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# Utopia™ III

Grande Utopia™ EM™ - Scala Utopia™ - Diablo Utopia™





## Utopia™ III

Grande Utopia™ EM™ - Scala Utopia™ - Diablo Utopia™





Five years ago, Jacques Mahul handed me the Home product management...

In the line of sight of this new challenge, there's the Utopia range.

2005. I sketched out the first frame of what could be the future of Utopia. First of all, re-specify the foundations of Utopia. Be ambitious, defy the limits to aim at the exceptional... Keeping Focal intrinsic values and "the Spirit of Sound": technological innovation with the benefits of tradition to reach the best worldwide performance to serve musical pleasure.

Four dimensions are emerging:

- The technological dimension: in 2002, with the Beryllium tweeter, we jumped forward with high frequencies, with the 3<sup>rd</sup> generation, we had to make our "r"evolution in the low frequencies. It was obvious.

- The listening quality dimension: this technological breakthrough had to bring a major gain to the listening experience in matter of realism, precision and sound dimension.

- The design dimension: to be stylish, the object must radiate strength and a natural identity that make it unique and... eminently desirable.

- The personalization dimension: because at this level, the final customer wants a unique object that satisfies his aesthetic and sound taste.

The adventure began with the setting-up of a team that would take up this huge challenge: stylists, a master craftsman, driver and crossover engineers and a project manager to coordinate the whole...

In Autumn 2005, we knew that the path ahead of us would be really treacherous and that only a state of mind resolutely turned towards the possible solutions could enable

us to reach our goal. Everybody in their own level should transcend themselves... and mobilize their own team.

Our wish? That these pages help you discover this unique adventure. We hope you'll be amazed, seduced and in the end you'll feel enthusiastic so that you play, in your turn, a major part in this exceptional adventure.



*Gérard Chrétien*  
Gérard Chrétien.



**1995**

W Cone | Focus Time | Multiferrite

**2002**

+ Beryllium | Power Flower | OPC | Gamma Structure | Focus Ring

**2008**

+ EM | Adjustable Focus Time | IAL2 | OPC+

**MYTHS DEVELOP OVER THE YEARS**



# SCULPTURE

# ACOUSTIC

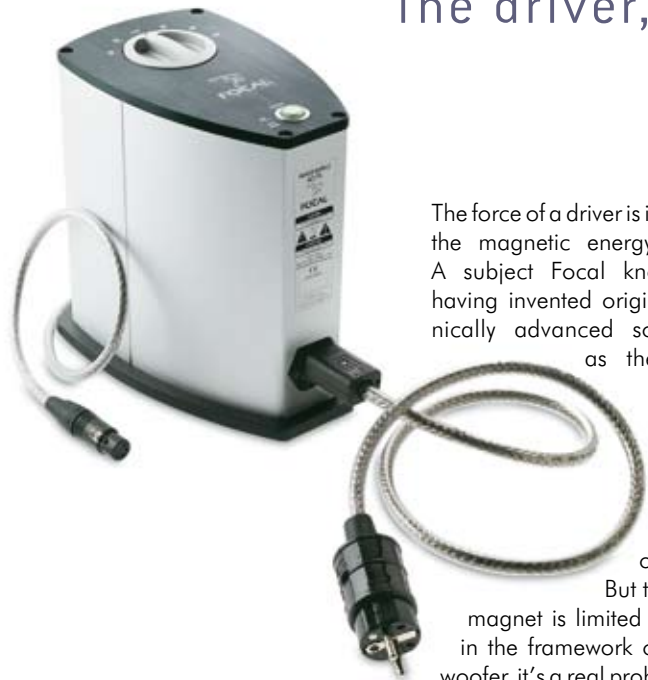
The Grande Utopia story started in 1995 with a major innovation: the W composite sandwich cone. It went on in 2002 with the Grande Utopia Be that introduced the pure Beryllium inverted dome tweeter. Other important inventions distinguished those two reference loudspeakers, which are still existing in the 2008 Grande Utopia. But nothing that can be compared to the W sandwich or the Beryllium, showcase of Focal's know-how, Focal, designer and manufacturer of the best drivers in the world. The 2008 technological break concerns once again the driver - at the heart of Focal's know-how - with the Electro-Magnet woofer technology. Such a decisive step that it gives its name to this third generation of Grande Utopia. It's a new milestone that is added to the long list of innovations coming from the previous generations of Grande Utopia: "W" cone, Focus Time, Multiferrite, Beryllium, Power Flower, OPC, Gamma Structure, all Utopia's patrimony is taken up in its entirety, enriched with new technologies.

