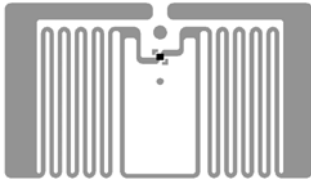




## “PEARL” JEWELRY/COSMETICS INLAY

The Alien Technology® ALN-9816 “Pearl” RFID inlay is designed for use in jewelry and cosmetic applications where the tag may be in close proximity to small metal or metallic coated objects



### Applications

- Jewelry tagging
- Use with small metallic objects
- Cosmetics

FEATURE	DESCRIPTION	BENEFIT
Small form factor, non-near field read tag	Despite its diminutive size (22 x 12.5mm), this tag uses conventional long range UHF antenna unlike many other competitive tag solutions.	Offers read/write distances in the order of feet/meters unlike other competitive tags that are near-field and only read an inch or two.
Tuned for metal and cosmetics	Designed to be in close proximity to metal or metallic surfaces.	Uses the metal surfaces to “amplify” the read/write distance of the tag.
New error correcting Sentinel™ Memory and best-in-class reliability.	A unique and robust error correcting memory architecture fixes single bit errors and flags dual bit errors. 200,000 write cycles, two times that of competitors.	Provides customers reassurance the stored data is protected and data loss/corruption minimized. More robust memory for high-write applications.

### Features:

- › Designed to meet EPCglobal Gen2 (V1.2.0) and ISO/IEC 18000-6C
- › Worldwide operation in the RFID UHF bands (860-960 MHz)
- › 512-Bits of NVRAM Memory
  - 128-EPC Bits
  - 128 User Bits
  - 48 Bit Unique TID
  - 32 Bit Access and 32 bit Kill Passwords
- › User Memory can be Block Perma-Locked as well as read password protected in 32 Bit Blocks
- › Class leading read and write performance
- › *BlastWrite™* and *QuickWrite™* mass-encoding
- › Dynamic Authentication™ - anti-cloning/anti-counterfeit technology
- › Available in high-yield, high capacity dry/wet inlay rolls

### Product Overview:

Powered by Alien®’s break-through **Higgs™-EC UHF RFID IC** and **innovative “Pearl” antenna design**, the ALN-9816 delivers industry leading EPC Gen 2 performance and reliability for retail jewelry and cosmetics especially when tagging in compact and highly dense areas.

With its Higgs™-EC core, the Pearl delivers next generation read and write performance, yet is completely **optimized for the highest volume enterprise and retail applications.**

An optimized memory footprint includes a 32-bit TID, a **48-bit Unique TID for authentication** and **next generation serialization** applications, a 128-bit EPC memory bank, 128-bits of user memory for distributed data applications, and **password protected read and write** support capabilities to prevent unauthorized viewing and modification of the tag’s data.

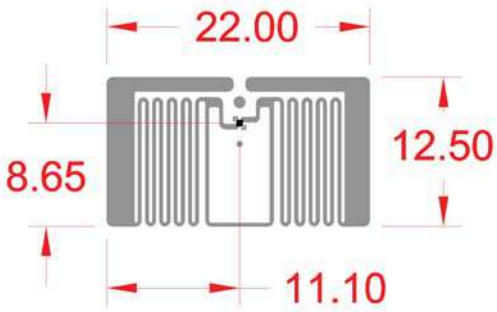
ALN-9816 inlays are World Tag compliant, enabling consistent operation across the diverse frequencies of the Americas, Europe, Middle East, Asia, and Africa.



