



BMW Group
Klimawindkanal



AIOLOS ENGINEERING

CORPORATE PRESENTATION



AIOLOS
ENGINEERING
CORPORATE PRESENTATION



Market Sectors



Capabilities



Experiences

WELCOME MESSAGE

CORPORATE
PRESENTATION

ENGINEERED SOLUTIONS

A world leader in the design and construction of wind tunnels and test facilities. Our success is thanks to experienced professionals with the knowledge and skills essential for clients who need facilities that simulate real-world conditions, with accuracy and repeatability.

Market Sector

ENGINEERED SOLUTIONS

Aiolos has been actively providing services to a broad client-base in a number of market sectors. The main sectors serviced by **Aiolos** are Automotive and Aerospace.



AUTOMOTIVE

Automotive test facilities aim to reduce the time and expense of extensive road and track testing by executing most of the tests in the controlled environment of a wind tunnel.



AEROSPACE

Aircraft and spacecraft test facilities designed by Aiolos can simulate diverse aerodynamic, acoustic, aeroacoustic, and environmental conditions necessary for the successful development of civil and military flight vehicles.



Special Projects

Aiolos services clients with special test facility projects that aren't specifically automotive or aerospace related. For example, boundary layer tunnels, reverberant chambers, Windee tunnel.

WHAT WE DO

ENGINEERED SOLUTIONS



Complete Engineering and Integration Services.



Planning & Total Project Management of turnkey (EPC) construction projects.



Feasibility Studies to determine full extend of planning requirements.



A.

Project Management and Engineering of Complex Multi-disciplinary Projects

B.

Process design experienced in Fluid Dynamics, Thermal, Acoustics and Aero-Acoustics

C.

Mechanical design of custom Mechanical Systems, Structural Analysis & FEA

D.

Test Facility Electrical, Control & Instrumentation design

E.

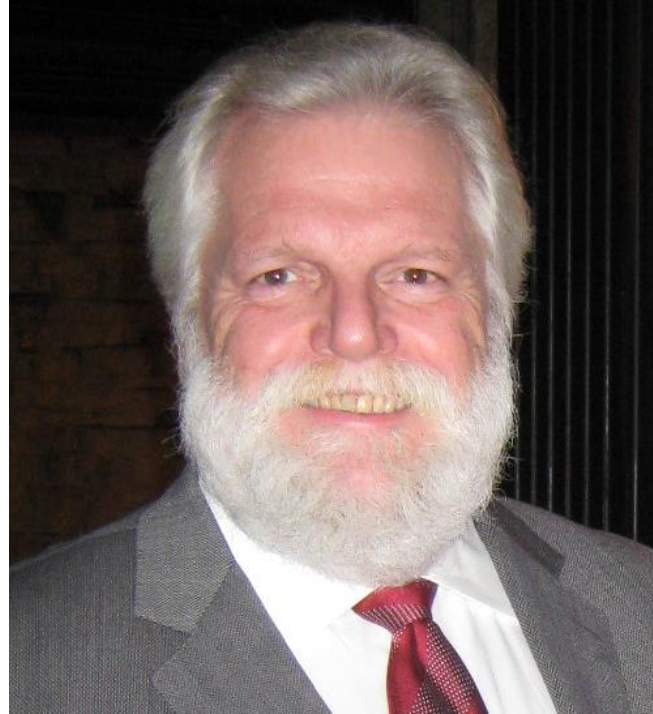
Certified to the latest standard of ISO9001. Quality Control & Performance tracking process



