



## **RIGGING AND SUSPENSION OF ON POINT AUDIO PRODUCTS**

Several models of On Point Audio loudspeaker products are designed to be suspended. Each product has been carefully designed to provide maximum flexibility for a wide variety of applications. Their internal rigging points and external rigging/flying accessories have all been carefully designed to offer a high degree of structural integrity. Each model, when suspended properly will provide safe and reliable long-term operation.

Suspension of any loudspeaker requires a complete understanding of not only the structural limitations of the products and their specific external rigging but also requires an understanding of the structural limitations of the mating surface. In addition, local, regional, and national codes may apply and these codes must also be understood and observed in order to insure a safe installation.

Because improper suspension of a loudspeaker can result in personal injury or death, it is critical that products be suspended **ONLY** by persons experienced in proper and safe suspension techniques and methods. On Point Audio products should not be suspended without a complete knowledge of the relevant local and national codes and should **ONLY** be installed by a professional experienced in installing these types of products.

**DO NOT ATTEMPT TO SUSPEND ON POINT AUDIO PRODUCTS WITHOUT READING THIS RIGGING MANUAL COMPLETELY.**

**DO NOT ATTEMPT TO SUSPEND ON POINT AUDIO PRODUCTS WITHOUT**

**UNDERSTANDING EVERY ASPECT OF THIS MANUAL.**

**DO NOT ATTEMPT TO SUSPEND ON POINT AUDIO PRODUCTS WITHOUT UNDERSTANDING LOCAL AND NATIONAL CODES THAT APPLY TO OVERHEAD SUSPENSION OF PRODUCTS.**

**DO NOT ATTEMPT TO SUSPEND ON POINT AUDIO PRODUCTS UNLESS YOU ARE A PROFESSIONAL WITH KNOWLEDGE OF LOCAL AND NATIONAL CODES RELATED TO SAFE SUSPENSION AND ARE EXPERIENCED IN SUSPENDING PRODUCTS OVERHEAD.**

**ON POINT AUDIO IS NOT RESPONSIBLE FOR FAILURES RELATED TO NON-COMPLIANCE WITH LOCAL AND NATIONAL CODES AND SAFE SUSPENSION PRACTICES.**

### **Safe Suspension of ON POINT AUDIO Products**

Please read this entire manual. Please read every part of this manual and do not omit or delete any portions of this manual. Each statement contained in this manual is intended to assist the user in insuring a safe and reliable installation and, as a consequence, every part of this manual should be read and understood.

Please employ a professional rigger who is experienced in overhead suspension of products and is familiar with local and national codes related to overhead suspension of products. Codes may vary from country to country and each country's codes should be completely understood prior to installation of these products.

This manual is NOT a substitute for a professional with experience and should not be used as a substitute for employing an experienced professional with knowledge of all appropriate local and national codes. It is the responsibility of the user to insure that all local and national codes have been observed and obeyed and that appropriate safe working limits have been observed.

### **Secondary Safeties**

All On Point Audio loudspeaker systems should be suspended using a secondary safety in addition to the main load-bearing rigging/fly points. It is the responsibility of the user to insure that secondary safeties are properly installed where required by code.

It is highly recommended that secondary safeties be utilized even where local or national codes do not require such redundant safety devices.

## **Safe Suspension Practices**

Do not substitute any rigging or rigging accessories. Use only the parts and accessories that are supplied with On Point Audio products. Each rigging/suspension accessory has been tested by a certified laboratory and has been rated accordingly. Substitution will alter the rated safety factors and may result in reduced safety margins.

**DO NOT ATTEMPT TO SUSPEND ON POINT AUDIO PRODUCTS UNLESS YOU ARE A PROFESSIONAL WITH KNOWLEDGE OF LOCAL AND NATIONAL CODES.**

Do not modify any On Point Audio rigging/suspension accessory in any manner. Do not drill, file, sand, or otherwise modify any aspect of the loudspeaker, the associated rigging, or any other supplied accessory.

Do not install On Point Audio products in any manner except as shown in the product-specific literature.

## **Associated Rigging**

The term “Associated Rigging” refers to any and all rigging not supplied by On Point Audio but used to suspend On Point Audio products. All associated rigging is the responsibility of others. This may include, but is not limited to, wire rope assemblies, beam clamps, shackles, etc. All associated rigging must conform to local and national codes and be rated for overhead suspension. All associated rigging should be specified by a professional engineer experienced in overhead suspension of products and familiar with local and national codes governing such products and applications.

