



FRAZER-NASH NAMIR BY GIUGIARO

The fastest and most ecological hybrid in the world

Namir is a concept car born of the collaboration between Italdesign Giugiaro and Frazer-Nash, a company specialized in the design, construction, and marketing of hybrid systems deeply rooted in the historical automotive manufacturing company founded in England by Archie Frazer-Nash in 1923.

Presented during the 79th edition of the International Motor Show in Geneva, *Namir* represents the turning of a new page in the book being written by the Torino-based firm since 2004, opening with the Alessandro Volta project and followed up with the commemorative *dream car - Quaranta* - the result of research and development on sports cars fuelled by hybrid systems produced last year in celebration of the 40th anniversary of the company's founding.

The Arabian name *Namir*, meaning "tiger", sums up the main features of the concept car: elegance and power, aggressiveness and liveness of lines. Without any doubt it is a sports car: a coupé with two bucket seats and an accurate equilibrium between style and mechanics, aesthetics and contents. The sophisticated mechanics as well as the avant-garde electric and electronics systems are wrapped up into an aggressive package with an exquisitely balanced proportion of volumes and a stunning contrast between the sharp accents of the rear end and the sinuous front lines that emphasise this supercar's performance: **over 300 km/h (187 mph)** at maximum speed and an acceleration of **0 to 100 km/h in 3.5 seconds** and **from 0 to 200km/h in 10.4 seconds**, making this the **fastest hybrid car in the world**.

Namir is also an ecological vehicle. The hybrid system developed together with Frazer-Nash combines an 814 cc endothermic rotary engine with four electric motors, guaranteeing autonomy of **39 km with one litre** of fuel CO₂ emissions of **less than 60 grams per km** travelled.

Namir is not merely an exercise in style in and of itself, but rather a fully developed project followed in each and every phase by the Torino-based firm: chassis, body, and mechanical layout were designed and constructed by the Engineering Division, the exterior and interior style was entrusted to the Italdesign Giugiaro Style Centre, while the electrical and electronic elements were developed in collaboration with Frazer-Nash.

The prototype was built entirely in the Italdesign Giugiaro plant.

About Italdesign Giugiaro - Frazer-Nash collaboration

“The encounter with Frazer-Nash dates back to about a year ago” explains Fabrizio Giugiaro, Vice President and Styling Director of Italdesign Giugiaro, “and it was a pleasure to meet with a name that has made automobile history. Since the early 1990s, Frazer-Nash has taken the lead in the engineering and construction of hybrid systems for vehicles; they were very interested in our branch of research dedicated to hybrid systems applied to sports vehicles and, a few months ago, contacted us about collaborating with them in developing a product that would be able to showcase the potential of their systems. Frazer-Nash then began concentrating on the development of a fuel, traction, and transmission system bespoke for *Namir*, while the talents and expertise of Italdesign Giugiaro were exploited for the interior styling, planning, engineering and mechanics. It certainly was an interesting and profitable collaboration that resulted in a unique vehicle with very exciting performance levels in terms of speed and pick-up, above all in terms of low fuel consumption and CO₂ emissions”.

Mechanics and electronics in a brand new system

The structural architecture of the *Frazer-Nash Namir by Giugiaro* consists of a monocoque chassis in carbon-fibre with honeycomb panels that encloses the rear suspension: this structure is guaranteed to be lightweight - with a total frame weight of just 110 kg - without compromising strength and rigidity to ensure an adequate level of driver and passenger safety.

Namir boasts a 4-wheel powered series hybrid system with digital differential complimented by an auxiliary power unit comprising an 814cc rear transverse rotary engine that runs on petrol coupled with a generator that charges the lithium polymer power cells, and by 2 twin electric motors installed on the front and rear suspensions, thereby developing an overall power of 270 kW, equal to 370 hp.

In this way, the series hybrid system guarantees unprecedented fuel consumption and emissions, about 39 km with one litre and less than 60 g/km of CO₂. The fuel tank integrated into the chassis at the height of the right door sill under the passenger’s seat has a 50 litre capacity, meaning a total autonomy of almost 2.000 km.

The four-wheel powered drivetrain is fully electric with digital differential. Software manages the power load to the drive as needed, according to driving and terrain conditions, making use of all the electronic control systems used in mass-produced vehicles: ABS, drive control, and stability control.

The drive system and motor and battery lay out was developed by Italdesign Giugiaro in collaboration with Frazer-Nash, allowing the calibration of the concept car on a 2630 mm wheelbase, which is ideal for a car with a central engine.

