



PARTNER | SOLVE | DELIVER™

STANDEX

Power Magnetics For Mil/Aero

StandexElectronics.com

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Standex Electronics

For many years, Standex Electronics have supplied power magnetics for Mil/Aero applications, including NASA programs and satellite manufacturers. For our magnetics to succeed in the harsh demands of outer space, they must be meticulously designed, engineered to work for years in extremely tight spaces, built to exacting specs, and then proven in the industry's leading test lab.

At Standex, we understand getting it right the first time is critical. We know that in addition to looking good on paper, our products must perform in the field. To ensure this performance, we prove them in our industry-leading environmental test lab first.

With decades of meeting Mil-Spec standards and earning our way onto Mil PRF-27 Grade 4, 5, and 6, our engineering team

understands how critical weight and space are to the industry. We understand both the electronics of the application and the mechanical aspects to allow it to succeed in harsh environments.

We understand what can be done, and then we find a way to develop a workable solution. And we back it up with the most up-to-date certified quality systems and procedures required to operate in the military and aerospace arena. When designing the most advanced jet fighter in the world, you never want to hear “you’re grounded.”

That’s why our customers trust Standex Electronics, and they “don’t leave the Earth without it.”

At Standex, we understand getting it right the first time is critical.

Powerfully Transforming

"When failure is not an option, designers of critical electronic components rely on Standex and their decades of experience."



Our Capabilities

MANUFACTURING

- 52 to 5awg Magnetic Wire Winding
- Foil, Flat, & Square Wire Winding
- Automatic CNC Winding
- Bobbin, Layer, & Self-Supporting Winding
- Toroidal Hook & Shuttle Winding
- Thermoplastic & Thermoset Overmolding
- Impregnation, Casting, & Potting
- Void-Free Vacuum Potting
- NASA Certified Soldering
- Wire Prep & Harness Assembly
- Injection Molding
- Metal & Plastic Fabrication
- Complete, In-House Machine Shop
- Laser Welding

ENGINEERING

- 3-D CAD Modeling
- 3-D Printing
- Mechanical Design & Packaging
- Rapid Prototyping
- Magnetic Simulation Software
- Mechanical, Thermal & FEA Analysis
- Plastic Mold Flow Simulation
- APQP Project Management
- Custom Bobbin/Header Tooling
- Custom Core Tooling
- Safety Agency Compliance Services
- Mission Critical Design Services