To preserve this heritage, the 2008 Grande Utopia had to be immediately visually identifiable, keeping its imposing aspect of a reference loudspeaker, without being massive. To reach our first goal, we kept the Focus Time structure and the separate blocks for each driver, the true aesthetic signature of the Grande Utopia. To lighten the shape, the delimitation between the blocks is more important. Simplifying the object in the extreme and eliminating what could be aesthetically superfluous. Handed over to Pineau & Le Porcher agency, with which Focal-JMLab has been collaborating since 2003, the Grande Utopia EM's design is all purity and clarity - obvious. That's a truly amazing feat for a loudspeaker that now reaches 78" (2m) high and weighs 573lb (260kg)...

# EM™



## The driver, a matter of MAGNETISM



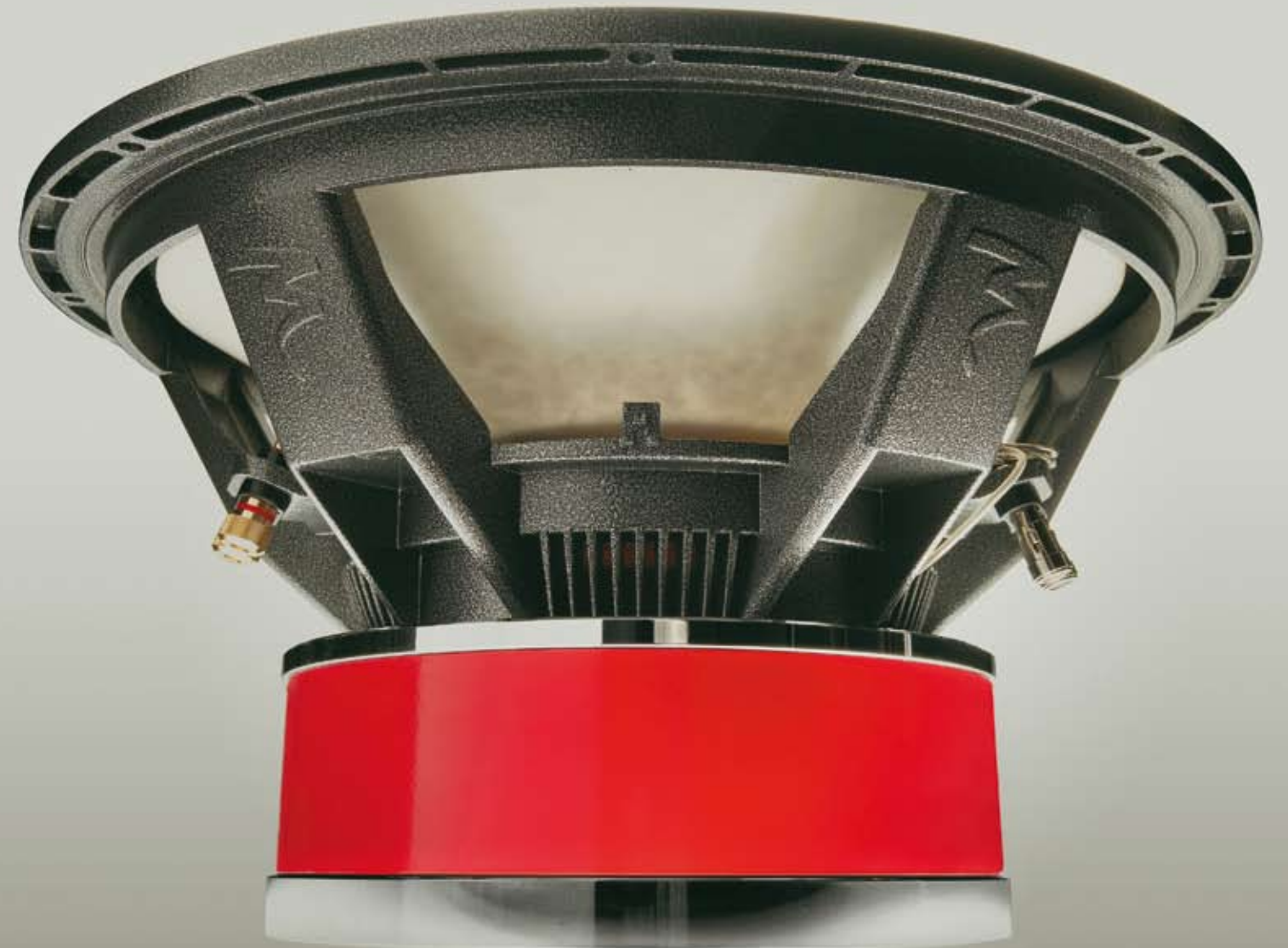
The force of a driver is its magnet and the magnetic energy transmitted. A subject Focal knows well for having invented original and technically advanced solutions such as the Multiferrite magnet that was and still is one of the technological signatures of the brand.

