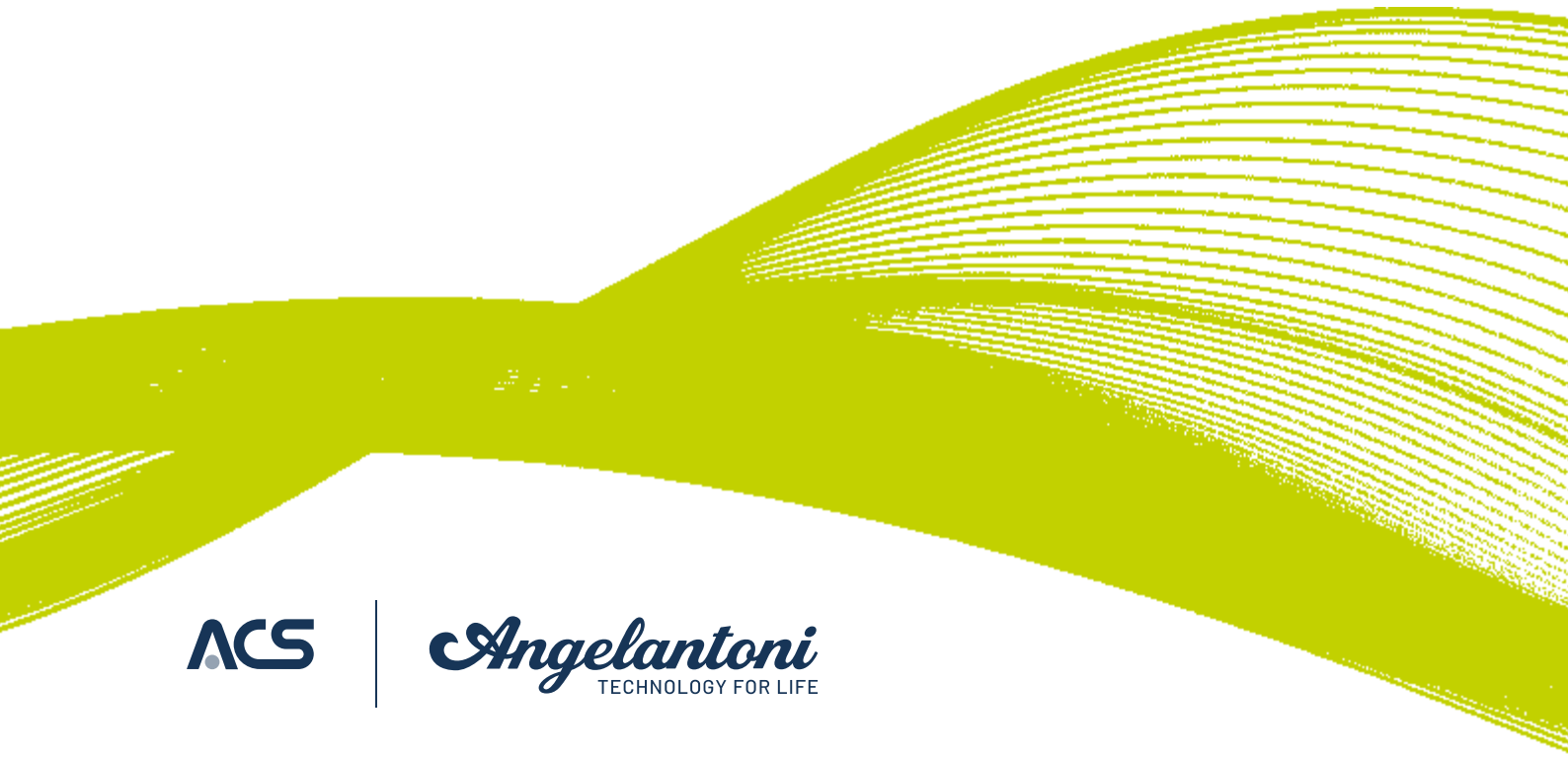
ACS | TESTING FOR A BETTER PLANET

Angelantoni

Altitude test chambers

acstestchambers.com



ACS | Angelantoni TECHNOLOGY FOR LIFE

Angelantoni Test Technologies
stay ahead to meet the needs
of the Industry of the Future, where
Internet Technology,
Remote Connections,
Communication & Networking
are the keywords for success.

