White Paper

Military Wire and Cable Manufacturing

Selecting A Strategic Manufacturing Partner

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Mercury Wire

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About the Author

Jesus Mendoza is a design engineer with over 10 years of experience in the wire and cable industry. Throughout his career, Jesus has led innovation through the engineering and designing of wire and cable products used in markets supporting consumer, industrial and military applications.

His passion to find innovative solutions is evident in the highly collaborative approach he applies when working with customers on both defining and designing the most appropriate solution for their specific application needs.

> *"In my experience, whether supporting customers in early stage R&D or engineering wire and cable to meet specific requirements, thoroughly understanding a customer's needs helps deliver the most effective solution by aligning expectations and capabilities to optimize value and reduce waste."*

In his current role, Jesus leads design and engineering efforts at Mercury Wire Products in Spencer, MA, a privately held organization that designs and manufactures custom cable and assembly solutions.

Introduction

When sourcing military-grade wire and cable that is fit for use in government and defense applications, a manufacturer's ability to meet military specifications (MIL-SPEC) and standards (MIL-STD) along with price are often the leading factors in the supplier selection process. While these two criteria are in-fact critical in meeting both performance and cost targets, there are additional factors that organizations can use to more effectively leverage the value that each of their manufacturing partners add to their operations.

Additional factors such as a supplier's ability to support innovation, compliance with International Traffic and Arms Regulations (ITAR), and their ability and flexibility to support and tailor their operations with specific organizational needs are within the extended list of factors that help differentiate a supplier from a strategic partner.
This white paper will focus on providing the reader with a general understanding of how the Defense Standardization Program (DSP) uses military specifications and standards in meeting its goals and objectives, highlight the importance of complying with International Traffic and Arms Regulations (ITAR), and discuss key criteria to consider when seeking to establish strategic partnerships with U.S. manufacturers to support your success.

Military Specifications and Standards

In the United States, defense contractors, direct manufacturers, and other entities supplying goods to government agencies such as the Department of Defense (DOD) are required to adhere to precise standards that help ensure that products supplied to them meet specific requirements. The Department of Defense manages creation of standards and specifications through its Defense Standardization Program (DSP). The goal of the Defense Standardization Program is to develop standardized guidelines for use in the manufacturing of goods that support the Program's goals to improve military operational readiness, reduce total cost of ownership, and reduce cycle time. A detailed description of Defense Standardization Program goals is summarized in Exhibit I.

The Defense Standardization Program documents specific requirements and makes these available formally to the public via both military standards (MIL-STD) and military specifications (MIL-SPEC/MilSpecs). It is important to note that while often used interchangeably, the purpose of military standards and military specifications vary in both scope and use. The purpose of Military Specifications is to provide both procurement and manufacturers alike with a description of the physical and/or operational characteristics of a given product or component. Military Standards on the other hand, provide details on processes and materials used in the manufacturing of products.

Confirming that potential manufacturing partners have the capabilities to meet required military specifications and/or standards is at the top of procurement professional's list of qualifying criteria. Potential manufacturing partners that do not have the capabilities to meet required military specifications or standards must simply be withdrawn from consideration for the specific wire and cable construction. Procurement professionals must also take special care in considering a manufacturer's capabilities in total rather than specifically on their ability or inability to meet a unique military specification.

Keep in mind that there are some extremely demanding specifications that challenge even the most sophisticated of manufacturers. Depending on your business strategy, product mix, and of course, current and potential strategic manufacturing partner relationships, you may consider a dual supplier strategy in areas where immediate gaps exist or while your preferred manufacturing partners enhance their capabilities.

Exhibit I. Defense Standardization Program Goals

Standards and specifications developed by the Defense Standardization Program (DSP) provide both procurement personnel and manufacturing partners with the guidance needed to support key government and defense program goals.

Improve Military Operational Readiness

- Achieving interoperability of systems, subsystems, and equipment with U.S. allies and among the Military Departments
- Reducing the variety of supply items to improve logistics support
- Improving the reliability, maintainability, and safety of systems and supply items
- Modernizing existing systems, subsystems, and equipment through the insertion of new technology and parts
- Ensuring relevance of standards to the warfighter

Reduce Total Ownership Costs

- Reducing the number of nonstandard parts
- Facilitating competition
- Promoting the use of common processes and open systems
- Promoting standard commercial processes and practices
- Reducing training costs and standardizing best training practices
- Optimizing systems engineering requirements by reaching a consensus on requirements
- Keeping standards current by incorporating cost-saving changes and lessons learned

