





# NARDÒ!

— A perfect circle with endless possibilities—the Pista di Nardò in southern Italy. The design of the 12.6-kilometer circular track with a diameter of four kilometers makes it perfect for high-speed endurance test drives. The addition of this unique circular track and the other facilities at Nardò significantly expands the already vast portfolio of services offered by Porsche Engineering.

Photos: Gabriele Torsello

Unique climatic conditions enable

## TESTING 365 DAYS A YEAR



The Apulian sun beats down on the asphalt mercilessly. The air shimmers above the track, which only reveals its curved shape upon a second glance towards the horizon and banks inwards at up to 12 degrees like the rim of a bowl. “La Pista di Nardò”—the place where car legends are made.

### Characteristic feature: circular track

This perfect asphalt circle has been the site of many records since it was opened in 1975: There have been hundreds of them in the last few decades. Yet the circular track was never a race track, but has long been used for testing purposes. The ideal conditions for tests on the four lanes of the circle allow speeds that would only be feasible elsewhere with considerably more difficulty. Precisely 387.87 kilometers per hour was the top speed reached by the Koenigsegg CCR—and that at the end of February 2005, the heart of the meteorological winter. And that’s not

even the limit: In 1979, a Mercedes-Benz C1 topped out at a speed of 403.98 km/h.

### Unique conditions

“One of the great advantages of Nardò is the climate: Tests can be run here in Apulia throughout the year; rainy days and frost are extremely rare,” explains Francesco Nobile, Managing Director of the Nardò Technical Center. Nobile is well acquainted with the assets of the track regarded by experts as the fastest circuit in the world – as well as those of its other facilities. The circular track with its four parallel lanes plus interior emergency lane allows top speeds with minimal vertical forces and thus low tire wear, enabling cars to drive at a blistering pace while maintaining optimal control: In the outermost lane, lane four—like the other three lanes four meters wide—thanks to the banking cars can drive at up to 240 kilometers per hour without having to steer to stay on course. Lane three allows

the same at up to 193 km/h, lane two creates the sensation of a straightaway at up to 140, and the first lane next to the innermost emergency lane allows 100 km/h without touching the steering wheel. This uniform construction



**911 CARRERA MODELS:** Fuel consumption combined 11.7–8.2 l/100 km; CO<sub>2</sub> emissions 275–194 g/km

with its perfectly maintained radius and slope of the track essentially preclude unidirectional forces during driving. And of course, higher speeds are possible without having to reckon with premature wear of tire materials due to unfavorable track conditions: Up to 500 kilometers per hour are possible.

That the Pista di Nardò was designed and built this way in the 1970s can only be regarded as visionary and forward-looking for its time. Indeed, even today, in 2012, the grounds are still perfectly suited for testing current and future cars of all classes. Experts concur that not even the legendary oval in Fontana, California, the Auto Club Speedway, can compare.

#### **Practically unlimited testing opportunities**

The unique circular track is complemented by its auxiliary facilities: A unique handling track that includes hills and compressions to test the limits of the vehicle material is as much a part of the Nardò Technical Center

as a vehicle dynamic track, a track with various surfaces, dirt and gravel tracks, as well as a noise test track for a diverse array of testing requirements. And the tracks are supplemented by the necessary infrastructure: Workshops for test teams that have booked track time are available on the 700 hectare grounds.

#### **The grounds have been open to all customers since way back**

Opened by Fiat in 1975, the grounds were sold to Prototipo SpA by the Italian government in 1999 and managed by the company until 2012. Use of the facility has been open to all manufacturers since the beginning. Since May of this year, the complex in the province of Lecce has belonged to the Porsche Group—but continues the tradition of over 80 years of Porsche history in customer projects and remains open to all manufacturers. The facility adds yet a new element to the engineering service portfolio offered by the Porsche Group. Customers that have called on the development skills of Porsche Engineering

engineers through computer simulations, on sophisticated test benches and on the test track in Weissach can now have Porsche Engineering engineers test whether their product can withstand the toughest real-world forces on the test tracks at Nardò.

Full speed stability over long distances, the performance of brake systems, the reliability of individual components in real, integrated system deployment, thermal characteristics and many other factors can be tested under ideal conditions at the Nardò Proving Ground. Complete vehicle expertise is constantly being expanded at Porsche Engineering.

