



LUX-IDent
RFID Inlays & Labels Manufacturer

General Smart Inlay Delivery and Packaging specification

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...tuned to your frequency



General Smart inlay Delivery and Packaging specification

Dear Customer,

Thank you for choosing LUX-IDent as your supplier for high quality Smart inlays.

This document provides important information and technical data about packaging, shipping and compliances.

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1 Product description

LUX-IDent Smart inlays are ultra-thin, flexible and are designed to be combined with the ideal RFID chip type to attain the highest possible performance level at minimum cost.

Standard Smart inlays are designed for use in various converting equipment for the production of RFID components such as smart labels, tickets, smart cards, tokens and much more. Such products are typically used for RFID applications in logistics, asset management, supply chain management, transportation and mass events.

LUX-IDent is specialized in developing and prototyping of customized Smart inlay solutions.

2 Smart inlay specification

LUX-IDent provides a specific Product Datasheet for each type of standard smart inlay. The datasheets contain detailed technical information which are necessary when processing further in label converting machines or employing other processes to produce other types of RFID transponders.

The desired datasheet can be downloaded from the LUX-IDent website: <https://www.lux-ident.com/downloads/> or requested from the LUX-IDent customer service via email sales@lux-ident.com

3 Smart inlay product code

Each LUX-IDent Smart inlay has its unique product code for the particular definition of its characteristics and features. Because of the broad range and diversity of Smart inlay products the product codes are complex. Following an explanation of the LUX-Ident product code definition.

L1x-CDDMDDTYP-CHP-REFER-ECCXX

Product group L1x HF, UHF or combi inlay	Dimensions CDDMDD antenna dimension and orientation	TYP Tuning variant or customized antenna	CHP Chip type used for this inlay	REFER Additional special information about inlay post-processing or special features	ECCXX Optional information about encoding

For more detailed information on the product code please contact sales@lux-ident.com.

4 Tape configuration

Smart inlays are delivered on reels.

4.1 Leader and trailer tape

Each Smart inlay reel comes with a leader and trailer tape to enable easy setup for further processing, e.g. in label conversion machines. The leader and trailer tapes are antennas without chips from the same antenna type like the inlay.

- Length of leader / trailer tape: approx. 1.5 m
- 5 sequential antennas at the end of trailer tape and beginning of leader tape are noticeable marked with ink dots

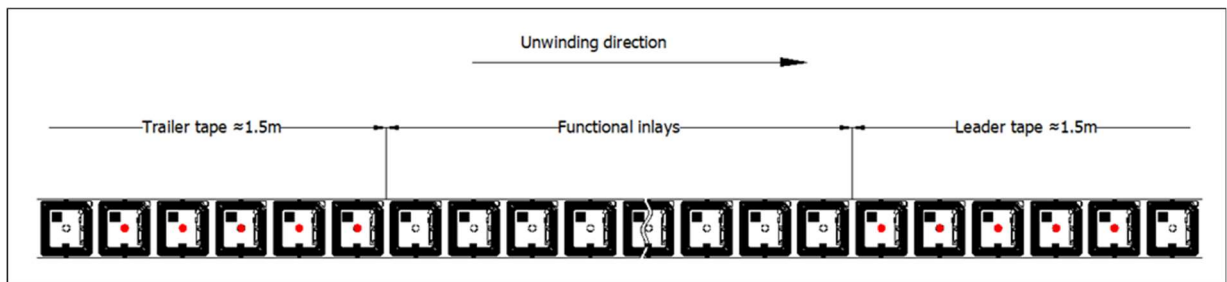


Figure 1: Example of leader and trailer tapes

4.2 Splices

Smart Inlay tapes may have up to 5 splices within a roll. The following rules apply to the splicing of inlay tapes.