ENGINEERING CAPABILITIES

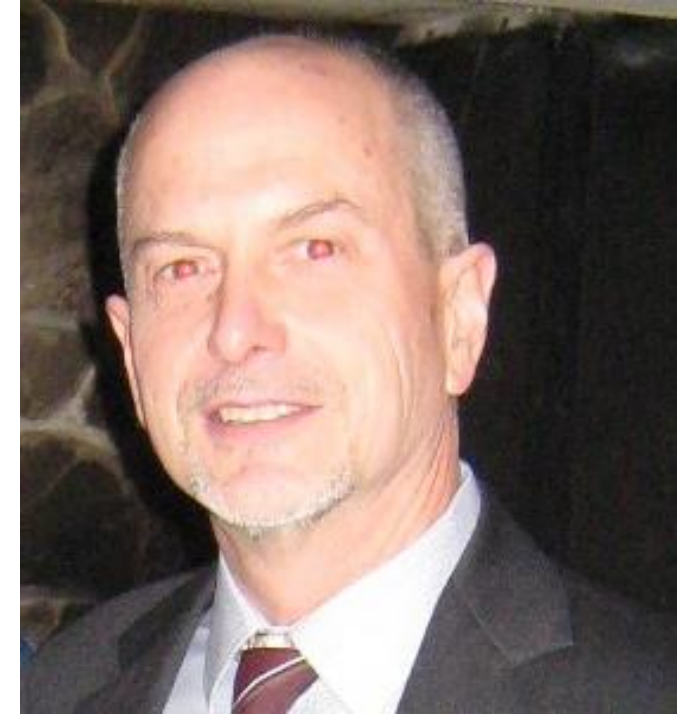
ENGINEERED SOLUTIONS

ABOUT TEAM



Steve HILLS

Chief Executive Officer



Graham THOMAS

Chief Operating Officer





Mike Doiron

VP Business Development



Keith SMITH

Director Business Development



Mathieu CARDINAL

Director Business Development





Alex HOLZWARTH

Director - Controls



Ian MYLES

Manager of Engineering



Ralph LEITNER

Manager of Projects & Procurement



RECENT Projects





BMW Acoustic Wind Tunnel

Munich, Germany

Test Facility Features

- **Confidential Performance**
- **Nozzle Greater than 20m²**
- **Will be the highest performing acoustic wind tunnel once completed**



BMW EVZ Test Complex

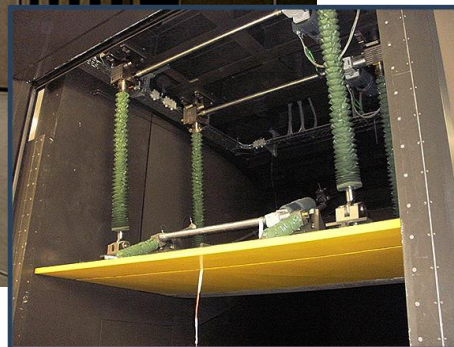
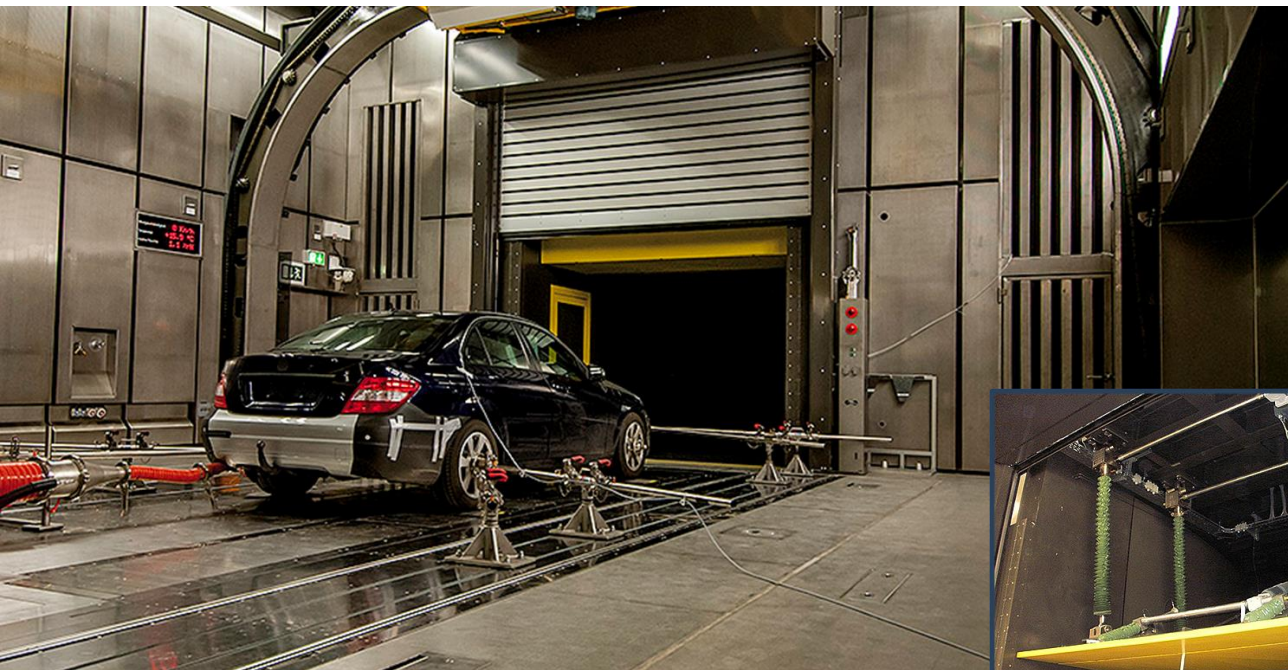
Munich, Germany