#### **E-Mobility testing**

Since July 2012, connections with various alternating currents up to 125 amperes have been available. This enables manufacturer-specific charging stations for full-scale testing of electric vehicles. This enables not only e-mobility test drives under extreme climatic conditions in temperatures of up to 40 degrees Celsius. The charging station, which can >





*Not just asphalt:  
The testing grounds also  
enable tests on a variety  
of different off-road tracks*

be converted to DC upon request, also enables high-speed battery-driven endurance tests to deliver robust, substantiated data from real driving conditions.

#### **Further investments in the works**

The range of possibilities on and around the circular track in Nardò is practically inexhaustible—to the benefit of Porsche Engineering custom-

ers, who now have the opportunity to move forward with a service provider that can provide a complete package of development and testing at the very pinnacle of excellence in terms of expertise and testing options. And plans are underway to expand those options in the near future: Surfacing work is planned; the vehicle dynamics course may be enlarged to enable danger-free testing of extreme maneuvers; and a wet handling area is under consideration. The objective is to maintain and expand the commanding lead the Pista di Nardò holds over other test tracks.

#### **Beyond the ring – Apulia**

If the Pista di Nardò is a technical masterpiece for the automotive world, the region beyond the track also boasts plenty of attractions: The Pista's surroundings invite visitors to enjoy the ample charms of Apulia after a successful day of testing. The complex is located a mere three kilometers from the Mediterranean. Lodgings of various types and classes are abundant, as is the justly famous cuisine of southern Italy.



*100 percent challenged: Test drive on the handling course*



And there is no shortage of attractions: Apulia is a cultural hotbed rich in history. From the remnants of the “Magna Graecia,” the ancient Greek colonial realm, to buildings from the time of Frederick II or natural phenomena like the “gravine,” deep valleys cut into the limestone of the Murge plateau, there is much to see in Apulia. Other attractions include the “trulli,” the whitewashed round stone buildings with conical roofs in and around Alberobello. Travel and transport of goods to the Apulia region is quickest and most convenient via the international airport in Brindisi, which is just about 65 kilometers from the testing grounds. Somewhat farther north, the international airport in Bari serves various airlines. ■

**Where the grounds are located:**

40° 20' 0" N, 17° 50' 0" E



# 1 CIRCULAR TRACKS



**CARS**  
**LENGTH:** 12.6 km  
**DIAMETER:** 4 km  
**NO. OF LANES:** 4 (+1 emergency lane)  
**WIDTH PER LANE:** 4 m

**INDUSTRIAL VEHICLES**  
**LENGTH:** 12.5 km  
**DIAMETER:** 4 km  
**NO. OF LANES:** 2 (+1 emergency lane)  
**WIDTH PER LANE:** 4 or 5 m

Thanks to the large radius (2 km), Nardò has a unique ring track allowing top speeds with maximum safety.

The centrifugal force is compensated by the low parabolic profile, with the driving feeling of a straight lane.

Lane	Transversal inclination	Compensation speed [km/h]	Use
III	1° 48'	100 km/h	Cars and motorbikes
II	4° 30'	140 km/h	
I	8° 06'	193 km/h	
0	12° 36'	240 km/h	
x	0° 54'	84 km/h	Industrial vehicles
xx	3° 36'	141 km/h	

