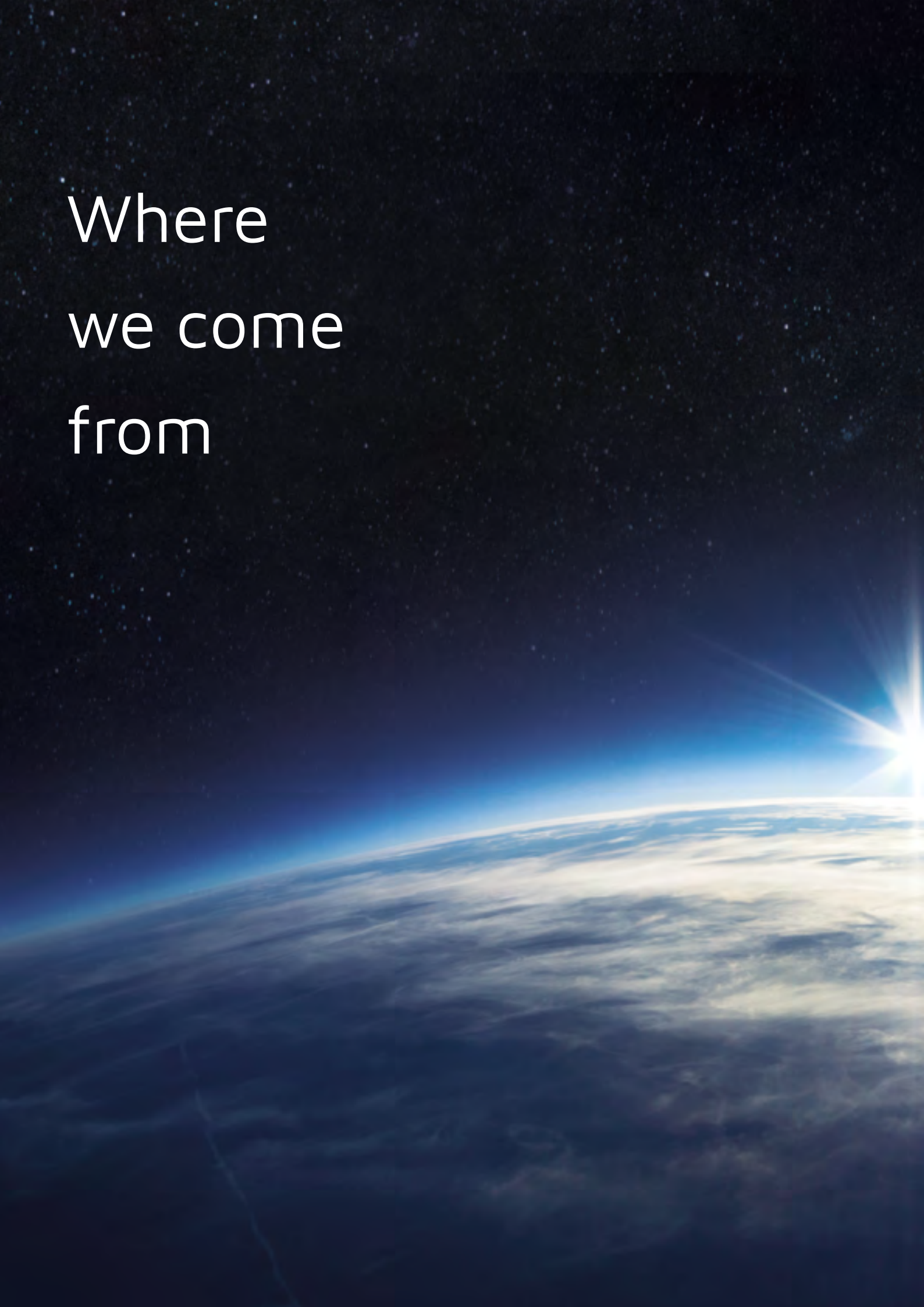





SPACE IS CLOSER

CORPORATE PROFILE

Where
we come
from



A full-page background image showing a view of Earth from space. The horizon is visible, with a bright light source (likely the sun) on the left, creating a lens flare and illuminating the atmosphere. The sky is filled with stars.

Avio is a space propulsion leader,
with over 1,000 employees located
in Italy, France and French Guiana.

Since its foundation in 1912,
the company has played a key role
in the design, manufacturing
and integration of space launcher
systems and tactical missiles.

