SPIRIT ONE
Technical specification sheet

Designed and developed in Saint-Etienne, like all Focal loudspeakers, the Spirit One draws on extensive technical knowledge to meet the three essential criteria of a headphone: comfort, sound insulation and of course sound quality. Welcome to the core of headphone know-how and innovation.

Comfort and insulation: connection to the headband

The choice of a closed headphone, completely sealed, is absolutely natural when you wish to keep out external noises and not disturb the quality of listening sessions. This is one of the key points of the specifications of the Spirit One: no music is possible in an environment that is too noisy.

On the Spirit One, even though the insulation is passive (no electronic noise compensation), it is very effective: above 18dB. Such a result is achieved by optimizing the coupling of the pads around the ear, by the choice of the foam that perfectly fits the curves of the skull and assures a total seal, and finally by the force exerted by the adjustable headband.

This headband is one of the key points of this excellent sound insulation thanks to a totally innovative design. In order to have perfect insulation, only one solution is possible: the pads must be perfectly sealed around the ears. To do so, the user simply has to press the headband slightly. Usually the anchorage is situated at the top of the earphone but in that case pressure cannot be uniformly exerted.

The Spirit One headband is designed with two joints. The first one is highly staggered and permits suitable pressure on the sides, instead of the top. Side pressure is much more efficient at pinning the pads against the skull. This pressure is passed on to the pads through the second joint placed at the centre of the earphones, to be uniformly distributed on the whole surface of the pad. Thus, the earphones will naturally fit the ear outline whatever the skull morphology. The pad seal can be acoustically satisfying without compromising comfort.

Comfort

The quality of the materials, the design and lightness of the physical structure of the headphone offer a very agreeable level of **comfort**, which is an essential requirement for a mobile headset.

The double jointed aluminum comfort headband maintains a uniform lateral pressure around the ear for excellent **insulation**.

The Spirit One headphone incorporates five chambres of different sizes and shapes that communicate sympathetically with each other. The changing of apertures is the key to optimizing **sound quality** and controlling the low frequencies.

The profile of the ear-pads is as smooth as possible to reduce wrinkles that in turn cause leakage and loss of insulation.

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Bass sculpture

From Focal's point of view, the supreme goal of any audio product remains sound quality. The acoustic work accomplished by our engineers on the Spirit One is unparalleled. Each headset presents no less than five cavities tuned with one another (eighth order acoustic filtering) to get balanced, deep, natural bass. Development, primarily comprising very precise tuning between the cavities (thanks to communication vents partly filled to hamper air flow) allowed us to sculpt the response curve until we reached the intended sound reproduction.
From this point of view, the bet is largely won because the Spirit One was measured down to 6Hz, and was thus able to retrieve information that the overwhelming majority of loudspeakers are just not able to reach. We achieved an incredibly deep but tight bass, adhering perfectly to the Focal sonic signature, without excess, without smearing, with all the animation and dynamics that characterize a Focal product. The reproduction of an "electro" track, or a more acoustic one like large organs, reveals information of incredible precision in the sub-bass, but with a true light weight due to the absence of smearing, thanks to the complexity of cavities... Any headphone listening session denies us the physical perception of true bass. Indeed, a serious and important part of the sub-bass is sensed by the body in the form of an impact that cannot be perceived with a headphone.

A very slight increase of the bass has then been preserved, not to create a spectacular over-rated touch, as it is commonly practiced in this segment, but to compensate for this lack of physical perception, to obtain the most realistic and natural possible reproduction. This is a method that prevents listening sessions lacking density and warmth in the bass.

The choice of capsule is an essential element that determines the sound quality of the headphone. Every mylar / titanium 40mm capsule used in the manufacture of the Spirit One headphone is systematically measured and tested to ensure utmost reliability in its performance and reproduction of sound.

The development of the Spirit One headphone lasted for two years and was confined "in-house" to our team of R & D, particularly for the delicate tuning phases of the ear-pad and capsule.

Choice and preconception

Another difference is that on a loudspeaker, the sound comes from the front, whereas with a headphone, the sound comes from all directions at once. However, like a loudspeaker or a driver, the ear has a variable directivity curve depending on the sound (from the front or from the back), linked to the facial structure and the ear auricle. A sound coming from behind doesn't have the same tone as a sound coming from the front, because perception is really different. That's why the response curve must be as flat as possible for a loudspeaker to be equivalent to the ear response curve that is frontal and linear. There is no compensation curve.
It's very different for a headphone, because it's necessary to take into account the entirety of sounds captured by the ear. You get the average response curve that must be corrected by a suitable response of the headphone, with important pre-emphasis, especially around 3kHz.
This pre-emphasis is the result of a choice by the manufacturer who will select the directivity zone of the ear, from 0° to 360°, which will greatly influence the response curve shape and ultimately the sound reproduction.
For Spirit One, we engineered a wide frontal zone that corresponds to classical loudspeaker reproduction, to match our quality criteria of realism and accuracy. It also helps in positioning the sound in front of you (just like with loudspeakers) and in avoiding the unpleasant feeling that the sound image is inside the skull.

By controlling all phases in the development of the Spirit One headphone from one end to another, until the individual control of each headphone, Focal can control the entire manufacturing process.

Creating a headphone in a laboratory is one thing; ensuring that the excellent performance of the Spirit One can be reproduced on all production models is another. The same quality control applied to loudspeakers manufactured by Focal is applied to the transducers: each diaphragm is measured (not in a sampling way, but as a true systematic control) to keep only those that suit the curves of the reference model. Then all the assembled headphones with selected diaphragms are measured at the end of a chain for quality control, guaranteeing excellent consistency of performance from one model to another.

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