

US Enclosure Technology Transfer Opportunity

I. Introduction

U.S. Enclosure is primarily an engineering and technology company which has been pioneering for over 10 years the technology regarding spherical and parabolic shaped loudspeaker enclosures. The company's proprietary technology has been refined over the years and is now well proven to the point where it is ready to be incorporated in the mass market. U.S. Enclosure is willing to consider transferring its design and manufacturing technology to an industry leader seeking to gain a meaningful strategic advantage in the loudspeaker marketplace.

II. The Background

Mr. Kris Metaverso began his research with spherical loudspeakers and enclosures in 1990 and was joined by Mr. Brian O'Neill in 1995. US Enclosure was incorporated as a sole proprietorship in 1996. Since then, the company has maintained a strong focus on refining its new technology and developing efficient manufacturing processes. The manufacturing methodology has been well proven through the company's introductory sales efforts to a large variety of individuals and companies. To date, US Enclosure has designed, built, and sold 343 loudspeaker enclosures with sizes ranging from 4" (.02 cubic feet) to 30" diameter (7 cu. ft.)

Partial List of Corporate Customers:

- Aureal Semiconductor
- Boeing
- Checkpoint
- Circus Circus Hotel and Casino
- Cirque du Soleil
- Columbia University, Princeton University, Massachusetts Institute of Technology, San Diego State University, Michigan State University, Delta State University, Saitama Medical School (Japan), University of California Davis.
- Ericsson
- Dolby Laboratories
- Lightware
- Sound Alignment Systems
- Firewire
- Instrumental Media
- Sound Advance

Overseas Sales:

Australia, Canada, England, France, Germany, Israel, Italy, Japan, and Sweden

III. U.S. Enclosure Innovations

- Proprietary multi-modulus composite construction material
- Largest spherical loudspeaker enclosures ever manufactured and sold.
- Largest ovoid loudspeaker enclosures ever manufactured and sold.
- Variable-size/shape construction process (egg, wing, etc)
- Proprietary ovoid damping insert technology
- Spherical D'Appolito (MTM) with ribbon tweeter
- Proprietary Super-stuffing (10 times more absorbent than Acousta-stuff)
- HRT binaural microphone with pinnae (flesh-like ear castings)
- 3-way, 4-way, and 5-way sphere and ovoid-based systems.
- Disk superstuffing system for subwoofers
- Adjustable dual-sphere rear-firing ribbon bipole THX/(r) style loudspeakers

IV. The Technology

US Enclosure's technology achieves great improvements in loudspeaker sound quality. The enclosure material technology and production process is based upon over 10 years of direct experience producing and automating fabrication of fiberglass and composite enclosures such as Kevlar, Carbon Fiber, Nomex, etc. The acoustic technology is based on research performed in the 1930's and 40's by Muller, Black, and Dunn, *Jour. Acous. Soc. Amer.*, Vol 10, No. 1, p.6, 1938 and Harry Olsen "Direct Radiator Loudspeaker Enclosures", *Audio Engineering*, November 1951, an AES paper presented October 27, 1950. The company's important engineering and design improvements on these original concepts are completely unique and achieve excellent quality through cost effective manufacturing processes.



Spherical Loudspeaker Enclosure

The various ovoid and parabolic shapes of US Enclosure's technology reduce diffraction effects both from the exterior and interior surfaces of the loudspeaker enclosure. The wall materials, unlike any other material used in loudspeaker enclosure manufacture, are specifically designed to absorb sound waves. The benefits of the selected materials are known only by a handful of specialists worldwide. The finish, strength, and vibration-absorption characteristics of the resulting products are taken to a completely new level.

US Enclosure's technology adds several hundred percent to the value of a given loudspeaker system. This is accomplished by smoothing and widening the output. The technology allows one to mold loudspeaker enclosure shapers that finally follow the Maxim *Form Follows Function*. The elements are simple, effective and fully tested.

Not only does the technology surpass the sound quality of wood enclosures, the manufacturing cost is practically the same as that of wooden box enclosures.

By combining flexible manufacturing, newly available chemicals, and a unique approach to enclosure manufacturing, our technique dramatically increases the look, feel, and performance of enclosures.

V. The Value Proposition

A product based on US Enclosure's technology provides several benefits to end users. First, the product will have a superior finish and will blend smoothly into existing architecture or décor. Custom colors and finishes are available to a degree unmatched by any other manufacturing technique except hand lay-up. The product can be easily cleaned and can be mounted on walls or ceiling to save floor space. The product is rated for exterior or interior use, enhancing the visual appearance of either architecture or interior design. Finally, the product will deliver superior acoustic performance compared to regular loudspeaker enclosures on the market. In loudspeakers this sound quality improvement is both audible and measurable.

The manufacturing process for this technology can be such that the cost impact to the end user for this added value can be negligible. If using standard tooling amortization the cost will be comparable or less. In most cases the cost should be less due to the fact that the tooling costs are much less compared to rotational-molding for example. In relation to common wood based loudspeaker enclosures, the same benefits hold true.

US Enclosure's technology provides strategic benefits to the marketplace especially in a strong competitive environment such as in the loudspeaker industry. The first strategic benefit is the ability to substantially increase sound quality by optimizing the loudspeaker enclosure, its walls, and its stuffing. Second, the shapes of the loudspeaker enclosures offer the ability to introduce new product lines that visually stands-out from the competition. Third, the manufacturing cost is extremely competitive and rivals traditional methods. The visual aspect of products based on US Enclosure's technology will mesh perfectly with the significant sound quality improvement while remaining price effective.

In today's rapidly changing markets, it is critical to speed up development cycles. US Enclosure's production techniques enable rapid prototyping and production runs without the high cost, slow speeds, or size limitations of other technologies such as solid printing.

VI. The Opportunity

US Enclosure's technology represents years of development and it is finally at a stage ready for implementation on the broader market place. The company believes that the market opportunity this technology represents is best served through the industry leaders in the loudspeaker industry. To this end the company is willing to consider a licensing arrangement for its technology with parties interested in leading its market development. US Enclosure will consider providing exclusivity on its technology to a single party should they require it.

The technology transfer itself and its manufacturing implementation would require significant input from US Enclosure's key personnel to ensure an effective transition. To this end US Enclosure is willing to offer full time technical support services and concurrently provide a variety of ongoing improvements to its established technology. In

addition, US Enclosure is willing to provide first right of refusal for a number of completely new design and technology improvements for loudspeakers.

US Enclosure believes that an important opportunity is currently made available to the industry through its willingness to license and support its technology after years of development. This opportunity can bring strong competitive advantages to a loudspeaker manufacturer. By greatly increasing the consumer-perceived value of the sound quality of one or more models with no additional manufacturing cost, the manufacturer can either achieve greater market share or increase those products margins.

VII. Demonstration Offer

US Enclosure is ready to demonstrate its technology with either its own loudspeaker models or by converting a manufacturer's existing model and then perform a performance comparison of before and after. The company would require 3 to 5 weeks to convert a model it is being given for conversion. A demonstration can be arranged at either US Enclosures facilities or at the manufacturer's headquarters. US Enclosure is confident that the improvements will self evident by ear and measurable in a test lab.