Altitude
test chambers

Besides their well-known key features - **high performances, flexibility, reliability** - these chambers are now equipped with **Weazy™**, the new onboard HMI providing an intuitive and rsponsive interface for our Powerful Control System.

This line of chambers comes in both thermostatic (temperature only) and climatic (temperature and humidity) versions.
500 and 1000 l models can be supplied in the ES version.

Altitude test chambers. Temperature and pressure control at high altitude

Angelantoni Test Technologies is proud to present its innovative range of altitude chambers for testing **components for the aviation market**.
These technologies require the utmost reliability of the components and systems on board, since human lives are often entrusted to them. It is therefore necessary to conduct life tests, including simulations of operating conditions, in both ordinary procedure and at the Quality Control and Production levels.
Generally speaking, when conducting tests having to do with the aviation industry, it is necessary to guarantee effective combined temperature and pressure control in the test chamber, the latter in order to simulate the altitude above sea level.
In some cases, humidity control is also necessary.
We have put to fruition more than 75 years of know-how and experience gained through constant feedback from customers and agents, with the aim of optimizing all the devices as best as possible and thus ensuring a wide variety of possible tests.
Since 1953 ATT has been designing and developing a complete series of standard chambers for vacuum tests up to 1 mbar (equivalent to 150,000 feet altitude).
These chambers are available in standard 150, 500, and 1000 liter capacities with a parallelepiped shape. A special wall thermoregulation system (optional) guarantees the best functioning below 300 mbar, thermoregulating the test environment by radiation. This range of altitude chambers is also available in both thermostatic (temperature and pressure control) and climatic (temperature, pressure, and humidity control) versions.
The new “ES” models now have even more environmental performance, whilst maintaining the same footprint and volume of the lower specification versions.
They have been designed for Environmental Stress (ESS) and are ideal for reliability growth processes where temperature rates of change of 5°C/min are pre requisite.

Features and advantages

- Robust structure.
- Top-of-sector performance, in terms of both the breadth of the regulation field and the speed of the temperature and pressure variations.
- Optimized system for the thermoregulation of the walls of the test chamber in both the heating and cooling phase, even for pressures close to the minimum value (optional).
- Industrialization of the control, cooling, humidification, and pumping devices, in order to guarantee maximum quality and reliability as well as ease of access to the various maintenance points.

Main standards

DEF STAN 0035 3-11 (High Temperatures, Low Pressures)
DEF STAN 0035 3-12 (High Temperatures, Low Pressures)
DEF STAN 0035 3-13 (Low Temp. and Pressures, High Humidity)
MIL-STD-810G METHOD 500.5 PROCEDURE I
MIL-STD-810G METHOD 500.5 PROCEDURE II
MIL-STD-810G METHOD 500.5 PROCEDURE III*
RTCA/DO-160C

* chamber equipped with special options.

Altitude
test chambers

Customized altitude test chambers

A wide range of solutions are available for any customer requirements.
Our company has extensive experience in supplying equipment for applications in aerospace, avionic industry and defence to worldwide customers.

2000 l capacity altitude chamber equipped with thermoregulated air blowing system

Altitude chamber for testing airborne large components, fully complying with MIL-STD-810-G Procedure I, II, III

Altitude chamber combined with vibration system, special standard requested: DEF STAN 00-35 CL9 severities B C Y E

Focus on features

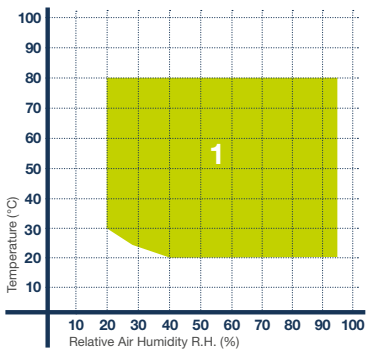
Basic Configuration

- **Weazy™**
- **Inspection window**: multiple-crystal, with double heated transparent film, 300h X 300 mm size
- **Internal lighting**
- **Feet**: height adjustable
- **Closing**: mechanical
- **Porthole**: 100 mm (right side). This allows internal-external electrical, mechanical or hydraulic connections
- **Thermostat**: max./min. digital thermostat with independent probe
- **Auxiliary contacts** (specimens, alarms)
- **Interface**: Ethernet port for remote control system connection and RS232
- **Water condenser**

