

**PaperTyger® DEFENDER™** is a new patent-pending, multi-ply laminate that contains a security barrier to prevent RFID detection at 13.56MHz and in the 860-980MHz range.

DEFENDER™ can be easily fabricated into envelopes, sleeves, leather goods or inserts used to protect RFID contactless smart cards and Gen 2 credentials from unauthorized access during mailing and storage. DEFENDER™ products offer light weight, water resistance, durability and the superior printing and converting benefits of the traditional PaperTyger® line of products.

DEFENDER™ meets FIPS 201 requirements. Testing by independent laboratories proves that DEFENDER™ provides

Property	Imperial	Metric	Test Method
Basis Weight*	32 #	120gsm	T-410
Yield	5710 in <sup>2</sup> / lb	0.00833 sm/g	Calculated
Caliper	4.2 mils	105 µm	T-411
Tensile (MD)	55 lbf/in	9.4 kn/m	T-494
Tensile (CD)	37 lbf/in	6.3 kn/m	T-494
Smoothness	120 Sheffield Units	120 Sheffield Units	T-538
Opacity	100%	100%	T-425

\*Writing & Printing basis: 17 x 22 – 500 sheets per ream (1298.6 ft<sup>2</sup>)

**HOW IT WORKS:** The unique configuration of DEFENDER™ provides effective shielding at 13.56MHz and 860-980MHz by limiting the flow of RF energy between the reader and the smart card or other RFID device. The conductive layer in DEFENDER™ creates a barrier which impedes communication between the reader and the card.

**SHIELDING PERFORMANCE:** DEFENDER™ RFID Shield has been tested for shielding effectiveness at 13.56MHz by independent laboratories<sup>1, 2</sup> using IEEE Method 299. This test involves the use of a test chamber fitted with a bulkhead opening where the shielding material to be tested is installed. This opening provides the only exit from the chamber for the RF signal. An RF generator is placed on one side of the bulkhead and a receiving antenna is placed on the other side. An RF signal of a known value is generated inside the chamber and measurements are taken by the receiving antenna outside the chamber. Shielding Effectiveness is the difference, expressed in decibels (dB), between the RF signal strength measured with the chamber opening empty and the signal measured when DEFENDER™ is installed. The shielding effectiveness results are contained in Tables 1 and 2.



## PRODUCT DATA SHEET

Reference No.  
**F3309**

**Durable RFID  
Shielding  
Material  
4 PLY**

**120gsm  
32#  
DEFENDER™**



RFID0112



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**Table 1: Shielding Effectiveness of DEFENDER™ at 13.56 MHz**  
Property Result Method

Property	Result	Method
RF Attenuation @ 13.56MHz (dB)	43	IEEE 299
RF Attenuation @ 13.56MHz (linear)	141.25 : 1	IEEE 299
Internal Skim Test (13.56MHz RF Reader)	Pass	Chase TP#606

1- MET Laboratories 914 West Patapsco Boulevard Baltimore, MD 21230

**Table 2: Shielding Effectiveness of DEFENDER™ in UHF Range**

Property	Result	Method
RF Attenuation @ 860 MHz (dB)	49	IEEE 299
RF Attenuation @ 870 MHz (dB)	40	IEEE 299
RF Attenuation @ 880 MHz (dB)	49	IEEE 299
RF Attenuation @ 890 MHz (dB)	51	IEEE 299
RF Attenuation @ 900 MHz (dB)	45	IEEE 299
RF Attenuation @ 910 MHz (dB)	57	IEEE 299
RF Attenuation @ 920 MHz (dB)	47	IEEE 299
RF Attenuation @ 930 MHz (dB)	44	IEEE 299
RF Attenuation @ 940 MHz (dB)	49	IEEE 299
RF Attenuation @ 950 MHz (dB)	52	IEEE 299
RF Attenuation @ 956 MHz (dB)	53	IEEE 299
RF Attenuation @ 960 MHz (dB)	47	IEEE 299
RF Attenuation @ 980 MHz (dB)	61	IEEE 299

2-Trace Laboratories, Inc 1150 West Euclid Avenue Palatine, IL 60067

*No product can guarantee the protection of personal information or that identity theft won't occur. However, when used properly, the company's testing procedures indicate that DEFENDER™ can greatly reduce the opportunity for loss of valuable information.*

Exclusive warranty: The Seller warrants for a period of 6 months from time of delivery its product to be free from defects in material and workmanship under normal wear and tear conditions. Seller warrants DEFENDER™ will provide RF shielding as defined by DEFENDER™ Technical Data Sheet for a period of 2 years assuming inner shielding layer is not compromised. Seller's obligation under this warranty is limited to replacement or, at its option, reimbursement of the purchase price of the product, provided that Buyer demonstrates to Seller's reasonable satisfaction within 60 days of shipment that the product is defective. Except as provided in this paragraph, Seller does not make and shall not be bound by any other warranty expressed, implied or otherwise. UNDER NO CIRCUMSTANCES WILL SELLER BE LIABLE FOR ANY LOSS, DAMAGE, EXPENSE OR INCIDENTAL OR CONSEQUENTIAL DAMAGE OF ANY KIND ARISING IN CONNECTION WITH THE USE OR INABILITY TO USE ITS PRODUCT.

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**DEFENDER™**



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