# 2 DYNAMIC PLATFORMS



**VEHICLE DYNAMIC TRACK:**  
 > Square with 280 m each side  
 > Two straight lanes: 700 m length, 20 m width

**INDUSTRIAL VEHICLE DYNAMIC TRACK:**  
 > Square with 175 m each side  
 > Two acceleration lanes: 600 + 170 m length

# 3 NOISE TRACK



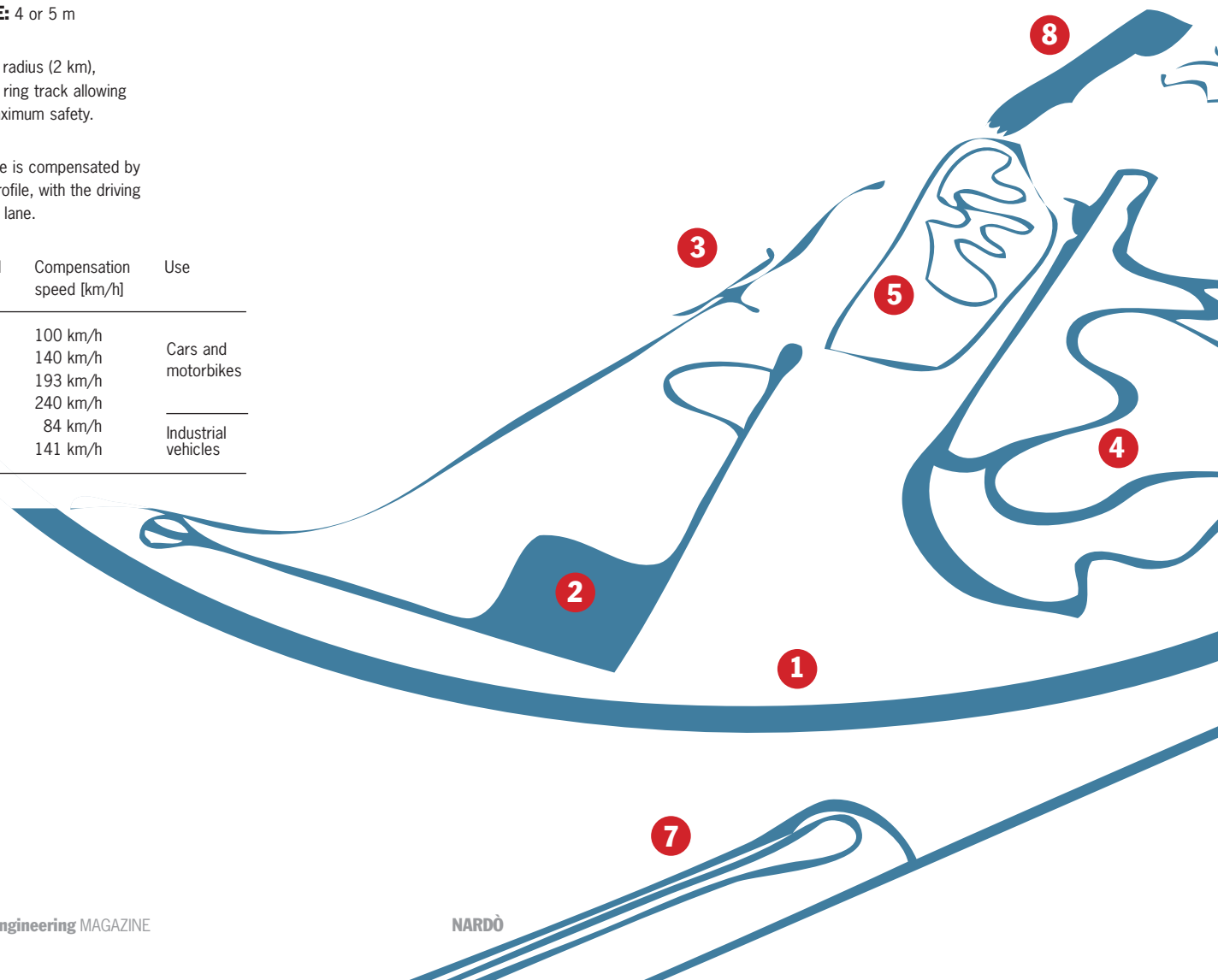
**LENGTH:** 2,132 m  
**WIDTH:** 4 m  
**AREA A:** 8 mm chipping size surface  
**AREA B:** 14 mm chipping size surface

Certified according to ISO 10844

# 4 HANDLING TRACK



**LENGTH OF CIRCUIT:** 6,222 m  
**LENGTH OF STRAIGHT LANE:** 1,000 m  
**WIDTH:** > 15 m straight lane  
 > 12.50 m remaining parts  
**BENDS:** > 7 right-hand  
 > 9 left-hand  
**BANKING:** ≤ 7% (±2.5%)  
 (Longitudinal slopes vary from +5.78% to -6.90%)