Options

- **Additional portholes**: 50, 100 and 160mm, see drawing for available positions
- **Internal shelves**: AISI 304 stainless steel
- **Max temperature extension**: limit at +180°C
- **Min pressure extension**: limit at 1 mbar
- **Set of no.4 analogic inputs:** 4÷20 mA for user's data acquisition (no. 1 set max)
- **Set of no. 4 PT100 inputs** (no.1 set max)
- **Set of no. 8 auxiliary contacts** (no.1 set max)
- **No break power unit for PLC**
- **Remote air condenser**
- **Wall cooling** (excluding door) with dedicated temperature sensor
- **Wall cooling/heating** (excluding door) with dedicated temperature sensor
- **MyAngel24™**
- **WinKratos S/W**

Humidity diagram



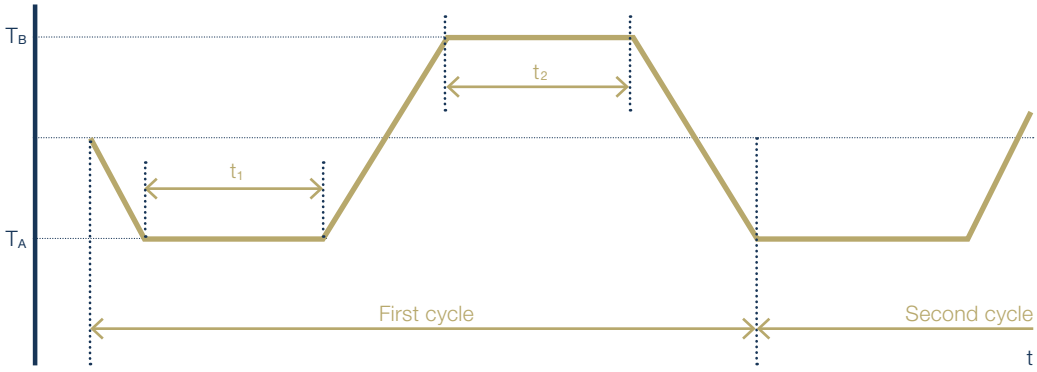
1. Standard working range

Two test methods just in one chamber

ACS has enriched its offer with “ES” altitude chambers, able to perform:
Temperature Rate of Change (at ambient pressure):

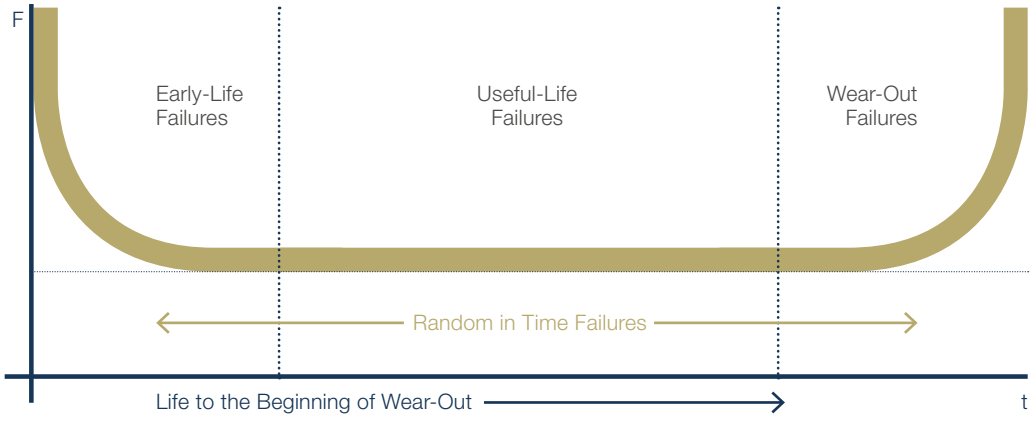
Heating: 5°C/min from -55°C to +85°C
Cooling: 5°C/min from +85°C to -55°C

Thermal cycle stress IEC 60068-2-14, test Nb



Stress screening ensures that defects, which normally arise during the product’s useful life, are discovered during testing prior to the pre-production phase.