Test Facilities

- 3 Climatic Wind Tunnels
- 2 Climatic Chambers
- Extensive Pre-Soak Chambers

Simulation Capabilities

- Altitude
- Rain & Snow
- Solar
- Emissions
- Motorcycles



Daimler WindKanal

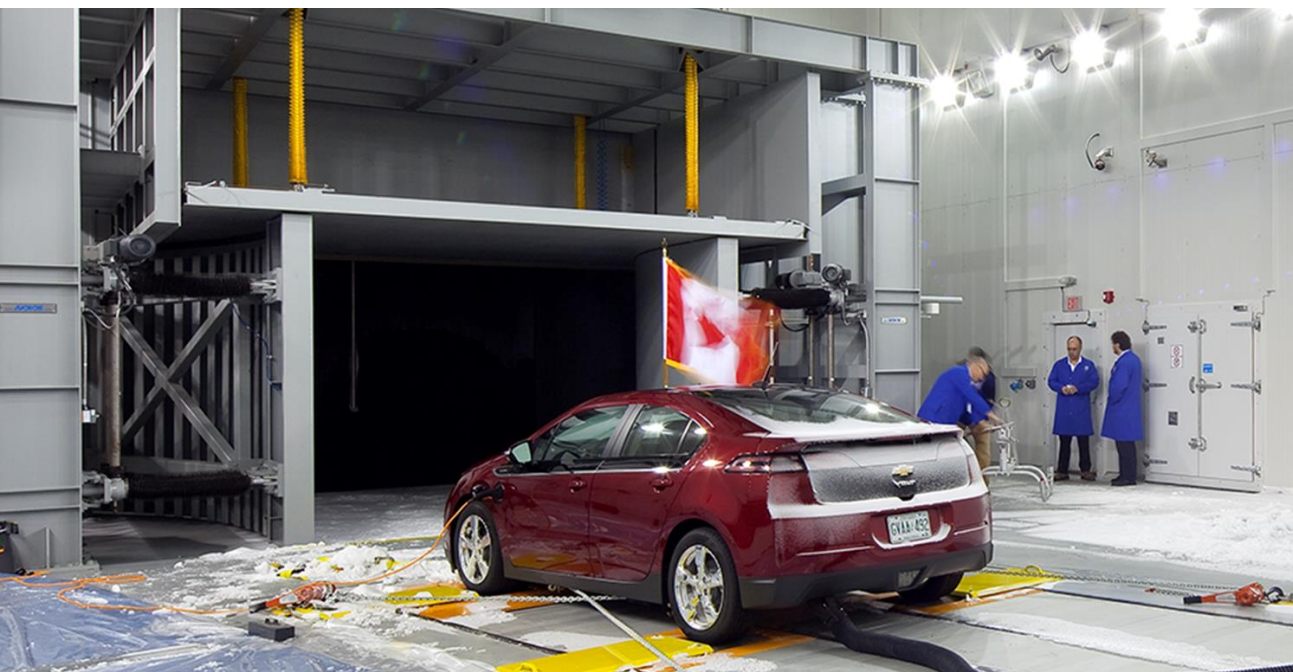
Sindelfingen, Germany

Test Facilities

- 2 Climatic Wind Tunnels
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- Emissions
- Motorcycles



Automotive Centre of Excellence

UOIT, Ontario, Canada

- Unique climatic wind tunnel
- Large and small climate chambers
- 4-Post climatic chamber
- Hemi-anechoic chamber with multi-axis shaker
- Operational 2010
- Aiolos currently converting to an AeroAcoustic Tunnel



Hyundai Aeroacoustic Wind Tunnel

Korea

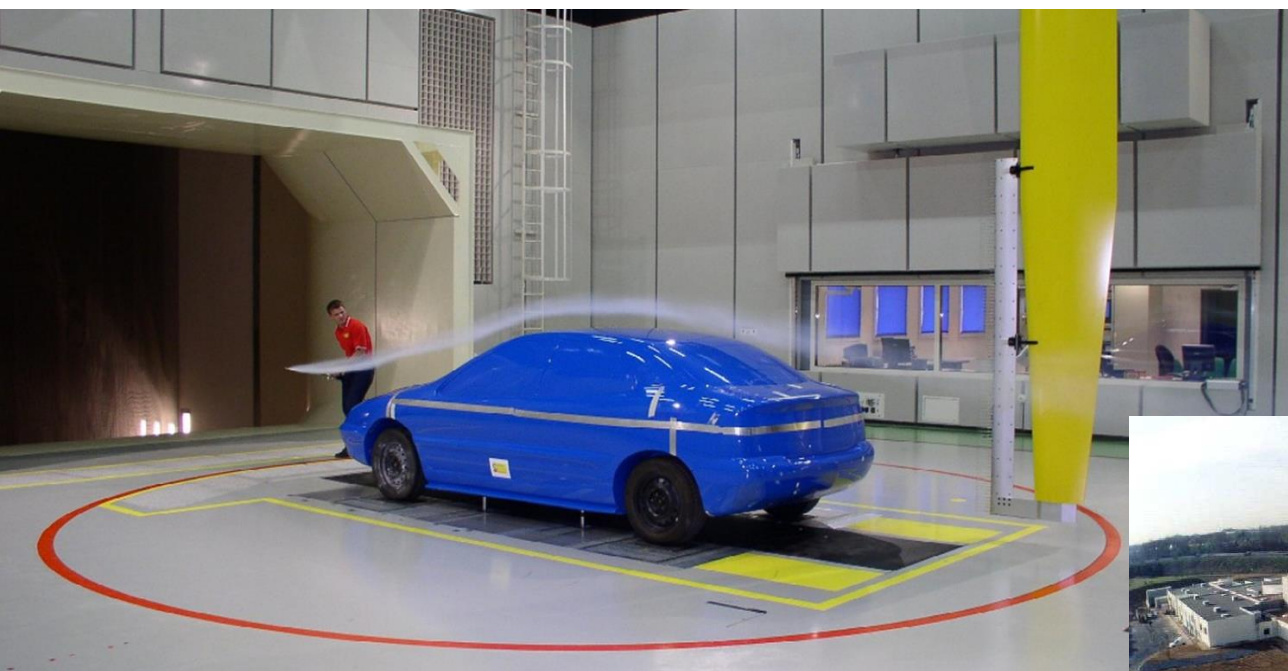
- 3D Traversing System
- Background Noise Level: 60 dBA at 100 kph
- 6 Component Balance
- Dynamometer
- Max. Wind Speed: 200 km/h