# 5 WHITE ROAD TRACKS



**LENGTH "O":** 2,130 m  
**LENGTH "S":** 2,135 m  
**WIDTH:** 6 m

# 6 SPECIAL PAVEMENTS TRACK

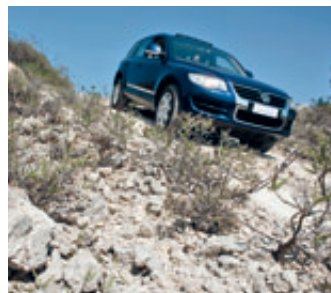


**TOTAL LENGTH:** 1,150 m  
**TOTAL WIDTH:** 4+4 m

## TWO LANES WITH DIFFERENT SURFACES:

- > Cobblestone 250 m
- > Twist 40 m
- > Belgian pave 375 m
- > Comfort (pot holes, long waves, washboard road) 530 m

# 7 OFF-ROAD TRACKS

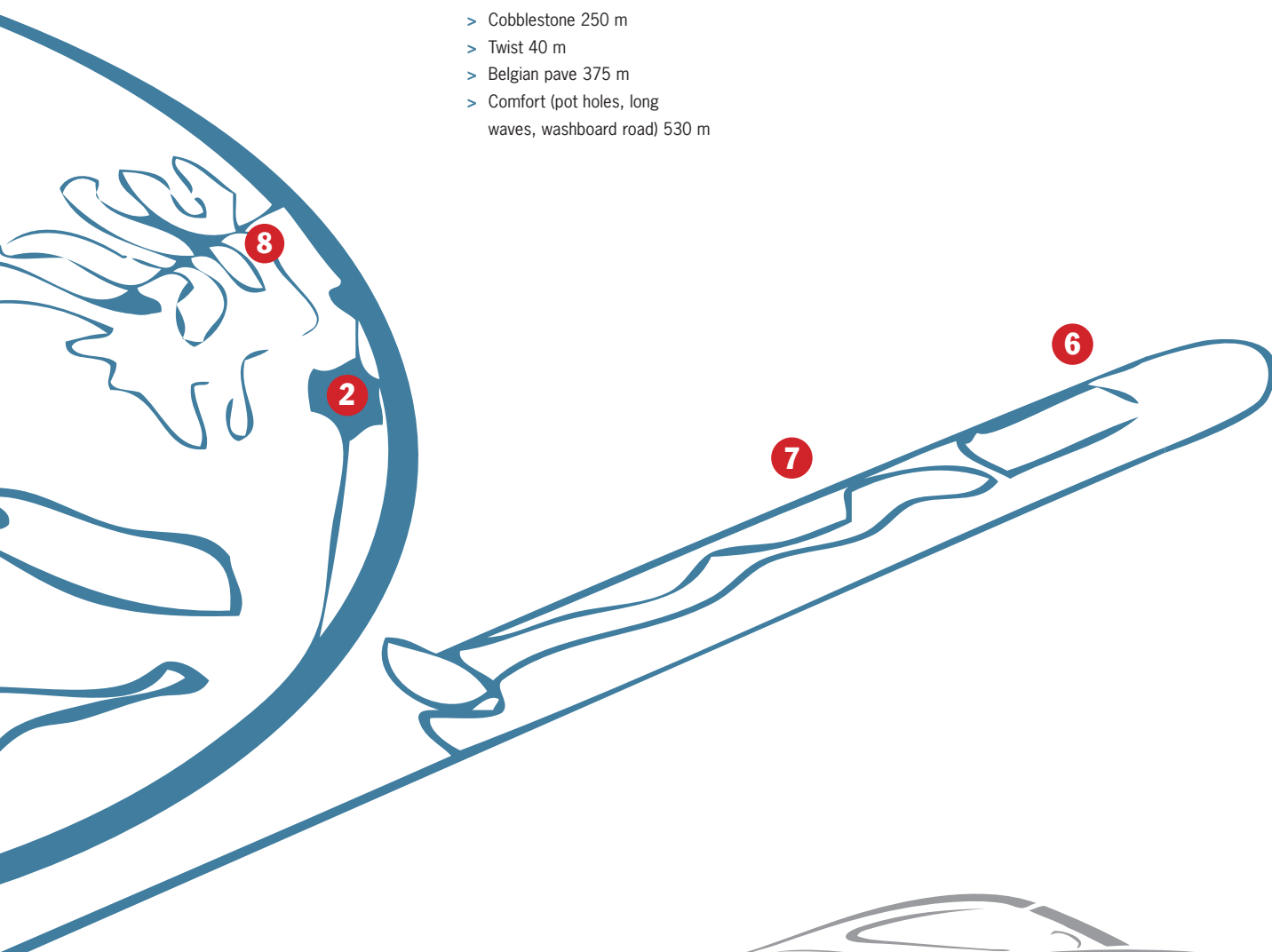


- > Off-road slopes
- > Cross-country track
- > Africa track
- > Oval off-road track
- > Mud track