With such a long history and track record,
Avio today has extensive expertise in
solid and liquid propulsion systems,
chemicals and propellants, composite materials,
system integration, experimental testing,
flight and simulation software, on-board
avionics and satellite launch operations.



Evolving towards the future

Since 2017 Avio has been listed on the STAR segment of the Italian Stock Exchange and was the first rocket manufacturing company in the world to become a public company with over 70% of its share capital floating on the market. With such a set-up Avio is today equipped to accelerate its investment ambitions, pursuing rapid growth for the future. In recent years Avio has delivered revenue growth at an average annual rate in excess of 15%.

Our mission

Our mission is to provide reliable and competitive access to space to improve life on earth. To this end, Avio has developed the Vega Launch System, a combination of launchers and adapters to carry any small-medium satellite into Low Earth Orbit on single, dual or multi-payload missions, serving any type of customer globally.

Avio is committed to over time deliver new versions of the Vega system to continuously improve reliability, flexibility and cost-competitiveness.



Vega Launchers

Avio has designed, manufactured and assembled solid and liquid propulsion systems for more than 50 years.

Avio focuses on the development of new materials and processes for the creation of propulsion system components and structures, developing cryogenic motors, and also patenting architectures of high performance combustion chamber components.



AVUM

Propellant: UDMH/NTO
Total prop. Mass: 550 kg
Nominal Thrust: 2450 N
Up to 5 ignitions

ZEFIRO 9

Propellant Mass: 10.570 kg
Max pressure: 75 bar
Combustion time: 120 s
Max Thrust: 317 KN

ZEFIRO 23

Propellant Mass: 23.820 kg
Max pressure: 94 bar
Combustion time: 77 s
Max Thrust: 1120 KN

P80

Propellant Mass: 87.730 kg
Max pressure: 88 bar
Combustion time: 110 s
Max Thrust: 3015 KN



VEGA



AVUM+

Propellant: UDMH/NTO
Total prop. Mass: 750 kg
Nominal Thrust: 2450 N
Up to 8 ignitions

ZEFIRO 9

Propellant Mass: 10.570 kg
Max pressure: 75 bar
Combustion time: 120 s
Max Thrust: 317 KN

ZEFIRO 40

Propellant Mass: 36.258 kg
Max pressure: 115 bar
Combustion time: 93 s
Max Thrust: 1345 KN

P120C

Propellant Mass: 142.000 kg
Max pressure: 105 bar
Combustion time: 135 s
Max Thrust: 4321 KN

VEGA C



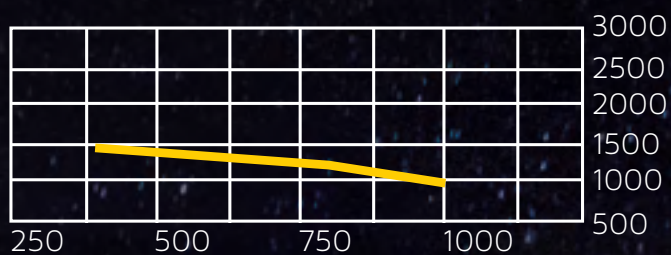
Vega is the Small launch vehicle that Avio designed for the European Space Agency to take small satellites into Low Earth Orbit (LEO). It can carry multiple payloads up to a maximum capacity of 1,500 kg in circular polar orbit of 700 km.



Vega options



SSO Performance Map



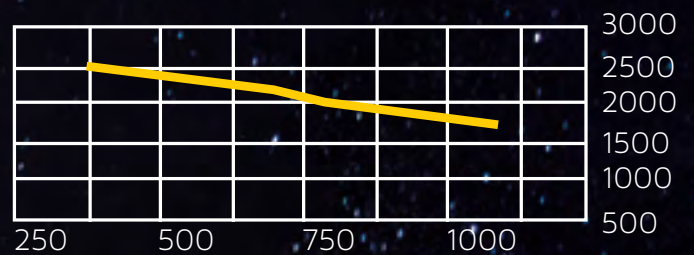


Vega C is an evolutionary development of the current Vega launcher. With Vega C, the payload capacity will increase from Vega's current 1,500 kg to 2,200 kg at the same reference orbit.

Vega C options



SSO Performance Map



Vega space system

Equipped with our Space System modules, Vega C is one of the most flexible and versatile launchers in the world.

