

First commercial airline flight using 100% drop-in SAF enabled by technology from Virent and Johnson Matthey

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In an historic first for the aviation industry, a passenger carrying commercial aircraft has flown using 100% drop-in sustainable aviation fuel (SAF) in one of its two engines. The BioForming® process, invented by Virent, a renewable fuels and chemicals technology company, and being further advanced for commercial deployment with Johnson Matthey, a global leader in sustainable technologies, and others was a key step in enabling the 100% drop-in SAF production.

On 1 December 2021, a United Airlines Boeing 737 Max 8 aircraft flew over 100 passengers from Chicago to Washington DC with 500 gallons of 100% drop-in SAF powering the one engine. The same amount of conventional jet fuel was used in the other engine to compare performance and confirm no operational differences with the alternative fuel. SAF in general has a substantially lower carbon intensity than conventional jet fuel while 100% drop-in SAF has the added benefit that it can be used without any modifications to engines, airframes or fuelling infrastructure.

The BioForming® technology converts sugar feedstocks into a product known as BioFormate® via a catalytic process. BioFormate can then be used to create biofuels, including BioForm® synthesised aromatic kerosene (SAK), which can be blended with renewable paraffinic kerosene to produce the 100% drop-in SAF. Johnson Matthey and Virent have partnered since August 2016 to further develop and commercialise the BioForming® technology and offer it for licence to third parties.

The event culminated with a reception hosted by United Airlines at Washington D.C.'s Reagan National Airport to mark this milestone event. Representatives from Johnson Matthey and Virent attended to mark the historic occasion.

Jane Toogood, Sector Chief Executive, Johnson Matthey commented: "We'd like to congratulate United Airlines, Virent and the other partners on this pioneering flight. We are delighted to have played such a key role with our partner Virent in this latest step in the decarbonisation journey and it is further evidence that Johnson Matthey's technologies as a whole are accelerating the transition to a net zero world. The BioForming process draws on a reliable and deep feedstock pool that can be sustainably produced. This flight demonstrates that creating 100% drop-in SAF is entirely possible and indicates a clear path for greater adoption of low carbon jet fuels by the airline industry."

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