Bathtube curve



The ES altitude chambers allow the best cost effectiveness using the same chambers to perform vacuum and stress screening test that can force infancy failures that would otherwise occur after final assembly and product delivery, and potentially during the warranty period

Altitude test chambers / **Technical features**

	MODEL[1]	UD150 C	UD500 C	UD1000 C	UD500 C ES	UD1000 C ES
Useful capacity (l)		151	544	1041	544	1041
Internal dimensions approx. (mm)	WIDTH	600	800	1010	800	1010
	DEPTH	500	800	1010	800	1010
	HEIGHT	500	850	1020	850	1020
External dimensions approx. (mm)	WIDTH	1200	1312	1528	1312	1528
	DEPTH	2630	2945	3455	2885	3455
	HEIGHT	2190	2490	2290	2490	2290
Temperature Range (°C) *pressure value > 300mbar*		-70...+100	-70...+100	-70...+100	-70...+100	-70...+100
Temperature fluctuation (K)		±1	±1	±1	±1	±1
Temp. changing rate Heating [4+5] (K/min)	(-70/+100°C)	2	1,6	3,5	NA	NA
Temp. changing rate Cooling [4+5] (K/min)	(+100/-70°C)	3,8	1,6	2,5	NA	NA
Temp. changing rate Heating [5] (K/min)	(-55/+85°C)	NA	NA	NA	5	5
Temp. changing rate Cooling [5] (K/min)	(+85/-55°C)	NA	NA	NA	5	5
Humidity range (%) [2]		20...95	20...95	20...95	20...95	20...95
Temp. range for climatic test (°C)		20...80	20...80	20...80	20...80	20...80
Humidity fluctuation (%)		± 3...± 5	± 3...± 5	± 3...± 5	± 3...± 5	± 3...± 5
Min pressure (mbar)		10	10	10	10	10
Pressure Fall down time to 10mbar (min.)		12	13	18	13	18
Rated power (kW)		18	22	34	31,5	45
Rated current absorption (A)		34	39	57	55	83
Weight (without packing) (kg)		1600	2100	2900	2200	3000
Sound pressure level dB(A) [3]		65	65	65	68	73
Max water consumption (m^3/h) [6]		2,4	3,2	5,8	5,8	8,7
Heating/Cooling of the walls (door excluded) pressure value < 300mbar [5] (°C) *(probe on the wall)*		+85...-70	+85...-70	+85...-70	+85...-70	+85...-70
Supply voltage (Vac)		400V ±10%/50Hz/3 + N + G				

1. For Temperature only version change the prefix UD with TD - **2.** t=+4°C/+79°C for continuous test - **3.** Measured at 1 m distance in front of the unit in 1,6 m height, free field measurement - **4.** According to IEC 60068-3-5 and IEC 60068-3-6 - **5.** The performance data refer to +22°C ambient temperature, 400V nominal voltage, without specimen - **6.** With water at T +29°C and temperature difference at 5°C (water temperature range +12÷+29°C)

weazy™ a lightweight, responsive and unique HMI for ACS chambers

Weazy™ is the onboard HMI, providing an intuitive and responsive interface for our powerful Control System, designed for use across an extensive range of our chambers.

