

SULO

Information on RFID and the System


listopac[®]
intelligent packaging

RFID on industrial packaging

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1

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SULO Identification System Listopac

... RFID for industrial and steel packaging



2

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listopac[®] – What is RFID technology?
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Common definitions ...

- **Radio Frequency Identification (RFID)** is an automatic identification method, relying on storing and remotely retrieving data using devices called RFID tags or transponders. An RFID tag is an object that can be attached to or incorporated into a product, animal, or person for the purpose of identification using radio waves. Chip-based tags contain silicon chips and antennae. RFID tags are categorised as active or passive. Active tags contain their own power source (ie. a battery) to help boost power and range, while passive tags rely entirely on the electric field created by the tag interrogator (ie. reader). RFID tags are capable of holding far more data than a bar code.
- RFID uses wireless technology to transmit product serial numbers from RFID tags to an RFID receiver, without human intervention. It is regarded as a likely successor to barcode inventory tracking systems.
- RFID is a complement to industry's current bar code-based tracking systems, allowing companies to automatically track inventory throughout an entire supply chain. RFID automatic data collection typically does not require line-of-sight or manual scanning as do most bar code-based systems. For example, information from RFID-tagged items can be read automatically using fixed, mobile or handheld readers rather than requiring individual bar code scanning.

3


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Envicomp Systemlogistik GmbH & Co. KG

Envicomp
S Y S T E M S **... part of the SULO Group**

Envicomp Systems develops and installs integrated system solutions for the management of disposal, logistics, route planning, identification and weighing for clients of the waste management industry.



approx. 50 staff members

4

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Envicomp
S Y S T E M S

- European market leader for system solutions of waste management industry
- expert knowledge and experience in installation of identification and weighing systems in different countries

References:


- ✓ approx. 7 million RFID tags
- ✓ roughly 1,300 vehicles equipped with electronic data capture systems
- ✓ 60 lifter types in use
- ✓ 180 IT-solutions for companies, communities and public authorities Europe-wide in use

European distribution network as partner of SULO group




5

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TECTUS

**TECTUS Transponder Technology GmbH based in Moers, Germany
belongs to
TECTUS Technology AG Switzerland, founded in 1997.**

- The key people and founders of TECTUS started in 1991 by developing the first RFID automotive transponder for immobiliser system (RFID Pioneers)
- Know-how and expertise in RFID application in harsh industrial- & metal surroundings
- Business segments are:
Industry & logistics, security & access control as well as animal identification



6

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TECTUS

TECTUS Transponder Technology

- Certified according to BVS 05 ATEX ZQS/E262 (RFID system components) 
- RFID frequency spectrum in LF (<135 kHz), HF (13.56 MHz) and UHF (869 MHz)
- Global sales network and customer base in Europe, USA, Australia and Asia
- RFID production capacity in Europe and worldwide > 120 million tags
- High quality and low cost RFID ISO 9001-2000 production 

7

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listopac[®] – Latest developments in RFID
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8


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listopac[®] – RFID on steel packaging
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Obstacles and difficulties reading RFID tags on metal:

If tags are directly placed on metal, it is difficult to obtain secure readings as metal distorts radio frequency signals. Furthermore, liquids also negatively impact data transmission.

 **Use of low frequency (LF) 125 kHz transponders as they are less vulnerable to distorting influences and adverse RFID environments.**
BUT: Reading distances decrease and no bulk scanning possible



In addition, a specially designed self-adhesive spacer is bonded to the RFID tag so it is not directly placed on metal. This tag is put and sealed in the chip nest located on top end of drum.

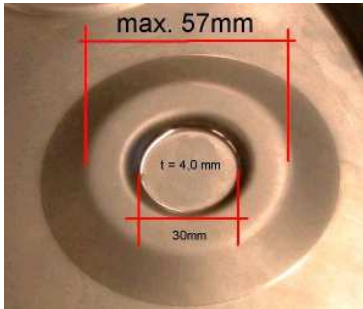
 **Device reading faults are as far as possible eliminated!**


