



NEW GENERATION RFID TAGS TESTED BY VOLVO CARS

The newly developed Confidex Corona Tag is designed to provide a greater safeguard against failure for Volvo Cars while simultaneously decreasing investment costs

Yvan Jacquet, Project Manager - Data & RFID, Volvo Car Gent in an interview with "RFID im Blick Global".

This is what automotive manufacturers demand from their technology suppliers: 100 percent security in all processes. A tag failure rate of 0.05% in a highly automated production environment is already enough reason to look for a better solution. In the case of Volvo Cars, the OEM is willing to work together with the RFID company Confidex in search of a more reliable solution. After more than one and a half years of developmental work and thousands of tests in production, a new generation of UHF-RFID-Tags is waiting in the wings for the production for Volvo Cars in Sweden, Belgium, and China. Yvan Jacquet speaks about the key benefits of the new generation of tags with "RFID im Blick Global".

Taking a look back – 12 years of RFID at Volvo

Since 2004, Volvo has pursued the strategy of 'one unique tag'. At the start of the production a UHF-RFID-Tag is bolted together at the chassis above the left front wheel at the shock-absorber system. The tag stays in this position during the whole production process. The tag is used to identify the particular vehicle at the single work stations. The adjustment of the antennas follows a platform solution. As a result a once-tested solution can be applied to other factories more easily. Today the factories in Torslanda, Sweden and Gent, Belgium as well as Chengdu, China already are RFID-enabled. Two additional Chinese factories are about to follow in 2016.

Continuous search for optimization

Despite the long-time experience of Volvo with RFID technology in the production of more than two million tags, this does not mean that a 100 percent solution has been found: "It is a positive never-ending story. Volvo could optimize the production processes on the basis of RFID making them more efficient. At the same time, new models enter the market which results in new challenges for our RFID solution. The current model campaign with the XC 90, the S 90, and the forthcoming V 90 follows a new language of form for example. Here we have to realize a nearly 100 percent identification with RFID as a result. Hence, we are required to constantly be looking for new solutions that are ideally even higher performance as well as cost-efficient."

Emergency cases: tag fracture in the paint-spray line

The reading rate in the production of Volvo is currently at over 99 percent. However, a minimal percentage of the RFID tags have difficulties, especially during the painting process. Volvo traces them almost certainly back to the construction and installation of the tags. "Before as well as after the painting processes, the bodyshell gets sprayed with different substances under high pressure in order to clean, to pre-process, and to maintain it. During the processes different vibrations occur at the tags. The exposed position at the exterior margin of the crash box as well as the PCB board structure of the tags can lead to instabilities," Yvan Jacquet explains. He continues: "Tag fracture only occurred in 0.05 percent of the cases. Nevertheless, it was enough to search for an optimized solution together with Confidex."

The new solution: More flexible, rugged, and cost-efficient as well?

The development of a new tag is a time-consuming task. Before the current solution was ready for serial production Confidex designed hundreds of different prototypes that were then tested for robustness and performance in the production of Volvo. "We started our test runs at the end of September 2015. We can only be sure that the tag is working in the serial production if several thousand test runs have run satisfactorily," Yvan Jacquet reports. Therefore, the new Confidex Corona is the result of one and a half years of development. "The tag consists of an inlay that was placed in flexible housing. The flexibility of the materials used fulfils the requirements of a higher resilience against vibrations. Consequently, tag fracture should be a problem of the past." Despite the slimmer design in contrast to its predecessor, the Confidex Corona is supposed to survive temperatures up to 230 degrees Celsius over a maximum of three hours

"Better RFID-Tags with lower investments at the same time. Can this work out? Yes! Because that is the big advantage of technological progress. Today we can buy a better product for a lower price compared to the past."



Yvan Jacquet
Project Manager - Data & RFID, Volvo Car Gent

without any damage. "The newly developed tag form is not only more suitable for our processes, but it can also be produced more cost-efficiently."

Good but not too good

A new RFID tag is supposed to increase the performance in the process while ideally being more cost-efficient than its predecessor. However, the new tag is not supposed to be 'too' good. What does that mean for the tag development? "Volvo has been using RFID technology for years in its production. This means that the complete RFID infrastructure of readers, antennas, and connections has been integrated along the manufacturing chain after years of testing. Thus, it is crucial that the application of a new tag does not result in extensive changes to the established system. Changes of the reader and antenna installations as well as re-configurations of the system would be impractical in terms of costs," Yvan Jacquet comments. The new Confidex Corona with a Impinji Monza 6 inlay showed a sensitivity which was far too high in some tests. The pursued aim of a high reader range without too much effort turned out to be an obstacle for the application at Volvo. "Confidex can adapt the sensitivity of the inlay via software in such a way that the tags function in our processes as required. It is impossible that the tags would over-reach and thus falsely identify a vehicle in the production line."

Extensive testing required

Volvo has produced over two million vehicles where RFID was used in the production. However, this does not mean that a new tag can be used without extensive testing. "We test in two steps. First, we receive tag prototypes in different designs. The tests of the prototypes result in a model that is produced automatically. Next, this model is tested again as it differs slightly from the prototype. Every new tag needs to be tested in thousands of vehicles in the production before we decide to go into serial production. We also need the experiences from the factory in Gent as well as the one in Torslanda. The two productions differ only slightly but we need 100 percent certainty that the RFID tags work without complications in all factories," Yvan Jacquet states. The extensive tests would be one of the reasons why more than two years can pass between the start of the development of a new tag and its use in the serial production. "We are certain that we have found a solution that meets our demands with the Confidex Corona. The next step will be to decide when the new tag is going to be used. At the moment we still have the predecessor in stock that needs to be used up before the changeover. The change should be completed at the beginning of 2017 at the latest," Yvan Jacquet says, looking ahead.



The Label

The first version of the Confidex Corona has been in use in the Volvo production since 2008. The newest model of the UHF-Tag, at 76 x 50 x 0.35 millimetres, survives temperatures of up to 230 degrees Celsius over a maximum of three hours. At the same time it is flexible enough to resist vibrations in the work processes due to a special polyester material.

The Production

The RFID tag gets fixed to the left front panel of every chassis on every vehicle. The tag remains there during the complete production process. It secures the explicit identification of every vehicle along the production chain. Every operating procedure gets documented in a retraceable manner.