The classic double wishbone suspensions are directly over the wheels for the front end and the rear.

Aluminium and carbon-fibre for a “tiger” style

At first glance, the *Frazer-Nash Namir by Giugiaro* strikes us as a vehicle with overwhelmingly sporty features. A coupé with two bucket seats, the stark yet streamlined styling lends it an aggressive look, accentuated by bold, angular lines and the contrasting colours of the sunny orange body and the black of the glass and the grills that cover the air intakes, recalling a tiger. A diamond theme dictates the signature styling of this concept car from all points of view, drawing its inspiration from the historic logo of the legendary English factory that marks the bonnet, which is accompanied by the classic red ‘G’ centred in the radiator grill that distinguishes all Giugiaro prototypes.

The front view evokes the racing ambitions of this vehicle, thanks to an aggressive profile accentuated by the sloping V-shaped relief of the central section, by the ample aeration in the design of the air grills, from the converging headlamps set into the fenders that swell above the aquiline bonnet, moulded in a carbon fibre single-piece, while other parts are in aluminium.

What truly stands out from both a structural and aesthetic point of view is the ample windscreen. The ‘V’-shape of the glass surfaces wedges nearly halfway into the bonnet, virtually extending the geometric motif onto the roof and along the sides; it hides, in its basis, solar panels that generate power necessary for the functioning of the cockpit conditioning system. The aesthetic continuity can be especially appreciated when the car is closed: the glass swoops from the bonnet over and beyond the driver and passenger’s heads to down alongside the doors, which open scissors-fashion, towards the rear wheels and meeting the air intakes of the same colour. The waistline starts at the front wheel arch and gradually rises towards the rear fender, cutting the transparent surface diagonally in an appealing contrast of volumes and colours.

The rear hood is characterised by highly angular lines that taper from the root towards the rear, where the air cooling vents form the central ‘M’ in *naMir*; in between is a over 400-litre boot capable of accommodating four suitcases and a golf bag. The rear end is topped off by a small stabilizer

that grants the vehicle downforce, while the lower aileron reminds us that it is, after all, an F1 spin-off.

The lighting clusters are extremely modern: the low-beam lights and the full-beam are Bi-xenon type. The direction indicators, the tail and rear stop lights are of the full led type, inserted in a single box but differentiated according to color.

Namir mounts 20"-OZ rims, Brembo brakes and Vredestein Ultrac Sessanta tyres, 245/40 front and 275/40 rear.

Great liveability and smiling technology for the interiors

The construction of the interior was based on a minimalist theme to create an airy and comfortable environment for driver and passenger; the surfaces dedicated to the controls and on-board information were concentrated into three touch screen monitors, combining the creativity and expertise of Italdesign Giugiaro with the Frazer-Nash's vast experience in electronics.

The three touch screen monitors are installed behind the hexagonal steering wheel, where the *infotainment* commands are located. The central monitor hosts the speedometer, tachometer, and trip data; the one to the right is dedicated to entertainment with information from the GPS, the hi-fi, air conditioning, and relative controls; the left screen is dedicated to technical information like the battery charge, fuel level, interior and exterior temperature, and warning messages. Furthermore, the cruise control, exterior lights, windscreen wipers, and electric mirrors will all be activated by a touch of your fingertip.

Nothing but the best leather and tweed, as a homage to British tradition, were used for the seating and dashboard with a view to contrasting the brushed steel used for the structural supports and plexiglass, thereby defining the forms of a technological environment that is also warm and welcoming.

The electronic transmission allowed to eliminate central tunnel, substituted by a tubular structure where the gear selector (with N, P, D and R positions), the start and stop engine button as well as the air conditioning vents take place. Between the two backs of the seats the tubular structure curves up to the roof and is embellished with leather and tweed storage bags.

The seats were designed in collaboration with Sabelt, drawing inspiration from those used in race cars but updating them to harmonize with the general layout of the interior; the Style Centre's extensive experience in industrial design has resulted in seats that are ergonomic, technological, and very comfortable, but with an understated sophisticated design.

Namir at Monza

The *Frazer-Nash Namir by Giugiaro* made its virtual debut at the Autodromo Nazionale in Monza, with very positive results: the record lap was 1'51".

The Giugiaro Virtual Reality Centre immortalised this run in a two-and-a-half-minute virtual video to be projected at the Italdesign Giugiaro stand (Hall 2, stand 2041) for the entire duration of the Geneva Motor Show.

