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RUNWAY TECHNOLOGY

Friction testing product offers additional data to aid in runway safety

A new tow-behind continuous friction measurement device is available from NAC Dynamics, LLC, a division of Neubert Aero Corp (NAC). *AIRPORT BUSINESS* recently spoke with NAC Dynamics, LLC representatives on the capabilities of its FAA-certified Dynamic Friction Tester™ (DFT) (patent pending) and the need in the industry.

The tow-behind, wireless, and cable-free system was designed around the need to provide an all-inclusive friction testing device for airports, says Tim Neubert, president of NAC. Up until now, to describe runway pavement braking conditions the industry has used good, fair, poor, and nil. "What does that mean?" says Neubert. "If you're in a 737 and the airport reports braking condition good, and I'm in my Learjet or my Cessna 172, that variable means something different to each aircraft.

"But when the airport reports actual friction value, those aircraft all have different performance ratings on that number. The flight computers that these airlines have been using for the past 15 years require that number to be put in, but it isn't because the industry is still using good, fair, poor, nil."

According to Barry Goff, VP of research and development for NAC, friction machines that are on the market today measure the coefficient of friction, designated by the Greek symbol Mu. "That Mu actually means the rolling resistance and the skidding resistance together. So the value that you actually give to the pilot is the combination of the skidding resistance and the rolling resistance. So the pilot know whether the rolling resistance has increased or decreased or whether it is the skidding resistance that's increased or decreased."

The Dynamic Friction Tester™ is designed to split out those two values. The device has two independent measuring tires; one measures the Mu factor, while the other measures the rolling resistance of the surface. "If you minus one from the other," explains Goff, "you actually get the skidding resistance of the surface. So we have two wheels that measure three things."

Goff says rolling resistance is an important measurement because if a runway or surface is dry, the runway resistance will just be the rolling of the tire on a dry service. However, as soon as there is water, snow, ice, or a contaminant in front of that tire, the rolling resistance increases, but the friction value may not necessarily increase at that point. The DFT, offering both values, gives pilots a more accurate reading of conditions on that runway.

Historically, says Goff, the device used to measure runway friction (decelerometer) gives some three to six readings per length of the runway. "That doesn't accurately locate low friction areas," he says. "It just gives the operator a total runway average."

The NAC Dynamics DFT is designed to perform continuous readings over the length of the runway. The final reading is at one reading every meter, but it's averaged out because, Goff says, it would be too much data. "We get one reading roughly every 34 milliseconds."

The forces are measured by two axis transducers physically mounted on each wheel, explains Goff. "We're measuring the forces exerted on the tires. That's transmitted wirelessly to a portable computer on the tow vehicle that's towing the DFT as we drive down the runway — so there's no cables. Then we have a facility to either transmit that data, if we like, to the tower. Or, more commonly, they would just radio to the tower, and then the tower would radio to the pilot what the friction level is."

For winter operations, the device also features a laser that shoots down to the pavement surface to tell the operator what the temperature of the pavement is as well as the ambient temperature. Explains Neubert, "That's important for when they do winter operations to be able to identify the pavement temperature to know how to adjust their winter operations. Whether or not they need to apply sand, urea, or ethylene glycol to deice the runway." This results in cost savings for the airport while being more environmentally friendly. Adds Goff, "Currently airports flood the whole length of the runway with deicing fluid. With this you would only go out and do deicing on [needed] portions of the runway."

A 500-liter water tank is also part of the tow-behind, suitable for performing summertime friction condition testing.

For more information, visit www.airportnac.com.