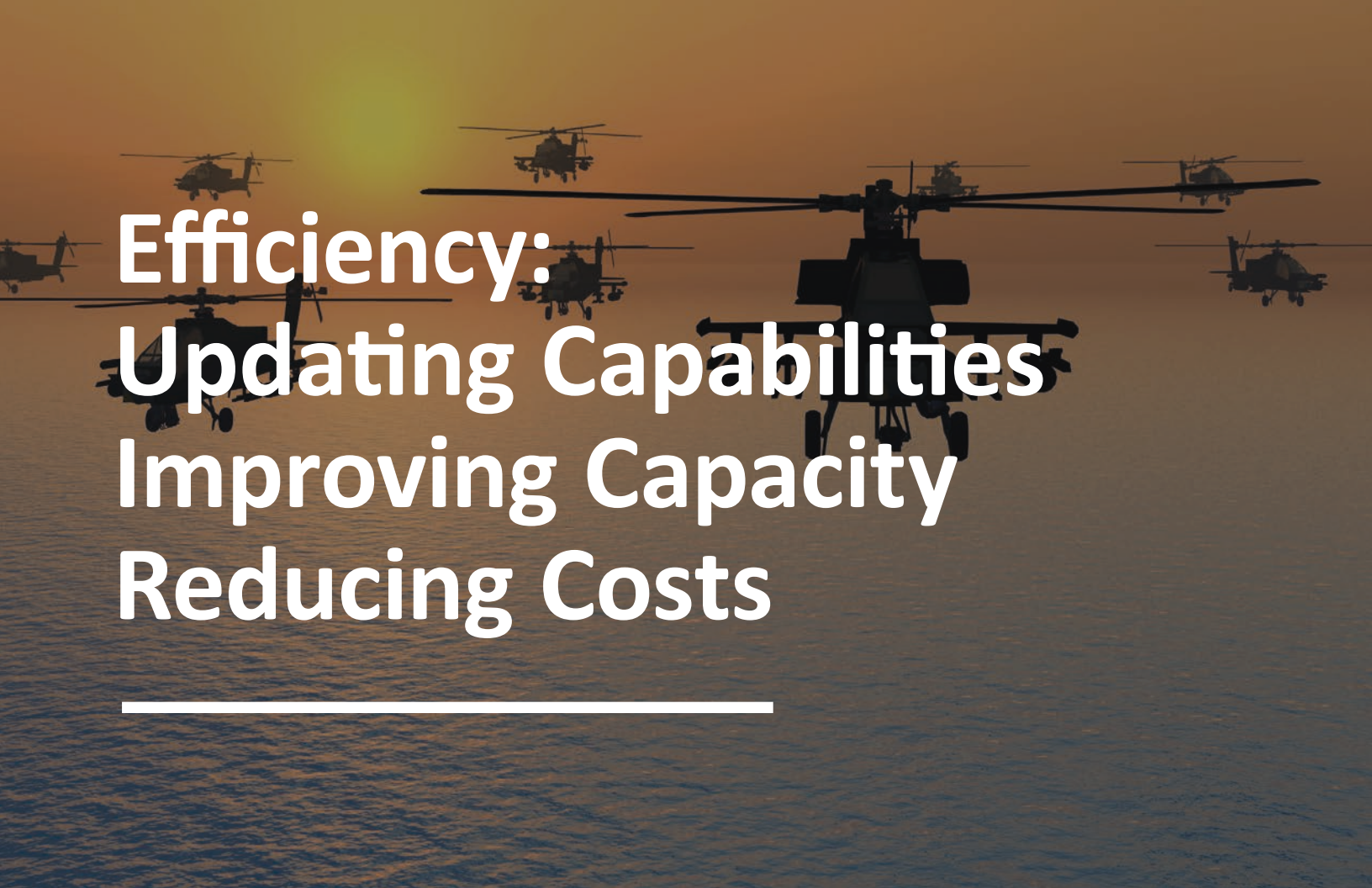


QUALITY & COMPLIANCE

- AS9100, ISO9001 & IATF16949 Certifications
- ITAR & NIST Compliance
- Regulatory Agency Approvals
- PPAP & First Article Inspection
- AS9102 First Article Inspection
- SPC Data Collection

TESTING & LAB CAPABILITIES

- Automated Transformer Testing
- Medical Safety Testing
- High Voltage/Partial Discharge Testing
- Temperature Rise Testing
- 2-D/3-D Microfocus X-ray Inspection
- Digital Microscopic Inspection
- Automated Optical Inspection
- Network Analyzer
- MIL-STD-202 In-House Qualification Testing
 - Mechanical, Shock & Vibration
 - Burn-In & Life Testing
 - Thermal Shock & Temperature Cycling
 - Humidity, Salt Fog, & Solderability
 - Moisture Resistance & Seal Testing



Efficiency:
Updating Capabilities
Improving Capacity
Reducing Costs

Planar Transformers And Inductors

Military and aerospace (Mil-Aero) applications typically require a lot of performance in a small, low-weight package. That's why over the past decade, the use of planar transformers in military and aerospace applications has grown rapidly.

Planar transformers and inductors are an ideal choice for applications where space and weight savings are vital. They meet the ever-increasing need to be faster, perform with greater accuracy, improve time to market, and reduce costs – replacing traditional wire-wound transformers as a solution that makes perfect sense for a successful blueprint.

Aside from their footprint, height, and weight, they also have the ideal power density for high frequency applications. In general, they're better than traditional wire-wound transformers for a

given power rating. Managing heat from components is key in these applications, so the planar transformer core's large surface area and its flat windings make these parts ideal for heat sinks and heat dissipation. **Planar parts are smaller and run hotter — but they are also easier to cool.**

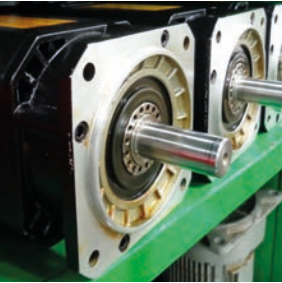
Because of their flat and open design, the component can be cooled either by mounting them to heat sinks that draw heat away or directing airflow around them. By contrast, traditional transformers are wrapped and contained, so the internal heat generated is far more challenging to get rid of.



**Planar parts are smaller
and run hotter — but they
are also easier to cool.**

A fighter jet, possibly an F-16, is shown from a low-angle perspective, flying upwards and to the right against a cloudy sky. The jet's wings are spread, and its engines are visible at the rear. The text is overlaid on the left side of the image.