But the permanent magnet is limited in power and in the framework of a reference woofer, it's a real problem. Because a woofer should at least combine two essential performances: high efficiency and ability to go down in the low frequencies. To go down

in frequencies, we can adjust the surround and the spider flexibility, but we should above all increase the cone weight. If we increase the cone weight, the efficiency drops. And to compensate this drop, we have to increase the magnet power. That's where the limits of the permanent magnet step in, forcing a compromise between efficiency and resonance frequency. Only solution for Focal, reconsidering the very existence of the permanent magnet. We adopted an Electro-Magnet for our new 16" (40cm) woofer. Thanks to the simulation software and to the existing materials, this extreme solution goes back to the very origins of the driver and was optimized to supply the expected force (patent

pending). The magnetic field in the air gap reaches 1.75 Tesla (0.9 for the woofer of the previous Grande Utopia Be that was yet equipped with a Multiferrite magnet) to supply a force factor (the real power of the motor) of 34T.m. The goal is reached: the efficiency for 1W @ 1m reaches 97dB, whereas the resonance frequency drops to less than 24Hz. Here lies the true performance.

# Force Factor + 83%





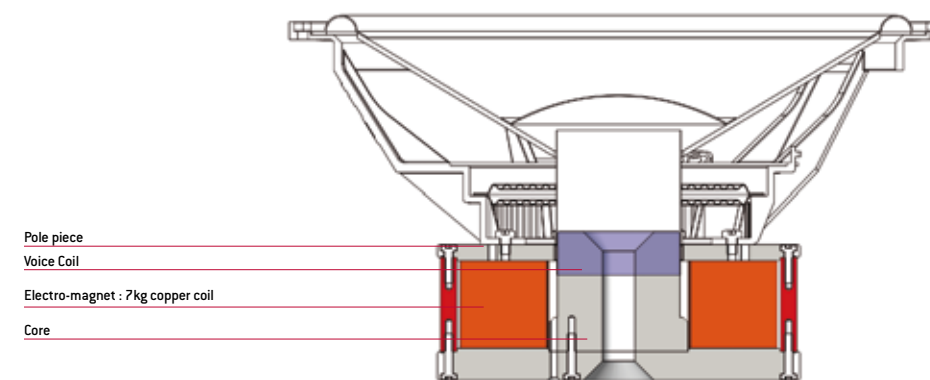
The EM Electro-Magnet is made of a 15.4lb (7kg) copper coil. The motor including the coil weighs 48.5lb (22kg). The 16" reaches a total weight of 52.9lb (24kg). "A monster" in the literal meaning of the word, where manufacturing costs cannot be compared to a standard magnet and are only conceivable on exceptional loudspeakers.

## A la carte

The EM driver needs an external supply, with automatic signal recognition, to supply the copper coil of the Electro-Magnet, continuously connected to the Grande Utopia EM. Designed and manufactured in France, this supply is adjustable on 6 levels (that's to say a power that varies from 9 to 90W) with a nominal position that corresponds to a bass level perfectly in line with

the other registers for laboratory measure conditions, which does not really correspond to the reality of a listening room where dimensions, proportions, wall nature (their rigidity) or even furniture, affect in considerable proportions the bass and sub-bass performance. That's why each supply level corresponds to a level increase of 2dB on the EM 16" woofer. Thanks to the

other available bass settings at the back of the Grande Utopia EM, the flexibility of use is total and the listening room/bass coupling is always reached whatever the circumstances.



Pole piece  
Voice Coil  
Electro-magnet : 7kg copper coil  
Core

Reminder of fundamentals: the cone acceleration is expressed by the  $a = BLi/m$  formula, where **B** is the magnetic flux in the air gap (in Tesla), **L** the voice coil length, **i** the current delivered by the amplifier and **m** the mass of the moving assembly (cone, voice coil, surround). We can always tell nice stories, but to speed up the cone and to get a maximum of dynamics, it's better to start with a high BL.