- Splicing is done in the middle of a Smart inlay. Each splice is causing a non-functional Smart inlay within the tape.
- Splicing tape is applied on top and bottom of the antenna.
- A PET based and heat stabilized pressure sensitive tape is used for the splice. Splicing tape can be colored, e.g. brownish for easier recognition during the processing of the Smart inlay tape.
- The splice can withstand temperatures of up to 180°C (350°F) for maximal 30 seconds.
- The static pull force of a splice is specified at minimum 30N for a 48mm wide tape at room temperature.

■ Splicing tape edge cutting

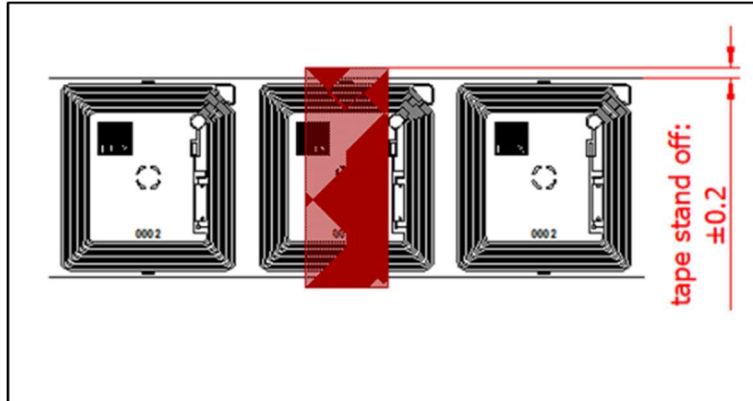


Figure 2: Splicing tape stand off

■ Pitch tolerance

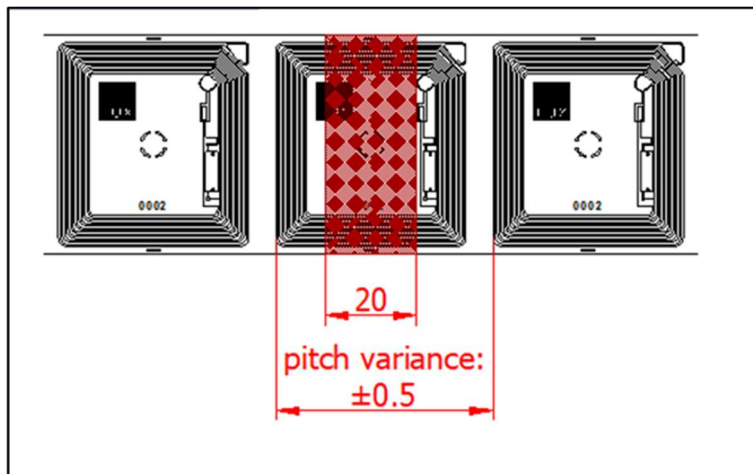


Figure 3: Pitch tolerance at splicing position

■ Maximum allowed angular failure

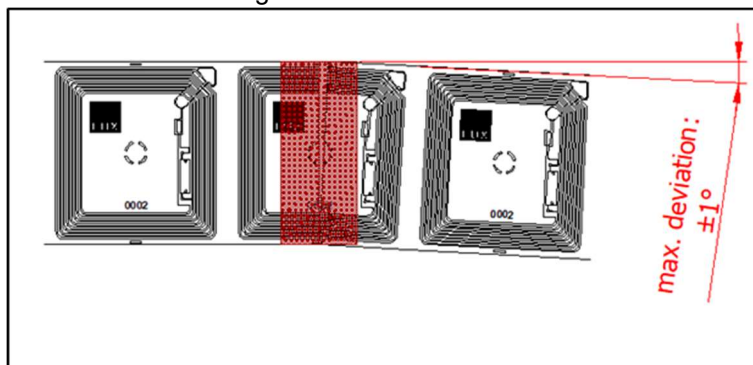


Figure 4: Maximum angular failure at splicing position

5 Smart inlay testing and marking

5.1 Smart inlay testing

LUX-IDent Smart inlays undergo a 100% inline Go/NoGo outgoing test during the chip bonding production process. Random rolls are additionally tested off-line for verification of the machine test result. Because of the nature of the product non-functional Smart inlays can't be removed from the tape and therefore the reel may contain non-functional Smart inlays.

