

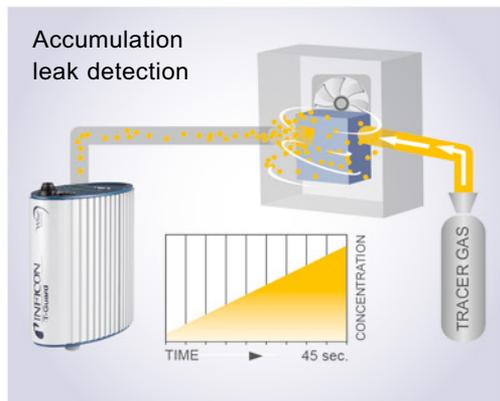
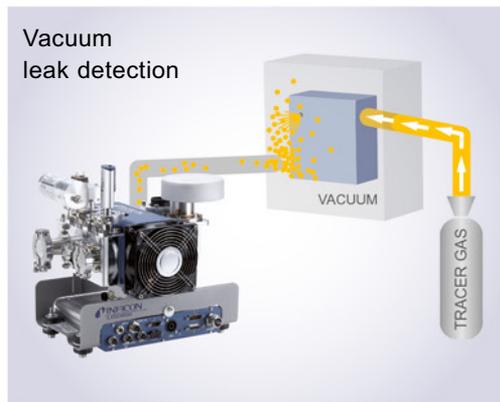
# Leak testing in the automotive industry

Applications for Component Manufacturing  
and Final Testing



## LEAK TESTING METHODS

INFICON offers a wide variety of leak detection options for the various leak testing methods available in the manufacturing of automotive components and sub-assemblies.



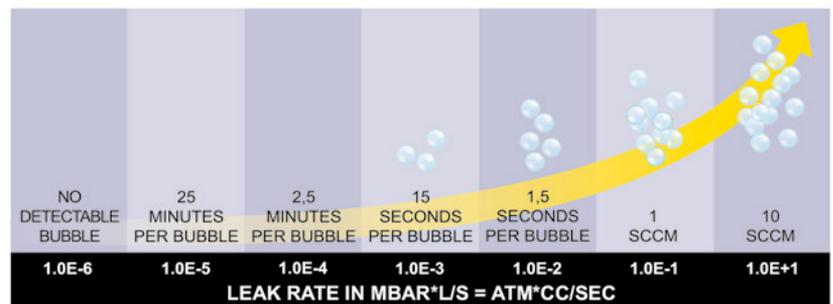
## INFICON IS THE IDEAL SUPPLIER FOR YOUR LEAK DETECTION NEEDS

- Leak testing with more than 100 times more sensitivity compared to water bath or pressure decay testing
- Leak location up to ten times faster for e.g. engine testing
- Dependable, accurate measurements
- High repeatability and reproducibility
- Extremely reliable leak detectors offering low cost of ownership
- Leak detectors for helium, hydrogen and final medium e.g. refrigerants, natural gas, fuel, etc.
- Leak detection as well as easy leak location
- Easy to operate

## TYPICAL APPLICATIONS

- Quality Assurance of components, sub-assemblies in component production and final assembly, as well as for rework loops
- Leak testing in garages and service centers

