

# RF SHIELDED ENCLOSURE PURCHASING CONSIDERATIONS

Many articles have been written which describe material selection and design concepts for Radio Frequency (RF) shielded enclosures. Few, however, have addressed questions or concerns which arise during the actual evaluation and purchase. This article will attempt to establish a base or guideline which will enable the procurement manager to evaluate a manufacturer or supplier of shielded enclosure systems as well as the enclosure itself.

**Michael J. Lahita, Braden Division of AMCA International Corporation, Tulsa, OK**

A recent survey indicates that there are in excess of 50 companies which design, manufacture, install or broker RF shielded buildings or enclosures. As with any product which is manufactured by a number of companies, each manufacturer claims that its product is superior to that of all competitors. With everyone claiming that they have the best product, choosing the best shielding system for specific needs can be confusing.

Prior to awarding a contract for a shielding system, the following areas should be considered:

- Current and future requirements.
- The ability of the shielding supplier to meet schedule requirements.
- A research facility (lab) in which the shielding supplier evaluates designs.
- Availability of performance documentation.
- Adaptability of the shielding system for future modifications.
- Design which enables the shielding system to be interfaced with that of another manufacturer's system.
- Capabilities and qualifications of the shielding supplier.
- Availability of test equipment which will be required to verify the performance of the enclosure upon completion of the installation.
- Bonding of the shielding supplier.
- Warranty of the shielding system.

- Availability of maintenance contracts.

This list may seem excessive, but all the areas mentioned should be evaluated carefully when deciding which shielding system is suitable for specific needs and which company will supply the system. In order to demonstrate the importance of these criteria, consider the typical company which must procure a shielded enclosure.

Picture the purchasing manager of a company that has received a contract to align a large number of VHF transceivers which operate in the 290 MHz range. The company's senior engineer has decided that a shielded enclosure is required. A purchase request is sent to the purchasing manager's office for an enclosure that will provide a 100 dB of isolation or shielding effectiveness at the frequency of 300 MHz. This is actually a simple request. The manager looks through a few technical magazines and a manufacturer's directory and comes up with four or five shielding manufacturers.

A call is placed to each manufacturer, and the requirements are explained to a salesperson. Within a matter of days, four quotes have arrived. The manager and the senior engineer review the quotes. They are all within 10 percent of each other. Now a decision must be made.

Prior to making that decision, the purchasing manager may wish to contact various department heads within the organization and inquire as to future contracts which may be awarded to the firm. The company's manager of sales mentions that there is an excellent possibility that the firm will receive a contract for the same type of work but that the transceivers will operate in the SHF

range. Consultation with the engineer indicates that a shielded enclosure will also be needed for this work.

The purchasing manager's first thought is, "Great, I've just wasted 4 days finding a system for the VHF job; now I've got to start over." But, instead of calling the companies which had submitted a quote and requesting a new quote, he decides to contact them and ask what the capabilities are of the original system that they had quoted.

Two of the companies state that their systems, as quoted, will provide shielding effectiveness of 100 dB up to 350 MHz. To go beyond 350 MHz, a different or upgraded system would be required. The other two companies, however, state that the systems they quoted will provide a shielding effectiveness of 100 dB up to 3000 MHz (3 GHz) and that for a nominal price increase, their systems will provide 100 dB to 10 GHz.

Obviously, the field of suppliers has been narrowed down to two companies, and possible future requirements have been met with little additional expenditure. Now one of the two suppliers must be selected. The engineer has no recommendation so the purchasing manager must make this important decision.

As stated earlier, there are many shielding companies; and some of them have been in business for only a few years. If one of the quotes received is from a new or young company, it may be wise not to discard their quote. Many new companies have talented individuals with many years of experience.