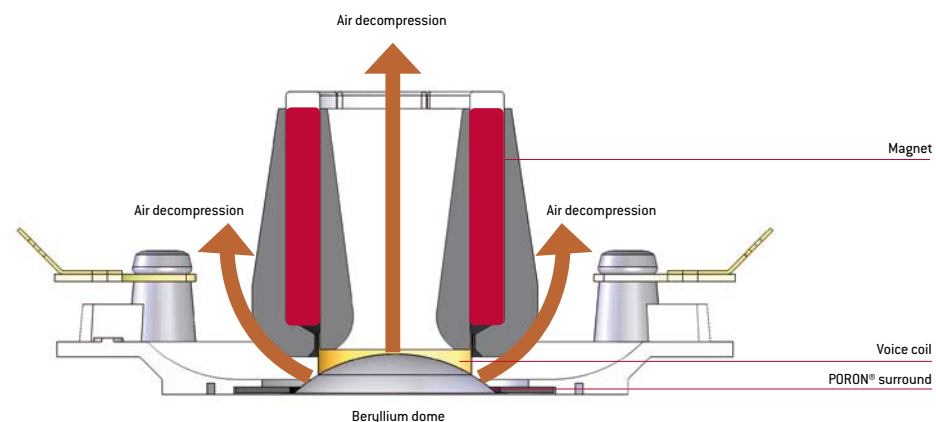
# Beryllium: IAL 2 generation

The inverted dome tweeter of the Grande Utopia Be had already demonstrated the superiority of pure Beryllium in the high frequencies thanks to its mechanical qualities. Two and a half times lighter than titanium, but 7 times more rigid with the same mass (Beryllium is the only metal able to scratch glass), this material combines all the qualities to offer high efficiency and a bandwidth very extended in the high frequencies. Six years after the first Beryllium inverted dome tweeter (patented), the one of the Grande Utopia Be, our know-how never stopped improving. In parallel, our other obsession, that started with Electra 1000Be and its IAL technology (Infinite Acoustic Loading), has been to make the tweeter go as low as possible. The combination of the inverted dome and the Poron® surround is decisive. In that way, this

approach is close to the EM woofer: how to go high and go deep down with a very high efficiency? How to make these fundamentally opposed principles coexist? By reconsidering the tweeter design going back to the fundamentals. We started from the IAL model with the only imperative to go even further in all fields. The principle is based on a tweeter designed like any other driver, the back of the dome and its surround, is totally open, to be loaded by a tuned cavity. Double advantage: keep a very low moving mass and push to the extreme the elasticity to get extended response in the bass and reduce the resonance frequency. Here is the key point: this frequency must be relegated to the lowest possible frequency, so that it won't interfere with the sound. Distortion and aggressiveness are the most obvious signs

of an insufficiently low resonance frequency. Going from 1280Hz to the Grande Utopia EM's 528Hz, the accomplished progress is clear, with a significant safety margin compared to the tweeter bandwidth, from 2.2kHz to 40kHz. Handing over the midrange – very critical for the ears between 2 and 5kHz – to a tweeter with an ultra-light dome rather than to a midrange cone, it's a unique experience in terms of precision, definition and spacialisation. No other treble transducer in the world is able to reach such performance.

Infinite Acoustic Loading 2 (IAL 2): the back of the Beryllium inverted dome and its surround are totally open to be loaded by a quasi-infinite air volume. To avoid air circulation disturbance the jet engine shaped magnet system is made of 5 sections of Neodymium placed all in length, which naturally cancels the motor warm-up and the Neodymium demagnetization risks. It supplies a magnetic field of 2.15 Teslas and its efficiency reaches 95dB.





The Power Flower drivers, coming from the Utopia Be line, are designed to limit magnetic leaks and to obtain optimum performance. But everything's new since the arrival of the third generation "W" cone, the spider, the surround and the voice coil in order to gain in efficiency. Necessary evolution for a midrange that should not be set back from a woofer and a tweeter in clear progress.



# 3<sup>RD</sup> generation W

The W composite sandwich technology is one of Focal's most famous inventions, an innovation that's still at the top, because its progress has never stopped.

