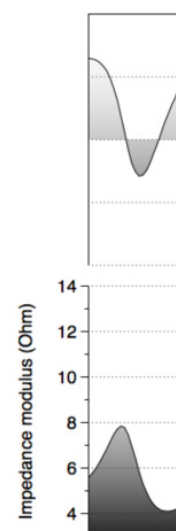
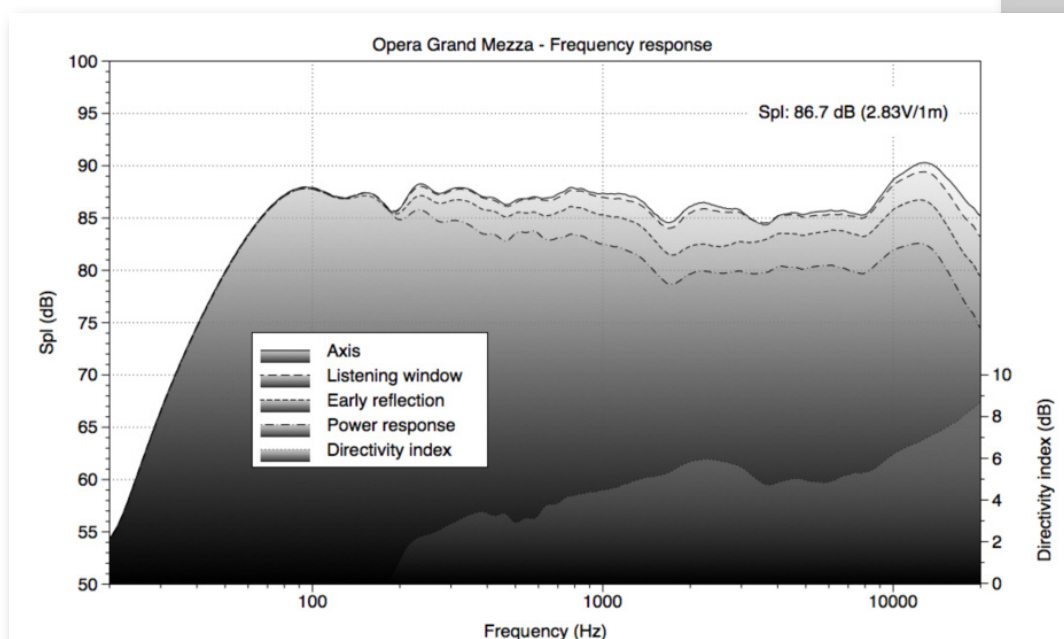