Where Do Planar Transformers & Inductors Reside?



AC-DC Resonant Designs

1KW - 250KW



Grid Energy Storage

10KW-250KW



Aerospace & Military



Automotive, Electric and Hybrid Vehicles



Switch Mode Power Supplies



Telecommunications



Test Equipment



Welding and Lasers

1KW-250KW

Planar transformer and inductor designs must be reliable, lightweight, low profile, and have high efficiency – but that's just the starting point. Developing the right magnetics design requires optimizing weight, size, and materials for each specific application.

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Distributed Isolated Power



Battery Charging and Management Systems

12V, 24V, 48V, 1-10KW




Isolated Inverters

Up to 50KW



Renewable Energy Sources

Wind and Photovoltaic

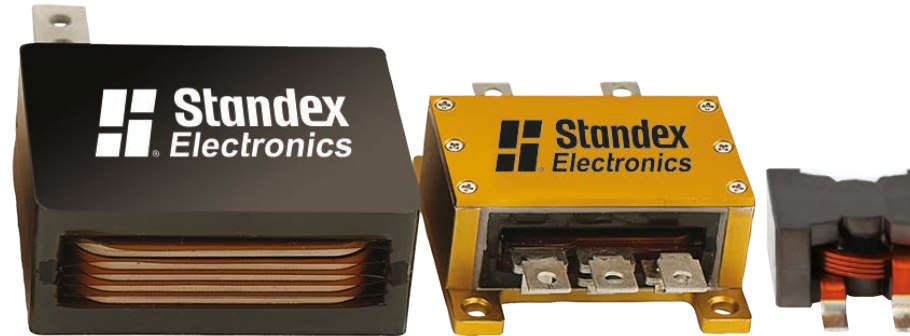
A dark submarine is shown from a high-angle perspective, moving across a light-colored, reflective surface. The submarine is sleek and elongated, with a conning tower in the center and a large circular sensor or antenna at the rear. The background is a soft, warm gradient of light brown and beige.

Standex Electronics has all of these abilities and has developed a **Partner, Solve, and Deliver®** approach

There are very few standard designs in this market, and the ability to adapt the design to exactly fit the customer's needs is essential. In addition to transformer engineering, manufacturers must have packaging and testing capabilities to meet U.S. military standard (MIL-STD) requirements. Standex Electronics has all of these abilities and has developed a **Partner, Solve, and Deliver®** approach, which draws from a broad range of planar and wire-wound engineering, packaging, and testing experience to create components that power various application needs.

Why Standex Planar Electronics?

- Repeatability, high-performance, and reliability
- Multiple winding options and topologies
- Low profile height and lightweight
- Low leakage inductance
- Space savings and capacity improvement (retro/custom fits)
- High efficiency (resistance, flux density)
- Customized terminations
- Volumetric efficiency (small size)
- High voltage isolation transformers
- Low turns count improves Cu loss
- Large core surface promotes heat transfer
- PCB construction yields lowest Cu loss
- AC resistance and proximity Cu loss minimized



Coupling Planar Transformers & Inductors — Hybrid Aerospace Design



Hybrid Aerospace Design

Standex has worked in tandem with a space satellite manufacturer on a fully custom packaged planar transformer and inductor solution. The design integrated a planar transformer and inductor in a single package. This resulted in a significant space reduction compared to individually placed wire-wound transformers. Watch the below video to learn about the coupled hybrid aerospace solution we developed.

[Watch Here](#)



Compared to wire-wound magnetics, planar magnetics offer a significant size and weight reduction and >99% efficiency. Planar transformers and inductors come in standard core sizes and custom configurations in an overall power range of 10W-250kW. Moreover, planar transformers offer superior thermal management using an attached substrate and heatsink.



Custom Ignition Coils for Mil/Aero & Space Applications





Standex Electronics supplies antenna coils and components using leading-edge design and manufacturing technologies. Our products are used worldwide, from military sonobouys in remote locations to innocuous environments like automotive keyless entry or garage door openers.

We offer engineering assistance at each stage of the procurement process – from product conception to volume production. Our "global footprint" means that we can produce the product you need close to your using facilities – thereby simplifying logistics and lowering costs.