However, a new company should be investigated thoroughly. Inquire about the availability of any and all

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## A BLUEPRINT FOR TEMPEST SECURITY

### STATEMENT OF WORK (select)

- |   |                                    |
|---|------------------------------------|
| <input type="checkbox"/> Architectural Shielding:                           | <input type="checkbox"/> EMP       |
| <input type="checkbox"/> Entire Building <input type="checkbox"/> Work Area | <input type="checkbox"/> HEMP      |
| <input type="checkbox"/> SVTC (Secure Video Telecom. Cntr.)                 | <input type="checkbox"/> NEMP      |
| <input type="checkbox"/> SVCC (Secure Voice Comm. Cntr.)                    | <input type="checkbox"/> ACOUSTICS |
| <input type="checkbox"/> Vault/Strongroom                                   | <input type="checkbox"/> SCIF      |

### QUALIFICATIONS (select one)

- ☐ **Piecemeal Approach:** Architect - Engineer - Consultant - Construction Manager - Contractor - Sub-Contractors - Material/Equipment Suppliers - Lawyers:

#### CONSULT YELLOW PAGES

- X** **Systems Approach:** One responsibility for the entire project with a contract providing for payment based upon performance:

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### GUARANTEED PERFORMANCE (select)

- |  |   |
|--|---|
| <b>RFI/EMI SHIELDING</b>                             | <b>ACOUSTICS</b>                                  |
| <input type="checkbox"/> NSA 65.5                    | <input type="checkbox"/> NIC-45 min. or _____ NIC |
| <input type="checkbox"/> NSA 65.6                    | <input type="checkbox"/> STC-45 min. or _____ STC |
| <input type="checkbox"/> NSA 73-2A                   | <input type="checkbox"/> NC-20 or _____ NC        |
| <input type="checkbox"/> MIL-STD 220A, 285, 461, 462 | <input type="checkbox"/> RT-60 _____ SECONDS      |

SCALE FULL	DATE 1-1-88
DRAWN BB	CHECKED BH
APPROVED JMB	

SECURITY SYSTEMS ENGINEERING

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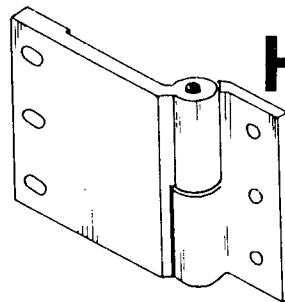
6601 AMMENDALE RD. BELTSVILLE, MD 20785 U.S.A.  
301-595-5220

SINGLE RESPONSIBILITY: DESIGN-ENGINEERING-FABRICATION-CONSTRUCTION-TESTING

A	1-1-88	PROPOSAL
ISSUE	DATE	PURPOSE
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ITEM - 1988		

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## HINGES

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REQUIREMENTS.

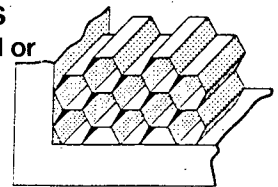
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data on their products. Ideally, they have actual performance data achieved with their product or system as well as information on the test procedures and test equipment utilized. Also it is wise to request a sample test procedure used to evaluate the shielding system once in place.

If expansion is the company's long-term goal, it is likely that an additional shielded enclosure will be required or that the existing shielded enclosure will be expanded. Consequently, the shielding manufacturer should be asked if the quoted system can be expanded or enlarged using components manufactured by other shielding companies.

Because this purchase is important to the firm, the shielding supplier should be asked if they are bondable for the full amount of the project. If bonding the project involves a significant cost increase, identify the reasons for the increase.

Warranties are the most misunderstood area of a shielding system purchase. The majority of manufac-

turers of shields will offer a guarantee of 5 years on the basic system (non-moving parts), a one-year guarantee on moving parts such as the door, and one year on electrical assemblies. Warranties do not usually cover unintentional abuse or misuse of items such as doors or electrical assemblies. Doors, which are in constant use, will degrade in performance if they are not maintained periodically as described in the manufacturer's maintenance procedures. If these procedures are not followed, there is a good chance that the warranties will not be honored. If maintenance of the enclosure cannot be performed by company personnel, ask the shielding supplier about the availability of their maintenance programs.

In conclusion, a shielded system installation has the potential of turning into a nightmare if all the *minor* details are not addressed prior to the issuance of a purchase order. Remember, as with any major purchase, it is wise to define specific needs and to evaluate fully both the shielding product and the supplier. ■