

The executive carriage features 10 seats and a private meeting room

Italian style

Trenitalia's chic new long-range high-speed train has four levels of service and a modular layout designed to accommodate changes easily

Its long red nose immediately defines the image of the Frecciarossa 1000 – or Red Arrow – Italian operator Trenitalia's new flagship train.

The 202m-long bidirectional train has a top speed of 400km/h and a maximum commercial speed of 360km/h. As well as connecting Italian cities including Bologna, Milan, Naples, Rome, Salerno, Turin and Venice, the train also meets interoperability requirements. Its multivoltage traction system enables it to run on high-speed lines in France, Spain, Germany, Austria,

Switzerland, Belgium and the Netherlands, and it can switch between fuels and signaling systems.

Team players

Following a tendering process, the €1.6bn (US\$1.8bn) contract to develop and supply 50 Frecciarossa 1000 trains was won by a partnership of AnsaldoBreda and Bombardier Transportation in 2010. The train also goes by the names Zefiro V300 and ETR 1000.

AnsaldoBreda and Bombardier Transportation also brought in Milan-based Bertone Design for

IN NUMBERS

4 levels of service

8 carriages per train

457 seats

2 wheelchair spaces

50 trains ordered

25 years of expected service

360km/h top commercial speed

97% of the materials used are estimated to be recyclable or reusable

the interior design, exterior design and aspects touching on technology, including noise and aerodynamics. The design house is particularly famous for its car designs.

Four levels of service

The train is eight carriages long and has seating for 457 passengers, plus two wheelchair spaces. Analysis of passenger flow and customer data from Trenitalia and the manufacturers was used to optimize the layout. The decision to incorporate four levels of service (executive, business, premium and standard) was made after the initial tender bid. The first design had two levels.



WHEELCHAIR ACCESSIBLE

The creation of two places for wheelchairs in the third carriage was an important element of the design. As well as spaces for the wheelchairs, the area features folding seats and a wide wheelchair-accessible

corridor that gives direct access to a dedicated toilet and to the adjacent bistro section.

The carriage's vestibule is fitted with a wheelchair lift that is close to both the compartment and the service facilities.

LEFT: The train has two wheelchair spaces, in the third carriage

BELOW AND BOTTOM LEFT: The executive seat, which can swivel to face the direction of travel

BOTTOM: There are overhead passenger information screens in every carriage

“Following the evolution of our service on other Frecciarossa trains, four levels were also implemented on the Frecciarossa 1000 project,” says Pietro Diamantini, Frecciarossa 1000 project manager at Trenitalia. “Afterward, the standard level was made even more comfortable with the introduction of face-to-face places, which were not in the original plan.”

Throughout the train, the design focus is on the seats. The design features neutral, hard-wearing and graffiti-resistant materials and soft indirect lighting on the walls and ceiling. The main, centrally controlled light beams are focused on the central aisle. Amenities include power sockets built into the tables and adjustable individual reading lights.

Competing with airlines

The train's long-distance mission made optimizing seat comfort very important. The seat design was developed at Bertone's ergonomics department and tested at seat manufacturer FISA, in northeast Italy. While the business, premium and standard seats share a similar aluminum structure, the executive (first) seat involved a totally new design aimed at an elite luxury market, echoing first class airline offerings.

The executive area is in the first carriage and features 10 seats. They are 74cm wide and arranged in 1-1 layout on either side of a 1.5m-wide central aisle. The seat features champagne-colored leather, thick padding, power





LEFT: The train has a top commercial speed of 360km/h

CENTER: The executive meeting room

DRIVER'S CABIN

The principles of comfort and technology, which informed the design of passenger areas, also applied to the design of the driver's cabin. Ergonomic studies were conducted to ensure the driver's comfort in the central seat, while wind tunnel testing was used to optimize the structure and shape of the cabin, to minimize air resistance.



sockets and twin LED reading lights integrated into the headrest. Reclining back and leg-rest extensions are controlled via buttons connected to the electronic control box. Each seat can swivel to face the direction of travel. "A lever on the armrest enables partial rotation by passengers, and a second is hidden inside the armrest, permitting total rotation by service personnel," says Luca Giantin, export sales manager at FISA.