IDEAL FOR A WIDE RANGE OF APPLICATIONS:

1. Keyless ignition assemblies for marine applications
2. Antenna coils for tire pressure monitoring receivers
3. Antenna coils for automotive and in-home security systems
4. Keyless car entry systems
5. Immobilizer coils for automotive, motorcycle, and marine ignition switches
6. Antenna coils which mount outside the rear-view mirror
7. Self-supported air-winding for antenna transmitter and receiver applications
8. Receivers for military sonobouys Broadest range of products & capabilities
9. Insert molded RF magnetics are compact, reliable, proven, and cost-effective
10. Custom air wound antenna coils for use at a variety of frequencies allow use in a variety of diverse applications
11. Metal stampings for 415 MHz PC Board Surface Mount Antenna Applications
12. Custom insert molded antenna coils for use from 315 KHz to 135 MHz 125 KHz
13. RFID antenna receivers can be custom molded in virtually any configuration for nearly limitless applications
14. Molded antenna receivers are ideal for hostile environments – including those in automotive and marine applications

IGNITION COIL MANUFACTURING & TEST CAPABILITIES INCLUDE:

1. Hi-volume, Progressive Die Stamping

2. Wire Prep and Wire Harness Assembly

3. Glass to Metal Sealing

4. 52ga-8ga & Foil Magnetic Component Winding

5. Wind and Assemble All Core Shapes and Types Including Laminated

6. Rapid Prototyping

7. IATF16949, AS9100, and ISO9001 Certified Plants

8. Fully Equipped Certified Test Labs

9. In-House Molding



Custom Quality Magnetics that Deliver Results

"When you are designing the most advanced jet fighter in the world, you never want to hear you're grounded. That's why customers trust Standex Electronics."

Standex Electronics has a proven record of developing a diverse range of space-saving planar transformers and power magnetics for military and aerospace applications. So, we understand the mechanical package design needs that perform reliably in harsh military environments. Therefore, Standex custom power conversion magnetic designs withstand thermal vibration and meet military specifications, providing high reliability.

Even amidst the toughest of challenges, our engineers follow Standex's **Partner, Solve, and Deliver**® approach, working closely with you to understand your needs and develop custom quality magnetics that deliver results.

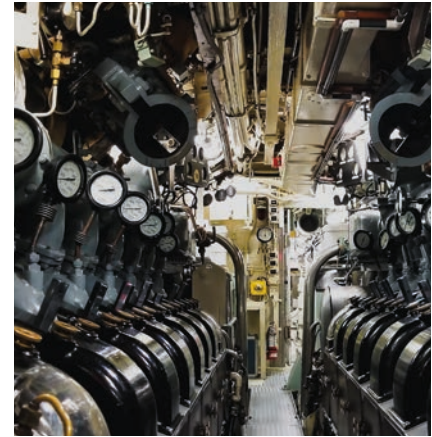
Our number one goal is to uphold the Standex promise of quality, high-reliability, and efficiency. Furthermore, we can meet almost any application-specific need. We produce low frequency (400Hz) and high frequency (20KHz to RF) magnetics. Below is a list of some military, space, and flight-grade application examples.



Aircraft controls



Satellite & space applications



Engine controls



Naval ship board power supplies



Current transformers



UAV (Unmanned aerial vehicle)
electrical power and control

Our manufacturing capabilities suit military and aerospace customers very well. For instance, we offer automatic CNC, toroidal hook, and shuttle winding using 52 gauge to 5 gauge magnetic wire. Additionally, we can wind bobbins, layers, or self-supporting windings of foil, flat, or square wire. Likewise, our robust mechanical designs include impregnation, casting, molding, encapsulation, and vacuum potting for high voltage and other unique applications. Lastly, our magnetics solutions are fully optimized using in-house MIL-STD testing according to AS9100.

In-House MIL-STD Qualification Testing

Check out the full list of Standex's MIL-STD testing and certifications.



- AS9100 Certified
- ISO9001 Certified
- IATF16949 Certified
- ITAR & NIST Compliant
- ASTM E595
- EEE-INST-002
- IPC J-STD-001FS
- IPC J-STD-006
- NASA-STD-8739.3
- NASA-STD-8739.4
- MIL-I-45208
- MIL-STD-981
- MIL-PRF-21038
- MIL-STD-202 In-House
 - Mechanical, Shock & Vibration
 - Burn-In & Life Testing
 - Thermal Shock & Temperature Cycling
 - Humidity, Salt, Fog, & Solderability
 - Moisture Resistance & Seal Testing
- MIL-T-27
- MIL-PRF-27 Grade 4,5 & 6



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