FAW-Toyota R&D NVH Climatic Wind Tunnel

Tianjin, China

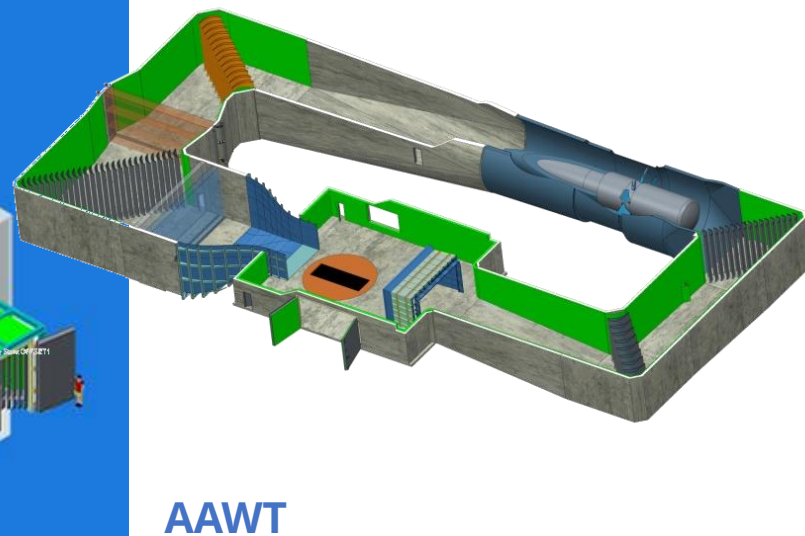
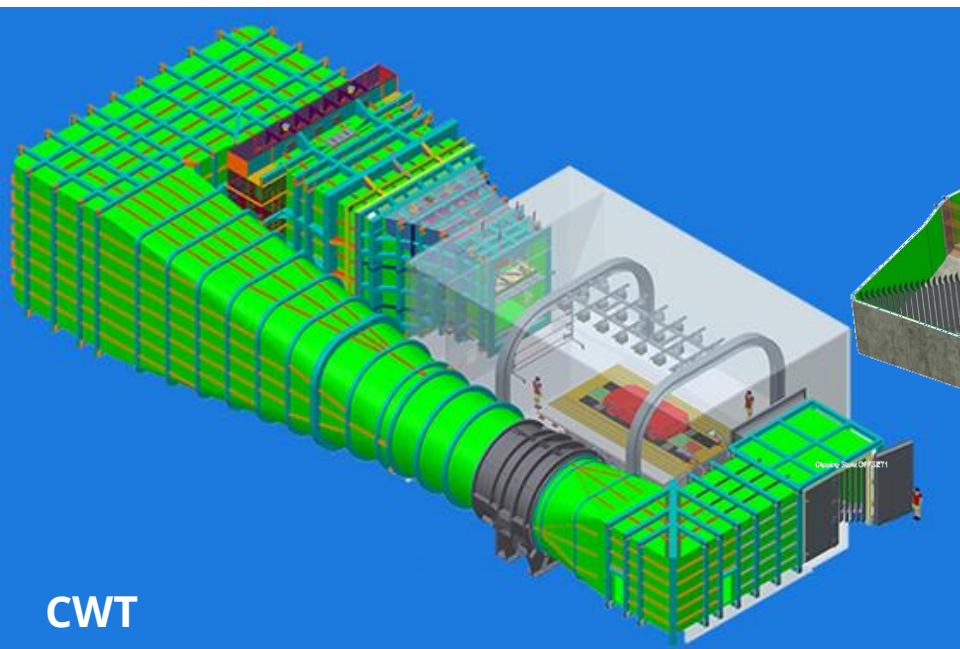
- Idle/City testing capability
- Full spectrum solar simulation
- <74 dB(A) at 100km/hr and <55 dB(A) at 55 km/hr
- Max air speed of 150 km/hr
- Temperature range: 15 °C to 50 °C
- Humidity controllable: 30 % to 80 % RH



GIE S2A Aerodynamic Center

Paris, France

- Renault, Peugeot and CNAM joint venture
- 24 m² AeroAcoustic Wind Tunnel for Full Scale Models
- 3.8 m² Aerodynamic Wind Tunnel for 40% Scale Models
- Vehicle prep areas, workshops and small lab rooms
- High security for competing partners and external users