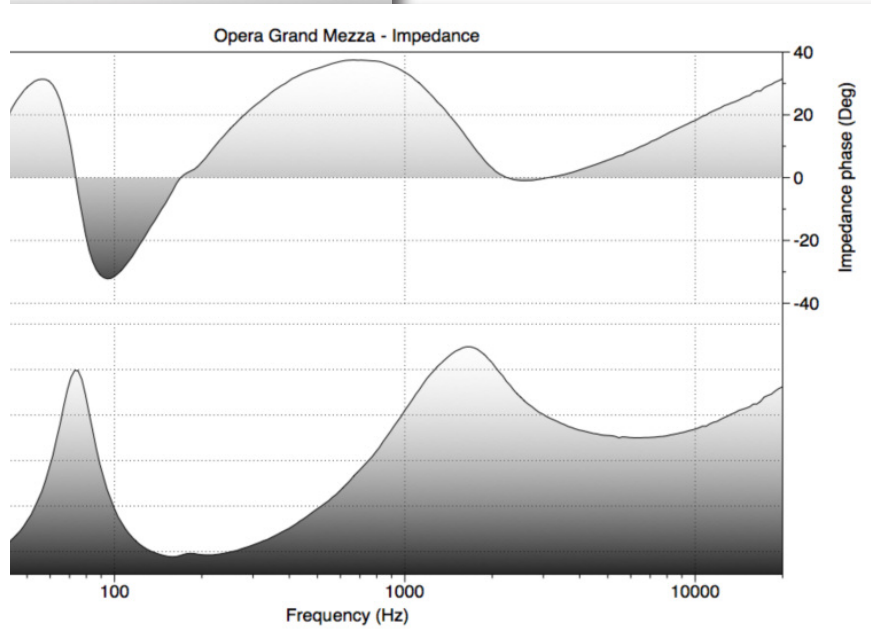
# OPERA GRAND MEZZA

## TECHNICAL ANALYSIS

*The sensitivity of the speaker (obtained from the mean levels of the curve in the listening window between 100 and 12,000 Hz) is about 86.7 dB; this is an average value for speakers of this type, and it's always wise to take care over the interfacing with a powerful amplifier. The frequency response on the axis measurement appears quite regular; the emission peak of the tweeter clearly shows at about 13 kHz, with the slight dip at 1800 Hz, due to a rather open crossover region. The representative average of the listening window follows the axis measurement, confirming the good phasing of the speakers and the cleanness of the acoustic load from the front panel. The graphics are also fairly regular displaying the response in correspondence with the generators of the early reflections, and so is the power response. There's still a pretty obvious dip in the midrange and a characterized response in the high frequencies, shown also in the*

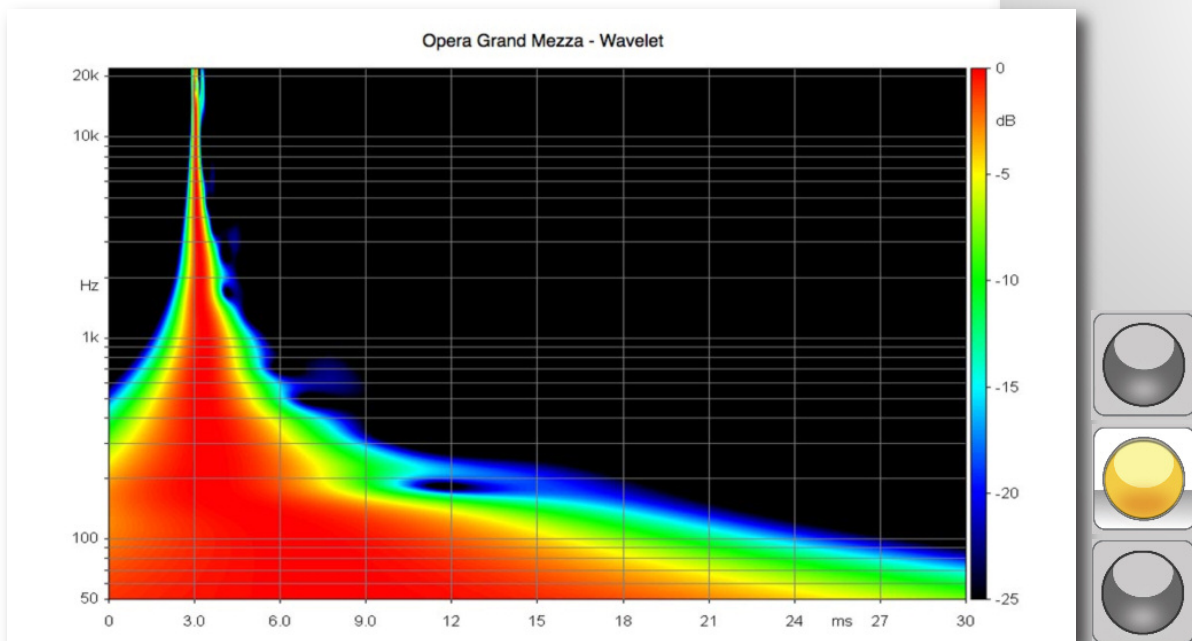


*function that expresses the directivity index of the speaker (the difference between the power response and the listening window).*