5.2 Non-functional Smart inlay marking

Each non-functional (bad) Smart inlay is clearly marked with a printed mark (round or square) on a defined position on the Smart inlay. The position of the bad-mark is described in the drawing shown in the Smart inlay datasheet.

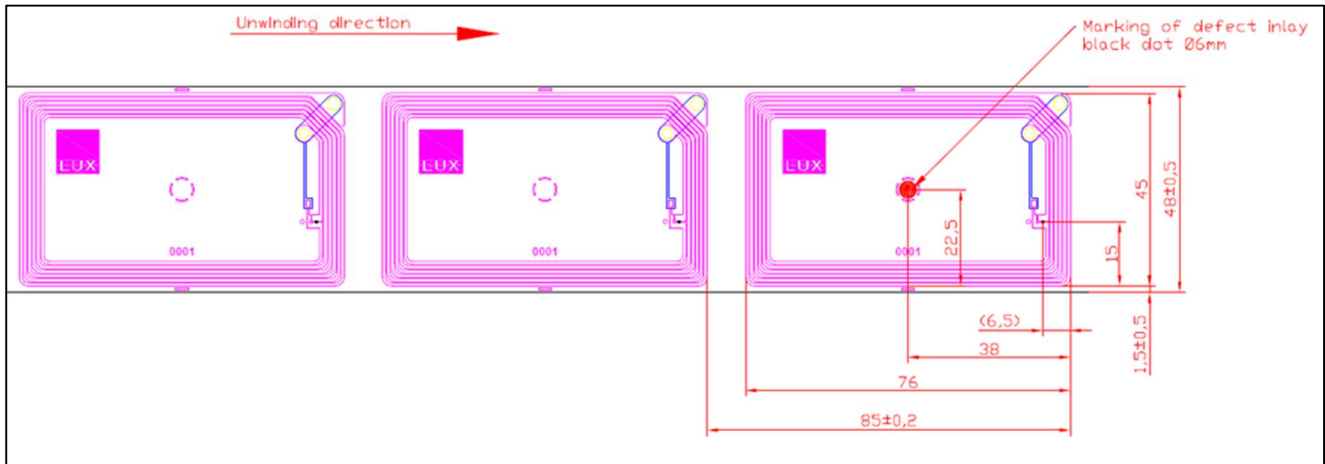


Figure 5: Marking of non-functional Smart inlays

5.3 Yield specification

The following formula is used to calculate the yield (ration of good parts to total number of delivered parts) of a delivery batch:

$$Yield = \frac{\text{Number of good parts}}{\text{Number of good parts} + \text{number of bad parts}} [\%]$$

LUX-IDent specifies a minimum average yield of 99% for inlays under the following conditions:

- Products are based on antennas designed and manufactured under the control of LUX-IDent, chips are ordered under the control of LUX-IDent
- Delivery batch volume is more than 50,000 inlays
- Individual reels within a delivery batch can have an exceptionally lower yield of minimum 97% but does not lowering the average yield below 99%

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In case that a delivery batch will not fulfill this specification, LUX-IDent will contact the customer prior to delivery and ask for waiver to deliver this batch.

Excluded from this rule are all production runs with consigned antennas and/or first time used components (antennas, chips, substrates), test runs, initial production batches, etc. where LUX-IDent did not collect sufficient data about the realistic production yield.

6 Shipping and Packaging

Smart inlays from LUX-IDent are produced Reel-to-Reel and delivered on reels made of cardboard. All reels are hanging on a core tube and are protected by corrugated paper side walls. This protects the Smart inlays from damage during transport and handling. The reels are packed in sturdy corrugated paper shipping boxes for safe transport from factory to user.