Our Space System consists of modular dispensers to place multiple aggregates of small satellites with simplified qualification and integration processes.



VAMPIRE

Vampire Payload Adapter enables a ride to orbit for main and SmallSats.

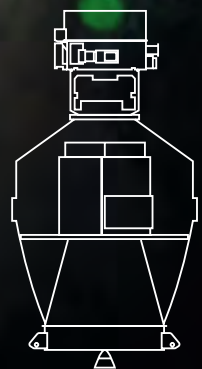
PAYLOAD
1500 kg +
(120 kg x6)



SSMS

The Small Spacecraft Mission Service is a modular dispenser and adapter for the release of multiple satellites in a "rideshare" configuration.

PAYLOAD
1 to 400 kg
mass class SmallSats



VESPA C

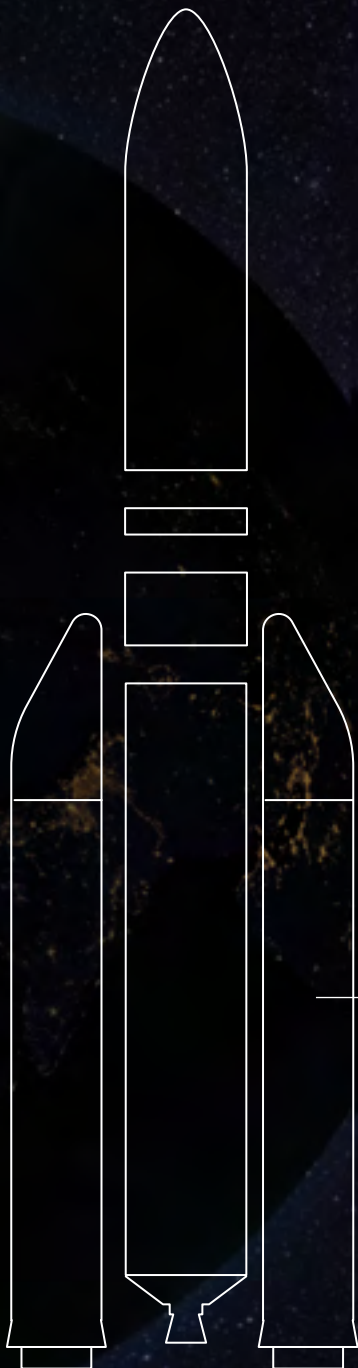
Vespa C ensures dual launch capability for medium size payloads.

PAYLOAD
100 to 1000 kg
(2x)

Ariane Launchers

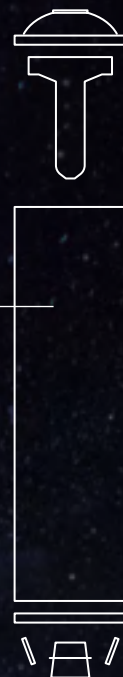
ARIANE 5

Ariane 5 is the heavy lift launcher developed by Ariane Group for the European Space Agency with a payload capacity of up to 10 tons in GTO. Avio and Ariane Group through their joint venture Europropulsion, have designed, manufactured and assembled the solid propulsion strap-on boosters of this launcher, which deliver 90 percent of the thrust at lift off. Avio in particular has developed the insulated motor cases and the casting of the solid propellant through its subsidiary Regulux.



P230C

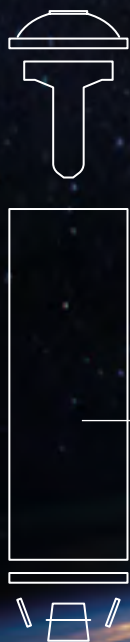
Propellant Mass: 240,5 t
Max pressure: 6.9 MPa
Combustion time: 129 s
Max Thrust: 6,996 MN