## COMPARISON OF BUBBLE TESTING TO DETECTABLE LEAK RATES



## ABOUT INFICON

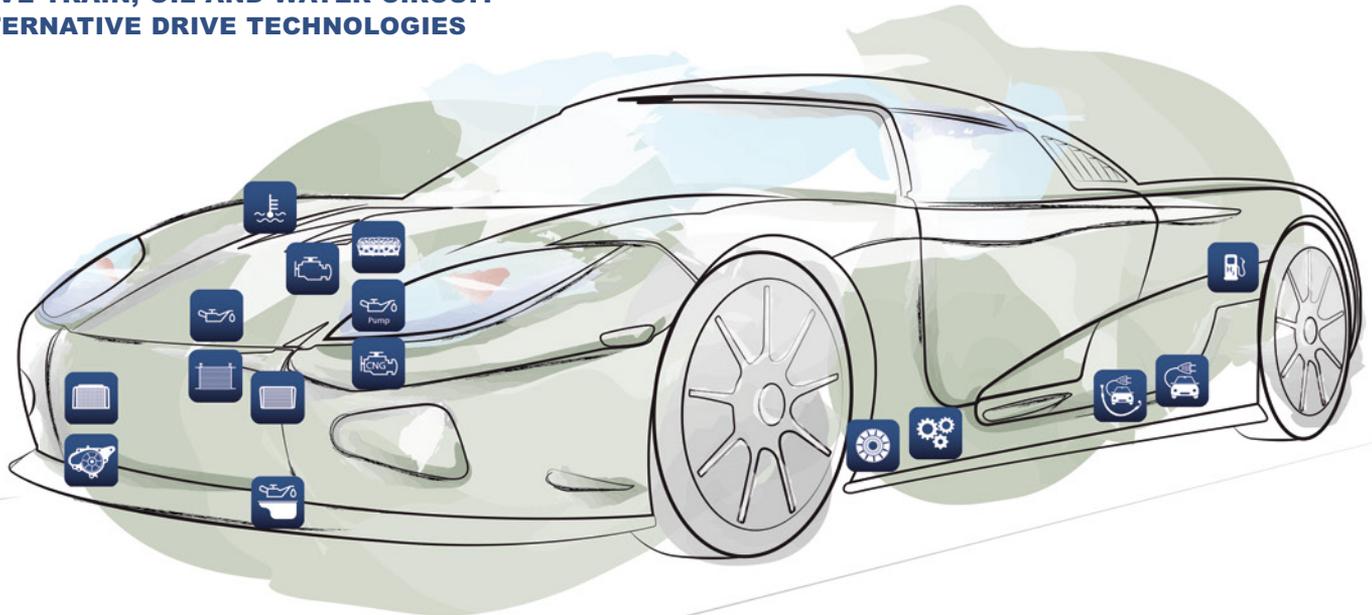
INFICON is a global provider of innovative instrumentation, critical sensor technologies and advanced process control software used for leak detection in air conditioning, refrigeration, and automotive manufacturing.

INFICON employs approximately 950 people worldwide, including more than 350 in North America.

INFICON technologies set quality-control standards for leak detection at automotive manufacturing facilities around the globe. Innovative INFICON helium, hydrogen and refrigerant gas leak detectors are used for checking a variety of components and subassemblies. Auto makers and their suppliers utilize INFICON products to ensure quality throughout their manufacturing and assembly operations.

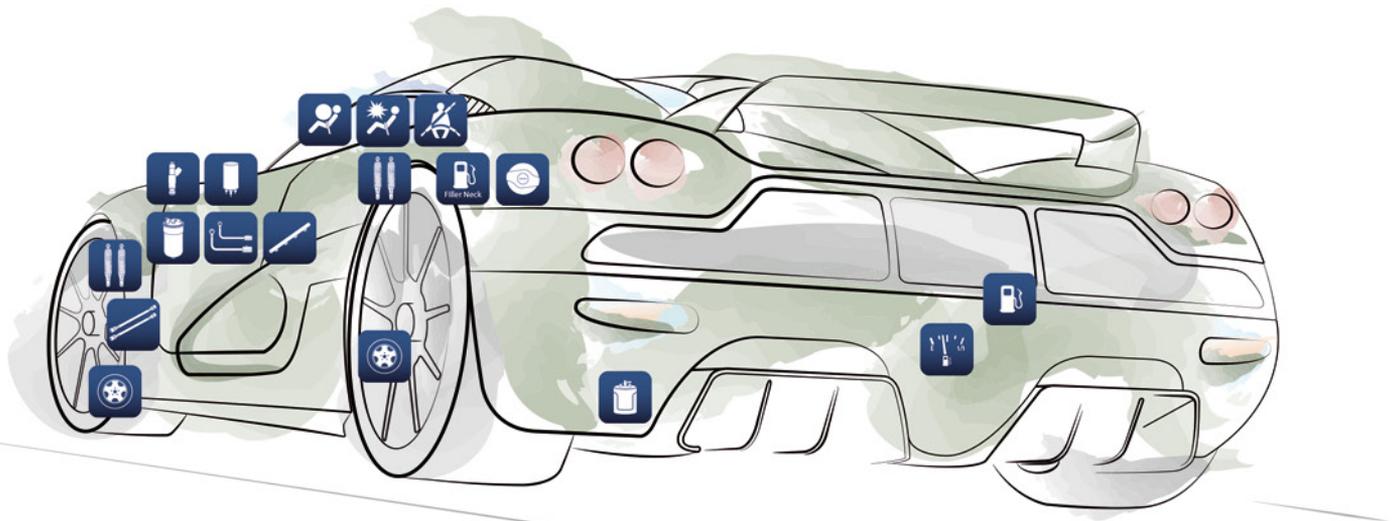
# Reliable, accurate tools for any of your leak detection tasks

