



# COMP Series Subwoofers

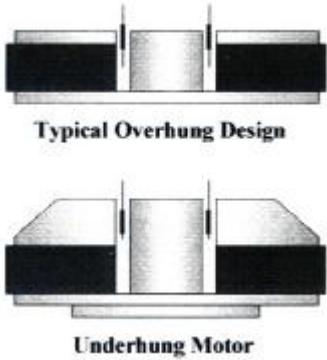
The **COMP** Series subwoofers from Crystal Mobilesound feature speaker technology optimized for low-frequency audio reproduction. Crystal's research into the signal

behavior of high excursion speaker systems has resulted in this new series of high power handling, high SPL, ultra-linear subwoofers.

Within the massive precision-machined motor assembly is a special three inch diameter, multi-layer copper voice coil. What makes it so special is how it operates. Instead of using a long voice coil in a short magnetic gap (conventional overhung design), the **COMP** Series employs an underhung voice coil, a short voice coil in a long magnetic gap.

Xmax is defined as the distance that a speaker's voice coil can travel in one direction and maintain a constant number of wire turns in the magnetic gap. A speaker is considered to be operating in a linear fashion if the number of turns of wire in the gap is constant and in a non-linear fashion if the number of turns of wire in the gap changes.

A speaker's operating parameters will change dramatically during non-linear excursion and as the excursion exceeds Xmax, 3<sup>rd</sup> order harmonic distortion can increase as much as 3%.



In high power handling situations, a conventional overhung voice coil can easily become non-linear. As increased voltage is applied to the speaker, the voice coil moves out of the gap and the number of turns of wire in the gap decreases resulting in non-linear excursion of the cone.

In a Crystal **COMP** Series subwoofer the magnetic force on the voice coil is constant and the motor delivers over two inches of peak to peak linear excursion. There is a constant relationship between applied current and generated motor force. In addition, the Thiele / Small parameters of a **COMP** speaker are more consistent being less dependent on coil position. With the voice coil always surrounded by the top plate, the electrical impedance also becomes position independent.

Since the underhung design is inherently stable, it does not have to rely on a stiff suspension to attempt to keep distortions in check. Instead, the **COMP** series' eight inch spider is optimized to be very linear and compliant, resulting in a very low resonance frequency. This contributes to excellent mechanical linearity, exemplary low-frequency response, and overall greater versatility in system design.

We recommend using 3/4" or thicker MDF to construct an enclosure for the **COMP** subwoofer. Liberally apply wood glue to all joints and use screws to assemble the enclosure. Seal the seams inside the enclosure with a high grade silicone caulking. In order to insure a rigid enclosure, brace all enclosure walls to prevent any panel flex. Make sure when calculating the enclosure you take into account the volume occupied by the bracing and wall thickness of the enclosure. Our Sealed Enclosures suggestions are constructed using normal polyester fill at a ratio of approximately one half pound of fill material per cubic foot.

COMP 10	SAE	Metric
Fs	33.5	33.5
Qms	6.4	6.4
Vas	0.83 cu. ft.	23.5 liters
Cms	53.77 in. / lb.	0.154 mm / N
Mmd	5.04 oz.	143 grams
Xmax	0.71 in.	18 mm
Qes	0.46	0.46
Re	3.3 ohms	3.3 ohms
Z	4.0 ohms	4.0 ohms
BL	15	15
Pe	1000 Watts	1000 Watts
Qts	0.42	0.42
SPL	84.7 dB	84.7 dB
V.C.	3.0 in. Dia.	76.2 mm

**Recommended Sealed Enclosure**

Total Enclosure Volume: 0.5 cu. ft.  
 Fe: 33 Hz  
 Acceptable Enclosure Volumes: 0.4 – 0.6 cu. ft.

**Recommended Ported Enclosure**

Total Enclosure Volume: 0.9 cu. ft.  
 Port Diameter: 3 in.  
 Port Length: 12 in.  
 Fe: 33 Hz

**Additional Information**

Speaker Displacement: 0.07 cu. ft. (1.98 liters)  
 Mounting Depth: 5.75 in. (146 mm)