China Automotive Test and Research Center (CATARC) Climatic and AeroAcoustic Wind Tunnels

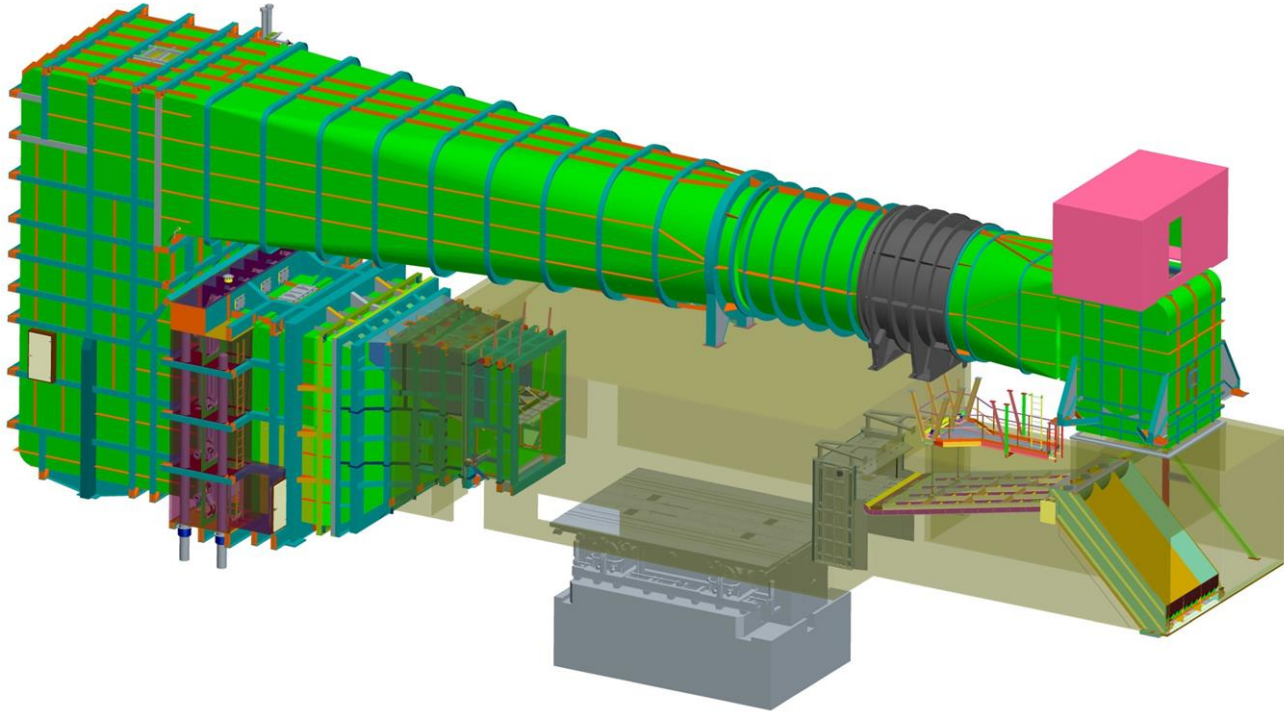
Tianjin, China

CWT

- Nozzle Size: 14, 7 and 5 m²
- Max. Wind Speeds: 130, 200 and 250 kph
- Temperature Range: -40 °C to +60 °C
- Humidity 5% R.H to 95% R.H
- Rain and Snow Systems
- Solar Simulation System