## COMPONENTS TESTING: DRIVE TRAIN, OIL AND WATER CIRCUIT ALTERNATIVE DRIVE TECHNOLOGIES



							
Engine block	Engine head	Transmission	Torque converter	Charge-air intercooler	Plastic oil tank	Oil cooler	Oil pan
<b>Typical leak rates in mbar · l/s or atm · cc/s (in sccm)</b>							
10 <sup>-1</sup> - 10 <sup>-2</sup> (1 - 12)	10 <sup>-1</sup> - 10 <sup>-2</sup> (2 - 12)	10 <sup>-1</sup> ...1 (5 ... 100)	10 <sup>-3</sup> - 10 <sup>-4</sup>	~ 10 <sup>-3</sup>	~ 10 <sup>-3</sup>	10 <sup>-2</sup> ...10 <sup>-4</sup>	~ 10 <sup>-2</sup>
<b>Recommended INFICON products</b>							
Sensistor Sentrac	Sensistor Sentrac	Protec P3000(XL) Sensistor Sentrac T-Guard	T-Guard LDS3000	T-Guard LDS3000	T-Guard	Modul1000 LDS3000 Sensistor ISH2000 T-Guard	T-Guard Sensistor ISH2000
							
Oil pump	Coolant expansion tank	Water cooler	Water pump	E-car battery	E-car battery cooling hoses	Natural gas engine	Hydrogen fuel tank
<b>Typical leak rates in mbar · l/s or atm · cc/s (in sccm)</b>							
10 <sup>-2</sup> ... 10 <sup>-1</sup> (1 ... 10)	10 <sup>-2</sup> ... 10 <sup>-1</sup> (1 ... 10)	~ 10 <sup>-2</sup>	10 <sup>-2</sup> ... 10 <sup>-1</sup> (2 ... 15)	~ 10 <sup>-1</sup> (4 - 10)	10 <sup>-4</sup> - 10 <sup>-5</sup>	10 <sup>-4</sup> - 10 <sup>-5</sup>	10 <sup>-4</sup> - 10 <sup>-5</sup>
<b>Recommended INFICON products</b>							
Modul1000 LDS3000 T-Guard	Sensistor ISH2000 T-Guard	Sensistor Sentrac T-Guard LDS3000	Modul1000 LDS3000 T-Guard	T-Guard Protec P3000(XL)	Protec P3000(XL)	Protec P3000(XL)	Protec P3000(XL)

