

### h. New interface with the end user's MES system

This function consists of a new interface, ready created with a set of ready-to-use data, which Iulius 4.0 instantaneously exchanges with the MES, the Manufacturing Execution System program that runs in the end user's IT. The MES has the main task of planning the line's production, improving and optimizing that of the overall facility.

The data exchanges between the Iulius 4.0 and the MES through this interface are of specific interest for the end users in order to digitally integrate their Properzi line with the logistical system, or with the supply chain in their factory, and/or with other lines present at the same production site.

Without entering into detail, it can be considered that these data exchanges mainly concern production plans, order plans, order completion, etc.

Through them, in combination with the KPIs, the email alerts, and reports computed by the Iulius 4.0 system, the production planning, tuning and control by the factory managers becomes much easier, more flexible and effective.

The data exchanges of this MES interface are carried out through a very common and effective protocols (such as OPC), which simplify the implementation on the end user side.

Furthermore, the interface also makes use of several stored data to keep track of the exchanges with the MES system, and this is done with added extended tables (in the context of the previous function g.).

Naturally, this is a standardized solution so as to be ready-to-use for the end users. But if requested it can also be customized (i.e. additional data can be included, for different database standards, or different communication protocols).

### Conclusions

This article presents the complete program of the Iulius 4.0 system, with its full set of currently available functions.

With the latest updates, the package now also includes two new features:

- Completely redesigned KPIs dashboard pages, with new highly improved graphics and searching or filtering capabilities,
- A new interface with the MES system ready-to-use for easy and immediate integration in the end user's factory.

Along with the Iulius 4.0 description the advantages for the Properzi end users have been highlighted. The most significant advantages are:

- Iulius 4.0 is specifically designed, engineered and realized for the non-ferrous metal market in which Properzi has been active for

more than 70 years

- Together with the IT functions provided, it also includes all the concerned automation advantages,

- It captures and records all of the data that are essential for the process concerned, to provide ready-made KPIs and dashboards to the end users' managers on their PCs and mobile devices,

- It automatically generates emails containing alerts and reports on the managers' mobile devices, relieving them from having to monitor the plant to make sure everything is operating smoothly,

- It provides a set of databases and interfaces ready-made for the end user's IT, to drastically reduce resources, costs, and the time required to integrate the Properzi line in their digital factory.

All of this, in cascade fashion, produces benefits for various performance aspects, such as product quality on a more consistent basis, increased Overall Equipment Efficiency (OEE), easier and more timely identification of corrective actions, better yields, more timely decisions, etc.

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## Lkw-Kryotanksystem für LH<sub>2</sub> im intensiven Testeinsatz bei OEM

Das von der Salzburger Aluminium Group (SAG) zusammen mit Daimler Truck entwickelte erste LH<sub>2</sub>-Kryotank-system für flüssigen Wasserstoff ist im mit Brennstoffzellen betriebenen Mercedes-Benz GenH<sub>2</sub> Truck-Prototyp im intensiven Testeinsatz.

Die Entwicklungspartnerschaft beider Unternehmen im Bereich Kryotanksysteme für Flüssigwasserstoff-betriebene Lkw geht in die nächste Phase. Das von österreichischen Ingenieuren entwickelte erste LH<sub>2</sub>-Speicher für Brennstoffzellen-Lkw ist auf der Daimler Truck Teststrecke im intensiven Testeinsatz. Das SAG-System zeichnet sich aus durch kompaktes Design, großes Füllvolumen, technische Verlässlichkeit und hohe Reichweite.

SAG sieht in grünem Wasserstoff einen Schlüssel zur CO<sub>2</sub>-neutralen Mobilität. Das

Unternehmen verweist darauf, dass Wasserstoff (LH<sub>2</sub>), vor allem in flüssiger Form, ein sehr effizienter Energieträger ist, der eine hohe Energiedichte aufweist. Dies ermöglicht eine größere Tankmenge und damit verbunden eine höhere Reichweite von Fahrzeugen.

Johannes Winklhofer, Leiter Forschung und Entwicklung bei SAG, benennt die Vorteile des Tanksystems für LH<sub>2</sub>: „Nur mit flüssigem Wasserstoff erreichen wir eine ähnliche Leistungsfähigkeit wie beim konventionellen Diesel-Lkw, nämlich 1.000 Kilometer und mehr. Und nur damit ist die Praxistauglichkeit vor allem im schweren Fernverkehr gegeben. Die Zusammenarbeit mit Daimler läuft sehr erfolgreich und wir sind schon sehr gespannt auf die Ergebnisse der Einsätze auf der Daimler Truck Teststrecke.“

Das von SAG entwickelte bauraumoptimierte LH<sub>2</sub>-Tanksystems ermöglicht ein ho-

hes Transportvolumen. Der doppelwandige, vakuumisolierte Edelstahltank, gewährleistet die konstant niedrige Temperatur des Wasserstoffs auf minus 253 °C. Ein spezielles Ventilsystem, das für diese extrem niedrige Temperatur ausgelegt ist, sichert eine zuverlässige Versorgung der Brennstoffzelle mit Wasserstoff.

