker is a dominant force, the rest is exported, predominantly to the USA, Europe, and Australia.

To fulfill the requirements for exporting its products, Hiram Walker uses Anton Paar density meters to measure the alcohol strength according to AOAC or Excise Canada, as required. The DMA M density meters have approval and certification from Excise Canada and therefore meet all requirements for the measurement of alcohol strength for Canadian taxation purposes. Dr. Paik remembers the installation of the devices: “The technicians from Anton Paar Canada came and set up the density meters to use the alcohol tables required by Excise Canada. The accuracy of the measurement on DMA 5000 M is high enough to meet the stipulations and we’ve had no problems in this area, neither with the measurements or the approval of the instruments.”

Dr. Don Livermore, Master Blender at Hiram Walker, and Dr. Jayna Paik in the bottling plant (left); spirits in barrels before bottling (right).

The technicians from Anton Paar visit periodically to service the devices but usually contact is via telephone or email. If there is ever an issue with the density meters, Dr. Paik is good at finding out the cause and the telephone support is often sufficient to resolve the situation. Dr. Paik reports: “We are happy with our DMAs, they run measurements all day, five days a week. We validate our instrumentation every 3 hours with deionized water as required by Excise Canada, and only have to make air/water adjustments monthly.”

The Blending Laboratory equipped to test liqueurs and spirits.

> *“For measurements after distillation, we can simply switch the Alcolyzer setup to just the density meter and measure the alcohol strength on that.”*
>
> *Dr. Jayna Paik*

Two options for liqueurs

Besides measuring the alcohol strength of aged and neutral grain spirits, Hiram Walker also needs to check the alcohol content on its portfolio of liqueurs. To meet the excise regulations, liqueurs must be distilled before using the DMA 5000 M density meter to determine the true alcohol strength of the products. However, Hiram Walker has recently invested in Anton Paar’s Alcolyzer Spirits setup for “in-process” sample testing throughout the liqueur blending process as well as for blend verification after transferring product to the bottling lines.

Dr. Paik reports on the decision to invest in Alcolyzer devices: “Alcohol determination by distillation takes about 1 hour to get a result. We used to measure our in-process liqueurs using NIR technology which takes a couple of minutes, but we wanted to reduce errors in measurements caused by poor sample vial preparation and temperature variation, and get away from all the waste. With the Alcolyzer setup, the system simply draws the sample through by peristaltic pump, and then the system can be flushed out with water after the measurement is complete.” Three modules comprise the Alcolyzer setup: the DMA 5000 M density meter working with an NIR-based alcohol meter and a polarimeter. The polarimeter measures the saccharose and invert sugar content of the liqueur and automatically corrects its influence on the alcohol results accordingly. For the alcohol determination without extra distillation, the Alcolyzer setup delivers quick results as no sample preparation is required. “It’s done in less than five minutes,” Dr. Paik explains. “For measurements after distillation, we can simply switch the Alcolyzer setup to just the density meter and measure the alcohol strength on that.”

The Canadian whisky "Lot No. 40" is one of the best-selling whiskies produced at Hiram Walker.

With the Alcolyzer configuration there's another reason the Quality Team saves time when measuring spirits during the production process, as Dr. Paik explains: "A lot of the time when we make new products we'd like to know in-process roughly where we are for the distillations and the Alcolyzer has proven to be much more reliable on unknown samples than our previous NIR device which often required us to build a model with several data points before it could give a reasonable result."

Looking at the well-equipped distillery, blending, and bottling laboratories it's clear just how much technology supports the production of Hiram Walker's amazing spirits. The Anton Paar instruments are among a number of devices used every day to give insight into the production process and deliver values which are important for quality control and taxation purposes. Both the DMA 5000 M and Alcolyzer Spirits devices are appreciated for their ease of use and compliance with the regulations, and make a small but significant contribution to the successful production of Hiram Walker's high-quality spirits.

Main points at a glance

MEASURED PARAMETERS Alcohol strength %v/v

SAMPLES Whisky, vodka, rum, liqueurs

INSTRUMENTS DMA 5000 M, Alcolyzer Analyzing System for Spirits and Liqueurs (consisting of DMA 5000 M, Alcolyzer Spirits ME alcohol meter, MCP 100 polarimeter), Xsample 320 and Xsample 22 sample changers

ACCURACY 0.000007 g/cm³ (density meter)

REPEATABILITY 0.01 %vol (Alcolyzer setup)