## **Installation to a mating surface**

On Point Audio products are designed to be suspended from a “mating surface”. This surface may be a wall, ceiling, floor, or other structure. These mating surfaces must be capable of safely supporting the weight of the On Point Audio loudspeaker enclosure(s), the additional weight of all On Point Audio rigging, and all other associated rigging. In addition, the mating surface must be capable of supporting an additional force equal to that specified by all local and national codes.

The structural characteristics of mating surfaces can vary a great deal and significant care must be exercised when determining the suitability of a mating surface for attaching rigging or rigging points.

## **Safety Factors**

All On Point Audio® products and rigging accessories are designed with a minimum 8:1 safety factor. The safe working load specified for each On Point Audio loudspeaker and rigging/suspension accessories should never be exceeded. The safe working load incorporates the 8:1 safety factor.

The mating surface must equal or exceed the rating of the overall system (loudspeakers and associated rigging) and must include a safety factor specified by local or national codes.

Each On Point Audio loudspeaker enclosure will have a specific safe working load rating. This product-specific rating includes the maximum permissible total load on the rigging assembly.

It is appropriate to provide an explanation of the process that On Point Audio uses to rate their loudspeaker systems and accessories in order to illustrate the proper calculation of the maximum weight that may be suspended below any suspension accessory.

When a loudspeaker system and bracket assembly are tested, they are pulled at various angles until a “functional failure” is observed. This “functional failure” is not the same as a complete structural failure. A structural failure is the result of suspension components or any other structural components of the loudspeaker or rigging/suspension system actually breaking. This type of failure will result in the possibility of the loudspeaker falling and causing damage or serious injury and death. A “functional” failure occurs before a structural failure. A functional failure is described as any significant deformation or alteration of the loudspeaker’s structure or its rigging/suspension hardware. The evaluation of a functional failure is very subjective but it always occurs prior to a structural failure. For this reason, On Point Audio uses functional failures to set a final rating.

On Point Audio’s testing procedures requires the system under test also be tested to a structural failure and another evaluation is made that compares the magnitude of the force that separates the functional failure from the structural failure. This can be considered a type of “mechanical headroom” where a sufficient force is required between the functional limit and the final structural limit.

An example may be useful to illustrate how a final rating is achieved: A loudspeaker may be pulled to a force of 2,000 lbs / 980.3 kg before a functional failure is observed. (This failure may be due to a separation of two of the loudspeaker’s wood panels or due to a force on a forged eye bolt that results in a permanent deformation of the bolt, etc). The loudspeaker under test will then continue to be pulled until a structural failure results. In this example, say the

structural failure occurs at 2,900 lbs / 1,315.4 kg.

The 8:1 safety factor is now applied to the functional failure (not to the structural failure). So, the functional failure of 2,000 lbs / 980.3 kg is divided by 8, which results in a product rating of 250 lbs / 113.4 kg.

What this implies is that a total load of 250 lbs / 113.4 kg may be suspended from the top loudspeaker. If the loudspeaker in question weighs 120 lbs / 54.43 kg then another loudspeaker, or any other object, with a total weight not exceeding the combined limit may be suspended. (NOTE: the weight of the additional rigging/suspension hardware must also be included in the overall equation. If a second 120 lb / 54.43 kg loudspeaker were suspended below the test unit in this example, then the rigging used to suspend the second loudspeaker from the top loudspeaker could not exceed 10 lbs / 4.53 kg.

The example above is intended to illustrate how safe working limits are produced. The above example does not represent actual data or reflect any specific On Point Audio models.

### **Inspection of Rigging**

All enclosures and associated rigging should be inspected at least once a year. This inspection should be performed by an individual experienced in structural analysis and one familiar with local and national codes. The purpose of this yearly inspection is to insure the integrity of each rigging point and to observe any signs of structural degradation in the enclosure and associated rigging.

### **Warning**

Suspending any object overhead is a serious undertaking and should never be attempted by those not experienced in this process. Products should not be suspended without a complete knowledge of local and national codes.

**ALWAYS CONSULT A PROFESSIONAL EXPERIENCED IN OVERHEAD SUSPENSION OF OBJECTS. ALWAYS CONSULT A PROFESSIONAL THAT UNDERSTANDS AND OBSERVES ALL LOCAL AND NATIONAL CODES.**