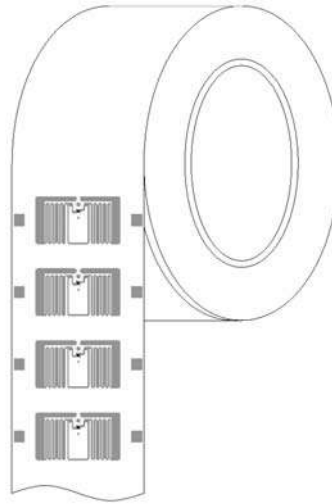
# ALN-9816 Pearl Inlay

All dimensions in millimeters unless specified otherwise

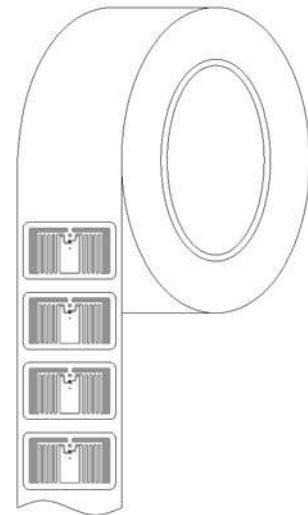
## ALN-9816 Antenna Size



## ALN-9816 Inlay Orientation



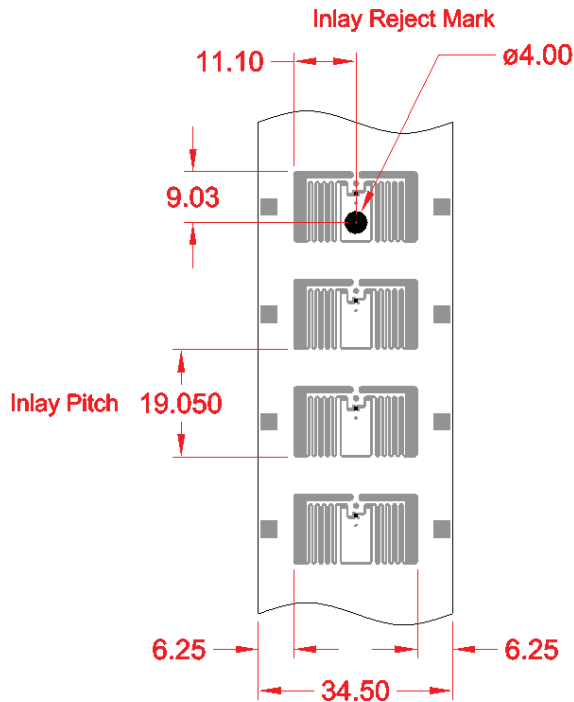
**ALN-9816-R**  
(Dry Unslit Roll)



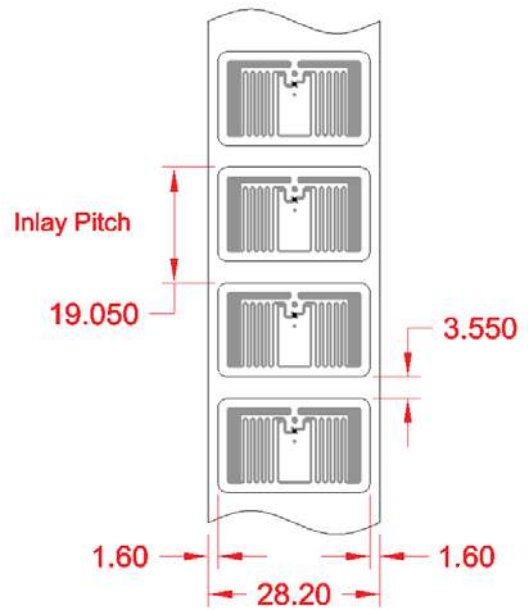
**ALN-9816-WRW**  
(White Wet Inlay)

Standard Alien Inlay rolls unwind with metal antenna side facing outward, with respect to the core.