Available on 10 inch display

Simple to use graphical interface

Clarity, consistency and efficiency of use

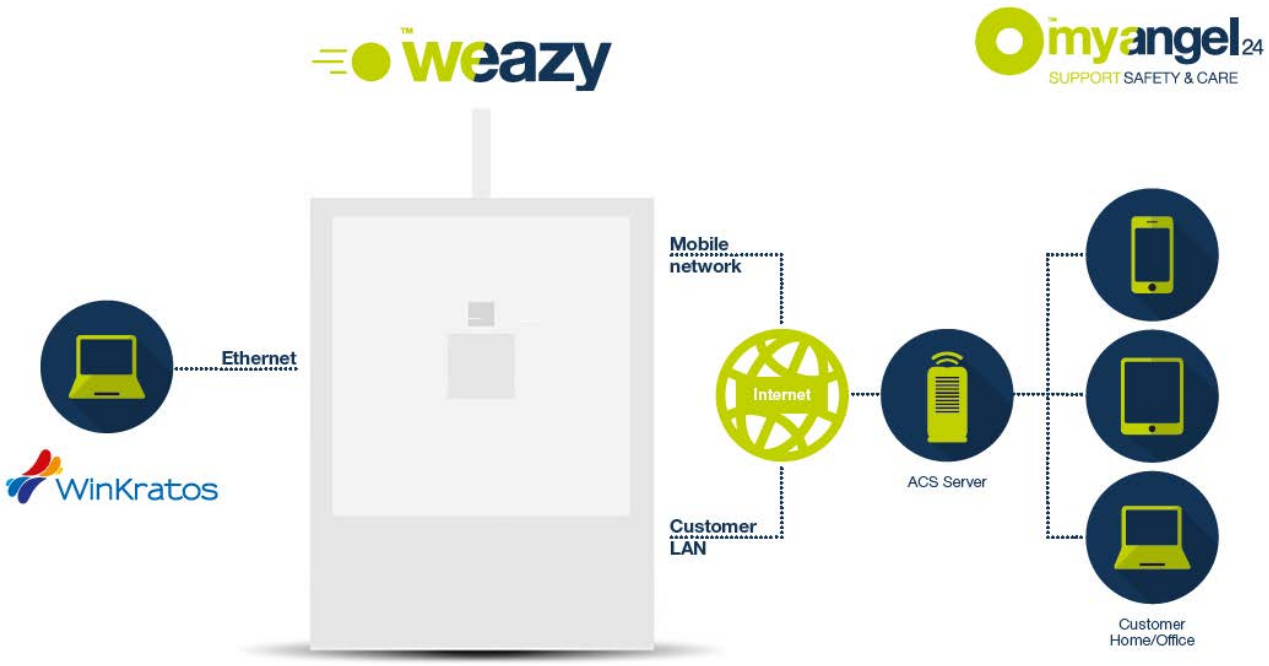
Fully Modular and User-Configurable Control System

The chamber is equipped with a **PLC** (Programmable Logic Controller) for managing all the chamber's functions and safety interlocks.

The chamber basic control is supplied by **Weazy™**, a very flexible HMI accessible on the 10 inch on board display.

WinKratos (optional) allows the complete management of the chamber functions: from manual control to the creation (through the graphic editor) of test profiles, including monitoring and recording, processing, graphical representation and analysis of data.

MyAngel24™ (optional) is the Advanced Services Platform developed by ACS to offer fast, effiicient and secure remote activities, allowing Automatic Reporting and Preventive Maintenance.



Weazy™ HMI makes it possible to manage and monitor the chamber via the 10” on-board panel.

Main features

- Ethernet connection to the chamber
- Visualization of measures and recordings
- High configurability of chamber parameters
- Program and Manual chamber operation modes
- Delayed start of a program
- Automatic notifications of events and alarms
- 7 days data storage
- System available in several languages

Test program editor

- Possibilities for storing cycles of 370 segments delaying their execution
- Internal repetitions of 10 groups of segments up to 999 times each
- Possibility to upload, edit, export, and delete already existing cycles
- Numeric profile parameters data entry

Graphic functions (Graphic viewer)

- Live data update of measures on the charts
- Graphic charts or numeric table representation views on the monitor
- Enable/disable of chart display
- Zoom in, zoom out and scroll functions

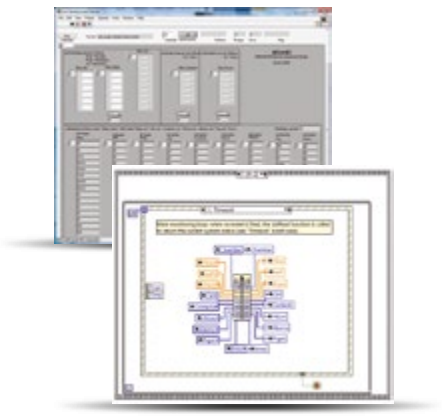
Export function to convert the Weazy™ log file into ASCII format (usable in Excel or other applications)

Additional S/W tools for an Easy Integration of ACS test chambers in Test Labs

Communication drivers for an easy integration into customer-developed Serial or Ethernet based applications, (LabVIEW, LabWindows CVI, Microsoft.NET, Visual Basic 6, etc…) can be supplied on request. The drivers come with a set of examples written in Visual Basic 6, LabView, LabWindows CVI, VB.NET, and permit total interaction with ACS test chambers, for both reading and writing.

Our communication protocol - ModBUS RTU for serial or Fetch/write for Ethernet communication, can be supplied to allow any chamber connection using the customer’s own programming languages and operating systems.