Meetings on the move

The executive carriage also contains a private five-seat meeting room, with upright desk-style chairs around a central table and a wall-mounted color screen that can be connected to a computer.

The remaining carriages feature wide overhead luggage racks and luggage space between the seats. Seats are upholstered in leather in business and premium, and eco-leather in standard.

The business area is located in the second carriage and half of the third, which is also the location of the wheelchair-accessible area. The other half of the third carriage is used for the bistro/bar. The business seats are laid out in a 2-1 configuration and are 69cm wide. The aisle is more than 1m wide. The section has a blue and gray color scheme and tinted glass partitions between rows to give additional privacy.

The fourth carriage is used for the premium service. The seats are laid out in a 2-2



FAR LEFT: The business area has a 2-1 layout, with partitions to create a sense of privacy

LEFT: There is one carriage dedicated to premium service

FRECCIAROSSA 1000 TIMELINE

Trenitalia launches tender for 50 trains	AnsaldoBreda and Bombardier Transportation win the tender	Full-scale mock-up unveiled	First trains delivered for testing in Italy and the Czech Republic	Night testing on high-speed lines in Italy	Official inauguration by Italian President Sergio Mattarella	Commercial service entry	Expected entry into service of 50 th train
November 2009	August 2010	August 2012	August 2013	2014	April 2015	June 2015	2017



MOVEABLE FEAST

“Food is a precious aspect of our culture – which is why we have to ensure that the quality of our country’s products is promoted to all travelers,” says Carlo Cracco, who began working with Trenitalia in 2014 to bring gastronomic allure to executive service.

Cracco is a master of contemporary Italian cuisine, and has a two-Michelin-star restaurant in Milan. His signature

dishes are available on the lunch and dinner menu in Frecciarossa 1000’s executive carriage. Executive service also includes breakfast and snacks, all served at the seats. The menus focus on seasonal and regional fare.

The train also has a bar/bistro, where passengers can buy food and drink. They can also pay for refreshments to be brought to their seats.

LEFT: Wine, beer and soft drinks are served in the executive car

RIGHT: The bar/bistro

BELOW: Four cars are dedicated to standard service



The modular solutions we adopted guarantee the interior can be reconfigured easily

Pietro Diamantini, Frecciarossa 1000 project manager at Trenitalia



configuration, mainly face-to-face. The carriage has a predominantly red color scheme and features additional luggage racks.

The four remaining carriages are occupied by 300 standard seats in 2-2 configuration. Around 70% of the seats are arranged face-to-face. The seats are finished in a gray eco-leather with orange stitching.

Train connections

Another feature that evolved during the design process was the wi-fi. “During the last stages of the project and the early tests, it was decided to strengthen the wi-fi, telephony and passenger information systems, to upgrade them to the latest technical developments, such as the use of 4G-LTE,” says Diamantini.

Passenger information, including travel news, is regularly updated and displayed on overhead screens in each carriage. There is also an onboard entertainment system that can be accessed on passengers’ computers, tablets and smartphones. The entertainment includes music channels and free and pay-to-view films.

The trains are being manufactured at Bombardier’s factory in Vado Ligure, Italy, and AnsaldoBreda’s facility in Pistoia, Italy. The first

entered commercial service on June 14, 2015, and the last is due to be completed by 2017.

Maintenance matters

The Bombardier-AnsaldoBreda partnership has been awarded a 10-year maintenance contract for the trains, which have a planned 25-year life. Care has been taken to ensure adaptability over the years to come. A modular system has been used throughout to facilitate quick changes of layout or renovation. Each seat is supported on a central post that is attached to a floor rail by four screws.

Similarly, the integration of the reading lights into the seats rather than the overhead luggage racks was intended to enable passengers to personalize their lighting, and also for easy modification of the layout. Pared-back vestibules and wide entrance doors are intended to ensure easy access.

“The Frecciarossa 1000 has a useful life in commercial service of 25 years,” says Diamantini. “Obviously, during this time the interiors will need to be updated, improved and maintained. The modular solutions we adopted guarantee that the interior can be reconfigured easily, enabling it to continue to meet our business needs, however they may evolve.” ☒