## ALN-9816 Inlay Specification



**ALN-9816-R**  
(Dry Unslit Roll)



**ALN-9816-WRW**  
(White Wet Inlay)



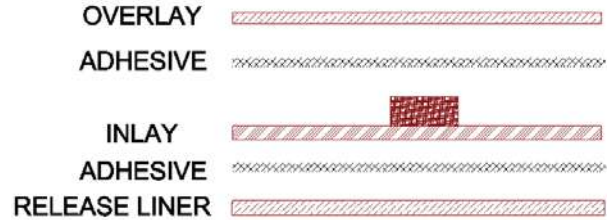
### ALN-9816 Inlay Stackup

DRY INLAY THICKNESS $\pm 10\%$	
Over Antenna	0.06mm
Over Chip	0.24mm

WHITE WET INLAY THICKNESS $\pm 10\%$	
Over Antenna	0.16mm
Over Chip	0.32mm

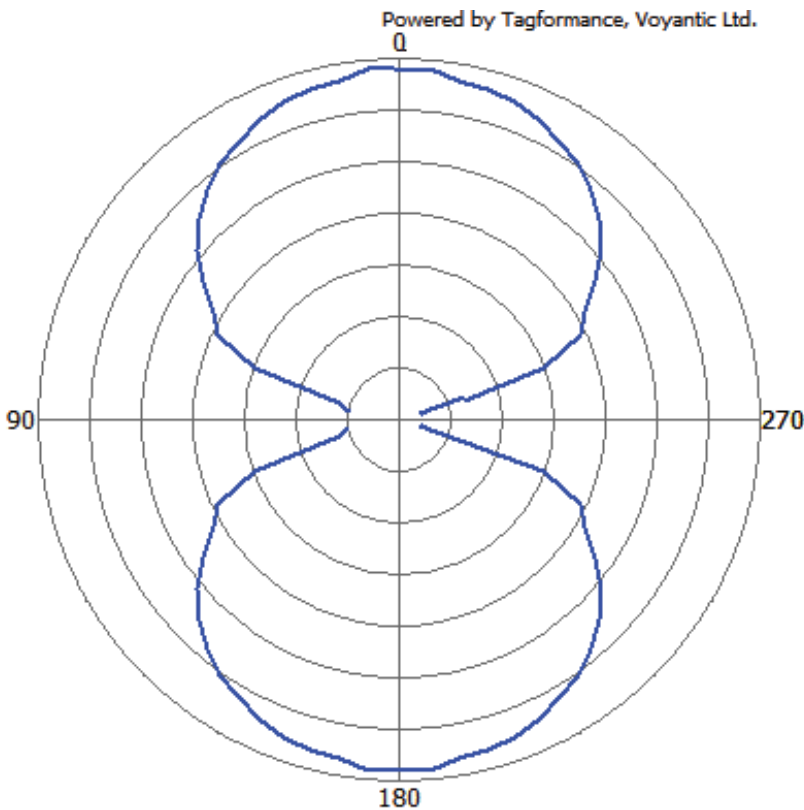


ALN-9816-R  
(Dry Unslit Inlay)

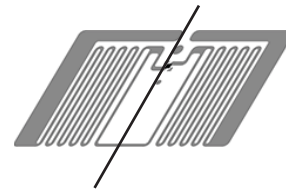
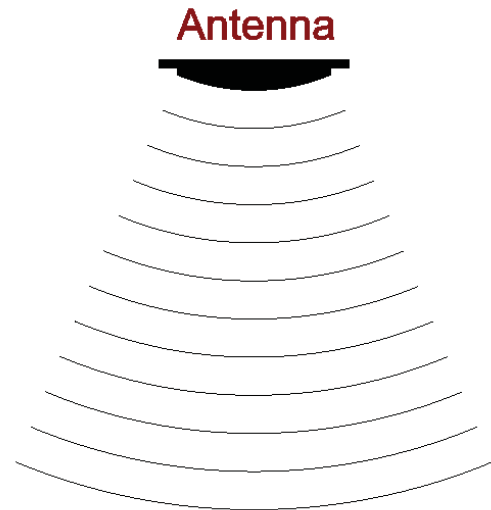


ALN-9816-WRW  
(White Wet Inlay)

### ALN-9816 Inlay Angular Sensitivity



Angular Sensitivity  
(Relative Read Range vs. Orientation)