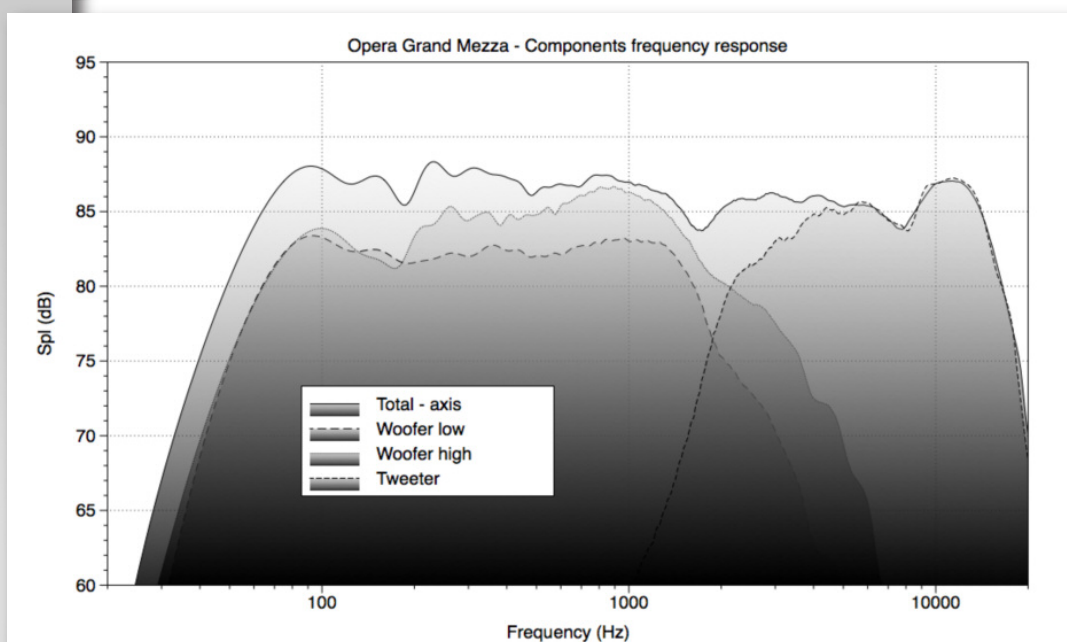
*The impedance module shows parallel at low frequencies of the two woofers, with a minimum a little over 3 ohms just above 150 Hz; at these frequencies the phase is the negative zone, so here we find the maximum load conditions for the amplifier, in a fraction of the spectrum rather rich in energy content. Even here, therefore, it's necessary to pay attention to the interfacing with the amp, which must be stable at low impedances. A*

*slight alteration of the module is visible at around 190 Hz: these are the principal resonances which are generating in the internal volume, which acts as a resonator, right on the half-wave of the larger dimension, equal to about 90 cm. This is a small thing, but it is also clearly visible in the frequency response graphic, especially on the principal axis of emission.*