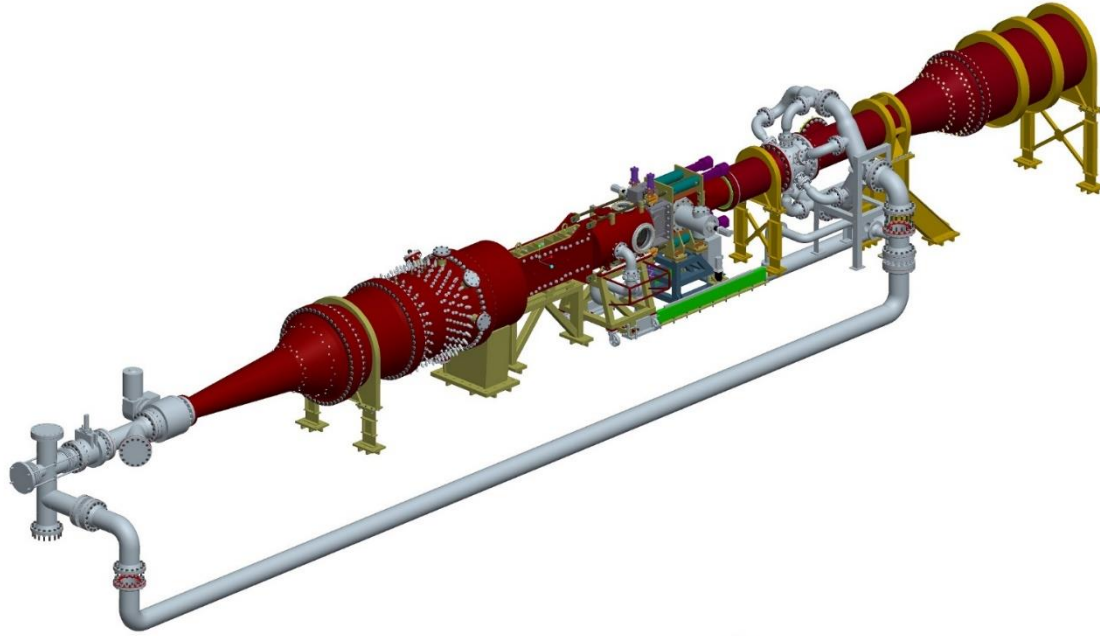
AAWT

- Max. Wind Speeds: 250 kph
- Temperature Range: 25°C
- Moving Ground / Balance System
- Traversing System
- Acoustic Performance dB(A)
- 42 @50km/h
- 48 @100km/h
- 59 @150km/h
- 68 @200km/h



First Automotive Works Climatic Wind Tunnel

Changchun, China



 THE FLORIDA STATE UNIVERSITY
POLYSONIC WIND TUNNEL

Florida State University Polysonic Wind Tunnel

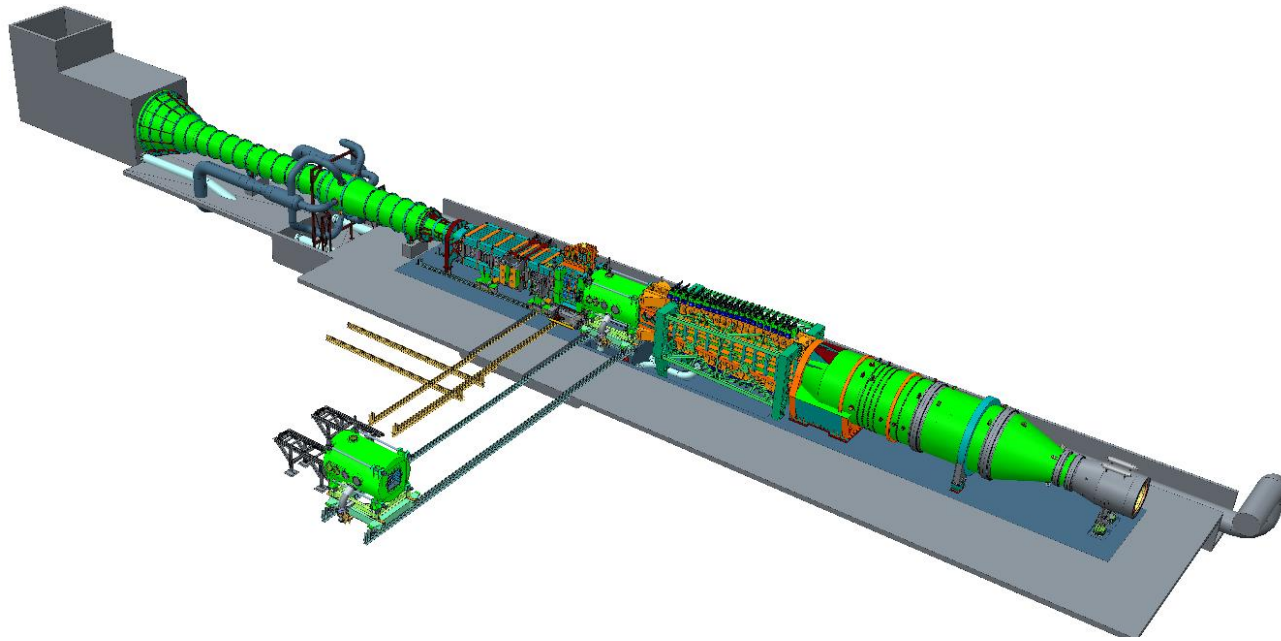
Tallahassee, FL, USA

Subsonic

Transonic

Supersonic (Mach 5)