9

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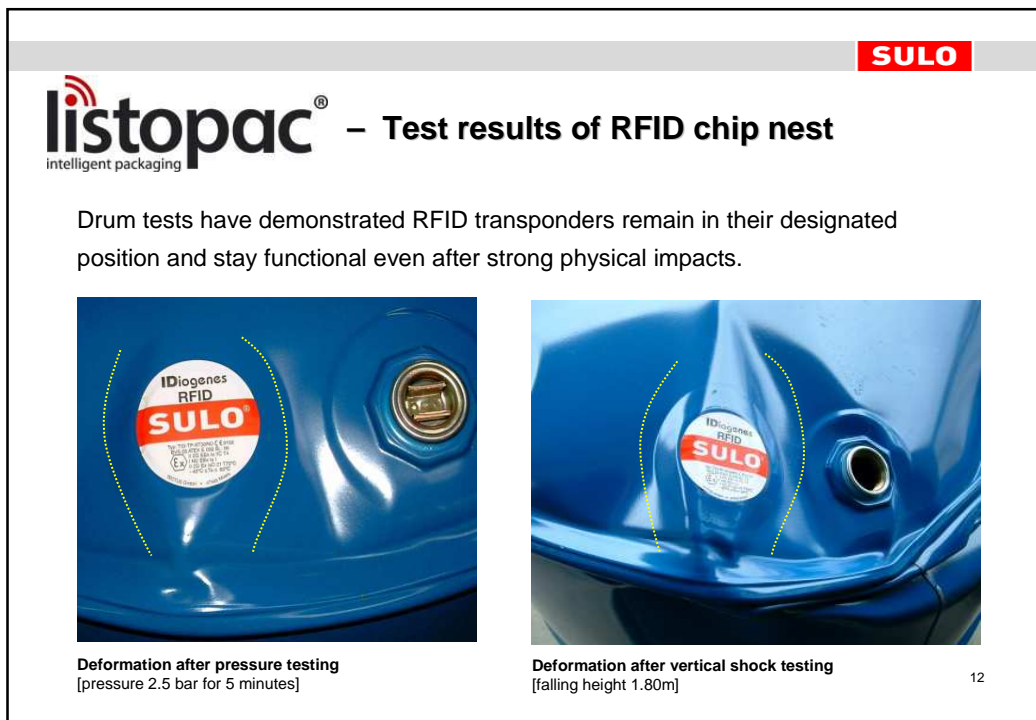
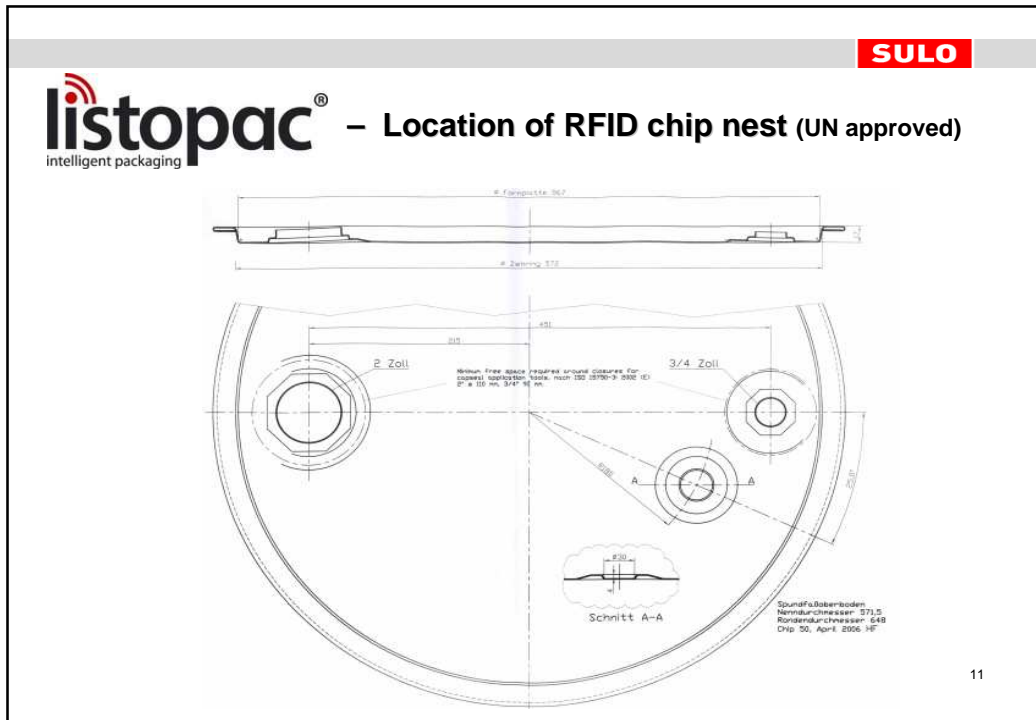
listopac[®] – New designed RFID chip nest
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The chip nest is designed to protect tags from shocks that occur during drum handling and drum shipment. It is located at a predetermined position next to the 3/4" bung of the drum.






10




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listopac[®] – Results of reconditioning tests
intelligent packaging

The positive chip nest characteristics became also obvious during the process of drum reconditioning (flushing, outer cleaning and later steel corn blasting). RFID data can still be retrieved after 25 minutes of drum flushing.