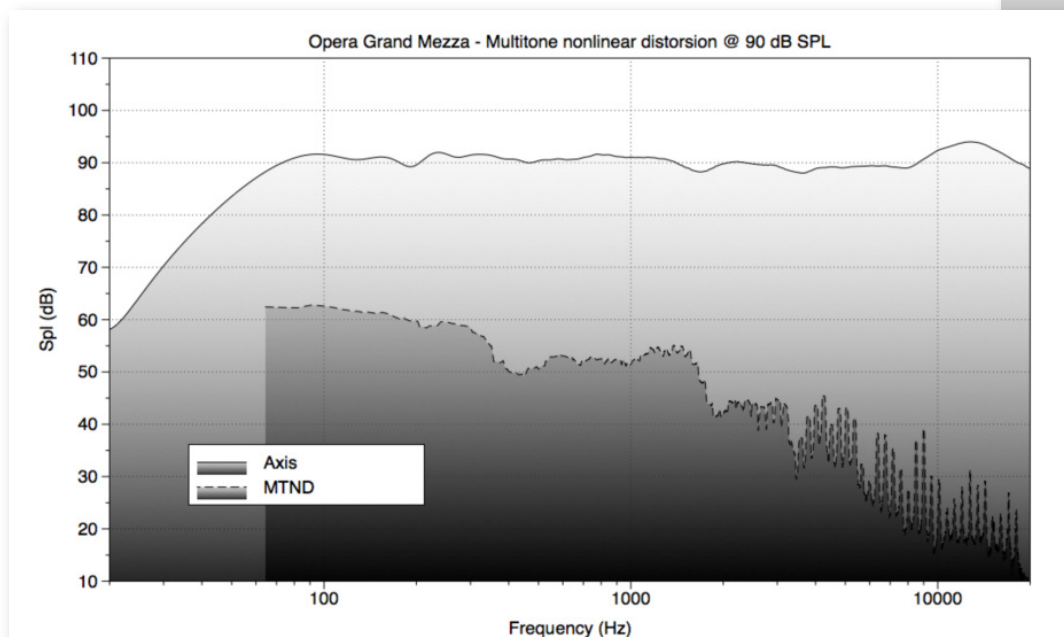


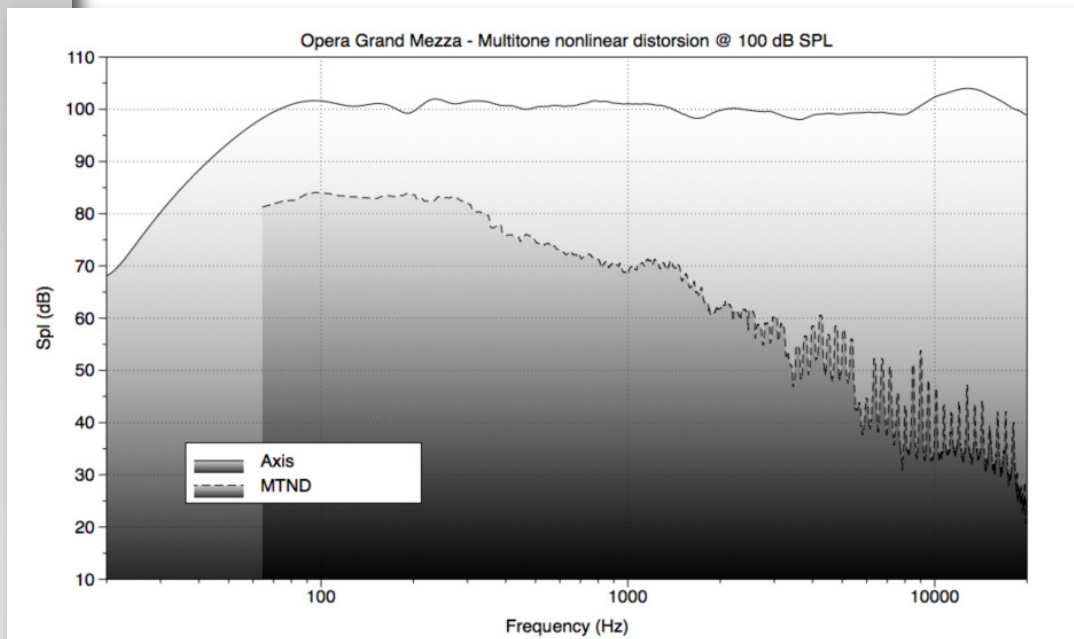
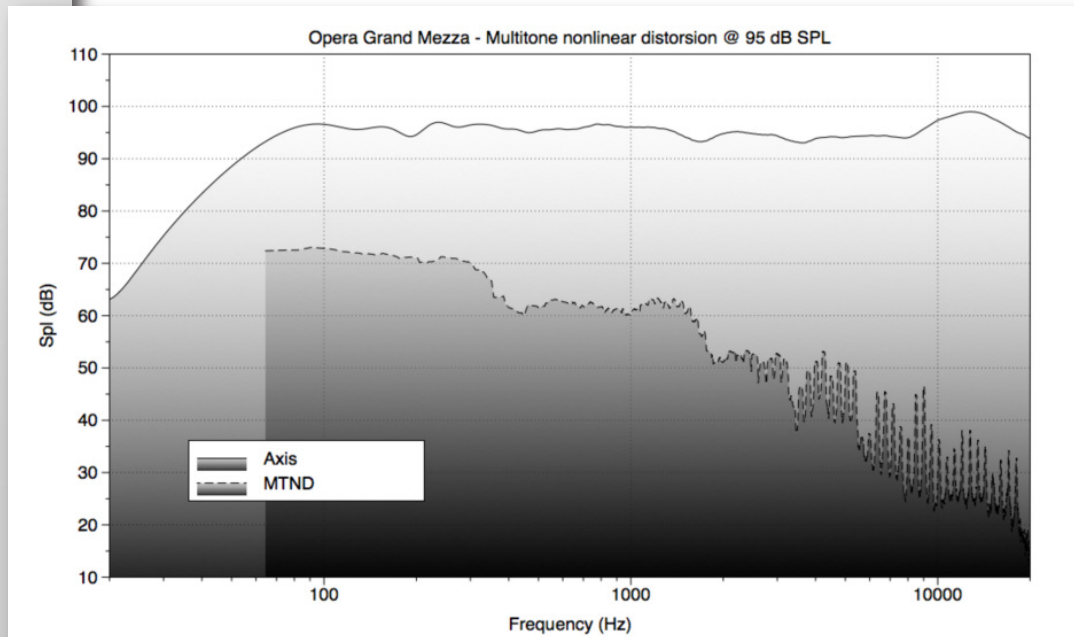
*The Wavelet of the impulse of the axis measurement confirms the observations made in other measures: the energy dissipation in the midrange zone is very quick and clean, with only very slight perturbation in the upper emission zone of the mid-woofer, and also shows an uncertainty around 190 Hz, due to the internal resonance of the volume of the speaker. I believe that the choice to keep most of the volume empty should be attributed to the desire to obtain the maximum S<sub>pl</sub> at low frequencies, a parameter certainly much appreciated in this market segment, which is fought to the last few Hertz, and the small amount of sound-absorbing material positioned in the upper zone volume can still keep the situation under control.*