Angular Sensitivity  
Inlay is rotated in the x, y, plane about the z axis



## ALN-9816 Specifications

### Dry Inlay

Antenna Width	0.866" [22mm]
Antenna Length	0.492" [12.5mm]
Web Width	1.358" [34.5mm]
Web Pitch	0.750" [19.05mm]
Core Width	1.358" [34.5mm]
Core ID	6" [152.4mm]*
Core Material	Fiberboard
Inlays per Roll	15,000 Nominal
Maximum Roll OD	< 12" [304.8mm]
Roll Labeling Data	Roll #, Quantity

### Wet Inlay

Inlay Width	0.984" [25mm]
Inlay Length	0.610" [15.5mm]
Web Width	1.110" [28.2mm]
Web Pitch	0.750" [19.05mm]
Core Width	1.110" [28.2mm]
Core ID	6" [152.4mm]*
Core Material	Fiberboard
Inlays per Roll	15,000 Nominal
Maximum Roll OD	< 16" [406.4mm]
Roll Labeling Data	Roll #, Quantity
White	TT Printable White Film Only
Overlay Adhesive	General Purpose Permanent
Inlay Adhesive	General Purpose Permanent
Adhesive Application Temperature	> +25°F [-4°C]
Adhesive Service Temperature	-40°F to +200°F [-40°C to +93.3°C]
Release Liner	40# SCK

### Environmental

Shelf Life	Dry Inlays: 5 years at +77°F [+25°C] @ 40% RH Wet Inlays: 2 years at +77°F [+25°C] @ 40% RH
Recommended Storage	+77°F [+25°C] @ 40% RH
Storage Limits	-13°F to 122°F [-25°C to +50°C] 20% to 90% RH Non-condensing
Operating Limits	-40°F to +158°F [-40°C to +70°C] 20% to 90% RH Non-condensing
Bend Diameter	> 1.97" [50mm]
Pressure	< 5N/mm <sup>2</sup>
Drop Resistance	Per ASTM D5276
Write Cycles	200,000 @ 25°C
RoHs	2002/95/EC (RoHS 1), 2011/65/EU (RoHS 2), 2015/863 (RoHS 10)
REACH	EU 143/2011, EU 125/2012, Annex XIV of EC no. 1907/2006
ESD Limit- HBM / CDM	5.0kV / 1.5kV

### RFID

Protocols Supported	ISO/IEC 18000-6C EPCglobal Class 1 Gen 2
Integrated Circuit	Alien Higgs™-EC
Operating Frequency	840–960 MHz
EPC Size	128 Bits
User Memory	128 Bits
TID	32 Bits
Unique TID	48 Bits
Access Password	32 Bits
Kill Password	32 Bits

\* Shipped with 6" to 3" plastic core adapter

November 3, 2017

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HANDLING PRECAUTIONS Observe standard handling practices to minimize ESD.

DISCLAIMER Application recommendations are guidelines only - actual results may vary and should be confirmed. This is a general purpose product not designed or intended for any specific application.

This product is covered by one or more of the following U.S. patents: 7967204, 7931063, 7868766, 7737825, 7716208, 7716160, 7688206, 7659822, 7619531, 7615479, 7598867, 7580378, 7576656, 7562083, 7561221, 7559486, 7559131, 7554451, 7551141, 7542301, 7542008, 7531218, 7522055, 7500610, 7489248, 7453705, 7425467, 7417306, 7411503, 7385284, 7377445, 7364084, 7353598, 7342490, 7324061, 7321159, 7301458, 7295114, 7288432, 7265675, 7262686, 7260882, 7253735, 7244326, 7218527, 7199527, 7193504, 7173528, 7172910, 7172789, 7141176, 7113250, 7101502, 7080444, 7070851, 7068224, 7046328, 6998644, 6988667, 6985361, 6980184, 6970219, 6952157, 6942155, 6933848, 6927085, 6816380, 6780696, 6731353, 6693384, 6683663, 6665044, 6657289, 6623599, 6606247, 6606079, 6590340, 6586338, 6566744, 6555408, 6527964, 6479395, 6468638, 6420266, 6316278, 6291896, 6281038. Other patents pending.

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