# 8 OTHERS



- > Slopes
- > Curbstone track
- > Tire laceration track
- > Rolling track
- > Low-mu surface





# Interview

## Francesco Nobile

\_\_\_\_\_ Francesco Nobile has been the Managing Director of the Nardò Technical Center as part of Porsche Engineering since May. But his experience at the Nardò Proving Ground goes back to June 2007, when he joined Prototipo SpA as Managing Director and board member. Nobile continues to lead the 120-strong staff on site after Porsche Engineering's acquisition of the Nardò Technical Center. We spoke with him about the opportunities that Nardò has to offer.

**Porsche Engineering** *Mr. Nobile, what makes the Pista di Nardò so special in your estimation?*

**Nobile** The special thing is undoubtedly the design of the circuit: a perfect circle 12.6 kilometers in circumference with the ingenious slope of the track allowing speeds of up to 240 kilometers per hour without turning the steering wheel. It's one-of-a-kind. The vertical load on a test vehicle remains low up to this speed, meaning that tires are subject to less stress than on an oval race track. And Nardò has a lot more to offer as well, such as the Formula 1-like handling track with hills and lateral banking. It subjects

test vehicles to greater longitudinal and vertical forces than normal, flat Formula 1 tracks. And then there are the standards like the dynamics test track, special pavement tracks, or the noise track.

*Are there any other advantages to testing vehicles in southern Italy?*

**Nobile** Our climate is one of the most important factors. Conditions in Apulia are ideal year-round. There are hardly any rainy days and we practically never have frost, so the ring and other tracks can be used 365 days a year. Moreover, the hot summers offer the chance to test the durability of

vehicles and components under extreme climatic conditions. The decision to build this kind of track here was visionary in every way—to this day, the Pista di Nardò remains the ideal test track for sports cars. That hasn't changed since the track was opened under the direction of the Fiat group in 1975, nor did it change when the facility was sold to Prototipo SpA in 1999.

*What possibilities do you see for the Nardò Technical Center in the future?*

**Nobile** There are many possibilities to expand and optimize the proving ground. We might consider expanding





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## Francesco Nobile

*...knows the automotive industry like the back of his hand, having served as a member of the board at Isringhausen SpA (Italian subsidiary of the German manufacturer of commercial vehicle seats, 1992–1999) and Managing Director at Webasto Italy SpA in Milan (1999–2007). Since 2007 Nobile has directed operations at the Nardò Technical Center. Francesco Nobile spent his youth in Germany and speaks fluent German, in addition to excellent English skills and some command of Spanish. Among other things, he studied mechanical engineering in Mönchengladbach (1982–1984). With his assumption of the directorship of the Nardò Technical Center, he returned to his homeland on the Gulf of Taranto in 2007.*

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the dynamic platforms, construction of a “straight line” track and a “wet area,” or additional workshop areas to improve the options available to our customers. Surface improvements for the ring track are also a consideration. We’re not talking about a renovation of the testing grounds—the facility is in excellent condition. The objective is more to expand our lead over other test tracks. For instance, charging stations have been available to our customers for e-mobility tests since July.

*Will anything change for Nardò customers due to the acquisition by Porsche Engineering?*

**Nobile** Of course, but only in positive ways: Other vehicle manufacturers are still very welcome to carry out their tests on our tracks. We will also continue to offer our customers tailored workshops, which provide optimal support for work on the test tracks and are adjusted to the customers’ needs. Beyond that, they will now have the opportunity to tap the expertise of the Porsche Engineering experts. Development and testing in Nardò will be offered as a complete package with Porsche Engineering. Such a combination of an ideal test track and comprehensive support for customer projects is every bit as unique as the Pista di Nardò itself. ■