RFID chip monitors blood, sensitive freight

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In cooperation with partners, Siemens has developed a system that continuously monitors highly sensitive products with the help of RFID chips. Originally conceived for use with banked blood, the chips are now also being used when shipping sensitive goods. The key element is the integrated temperature sensor, which provides important data about the condition of a product. The chip also boasts an impressive service life and robustness. Battery life is as long as three years; the sensor is watertight and resistant to X-rays as well as voltages of 18 kilovolts; and it can also withstand falls from a height of 1.5 meters without damage.

Blood is precious. According to the German Red Cross, roughly five million units of banked blood are needed in Germany each year, with 75 million units needed worldwide. There are generally fewer donors than recipients, which is why thorough documentation — and thus prevention

of spoiled blood due to a break in the cooling chain or an exceeded expiration date — is so important. Unspoiled blood saves lives, and as much as €1 million a year can be saved by avoiding waste. The chips are now being successfully used at three Asklepios hospitals in Hamburg, Germany.

The biggest technical challenge is the need to protect the chip against the powerful forces at work in centrifuges, where it is subjected to as much as 5,000 G. The battery and the RFID chip survives undamaged in a specially developed housing. A micro-controller stores up to 30,000 measurements by the integrated temperature sensor and continuously plots the temperature curve.

DB Schenker, a global German logistics firm, and the world's largest diagnostic company now also uses the clever chips to continuously monitor the temperature of sensitive air freight, such as medicines. On the chips is mounted a small green LED which shows the function of the data logger. If the temperature exceeds or falls below the predefined limit, the LED blinks multiple times in a row every six seconds as a warning. This enables the recipient to recognize that the contents may have been damaged immediately upon opening the package. To find out for certain, the recipient places the chip in a reader, which transfers the data to a computer. The system is GMP produced and qualified and can be delivered with a three year valid on-board calibration certificate.

Source: Siemens