Figure 7: Example of Smart Inlay reel packaging

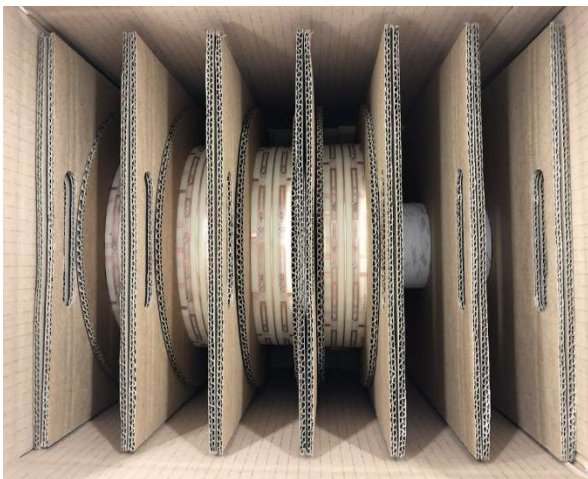


Figure 6: Smart inlays packed into shipping box

6.1 Reel

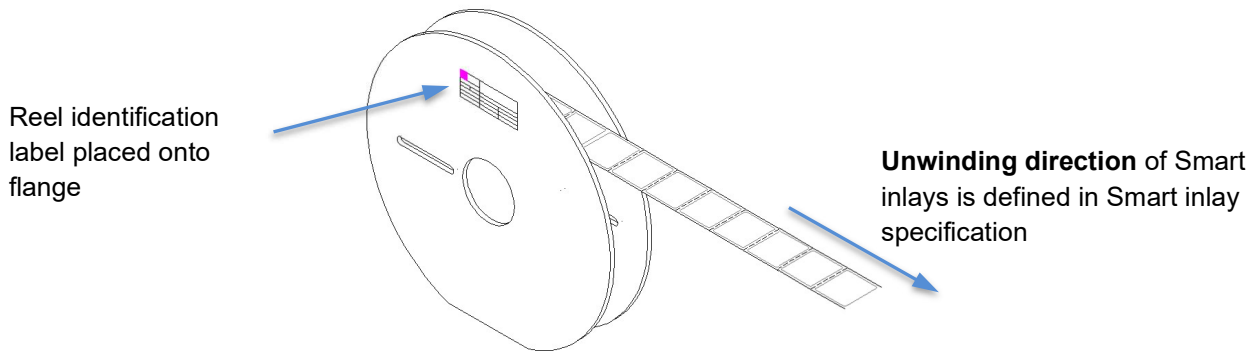


Figure 8: Smart Inlays delivered on reel

6.2 Packaging for shipment

Reel dimension	<p>Ø 265mm Standard size for nominal 5.000 Smart inlays ⁽¹⁾ – depending on inlay type. Typically for small inlay types (copper antennas) and low volume orders</p> <p>Ø 365mm Standard size for nominal 10.000 Smart inlays ⁽¹⁾ – depending on inlay type. Typically used for larger inlay types and high volume reels</p>											
Reel core diameter	76,2 mm (3")											
Minimum winding diameter	110 mm											
Reel width	Depending on Smart inlay width, Smart inlay width plus 15 ± 2 mm											
Cardboard shipping box dimension	<table border="1"> <thead> <tr> <th>Reel (mm)</th> <th>Multi box (mm) Max. 6 reels</th> <th>Shipping weight</th> </tr> </thead> <tbody> <tr> <td>Ø 265</td> <td>400x300x315</td> <td>Max. / 15 kg</td> </tr> <tr> <td>Ø 365</td> <td>400x400x415</td> <td>Max. 25 kg</td> </tr> </tbody> </table>			Reel (mm)	Multi box (mm) Max. 6 reels	Shipping weight	Ø 265	400x300x315	Max. / 15 kg	Ø 365	400x400x415	Max. 25 kg
Reel (mm)	Multi box (mm) Max. 6 reels	Shipping weight										
Ø 265	400x300x315	Max. / 15 kg										
Ø 365	400x400x415	Max. 25 kg										
	<p>⁽¹⁾ Number of inlays per reel is also depending on production order volume. LUX-IDent adopts the reel size depending on order volume and number of lanes of the antenna roll</p>											