Reduce Cycle Time

- Using readily available standard items
- Identifying interchangeability and interoperability requirements to permit rapid introduction of new technologies

International Traffic and Arms Regulations (ITAR)

Even when a manufacturer has the capabilities to meet specific military standards and specifications, that alone may not be enough to effectively conduct business with government agencies either directly or indirectly through third-party suppliers. When engaging manufacturers in the design and/or manufacturing of wire and cable specifically for, or serving dual use in a military application, procurement professionals must also ensure that any technologies, materials and information used in the design and manufacturing of such goods are carefully handled as specified within the International Traffic and Arms Regulations (ITAR) 22 C.F.R. Chapter I, Subchapter M, Parts 120 – 130.

To comply with ITAR, manufacturers must establish internal policies and processes that build awareness among employees, encourage compliance with critical regulations, and ultimately formally secure registration with the U.S. Department of State. ITAR registration serves as an indication to both the Department of State and an organization's customers that it has taken reasonable measures to ensure the protection of national security through the implementation of a series of safeguards and processes. A listing of ITAR compliance considerations can be found in Exhibit II.

ITAR registration and compliance is specifically important because organizations serving the government and defense segment directly or indirectly are often required to adhere to these regulations. Although rare, failure to comply with ITAR requirements may lead to costly federal investigations and significant fines.

Exhibit II. ITAR Compliance Considerations

ITAR registered organizations take special efforts to help ensure compliance across the supply chain by diligently following requirements set forth by the he Department of State's Directorate of Defense Trade Controls (DDTC).

Export and Order Fulfillment Screening Requirements

- Export Restrictions and Sanctions
- Diversion of Risk Screen
- Anti-Boycott Screen
- Proliferation End-Use (EPCI)

ITAR Specific Requirements

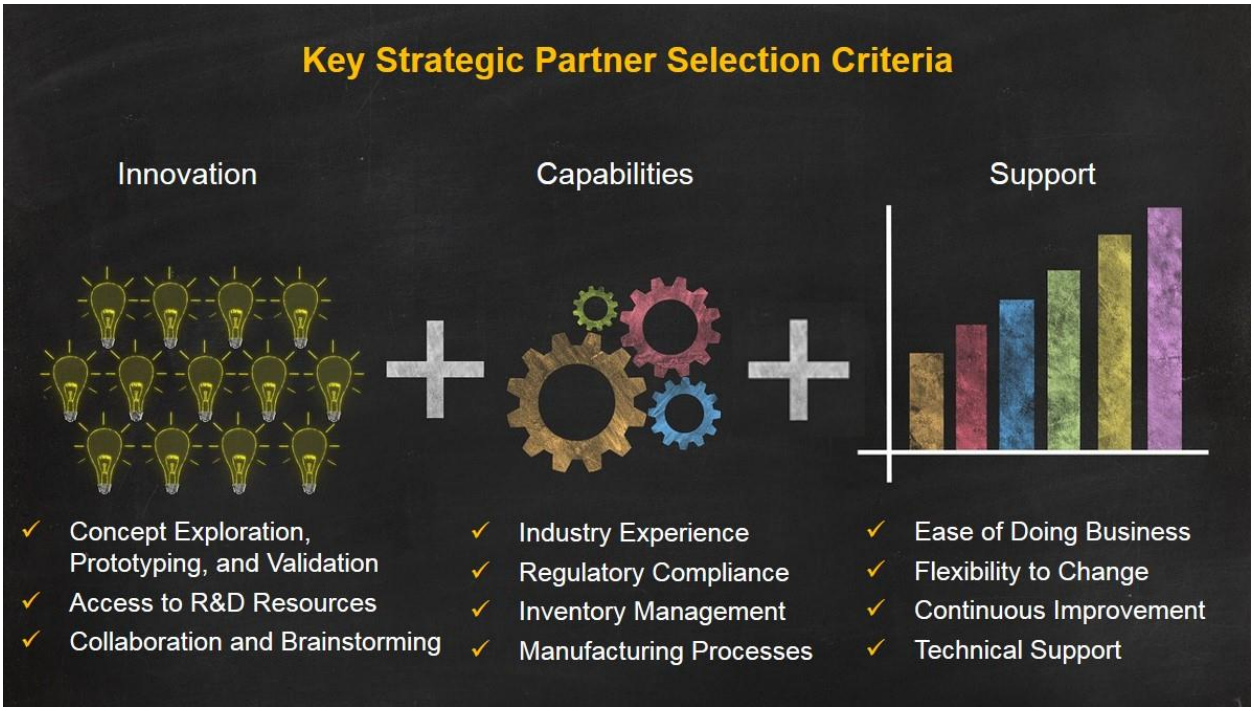
- ITAR Manual of Processes and Procedures
- Employee Awareness and Training
- U.S. Person vs. Foreign National
- Identification, Receipt and Tracking
- Record Keeping
- Export Documentation
- Plant Visits