ARIANE 6

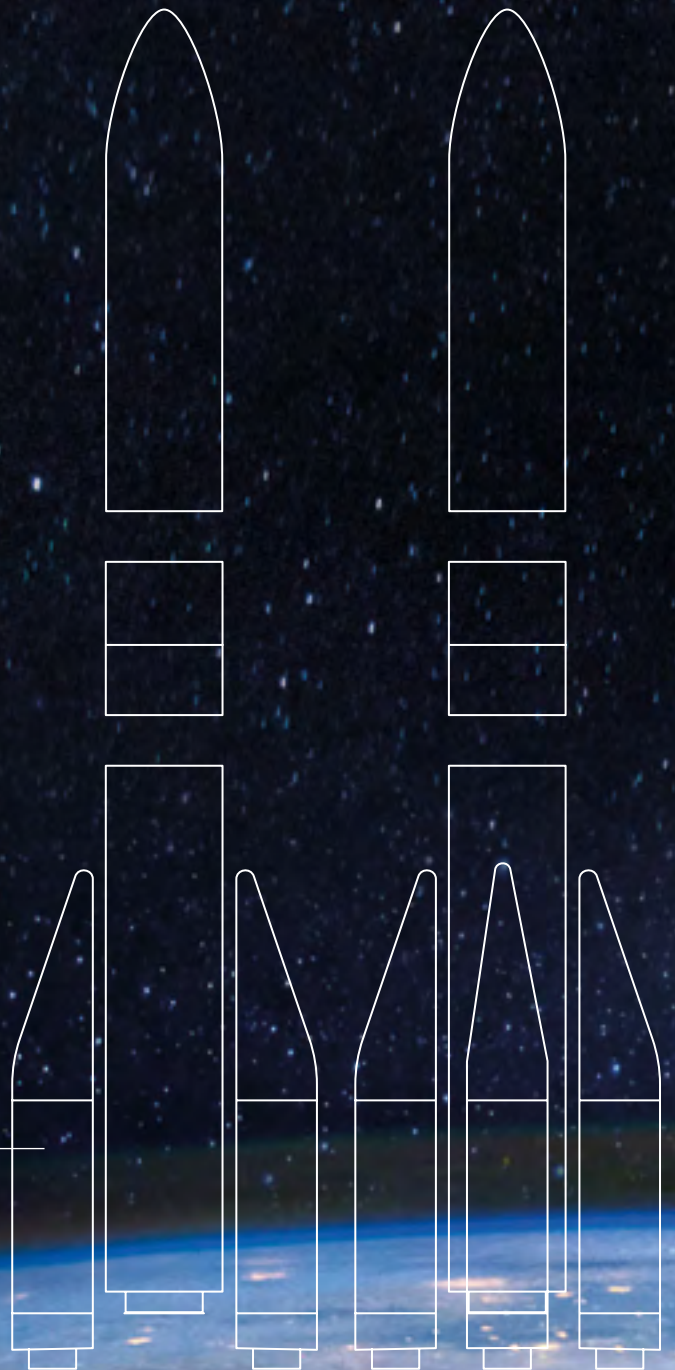
Avio and Ariane Group have jointly developed through their joint venture Europropulsion the P120 C solid rocket motor for both the Vega C first stage and the A6 boosters. The structural casing is manufactured by Avio in carbon fibre, using Avio's pre-impregnated material (patented).

The P120 C, with its 142 tons of propellant, is the world's largest monolithic solid rocket motor.



P120C

Propellant Mass: 142.000 kg
Max pressure: 105 bar
Combustion time: 135 s
Max Thrust: 4321 kN



ARIANE 62

ARIANE 64

Tactical

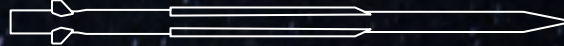
Avio is part of the joint Italian-French-British program for the production of Aster 30, an advanced two-stage hypersonic missile system for air defence against aircraft and missile attacks. The first-stage booster, fully designed and produced by Avio, is considered as one of today's most powerful and technologically advanced solid-propellant motors.

Concerning development programs, Avio has acquired from MBDA the contract for designing, developing and qualifying the rocket motor for the air defense missile Camm-er.