### Mehr Reichweite mit flüssigem Wasserstoff

Karin Exner-Wöhler, CEO der SAG, führt aus: „Wir entwickeln seit mehr als zehn Jahren Kryotanks für LNG und konnten so als Entwicklungspartner für Daimler Truck in vergleichsweise kurzer Zeit ein komplettes Tanksystem für LH<sub>2</sub> entwerfen und prototypisieren. Wir sind überzeugt, dass flüssiger Wasserstoff ein Game Changer in der klima-

neutralen Mobilität ist und es freut uns sehr, dass die Praxistests so positiv verlaufen. Wir kommen mit dieser Entwicklung der Klimaneutralität im Transportwesen einen großen Schritt weiter.“

Wasserstoff ist bei Herstellung über Elektrolyse mittels grünem Strom eine CO<sub>2</sub>-neu-

trale Alternative zum Dieselmotorkraftstoff. Bei der Umwandlung von Wasserstoff und Sauerstoff in elektrische Energie, die mittels einer Brennstoffzelle erfolgt, fallen lediglich Wasser und Wärme als „Nebenprodukte“ an. Da im Lkw-Verkehr mit komprimiertem gasförmigen Wasserstoff nur eine relativ ge-

ringe Reichweite erzielt werden kann, setzen OEMs vermehrt auf flüssigen Wasserstoff, sodass das von SAG entwickelte Kryotank-system eine echte Innovation „Made in Austria“ für den Weltmarkt darstellt. ■



Das LH<sub>2</sub>-Kryotanksystem für flüssigen Wasserstoff ist auf der Teststrecke bei Daimler Truck im Testeinsatz  
The LH<sub>2</sub> cryo tank system for liquid hydrogen is undergoing testing on the Daimler Truck test track

## Truck cryo tank system for LH<sub>2</sub> in intensive test use at OEM

The first LH<sub>2</sub> cryo tank system for liquid hydrogen developed by Salzburg Aluminium Group (SAG) in cooperation with Daimler Truck is undergoing intensive testing in the prototype of fuel cell-powered Mercedes-Benz GenH<sub>2</sub> truck.

The companies' R&D partnership in the field of cryo tank systems for liquid hydrogen-powered trucks is entering the next phase. The first LH<sub>2</sub> storage system for fuel cell trucks developed by Austrian engineers is undergoing intensive testing on the Daimler Truck test track. The advantages of the SAG system are a compact design, large filling volume, technical reliability and long range.

Green hydrogen is a key to CO<sub>2</sub>-neutral mobility, says SAG. Especially in liquid form, hydrogen (LH<sub>2</sub>) is a very efficient energy carrier with a high energy density. This makes it possible to fill up more tanks and thus in-

crease the range of vehicles.

Johannes Winklhofer, head of R&D at SAG explains the advantages of the inhouse developed cryo tank system for LH<sub>2</sub>: „Only with liquid hydrogen can we achieve a similar performance as with conventional diesel trucks, namely 1,000 kilometres and more. This is the only way to ensure practical suitability, especially in heavy long-distance transport. Our cooperation with Daimler is running very successfully, and we are already very excited about the results of the operations on the Daimler Truck test track.“

The space-optimized LH<sub>2</sub> tank system developed by SAG enables a high transport volume. The double-walled, vacuum-insulated stainless steel tank ensures that the temperature of the hydrogen remains constantly low at -253 °C. A special valve system designed for this extremely low temperature ensures a reliable supply of hydrogen to the fuel cell.

### More range with liquid hydrogen

Karin Exner-Wöhler, CEO of SAG, says: „We have been developing cryogenic tanks for LNG for more than ten years and thus we have been able to design and prototype a complete tank system for LH<sub>2</sub> in a comparatively short time as a development partner for Daimler Truck. We are convinced that liquid hydrogen is a game changer in climate-neutral mobility and we are very pleased that the practical tests are going very well. We are taking a big step forward in CO<sub>2</sub> reduction in transport with this development.“

Hydrogen – when produced via electrolysis using green electricity – is a CO<sub>2</sub>-neutral alternative to diesel fuel. When hydrogen and oxygen are converted into electrical energy by means of a fuel cell, only water and heat are produced as 'by-products'. Since only a relatively short range can be achieved in HGV traffic with compressed gaseous hydrogen, more and more OEMs are relying on liquid hydrogen, so that the cryo tank system developed by SAG represents a real innovation 'Made in Austria' for the world market. ■