*Intrigued by the particular configuration declared by the manufacturer, I decided to make an in-depth analysis of the emission of the individual speakers, to obtain the graphic that overlaps the emission of the individual components in reference to the combined total. The filtering that takes place on the low woofer anyway seems fairly bland, and introduces a slight phase shift with respect to the higher woofer which partially limits the acoustic sum in the middle frequencies. The widening of the crossover region with the tweeter is also obvious, and characterizes the power response of the system in the midrange; this behavior shall be considered as the result of an acoustic optimization carried out in the listening room, with the intent of obtaining a precise tonal character.*



*The measures of multitone distortion are not exactly brilliant: at 90 and 95 dB the system operates in an area of discrete linearity, although the distorting contribution of the two mid-woofers in the midrange is evidently affected by a high component due to the modulation of the inductance of the moving coil, and extends all the way even into the highest frequencies, with intermodulation and harmonic components. What you see in the graphic is essentially the distortion of the two mid-woofers, which comes to mask that of the tweeter in the highest range. At 100 dB measurements the asymmetry of the suspension of the two woofers becomes the dominant source of non-linear distortion, and the signal-distortion ratio is reduced to about 16 dB.*

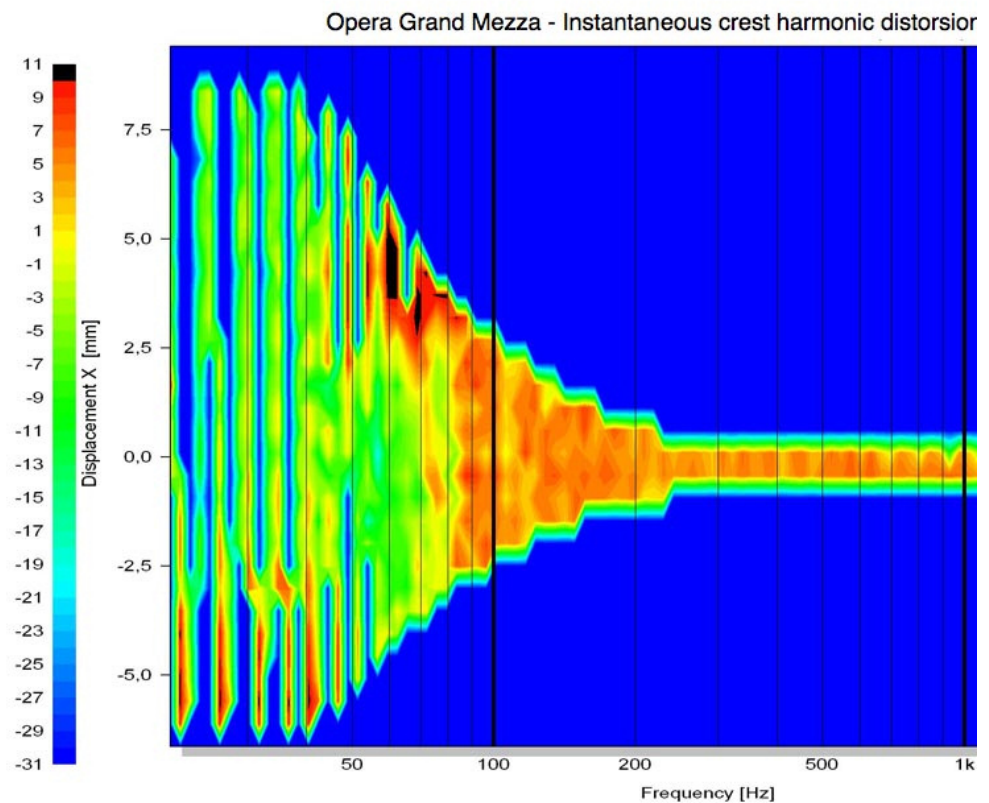


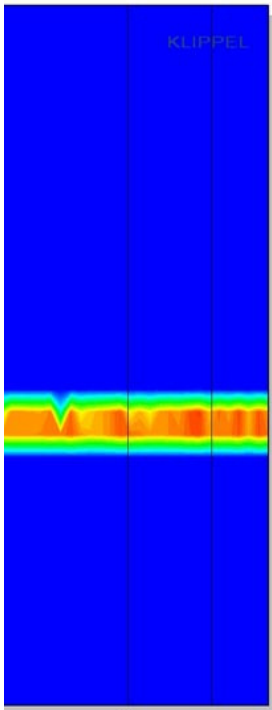
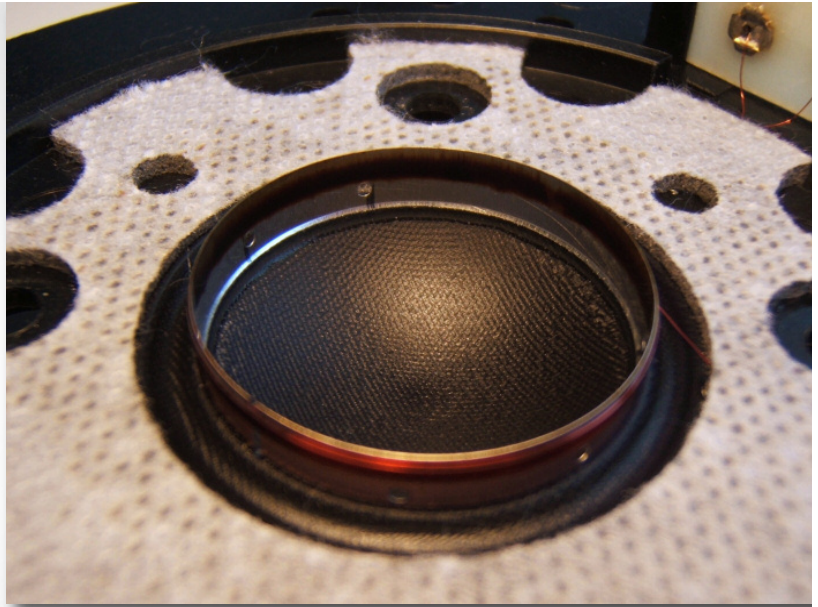




As can be seen in the graphic which represents the instantaneous harmonic distortion, mapped by monitoring acoustic pressure and the displacement of the membrane at the same time, a sweep of 8 V generates a positive offset of about 2.5 mm, and highlights the rather abrupt limiting of the suspension of the woofers for negative movements greater than 5.5 mm.

Certainly, the price range in which the Opera Grand Mezza are positioned necessitates some leniency in assessing their performance, but it's worth emphasizing that these are not the most appropriate speakers for playing in large environments at "live" levels of acoustic pressure ■





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