The Italdesign Giugiaro Virtual Reality Centre was the first of its kind with a big screen in Italy, created in 1999 to implement working methodology with a view to significantly reducing times and costs of the Style Centre of the Torinese firm. Thanks to the continual updating of software and hardware over the past decade, it remains a European leader, also thanks to the 21-square metre retroprojection videowall.

Having digitally reconstructed the entire Monza race track, the actual task of the Virtual Reality Centre was to elaborate all the factual data of the *Frazer-Nash Namir by Giugiaro* supplied by the Style Centre and the Engineering Division to faithfully represent not only engine performance (speed, acceleration...) but also handling on the road.

To bring this film to life, more than 4,000 images were elaborated; 30 photograms per second that guarantee results equal to, if not better than, reality...

Technical data

Length (inch)	179,52
Height (inch)	46,69
Width (inch)	77,63
Ground Clearance (inch)	4,52
Wheelbase (inch)	103,54
Front Tires	245/40 r20
Rear Tires	275/40 r20
Front Rims	8,5 x 20
Rear Rims	10 x 20
Weight (lbs)	3.196,70
Suspensions	Double Wishbone

Values and driving performance

Drivetrain	4 Wheel Powered, Digital Differential
Motor Technology	Permanent magnet brushless DC
Battery Technology	Lithium Ion Polymer Intelligent cell
Auxiliary Power Unit (APU) Rotary Engine with Generator (cm ³)	814
System total power (kW)	270
Voltage	400 V, 108 cells
Top speed (mph)	over 187
0 - 100 km/h (sec)	3,5
Fuel Consumptions	39 km/l
CO ₂ emissions	< 60 g/km

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- Brembo
- Sabelt
- Vredestein

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Italdesign Giugiaro: forty years dedicated to automobiles

The innovative formula of Italdesign was to establish its *raison d'être* as a service company for big industry, to assist in design, engineering, industrial development, all the way to the validation and final approval, without actually producing anything of their own.

When designer Giorgetto Giugiaro and planner Aldo Mantovani brought Italdesign to life in February 1968, the plant to produce the first fruit of their new venture, the Alfasud range, was already well underway in Pomigliano d'Arco.

In this way, a firm established to fulfil a simple commission became an innovative formula that continues to be valid even today.

During more than forty years of applying the “Italdesign formula”, more than 50 million examples of more than 200 models have been produced.

The first decade of activity was marked by the entire Alfa Romeo Alfasud range, the Lotus Esprit, the first generation of the VW Golf and Scirocco, and the Maserati Quattroporte III.

Between 1978 and 1988, the Audi 80, the BMW M1, the first generation of the Lancia Delta, as well as the FIAT Panda and Uno appeared.

The third decade marked the arrival of the Renault 19, the Subaru SVX, the Lexus GS300, the second generation of the SEAT Ibiza, and the first of the Fiat Punto.

Between 1998 and today, the Maserati 3200 GT, the second generation of the SEAT Toledo, the FIAT Grande Punto, and the Brilliance Zhonghua were born.

Many of these models, from the Alfasud to the Panda, from the M1 to the Zhonghua, from the FIAT Sedici/Suzuki SX4 to the second generation of the FIAT Croma were designed as well as engineered by Italdesign.

However, the “Italdesign formula” is also applied without design: even if models are designed directly by the manufacturers, they are industrialized by the Torinese team.

These include Ford Escort and Capri convertibles, the Lancia Delta HPE, the FIAT Marea and Siena, the entire range of the second generation of the Mini, the Citroën C3 Pluriel, and three variations of the Renault Megane family.

Italdesign is not synonymous with the industrial development and design of only automobiles, but also of commercial vehicles, like the FIAT Doblò, Scudo and Ducato, industrial vehicles like the IVECO Daily, Eurocargo and Eurostar, the Scania T-Truck; buses for IVECO and Volvo, tractors for Hurlimann, Lamborghini, and Same.

Projects range from wheels to rails, like high-speed and long-distance trains in China, Finland, France, Italy, Spain, Sweden, and Switzerland, not to mention trams and subways in Barcelona, Copenhagen, Rome, and Torino.

The Italdesign work method gradually gained renown in sectors unrelated to transportation, given their more than 20 years of collaboration for

technological objects like Nikon cameras and Indesit home appliances, and even architectural projects and packaging solutions like bottles for San Bernardo water for the Nestlé Group.

Italdesign is now on the verge of its second forty years entirely in the hands of the Giugiaro family, with Fabrizio flanking his father Giorgetto in the creative area since 1990 and with a management team led by Managing Director Enzo Pacella.