Example program LabVIEW
User interface



Development environment

MyAngel24™
ACS Advanced Services Platform

MyAngel24™ is the Advanced Services Platform developed by ACS for its customers. The system offers services designed to satisfy and anticipate customer needs, such as automatic reporting, remote chamber control, and monitoring of the main components status for preventive maintenance.
The chamber can be connected to Angelantoni servers through SIM card via mobile network or, through LAN connection via Ethernet.

Diagnostics

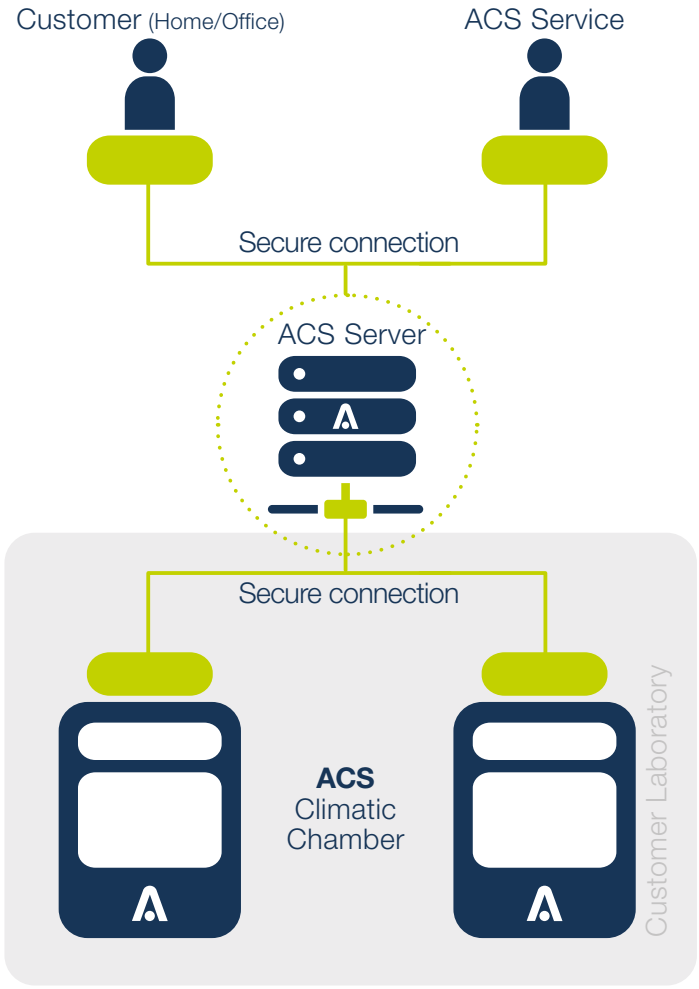
With **MyAngel24™**, the climatic chambers stay connected to the remote server 24 hours a day, monitoring running conditions in order to guarantee faster and more efficient service and activities

Accessibility

With **MyAngel24™**, you can stay in contact with the climatic chamber whenever you want and wherever you are, accessing its control panel from any web browser.

Security

MyAngel24™ uses the highest security standards available for authentication, secure connection, and storage. Moreover, you can suspend or limit the data sent to the central server for security reasons during one or more test sessions.



Control and Supervision Software for ACS Environmental Test Chambers

WinKratos is the Advanced Software developed by Angelantoni Test Technologies for the control and supervision of ACS environmental test chambers. Designed for comprehensive and intuitive management, the software enables full control of chamber functions, from manual operation to the creation of customized test profiles via a graphical editor.

WinKratos integrates advanced tools for monitoring, data recording, processing, and analysis, providing detailed graphical representations for optimal test management. Reliable and field-proven, the software supports the simultaneous management of multiple ACS chambers, offering exceptional flexibility to meet the specific testing requirements of each customer

Installed on a dedicated PC, WinKratos allows centralized control of multiple chambers from a single workstation.

The desktop-style graphical interface is designed for quick and intuitive access to all functions, simplifying system operation.

Additionally, the integration with a PC ensures scalable performance and expandable data storage capacity to meet operational needs.

Angelantoni Test Technologies, owned by the **Angelantoni Group**, is the only company capable of offering a comprehensive range of environmental test chambers - **ACS** branded - for a great variety of applications, thanks to the expertise and technical know-how of its teams of experts. Innovation, flexibility and organization have always been the keys to success for ACS, world-famous since 1952 also for its high-tech test equipment such as Thermal High Vacuum Chambers for Aerospace applications and Calorimeters.