The W cone was born at the same time as the Grande Utopia of 1995. At the time, the goal was to get closer to the theoretical ideals that consisted in getting simultaneously 3 essential qualities: create a material that is both ultra-light and more rigid than any other that benefits from high internal damping to avoid any sound coloration. The W sandwich was the perfect answer, but its incredibly complex creation confined it to the laboratory, exclusively restricted to the Grande Utopia.

Since then, we never stopped progressing thanks to our R&D department and our cone manufacturing workshop proximity and the W today equips numerous Focal loudspeakers.

Seven years later, the W knows a patented major evolution. Combining glass coats of different densities and in different layers (from 1 up to 3 on the front and back sides of the cone), but also internal foams of different thickness, we are learning how to sculpt the response curve of the drivers and to control one by one the cone characteristics whether it is used for a woofer or a midrange.

The third generation of W cone appears with the Utopia 3 line with laser trimming that permits to progress

once again. The laser's precision permits cut outs that were impossible so far, that's a major point when we consider the influence of the edge profile on the driver characteristics. Straight or tilted edge, round or almost round shape, this new W evolution permitted in particular to make the Diablo woofer/midrange, where the most critical point is the surround/cone coupling. What was impossible before becomes a challenge taken up each time by Utopia.



The W composite sandwich is made of a very rigid foam core, covered on each side by glass fabric skins.





The control panel of the Grande Utopia EM is hidden behind a trapdoor at the back of the loudspeaker. Multiple setting combinations allow to adapt to the listening room acoustics. All the settings can be done during listening with direct and immediate comparison effect.

# OPC +

Another key innovation linked to the 1995 Grande Utopia, the Optimum Phase Crossover (OPC) arises from a very simple thought: a crossover is acoustically perfect, in phase as in amplitude, when it only filters – but in no way corrects a transducer fault – which means that the drivers must have a linear and extended bandwidth far beyond the filtering frequency not to interfere. It's a permanent approach at Focal: solve the problem at its source in order not to have to electrically correct mechanical faults that only mask a problem without ever solving it.

The OPC+ is in line with this measure, but offers for the first time the ability to adapt the loudspeaker response curve to the room acoustics, to personalize the tonal balance according to the reverberation time, linked to the room size, the nature of clear or mat surfaces, Furniture or only the sound preferences of each individual. Fine tunings are then available to adjust the bass, mid-bass, midrange and tweeter, without altering the sound integrity. Indeed the additional components necessary for these corrections are systematically placed

in parallel with the resistance, inductors and capacitors used in original nominal configuration. Those components have been blindly tested in order not to be influenced by fashion or by famous brands. In the end, the 4-way crossover of the Grande Utopia EM is divided into 3 blocks in the loudspeaker body.





The Grande Utopia EM wide spread out and closed to the maximum: thanks to the Adjustable Focus Time, the "Sweet Spot" is mechanically adjustable.

## Adjustable Focus Time



The very structured shape of the Grande Utopia EM immediately evokes a kind of spine. Stylistic effect? No, because the design axis chosen for Utopia 3 brushes aside anything superfluous. Function justifies shape and if the Grande Utopia EM evokes a spine, it's because it's articulated.

True Utopia DNA since the beginning, the Focus Time consists in placing the drivers in an arc shape to orientate them towards the listening

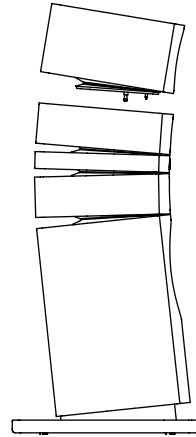
point. This time, the Grande Utopia EM offers a mechanical adjustment to optimize the "Sweet Spot" (the perfect listening point) according to the distance.

Articulating a 573lb (260kg) loudspeaker could have been considered as an unacceptable argument at least and without doubt as inconceivable. But too irresistible not to be tried! Thanks to a mechanical system operated by a handle (covered by seamless Chapal leather,

the best in Made in France luxury) placed in the back body of the tweeter compartment, the 4 upper enclosures of the Grande Utopia EM can spread out. In the end, the use is simple, the handling is soft and here comes the indefinable satisfaction of having tried and achieved the impossible. A little craziness makes the Utopias move forward.