Inspection of laundered drum
[Tag still readable after hot cleansing at 100°C]




Burning off caution marks
[Transponder still functional and data retrievable]

13


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listopac[®] – Reconditioning test results
intelligent packaging

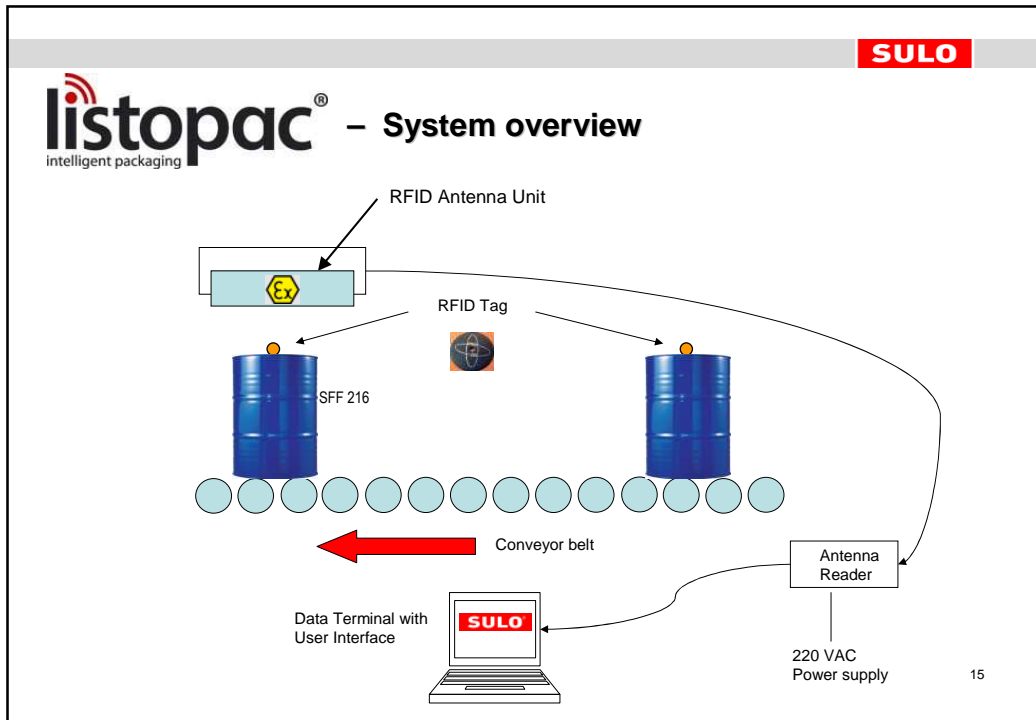
After solvent cleaning and steel corn blasting of a used drum the chip nest can be deployed again to carry RFID tags during the life cycle of a drum.



Tag reading of laundered drum



14



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listopac[®] – Two methods of identification
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- Identification of filling goods
- LF tag mounted in seal cap
- Identification of packaging
- LF tag nested and sealed in chip nest on drum top end

16


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listopac[®] – System components (LF RFID tags)
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Easy tag:


- to be placed in tab seal









Space tag:

- to be mounted and sealed in chip nest








 **Easy handling – simple assembly.**


17

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listopac[®] – System components (LF stationary reader unit)
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Stationary reader
(TPF 35 EX)



ATEX Antenna (TPA 700)



 **All LF Listopac components are suitable for usage in potentially explosive atmospheres (ATEX zone 1) and harsh industrial environments.**

18

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listopac® II – UHF range 865-869 MHz

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Various tests have been done to find a solution to automatically identify palletised drums (bulk scanning) and to overcome the constraint of limited reading range.

- **usage of standard UHF transponders**
(e.g. UPM Rafalac Dogbone tag)
- **adjustment of chip nest necessary**

Antenna size: 93 x 23 mm
3.661 x 0.906"

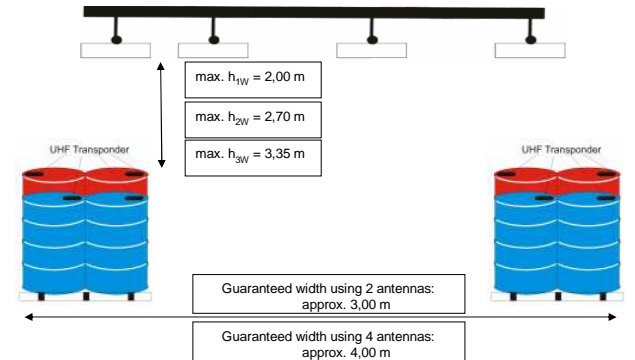
Die-cut size: 97 x 27 mm
3.819 x 1.063"




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listopac® II – reading distances

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Reading of a palletised drums
[using only two UHF antennas]


20


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– Components for mobile usage
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ATEX PDA hand reader
(suitable for Zone 1)






Industry PDA PSION
with hand reader



21

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Listopac RFID data capture software

- The distinctive number code of the RFID tag is stored in a separate database. The number can easily be linked to all further data of the filling content or the packaging. The database can be accessed locally (in-house solution) or globally using the World-Wide-Web.