ASTER 30

Weight: 450 kg
Length: 4.9 m
Diameter: 180 mm

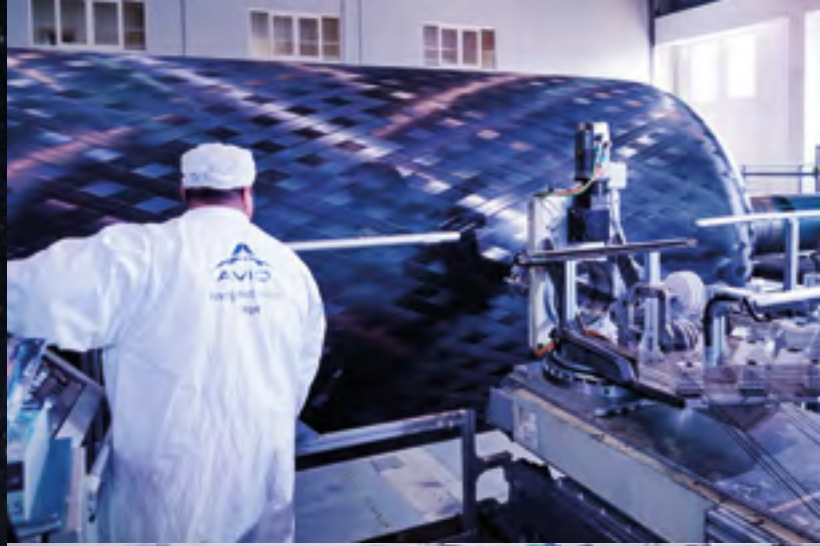


CAMM-ER

Weight: 160 kg
Length: 4.2 m
Diameter: 190 mm

Structures and Avionics

Avio has developed a family of pre-impregnated carbon-epoxy composites for large structures of transport systems, such as composite and metallic High Pressure Storage Systems, Pressurization Systems, Cryogenic Propellant Tanks, Fluid Control Equipment, Sensors and Transducers, Ignition Systems, Thermal Control Systems.



Thanks to a robust software and using flight hardware, our HardWare-In-the-Loop (HWIL) Laboratory allows testing and simulation of actual flight conditions, making Vega flights extremely reliable.

Avio operates the Vega launcher stage assembly in Colleferro and the launcher integration activities directly at the launch pad Mobile Gantry facility in the Guyana Space Center. Avio delivers the Ariane 5 booster segments for final integration by Europropulsion at the Guyana Space Center.



Paris

(GMT +2) N48.856 E2.351

Headquarters of Europropulsion (50% Avio and 50% Ariane Group), main contractor of the solid-propellant motors for Ariane 5 and Ariane 6, undertaking development, assembly and technical co-ordination.

Turin

(GMT +1) N45.067 E7.682

Avio designs and produces the liquid oxygen turbopump for the Vulcain and Vinci engines for Ariane 5 and Ariane 6.

French Guiana

(GMT -3) N4.003 E52.999

Ariane 5 segments, as well as the Vega P80 and P120C are manufactured and cast at REGULUS, an Avio subsidiary based at the European Spaceport located in Kourou, French Guiana.

Regulus' plants are equipped with four casting pits and two 11 ton mixers running in parallel over a 10 day-process, and ensuring a yearly flight rate of 7 Ariane 5 and 5 Vega. The facilities also include the Non-Destructive Control plants to verify possible anomalies in the cast propellant before the segments' delivery to EUROPROPULSION, the Avio - Ariane Group joint venture, for their final integration. Avio also operates the Vega Launch Zone, where the Vega stages' integration takes place before launch.



Avio on earth

Colleferro, Rome

(GMT +1) N41.727 E13.003

The company's headquarters serves as the main site for R&D, innovation and system integration activities, in addition to the production of solid and liquid propellant motors for launch vehicles and tactical propulsion systems. In Colleferro, Avio also carries out the development of the new launchers, Vega C and other evolutions, coordinating the contribution of various European companies.

Airola

(GMT +1) N41.061 E14.558

Carbon fiber impregnation facility.



Specs

>100
YEARS IN SPACE

>1000
EMPLOYEES

877 € Mln
ORDER BOOK

389 € Mln
2018 REVENUE

25%
OF REVENUE IN R&D

15%
ANNUAL GROWTH

Group's structure

SPACELAB
an Avio-ASI company

70% AVIO
30% ASI

REGULUS

60% AVIO
40% ARIANEGROUP

EUROPULSION

50% AVIO
50% ARIANEGROUP

Partner

esa

ASI
agenzia spaziale
italiana

arianespace
arianeGROUP

arianeGROUP

OHB

VITROCISET

TELESPAZIO
a LEONARDO and THALES company

CIRA
Centro Italiano Ricerche Aerospaziali

S.A.B.C.A.

Together
ahead. **RUAG**

YUZHNOYE

KN

What's next



2020

Vega C Maiden Flight

A new rideshare mission with SSMS



2021

the new launcher Vega Light,
capable of serving the SmallSats' community
with dedicated launches to LEO



2022

the first Space rider Mission,
the European reusable re-entry vehicle



2024

Vega E- short for Vega Evolution

ideal to release multiple satellites into
different orbits during a single mission



avio.com