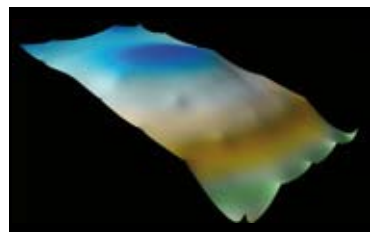
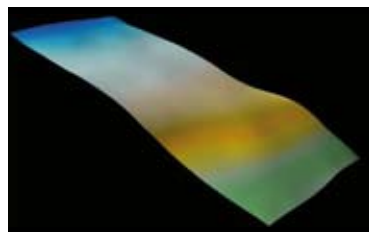
# Gamma Structure



The Gamma structure role is once again obviously simple. All the strength of the magnetic motor must be transmitted to the cone of the driver. If the loudspeaker moves, even in an imperceptible way (vibrations), it's because there is energy loss. The loudspeaker must oppose such an inertia and such a rigidity that it must stand

up to this force: that's the Gamma structure principle. To cope with vibrations, we called a French specialist, European leader in that field that put all its know-how to provide vibration cartographies of our cabinets. We can see that mass doesn't solve everything, neither the thickness of the sides that sometimes reach 2<sup>3/8</sup>" (6cm) thick MDF, but the

addition of reinforcement perfectly placed thanks to the data analysis becomes dreadfully efficient. The new Grande Utopia EM and all the other models of the Utopia 3 range offer the perfect mechanical reference, which is the mark of a reference loudspeaker.



Vibration cartography. The result analysis enables us to progress very efficiently in the elaboration and the rigidity of our cabinets.



Utopia 3 is available in 3 standard versions, Warm Grey Lacquer, Imperial Red Lacquer and Black Lacquer. Other "on demand" finishes to be available in 2009.



Guy HF, cabinetmaker company in Bourbon-Lancy (Burgundy) and historical partner of Focal, who became in 2007 its 100% owner, have built all Utopia cabinets since 1995.



It needs cutting, assembling, sanding, lacquering and polishing.



Utopia range is an entanglement of manual know-how, hand crafted traditions and sophisticated digital cut-out machines. To make a Grande Utopia EM cabinet, 2.05m high and 260kg, 52 hours of work are necessary, 68 wood parts, 13m<sup>2</sup> of MDF.



And start again and again until it reaches perfect assembly precision and finish.



**GRANDE UTOPIA™ EM™**





Grande Utopia EM, Warm Grey finish.



## More “Grande” than ever

The Grande Utopias are not only loudspeakers that have had a great impact on their generation. It's also the most accomplished concept of “The Spirit of Sound”, the ultimate reference. After the “W” cones and the pure Beryllium tweeter of the previous models that had marked a technological

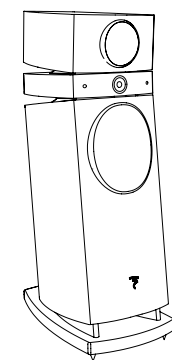
advance, the Grande Utopia EM adopts an Electro-Magnet woofer (EM) with a force that cannot be compared to classical technologies. Superlative performance, unique style: the Grande Utopia EM is not only a technological monument, it's above all an acoustic sculpture.

# SCALA UTOPIA™





## A 3-way in the middle



All Utopia in a 3-way floorstanding loudspeaker with moderate size, that's Scala Utopia. Endowed with superlative performance, Scala Utopia delivers incredible musicality. Everything is easy for this loudspeaker, everything becomes obvious, music

is naturally flowing. Scala Utopia is not even difficult to set up or install. That's a prestigious and fascinating loudspeaker, very high-end, without the common drawbacks.



Equipped with the OPC+ system, initiated by the Grande Utopia EM, the Scala Utopia is able to adjust in the bass and treble levels to submit to the room acoustics.

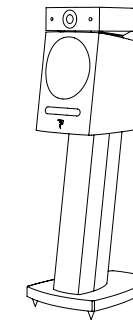




**DIABLO UTOPIA**<sup>TM</sup>



# Enchanting



Compact, distinguished and captivating, Diablo Utopia is the ultimate vision of the reference bookshelf loudspeaker, in the purest Focal's tradition. Largely inspired from the Grande Utopia EM, it sets new milestones in the bass thanks to its new patented 6<sup>1</sup>/<sub>2</sub>" (16.5cm) Power Flower, with almost no

saturation, and a driver integrated resonator. Fixed on a dedicated stand, Diablo Utopia enchants the midrange and the treble with its definition, demonizes the bass with a density and a power handling never reached so far.

# DIABLO

The Power Flower woofer of the Diablo Utopia benefits from a new kind of surround/spider coupling for high excursion of the cone. But beyond the critical point, the mechanical saturation becomes smooth, almost imperceptible, avoiding unpleasant distortions. Patent pending.