**COMPONENTS TESTING:  
FUEL SYSTEMS, SAFETY FEATURES AND MORE**

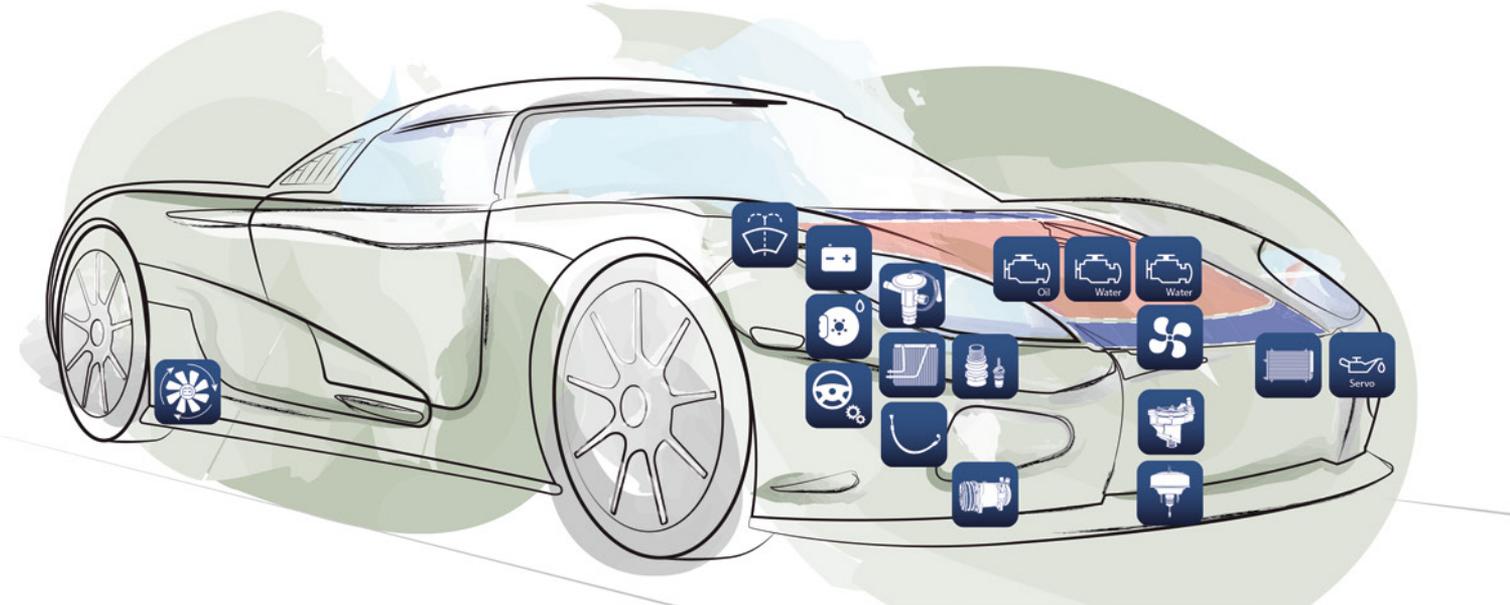


 Fuel tank	 Tank filler neck	 Tank filler cap	 Fuel tank sending unit	 Swirl pot (Diesel)	 Fuel injector	 Fuel pump	 High pressure fuel rails
<b>Typical leak rates in mbar · l/s or atm · cc/s (in sccm)</b>							
10 <sup>-4</sup> - 10 <sup>-6</sup>	~ 10 <sup>-4</sup>	~ 10 <sup>-4</sup>	~ 10 <sup>-4</sup>	10 <sup>-2</sup> - 10 <sup>-4</sup>	10 <sup>-4</sup> - 10 <sup>-5</sup>	10 <sup>-4</sup>	10 <sup>-4</sup> - 10 <sup>-6</sup>
<b>Recommended INFICON products</b>							
Modul1000	T-Guard	T-Guard	T-Guard	T-Guard	T-Guard	T-Guard	T-Guard
LDS3000	LDS3000	Protec P3000(XL)			Sensistor ISH2000	Sensistor ISH2000	LDS3000
 Fuel lines	 Diesel fuel filter	 Wheels	 Shock absorber	 Brake hoses	 Seat belt pretensioner	 Airbag ignitor caps	 Airbag generator
<b>Typical leak rates in mbar · l/s or atm · cc/s (in sccm)</b>							
10 <sup>-4</sup> - 10 <sup>-6</sup>	10 <sup>-4</sup> - 10 <sup>-6</sup>	~ 10 <sup>-4</sup>	~ 10 <sup>-4</sup>	10 <sup>-3</sup> - 10 <sup>-4</sup>	10 <sup>-3</sup> - 10 <sup>-4</sup>	~ 10 <sup>-4</sup>	Cold gas: ~ 10 <sup>-4</sup> Hot gas: 10 <sup>-3</sup> - 10 <sup>-4</sup>
<b>Recommended INFICON products</b>							
T-Guard	T-Guard	Modul1000	Modul1000	T-Guard	Modul1000	Modul1000	Modul1000
Sensistor Sentrac	Sensistor ISH2000	LDS3000	LDS3000		LDS3000	LDS3000	LDS3000

# leak detection expertise from a single source!

**COMPONENTS TESTING:  
AC SYSTEMS, VARIOUS**

**FINAL ASSEMBLY TESTING:  
AC SYSTEM, ENGINE, E-DRIVE**



Power steering housing	Servo oil reservoir	Windshield wiper fluid can	Starter battery	Brake fluid reservoir	Power brake booster	Vacuum brake pump	AC hoses	AC compressor
<b>Typical leak rates in mbar · l/s or atm · cc/s (in sccm)</b>								
10 <sup>-2</sup> - 10 <sup>-4</sup>	10 <sup>-2</sup> - 10 <sup>-4</sup>	~ 10 <sup>-2</sup>	~ 10 <sup>-3</sup>	10 <sup>-3</sup> - 10 <sup>-4</sup>	10 <sup>-3</sup> - 10 <sup>-4</sup>	~ 10 <sup>-1</sup> (5 - 20)	10 <sup>-4</sup> - 10 <sup>-5</sup>	10 <sup>-4</sup> - 10 <sup>-5</sup>
<b>Recommended INFICON products</b>								
T-Guard	T-Guard	Sensistor ISH2000	T-Guard	T-Guard	T-Guard	T-Guard	T-Guard	T-Guard
Sensistor ISH2000	Sensistor ISH2000	T-Guard	Sensistor Sentrac					LDS3000
								Modul1000
AC evaporator	AC condenser	AC filling valve	Expansion valve	Air conditioning systems	Engine oil circuit	Engine water circuit	Engine fuel circuit	Cooling circuit E-battery
<b>Typical leak rates (mbar l/s)</b>				<b>Typical leak rates in mbar · l/s or atm · cc/s (in sccm)</b>				
10 <sup>-4</sup> - 10 <sup>-5</sup>	10 <sup>-4</sup> - 10 <sup>-5</sup>	10 <sup>-4</sup> - 10 <sup>-5</sup>	10 <sup>-4</sup> - 10 <sup>-5</sup>	5 g/a refrigerant per joint	~ 10 <sup>-1</sup> (~ 10)	~ 10 <sup>-1</sup> (~ 10)	10 <sup>-3</sup> - 10 <sup>-5</sup>	5 g/a refrigerant per joint
<b>Recommended INFICON products</b>				<b>Recommended INFICON products</b>				
T-Guard	T-Guard	T-Guard	T-Guard	HLD6000	Sensistor Sentrac	Sensistor Sentrac	T-Guard	HLD6000
LDS3000	LDS3000	LDS3000	LDS3000	Ecotec E3000		Protec P3000(XL)	Sensistor Sentrac	Ecotec E3000
Modul1000	Modul1000	Modul1000	Modul1000				Ecotec E3000	