ENVIROMENTAL SYSTEM CERTIFICATION DNV·GL ISO 14001

QUALITY SYSTEM CERTIFICATION DNV·GL ISO 9001

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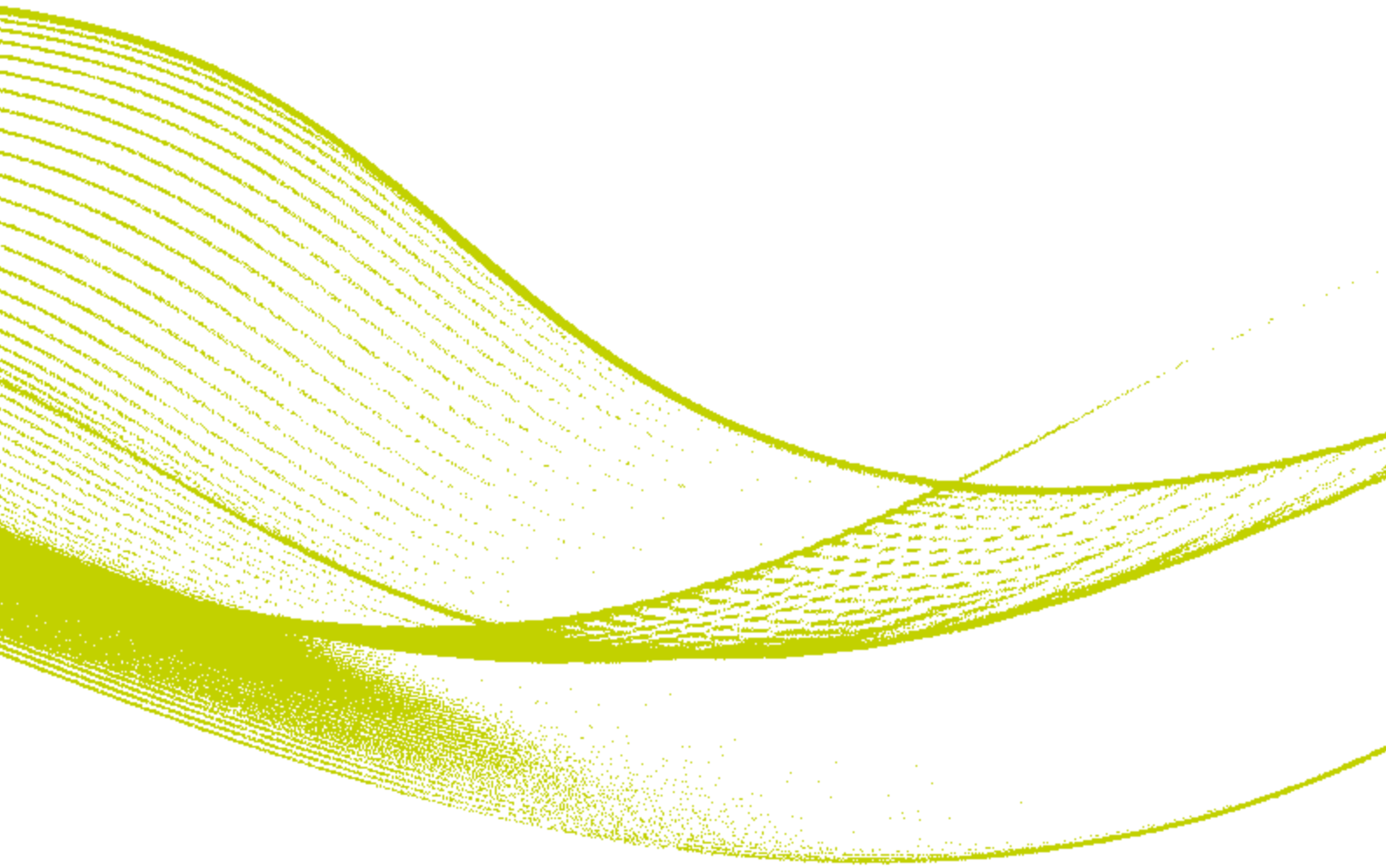

EN

Angelantoni
TECHNOLOGY FOR LIFE

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