# Utopia III

The Utopia 3 range will be completed during the year 2009.



## GRANDE UTOPIA EM

- 1 IAL2 pure Beryllium inverted dome tweeter**
  - > very large bandwidth from 1 to 40kHz
  - > IAL2 (Infinite Acoustic Loading): low resonance frequency at 580Hz
  - > definition, rapidity and transparency of the midrange/treble
- 2 Gamma Structure**
  - > MDF panels up to 2" [5cm] for a stable mechanical reference
  - > anti-vibration heavy structure, optimized by vibratory cartography
- 3 Laminar port**
  - > no air flow or distortion noises
  - > no dynamic compression of the bass
- 4 6 1/2" [16.5cm] "W" Power Flower midrange drivers**
  - > 3<sup>rd</sup> generation W composite sandwich technology, laser cut-out
  - > Power Flower magnet, maximal power and reduced magnetic leaks

- 5 OPC+ filtering**
  - > extreme bass to the extreme treble integral adjustments
  - > 1458 possible adjustment combinations
  - > audiophile type components
  - > WBT connectors
- 6 Adjustable Focus Time**
  - > entirely articulated loudspeaker body
  - > "sweet spot" sharp adjustment
  - > driver orientation towards the listener
- 7 11" [27cm] "W" midbass**
  - > 3<sup>rd</sup> generation W composite sandwich technology, laser cut-out
  - > high efficiency Multiferrite magnet
- 8 16" [40cm] "W" Electro-Magnet EM**
  - > extremely powerful Electro-Magnetic EM (BL = 34 T.m)
  - > 3<sup>rd</sup> generation W composite sandwich technology, laser cut-out

## SCALA UTOPIA

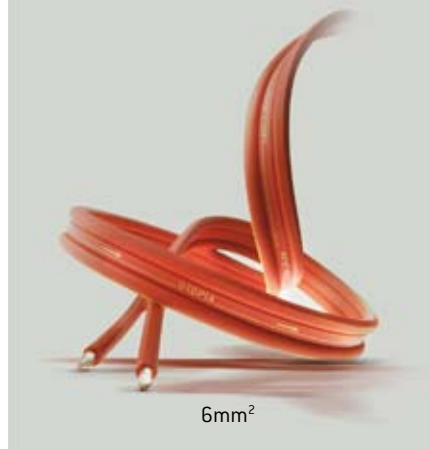
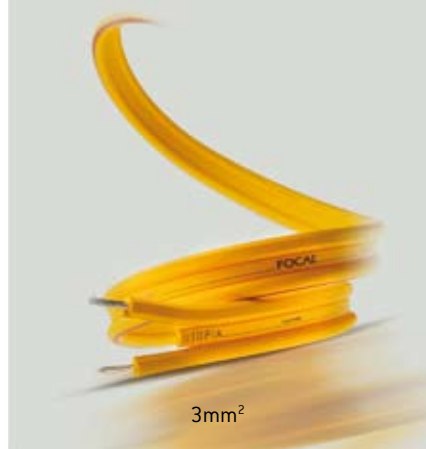
- 1 IAL2 pure Beryllium inverted dome tweeter**
  - > very large bandwidth from 1 to 40kHz
  - > IAL2 (Infinite Acoustic Loading): low resonance frequency at 580Hz
  - > definition, rapidity and transparency of the midrange/treble
- 2 Gamma Structure**
  - > MDF panels up to 2" [5cm] for a stable mechanical reference
  - > anti-vibration heavy structure, optimized by vibratory cartography
- 3 Laminar port**
  - > no air flow or distortion noises
  - > no dynamic compression of the bass
- 4 6 1/2" [16.5cm] Power Flower midrange "W" driver**
  - > 3<sup>rd</sup> generation W composite sandwich technology, laser cut-out
  - > Power Flower magnet, maximal power and reduced magnetic leaks

- 5 OPC+ filtering**
  - > bass adjustment on ±1dB, treble on ±1.5dB
  - > audiophile type components
  - > WBT connectors
- 6 Focus Time**
  - > mechanical phase optimization of the drivers
  - > driver orientation towards the listener
- 7 11" [27cm] "W" woofer**
  - > 3<sup>rd</sup> generation W composite sandwich technology, laser cut-out
  - > powerful permanent magnet