ISRO 1.2 m Trisonic Wind Tunnel

India

Joint venture project with Tata Projects

Aiolos is the technology partner

First Blow Down will be in 2022

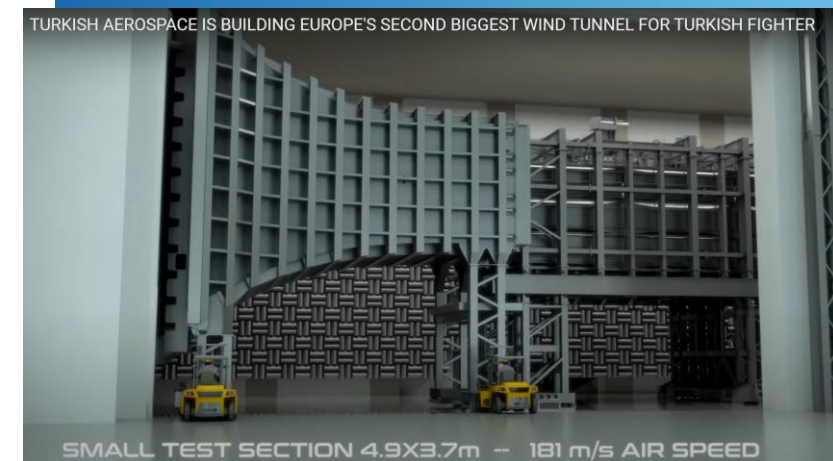


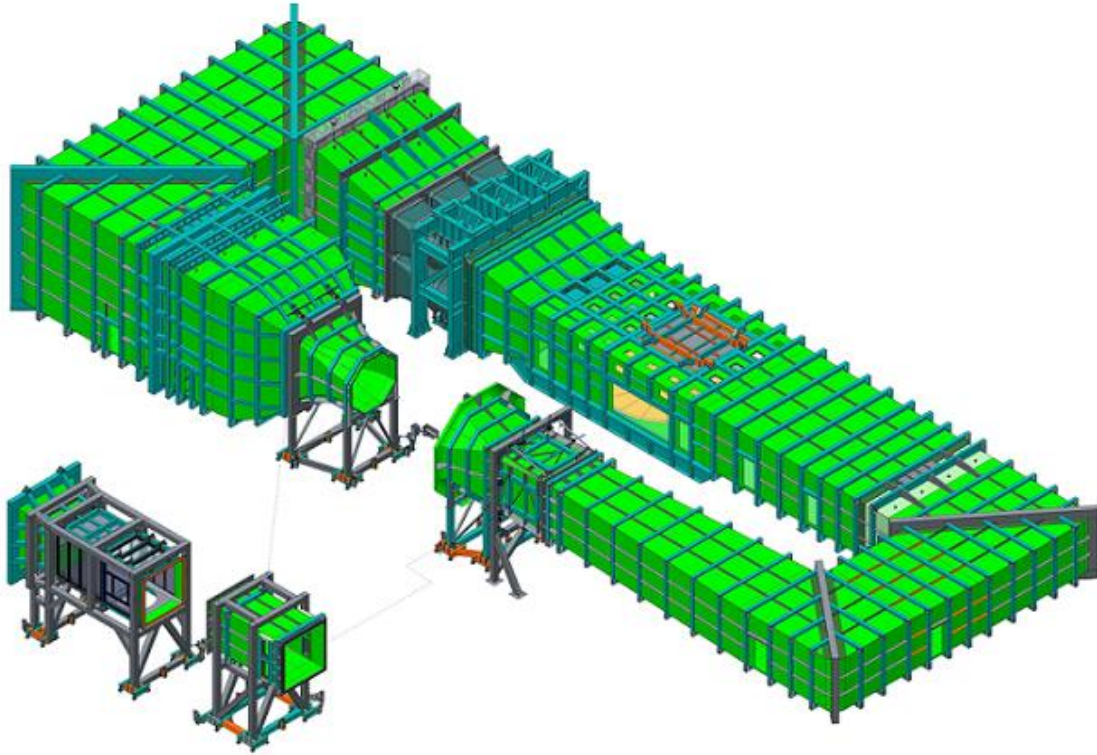


Turkish Aerospace TST Large Low Speed AeroAcoustic Wind Tunnel

Ankara, Turkey

Multiple Test Sections





Middle East Technical University Wind Tunnel

Ankara, Turkey

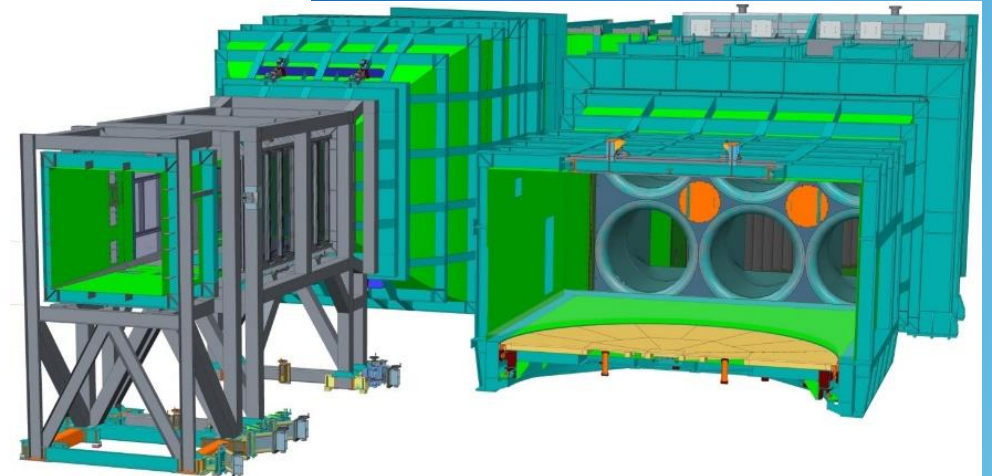
2.5 x 2.5m & 7.0 x 3.0m

Low Speed Wind Tunnel

Test sections:

Solid-wall: aerospace/wind engineering

Open-jet: aerospace



Recent Project list

Client	Country	Description	Aiolos Scope	Status
1. Lola Cars Int'l	UK	2.7m x 2.5m Aerodynamic Wind Tunnel for 50% scale F1 racing cars	Turnkey	
2. Sanden International	Germany	6 m ² Climatic Wind Tunnel	Turnkey	Operational 2000
3. Ford Motor Co.	UK	Environmental Test Laboratory: <ul style="list-style-type: none"> 4.65m²Climate/Altitude Wind Tunnel 2m² Climate Wind Tunnel/Chamber Altitude Chamber 	Engineering Services; Construction Management	Operational 2000
4. General Motors	USA (Michigan)	HVAC Climatic Test Facility: 50ft ² , 100ft ² , 150ft ² climatic wind tunnels	Engineering Services	Operational 2000
5. Volvo Truck Corp.	Sweden	6.3 m ² Climatic Wind Tunnel	Turnkey	Operational 2001
6. Volvo Car Corp.	Sweden	27m ² Aero/Thermodynamic Wind Tunnel; Upgrade for increased wind speed-test section inserts	Turnkey	Operational 2001
7. General Motors	USA (Michigan)	56m ² Aerodynamic Wind Tunnel; Upgrade to Aeroacoustic Capability	Turnkey	Operational 2002
8. Rail Test & Research	Austria	Railroad/Automotive Climatic Wind Tunnel (4.6m x 3.5m nozzle)	Engineering Services & Hardware	Operational 2002
9. PSA/Renault/ CNAM	France	Aeroacoustic Wind Tunnel Complex <ul style="list-style-type: none"> 1:1 scale aeroacoustic wind tunnel 2:5 scale aerodynamic wind tunnel 	Turnkey	Operational 2003
10. Hyundai Motor Co.	Korea	5.6m ² Climatic Wind Tunnel for snow testing	Turnkey	Operational 2003
11. Scania Truck	Sweden	4.2m ² Climatic Wind Tunnel	Turnkey	Operational 2006
12. Volvo Car Corp.	Sweden	27m ² Aero/Thermodynamic Wind Tunnel: Upgrade for moving ground system and increased wind speed-fan design	Engineering Services	Operational 2006

Recent Project list

Client	Country	Description	Aiolos Scope	Status
13. BMW AG	Germany	Energietechnisches Versuchszentrum (EVZ) <ul style="list-style-type: none"> Three 8.4m² climatic wind tunnels One altitude climate chamber One climate chamber 	Turnkey Consortium	Operational 2009
14. Daimler	Germany	Climatic Wind Tunnel Complex <ul style="list-style-type: none"> Two 7-12m² climatic wind tunnels Extensive soak room array 	Turnkey Consortium	Operational 2011
15. University of Ontario Institute of Technology	Canada	<ul style="list-style-type: none"> 7-14m² climatic wind tunnel 2 climate chambers 4-post climate chamber Multi-axis shaker cell 	Engineering Services	Operational 2012
16. Navistar	USA	Heavy Truck Climatic Wind Tunnel	Turnkey	Design Complete
17. Navistar	USA	Heavy Truck Hot Chamber	Turnkey	Operational 2013
18. LG	Korea	Climatic Wind Tunnel	Engineering Services	Operational 2014
19. First Auto Works (FAW)	China	Climatic Wind Tunnels (2)	Engineering Services	Operational in 2018
20. Hyundai Motor Corporation	Korea	Climatic Wind Tunnels (2)	Engineering Services	Operational 2015
21. PACCAR Corporation	USA	Heavy Duty Truck Climatic Wind Tunnel	Turnkey	Operational 2015
22. Halla Visteon	Korea	Climatic Wind Tunnel	Engineering Services	Operational 2017

Recent Project list

Client	Country	Description	Aiolos Scope	Status
23. Tianjin FAW Toyota	China	NVH Climatic Wind Tunnel	Engineering Services	Operational 2016
24. First Auto Works (FAW)	China	Altitude Climatic Chamber	Engineering Services	Acceptance Tests
25. CATARC	China	Climatic and Aero-acoustic Wind Tunnels	Detail Engineering and Project Management	Complete
26. Guangzhou Automotive	China	Aero Acoustic and Hot Climatic Wind Tunnel	Detail Engineering and Project Management	Design Complete. Currently erection phase.
27. UOIT	Canada	Automotive Centre of Excellence Upgrading the aerodynamic flow quality and acoustics	Engineering Services & hardware supply	In progress, Operational 2021
28. BMW AG	Germany	Acoustic Wind Tunnel	Turnkey Joint Venture	Design Stage
29. Navistar	USA	Relocation of Heavy Truck Hot Climatic Chamber	Engineering Services	Design Phase
30. Volvo Cars	Sweden	Turnkey Design and Supply of a new Climatic Wind Tunnel	Turnkey	Contract Awarded Sept 2021

THANK YOU