Final Assembly

# A wide range of leak detection products for your automotive application



## PROTEC® P3000(XL) HELIUM LEAK DETECTOR

Protec P3000(XL) is specifically designed for full-time sniffing applications in industrial production environments. Its patented Wise Technology® sensor offers highest availability and low cost of ownership. Protec P3000XL is designed to prevent operator errors and allows the operator to detect leaks in even difficult to reach locations. It is ideal for detecting gaseous leaks.



## LDS3000 HELIUM AND HYDROGEN LEAK DETECTOR

LDS3000 is a modular leak detector used in integrated leak detection chamber systems. Its compact design and variety of interfaces and protocols allows for easy integration into automated testing systems. An optional touch screen display enables easy operation.



## SENSISTOR™ ISH2000 HYDROGEN LEAK DETECTOR

Sensistor ISH2000 is a leak detector for automatic and accumulation systems. The use of a low cost forming gas (5% hydrogen in 95% nitrogen) makes it a low cost solution for many applications. The Sensistor ISH2000 is ideal for finding very small leaks that would allow leaking of liquids such as water, liquid fuel or oils.



## MODUL1000 HELIUM LEAK DETECTOR

Modul1000 is a plug and play leak detector for universal integration into industrial leak testing systems (vacuum or sniffer mode). With flexible vacuum architecture, the Modul1000 provides the adaptability to accommodate changes in production specifications.



## SENSISTOR SENTRAC™ LEAK DETECTOR

Sensistor Sentrac is a dedicated leak sniffer offering leak locating in a variety of situations, both on the production and repair lines. High selectivity, wide dynamic range and short recovery time make this detector highly adaptable. The Sensistor Sentrac - which uses 5% hydrogen in 95% nitrogen as tracer gas - excels in finding fluid leaks and is sensitive enough for finding gas leaks.



## T-GUARD™ LEAK DETECTION SENSOR

T-Guard is a leak detection sensor for use in integral leak testing of components. Through the use of the patented Wise Technology sensor T-Guard can be used in leak testing chamber systems without the need for vacuum. It offers the sensitivity of helium leak testing at the price of pressure decay systems, and is ideal for testing warm, wet or dirty parts.



## ECOTEC® E3000 MULTI-GAS LEAK DETECTOR

Ecotec E3000 allows the operator to detect leaks by sniffing for the escape of a final medium like fuel or refrigerant. The unit can detect four gases selectively at any time. Ecotec E3000 is designed to minimize operator error and to maximize reliability of testing.



## SERVICE LEAK DETECTORS

D-TEK® Select, Compass® and TEK-Mate® are refrigerant leak detectors for vehicle air conditioning service. The Whisper ultrasonic leak detector is a versatile tool useful in detecting leaks of any gas under pressure or vacuum, diagnosing solenoid operations and detecting worn pistons and bearings. Service leak detectors are battery operated tools, designed to maximize productivity on the job site.



## HLD6000 REFRIGERANT LEAK DETECTOR

HLD6000 is a sniffer leak detector for testing air conditioning assemblies. It is available for hydrocarbons (R134a, R1234yf) as well as for CO<sub>2</sub>. Its dual inlet technology guarantees high reliability and repeatability of results, even in environments with an increased concentration of refrigerant.

 **INFICON** Instruments for Intelligent Control®

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Due to our continuing program of product improvements, specifications are subject to change without notice.

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