Selecting A Strategic Manufacturing Partner

Step 1: Establish Criteria for Selecting Potential Partners

There are many factors to consider when selecting your ideal military wire and cable manufacturing partner. Rather than using a standard list of criteria, take the time to define activities and services that are valuable to your organization. Customizing your selection criteria will allow you to more effectively assess how well potential partners can support your specific needs.

Starting from scratch? No worries, there are three fundamental areas you can reference to begin formulating your criteria. These include innovation, manufacturing capabilities, and business support.



Ideally, selecting a manufacturing partner that meets all your needs is highly desirable. However, this is not always the case. In some instances, it is not uncommon for organizations to engage multiple partners where gaps in capabilities exist or where potential partners possess significant expertise in specific areas.

For example, a strategic manufacturing partner that focuses mostly on R&D may effectively accelerate innovation, but may not have the capabilities to deliver on high-volume production of goods. In this case, the benefits gained from shortening the new product development cycle may outweigh the incremental costs associated with engaging a separate manufacturer in setting up mass production of the goods.

Step 2: Ensure Regulatory Compliance

When seeking partners to support your military wire and cable needs, take special care to ensure that the manufacturer has established adequate internal compliance mechanisms that meet your procurement requirements and any external standards and/or regulations – including MIL-SPECs, MIL-STDs, ITAR registration, and so on. While many wire and cable manufacturers have the capabilities to meet the requirements outlined within MIL-SPECs and MIL-STDs, they may not always be registered with the Department of State, which suggests that they are not in full compliance with ITAR requirements. Selecting an ITAR registered manufacturer is specifically important when working with customers within the government and defense segment as they typically require both product performance and regulatory compliance across the entire supply chain including documentation, quality, delivery, and innovation.

Step 3: Make Contact

Another critical aspect in selecting a strategic manufacturing partner includes having a live conversation in person or via telephone regarding your specific organizational needs and to better understand their capabilities to support them before placing the first order. Making live contact early in the process can be very helpful in assessing whether potential partners are a good fit with your long-term goals and will also provide valuable insight into the type of relationship you and your new manufacturing partner may have.

Conclusion

For organizations working with commodity wire and cable intended for traditional consumer or industrial applications, availability of goods in a timely manner is often enough.

When procuring wire and cable for use in the government and defense segment however, there is more at stake than just on-time-delivery. Engaging manufacturers that adhere to parameters referenced in both military standards and specifications and that are also in compliance with International Traffic and Arms Regulations (ITAR) are critical factors in helping to ensure there is both product performance and regulatory compliance across the entire supply chain.

In addition to compliance with specification and regulations, building strategic partnerships with manufacturers can provide organizations with significant advantages including reducing the time it takes to deliver a new product to market and leveraging efficiencies gained from an integrated supply chain. The most successful partnerships start with aligning your organizational requirements with the capabilities offered by potential manufacturing partners.

Taking the time to define the key factors that are important to your organization is an essential step in helping to select a manufacturing partner to support both your short and long-term goals.

About Mercury Wire Products

Mercury Wire has been proudly designing and manufacturing custom wire and cable solutions in the United States for over 50 years. With a rich history of innovation, application of lean manufacturing best practices, and a solutions-oriented culture, Mercury Wire consistently provides its customers with the highest quality custom wire and cable and integrated assembly solutions at the best possible value.

As an ITAR registered manufacturer, Mercury Wire is committed to the design and production of wire and cable products that meet or exceed the physical and/or operational characteristics defined within Military Specifications.

- Custom Maritime/Shipboard Cable
- Buoyancy Controlled Cables
- High Voltage Power and Communication Cables
- Extreme Temperature and Environmental Resistance Cables
- Shielding Protection Against RFI and EMI
- Multi-Functional Configuration Options
  (Video + High-Speed Data + Power + Control)
- Superior Water-Blocking Application
- Chemical Resistance and Anti-Fungal Options
- Reliable Coax Cable with Strict Electrical Requirements

Learn more about our capabilities.

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