From a proprietary and management point of view, continuity has prevailed, while evolution has dominated the services offered in order to keep pace with market demands.

At the time of the Alfasud, the services specialist was also asked to supply the planning of the entire assembly line - a job that has since been transferred directly to the assembly line suppliers. Instead, for years now, Italdesign has been asked to experiment, validate, and type-approve new models, a phase that was jealously guarded by manufacturers at the dawning of this firm.

Today, the “Italdesign formula” also implies a direct dialogue with suppliers who provide production lines, so that car makers can be supplied with turn-key projects.

In forty years, three demands have remained unchanged: a service company must simultaneously involve creative and engineering resources, be faster, and reduce costs.

In 1968, “simultaneous engineering”, “time to market”, and “design to cost” were still uncoined jargon, but Italdesign had long been implementing such approaches.

How have things changed? The passion is the same as then, but now it is backed by forty more years of experience.

Italdesign Giugiaro in numbers

Founded in: 1968

2008 revenues: € 135 million (+5% over 2007), of which 75% export

Operating companies:

- Italdesign Giugiaro S.p.A. (Moncalieri, Torino, Italy)
- Sallig S.r.l. (Nichelino, Torino, Italy)
- Giugiaro Architettura (Moncalieri, Torino, Italy)
- Italdesign Giugiaro Berci (Buc Paris, France)
- Italdesign Giugiaro Diseño Industrial (Barcelona, Spain)
- Italdesign Giugiaro Deutschland (Munich, Wolksburg, Germany)
- Italdesign Giugiaro Shanghai (Shanghai, China)

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Sector activities: Style, Engineering, Product Layout, Modelling, Prototyping, Testing, Validation, Show Cars. Architecture, Industrial Design

Employees: approximately 1,000, of whom 23% abroad

Frazer-Nash overview

In the early 20th century, when the car industry was in its infancy, Archibald Frazer-Nash and Henry Ronald Godfrey, friends from technical college, formed a company to produce affordable motor vehicles.

They identified a gap in the market for simple and inexpensive vehicles and created the “GN” car. It took Austin Motors a further 10 years to enter the same market with their Austin 7.

By 1923, Archie formed the well-known Frazer-Nash sports car company and created a dynasty of sports cars that still have an internationally recognised reputation. He was a pioneer in the revolution of the motor vehicle and we are proud of our place in automotive history.

Inspired by this tradition, Frazer-Nash Research Limited, the flagship company of the Kamkorp group continues with innovations and development of electric and hybrid electric powertrain technologies that are in a class of its own to meet the requirements of more environmentally friendly alternatives to the conventional automotive drivetrains.

Frazer-Nash has over two decades of research experience and over 4 million man-hours of research, development and testing of innovative hardware and software solutions for the future of efficient transportation.

Frazer-Nash has created a unique Plug-in Series Hybrid Technology. The FN Series Hybrid powered vehicles are re-charged from a propriety on-board power source, regenerative charging and from the domestic power supply. They are pure electric cars with an integrated auxiliary power unit. The majority of hybrid cars produced today are parallel hybrid IC engined cars with electric assist.

Our Electric Powertrain Core Technology encompasses many unique proprietary systems. Each powertrain component is specifically designed and optimised to produce a unique super-efficient powertrain - the only one of its kind in the world, the only true powertrain system creators, all OEMs are just system integrators.

Frazer-Nash has created a unique Plug-in Series Hybrid Technology, incorporating:

Fully Integrated & Optimised Traction Power Systems

Battery Pack

- Intelligent Lithium Polymer Cells
- Battery Management System



Battery Charger
DC-DC Converter
Motors and Controllers
Wankel Rotary Engine
Generator
Generator Controller
Electronic Management System (EMS)

Fully Integrated & Optimised Powertrain

Proprietary highly efficient brushless, liquid-cooled DC motors
Proprietary liquid-cooled 'SVM' motor controllers
Proprietary digital differential control/drive System

Integrated & Multiplexed Control, Telemetry and Instrumentation Technologies

The whole system is linked and controlled through our proprietary multiplexed power system (AMPS) and FN software.

Integrated ECU

Lithium battery and charger management with remote monitoring and diagnostics

Comprehensive data acquisition, processing and telemetry

High resolution colour multifunction display module (CMFD)

Digital differential control/drive system

Every component of our hybrid system is designed and developed 'in-house'. These proprietary components are a direct result of Frazer-Nash's advanced hardware and software inventions and innovations. They all work in harmony to give efficiency and performance unmatched by any other vehicle manufacturer today.