## DIABLO UTOPIA

- 1 IAL2 pure Beryllium inverted dome tweeter**
  - > very large bandwidth from 1 to 40kHz
  - > IAL2 (Infinite Acoustic Loading): low resonance frequency at 580Hz
  - > definition, rapidity and transparency of the midrange/treble
- 2 Gamma Structure**
  - > MDF panels up to 2" [5cm] for a stable mechanical reference
  - > anti-vibration heavy structure, optimized by vibratory cartography
- 3 Laminar port**
  - > no air flow or distortion noises
  - > no dynamic compression of the bass
- 4 6 1/2" [16.5cm] Power Flower "W" woofer/midrange driver**
  - > 3<sup>rd</sup> generation W composite sandwich technology
  - > new no saturation surround/spider coupling (patent pending)
  - > Power Flower magnet, maximal power and reduced magnetic leaks

- 5 OPC filtering**
  - > phase optimal control for a perfect 3D image
  - > audiophile type components
  - > WBT connectors
- 6 Focus Time**
  - > mechanical phase optimization of the drivers
  - > driver orientation towards the listener
- 7 Diablo Utopia Stand**
  - > heavy stand of 41.8lb [19kg] with an aluminum body filled with sand
  - > the loudspeaker is fixed on the base for a total outflow of vibrations
  - > piano black lacquered MDF stand with massive decoupling spikes
- 8 Helmholtz resonator**
  - > tweeter compartment cavity tuned as a resonator
  - > smooths the bass impedance
  - > suppresses the typical resonance in the mid-bass of compact loudspeakers



Silvery copper wires, exclusively designed for Utopia 3, with 3 and 6mm<sup>2</sup> gauge.

WBT connectors for passive bi-amplification, Grande Utopia EM.

# UTOPIA Universe



High-precision connector, high power (6kW) for a physical offset compensation of the moving parts assembly.



The Grande Utopia EM spikes in their wooden box.

## GRANDE UTOPIA EM

Type	4-way, floorstanding bass-reflex loudspeaker
Drivers	Electro-Magnetic 16" (40cm) "W" woofer Multiferferrite 11" (27cm) "W" midbass 2 Power Flower 6 <sup>1/2</sup> " (16.5cm) "W" midrange drivers IAL2 pure Beryllium inverted dome 1" (27mm) tweeter
Frequency response (+/- 3dB)	18Hz - 40kHz
Response at - 6dB	14Hz
Sensitivity (2.83V / 1m)	94dB
Nominal impedance	8 Ω
Minimal impedance	3 Ω
Filtering frequencies	80Hz / 220Hz / 2200Hz
Recommended amp power	50 - 1500W
Dimensions (H x L x D)	79 <sup>13/16</sup> x 25 <sup>3/4</sup> x 34 <sup>5/8</sup> " (2012 x 654 x 880mm)
Weight	573.2 lb (260kg)



## SCALA UTOPIA

Type	3-way, floorstanding bass-reflex loudspeaker
Drivers	11" (27 cm) "W" woofer Power Flower 6 <sup>1/2</sup> " (16.5cm) "W" Midrange IAL2 pure Beryllium inverted dome 1" (27mm) tweeter.
Frequency response (+/- 3dB)	28Hz - 40kHz
Response at - 6dB	24Hz
Sensitivity (2.83V / 1m)	92dB
Nominal impedance	8 Ω
Minimal impedance	3.1 Ω
Filtering frequencies	250Hz / 2200Hz
Recommended amp power	40 - 500W
Dimensions (H x L x D)	49 <sup>1/8</sup> x 15 <sup>1/2</sup> x 26 <sup>3/8</sup> " (1247 x 393 x 670mm)
Weight	187.4lb (85kg)



## DIABLO UTOPIA

Type	2-way, compact bass-reflex loudspeaker
Drivers	Power Flower "W" 6 <sup>1/2</sup> " (16.5cm) Woofer IAL2 pure Beryllium inverted dome 1" (27mm) tweeter.
Frequency response (+/- 3dB)	44Hz - 40kHz
Response at - 6dB	40Hz
Sensitivity (2.83V / 1m)	89dB
Nominal impedance	8 Ω
Minimal impedance	4 Ω
Filtering frequencies	2200Hz
Recommended amp power	25 - 200W
Dimensions (H x L x D)	16 <sup>15/16</sup> x 10 <sup>3/16</sup> x 16 <sup>13/16</sup> " (431 x 258 x 427mm)
Weight	44lb (20kg)