No.	TAG	UN Number	Packing Group	Filling Charge	Info
1	123 456 789	1166	II	Dioxolan	i
2	123 456 788	1173	II	Ethylacetat	i
3	123 456 787	1307	III	Xylene	i
4	123 456 786	1547	II	Anilin	i
5	123 456 785	1565	I	Bariumcyanid	i
6	123 456 784	2647	II	Malonitril	i

22

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listopac[®] – RFID reading station at SULO plant in Herford (Germany)
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Antenna

Antenna and reader

23

Detailed description: This slide shows an RFID reading station at the SULO plant in Herford, Germany. It features two photographs. The first, titled 'Antenna', shows a blue barrel on a conveyor belt with a black antenna mounted on top. The second, titled 'Antenna and reader', shows a similar setup but includes a laptop computer connected to the system, which is used for data processing. The SULO logo is visible in the top right corner.

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listopac[®] – Exhibition Macropak in Utrecht (NL)
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24

Detailed description: This slide shows the RFID reading station at an exhibition in Utrecht, Netherlands. It features two photographs of the system in a public setting. The first, titled 'Exhibition setup 1', shows a black barrel on a conveyor belt with a white 'listopac' branded antenna unit. The second, titled 'Exhibition setup 2', shows a similar setup with a blue barrel and a laptop connected to the system. The SULO logo is visible in the top right corner.


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– Update regarding the progress of RFID standardisation


On 21.05.2007 the German standards committee NA 115-02-03 agreed in Düsseldorf to standardise the positioning of RFID transponders on industrial packaging ≥ 60 litres.

A working group consisting of members of steel drum manufacturers (SULO, Greif, Schütz, Mauser & Duttenhöfer), industrial packaging users and RFID experts met several times to define a common positioning of transponders on packaging.

DEUTSCHE NORM		1. Vorlage	März 2008
Verpackung — Elektronische Identifikation von starren Industrieverpackungen, Positionierung und Systemparameter für passive Transponder — Teil 1: Allgemeines; Text Deutsch und Englisch			6113 Teil 1
E DIN 6113-1:2008-03			
Packaging — Radio-frequency identification of rigid industrial packaging, positioning and system parameters for passive transponders — Part 1: General; text in German and English			
Emballage — Identification électronique d'emballages rigides industriels, positionnement et paramètres du système pour transpondeurs passifs — Partie 1: Général; texte in allemand et anglais			


Based on existing standards (e.g. DIN EN 14803 and the draft DIN 30745) a working paper was established that identifies the positioning on:

- steel drums,
- fibre drums,
- plastic drums and
- combination IBC.

 **The draft paper is now subject to commentary by stakeholders.**

25

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– Advantages of RFID technology ... just to name a few

- ✓ Reduction in handling costs
- ✓ Simplification of data acquisition
- ✓ Improvement of information flow (logistic in real-time)
- ✓ Improved quality control
- ✓ Improved transparency of the supply-chain
- ✓ Competitive advantages
- ✓ Gain in efficiency
- ✓ Enhanced authentication of products
- ✓ Efficient usage of resources
- ✓ Fast return on investment (ROI)

26

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listopac[®] – Strategic aims and objectives

System Listopac should provide a common basis for...

- implementation and usage of already existing RFID systems to identify steel & industrial packaging without additional development costs
- implementation and integration of further packaging systems, ie., canisters, IBC's and Flex-IBC's, cardboards boxes, etc.

27

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listopac[®] – Strategic aims and objectives

Listopac is useful...

- to give users certainty of receiving compatible components (tags, readers, antennas, etc.)
- to guarantee investments can be used for a long time (prevention of mis-investment)
- to minimise development costs
- to assure technical and legal aspects of packaging are considered
- to minimize implementation costs (setting standards)
- to minimize marketing costs
- to enable companies to participate without making own development efforts

28

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**listopac**[®] – Strategic aims and objectives

Listopac should...

- be open for a wide range of packaging manufacturers, suppliers of hard- and software, manufacturers of peripheral systems and parts around the packaging
- not be based on patented solutions of single parties
- be open for new developments
- be useful for all members and customers in the same way
- give a certain protection against „strange“ and unmeant developments
- set common, generally accepted standards
- communicate with official groups of interest


29

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**listopac**[®] – Strategic aims and objectives

The RFID technology can only succeed if

- ✓ systems and technologies are generally applicable,
- ✓ common standards are created and set in place,
- ✓ open partnerships within the packaging industry are formed.

**You are most welcome to work with us on further RFID developments so you can also profit from all RFID advantages.**

30