6.3 Reel and box labeling

Each **Smart inlay reel** is labeled with an identification label showing all relevant data such as:

- Product description and article code
- Batch number and reel number
- Production date
- Quantity of good and bad Smart inlays on reel




LUX	Article name: HF-Inlay D12mm, Pitch 25,4mm, Cu-Antenna, NXP ICODE SLIX, 100% offline testing		
	Article code:  560 /L15-D012G11-NI3-Q		
	Batch No.:  19/1546		
	Reel No.:  01		
	Quantity good pcs:  14000	Yield (%): 99.75	
	Quantity bad pcs:  35	Date: 16.1.2020	

Figure 9: Example of reel identification label

Each **shipping box** is marked with a label showing the following information of the reels contained in the box:

- Product description and article code
- Batch number and reel numbers inside box
- Production date
- Box number of whole shipment
- Quantity total of good and bad Smart inlays contained in box.

LUX	Article name: HF-Inlay D12mm, Pitch 25,4mm, Cu-Antenna, NXP ICODE SLIX, 100% offline testing		
	Article code:  560 /L15-D012G11-NI3-Q		
	Batch No.:  19/1546		
	Box No.:  01	Reel No.: 01 02 03 04 05	
	Quantity good pcs:  70000	Yield (%): 99.78	
	Quantity bad pcs:  155	Date: 16.1.2020	

Figure 10: Example of box identification label

7 Storage and handling



Please note:

Smart inlays are electronic devices which are sensitive to mechanical shocks and electrostatic discharge. Handle reels with care and don't drop them.



Figure 11: ESD warning label

LUX-IDent is adding an ESD warning label onto each Smart inlay reel and on the shipment boxes to make operators aware that these goods are sensitive to electrostatic discharge. It is advisable to unpack and handle the Smart Inlay reels in an ESD protected area. Special care has to be taken at unwinding of the inlays. Without any protective measures, this can create high static charges which may damage the chips on the Smart Inlays.

Always keep the Smart inlays in their original box to protect them against pollution and damage. Before usage, the Smart inlays should be acclimated to the room conditions.

8 Warranty, Liability and Compliances

LUX-IDent Smart inlays are thoroughly tested. It is the responsibility of LUX-IDent's customers to evaluate their use case for compatibility with the LUX-IDent Smart inlays properties and to ensure through appropriate process controls that the determined machine and material parameters are met on an ongoing basis. LUX-IDent does not accept warranty claims for material that has already undergone further processing.

The technical performance of LUX-IDent Smart inlays in regards to read/write distance, memory size and security functions is depending on the selected chip. LUX-IDent assumes neither liability nor responsibility for the technical performance and specification of the RFID chip used in the Smart inlay.

LUX-IDent reserves the right to make changes to its products or services or to discontinue any product or service at any time without prior notice, as long as there are no specific obligations with specific customers.



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LUX-IDent provides customer assistance in various technical areas, but does not have full access to all data concerning the use and applications of customer products. Therefore LUX-IDent assumes no liabilities and is not responsible for customer applications or product or performance relating to systems or applications incorporating LUX-IDent products.

LUX-IDent assumes no liability and is not responsible for infringement of patents and/or any other intellectual or industrial property rights of third parties, which may result from assistance provided by LUX-IDent.

LUX-IDent products are not designed, intended, authorized or warranted to be suitable for life support applications or any other life critical applications which could involve potential risk of death, personal injury or severe property or environmental damage.

LUX-IDent products are fully compliant to actually set industry rules, like RoHS, REACH and RED. Actual versions of the compliances certificates are available on request.



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9 Document revisions

Date	Revision	Status, modifications
25.06.2019	1.0	Initial release
16.01.2020	1.1	Change to new company logo Reel and Box labels will contain also bar codes for the main information (chapter 6.3)
28.04.2021	1.2	Add chapter 5.3, Yield specification
30.03.2023	1.3	Chapter 7: Add info about new ESD warning label



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