



OIL AERATION GENERATOR : **AIR-MIX**



TECHNICAL BROCHURE

DSi : AIR-MIX, THE RIGHT TOOL TO GENERATE AERATION

Air-Mix allows to generate controlled aeration.

DSi provides the Air-Mix generator services as a full package that includes activation services, equipment sales and renting and qualified manpower.

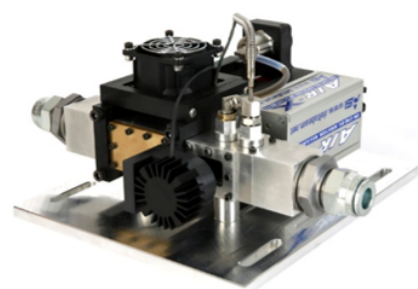
Our flexibility allows us to provide turnkey testing services that allows to benchmark your deaerator systems.

The Air-Mix methodology combines 2 subsystems :

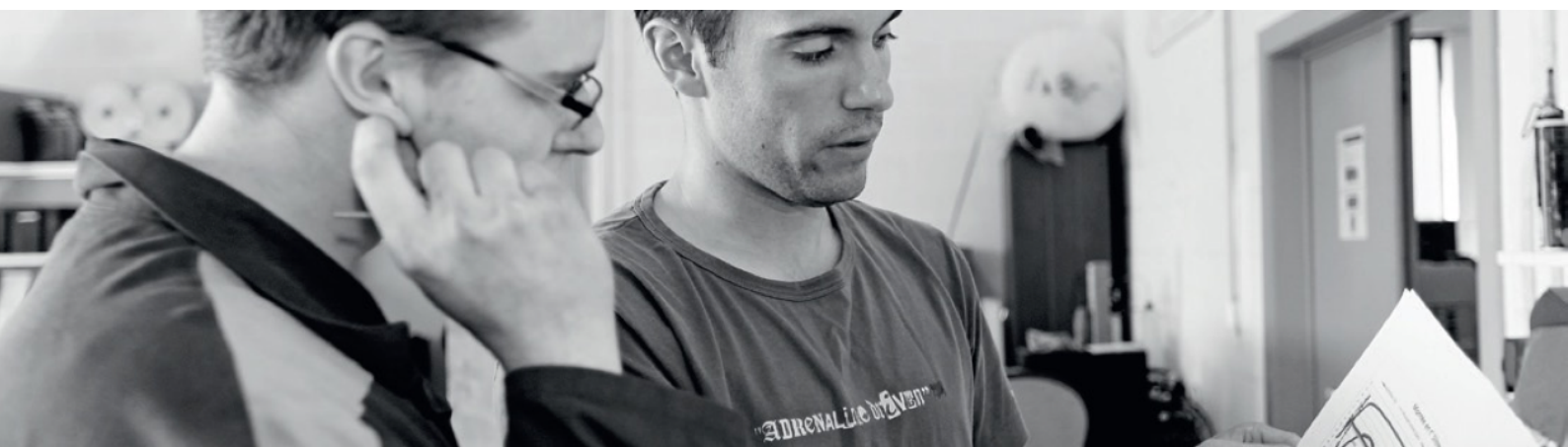
An aeration generator that covers a wide range of aeration levels between 0 and 75% & our Air-X equipment for on-line measurement of oil aeration.



AIR-MIX Oil Aeration Generator



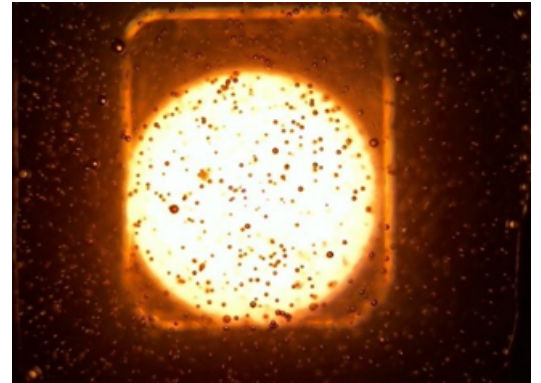
AIR-X equipment



The presence of air in the fluid of a working hydraulic system can cause significant performance problems. Mixed air may be in an entrained or dissolved state and it can directly affect such fluid parameters as density, bulk modulus, sonic velocity, etc.

Consequences can be the following:

- Loss of lubricity
- Higher oil temperatures
- Wasted horsepower
- Cavitation problems
- Noisy operation



Example of aeration visualization
by Air-X

In real operating conditions, high aeration level occurs when :

- the engine is tilted (off-road applications)
- oil level decreases in the sump
- engine speed is kept high over long period

The power of Air-Mix on aeration reproduction :



Air-Mix reproduces these conditions by delivering a very homogeneous mixture of oil and air.



The impact of aeration can be studied on undergoing mechanical systems.



Air-Mix allows comparing aeration produced by various lubricants for predefined conditions of the generator.



The generator can be combined with TLA/RNT equipment for on-line monitoring of wear of a critical part.

Air-X is able to sample and evaluate oil from atmospheric or pressurized lines in an operating hydraulic system.

Air-X has been designed for on-line monitoring of oil aeration in a running mechanical system (engine, oil pump, gear box, hydraulic circuit, etc.). The operating principle is based on an accurate density measurement using X-ray transmission combined to X-ray spectrometry analysis. An oil sample coming from the mechanical system is circulated continuously into a measuring chamber where the density measurement is performed.

Particularly suitable for stationary dyno, tilt rig, on-board and dry sump applications, it is a lightweight and ruggedized compact measuring chamber to be fitted close to the mechanical system. The electronics is deported to reduce the size at its best.

All measurement data (oil temperature, oil pressure and gas content) are recorded and can be visualized on a graphic during operation of Air-X. A dedicated routine is also provided, which allows converting the results to a .csv format.

DSi team has acquired a strong expertise in assisting engineers to understand and solve aeration problems.

Our services include :

- Service measurement with Air-X equipment in the customer facilities
- Service measurement at DSi including rent of engine test tools
- Solving aeration problems by adapting the oil circuit and lubricant properties
- Training on the aeration process (theoretical and practice)
- Design and manufacturing of dedicated test rigs for aeration measurement
- Development of special configuration in the hydraulic and mechanical industries



The tables hereunder show the performances and technical specifications of both Air-Mix and Aix-X.

Air-Mix

Aeration range (Air-Mix)

Measuring range (Air-X system)

Oil volume in Air-Mix tank

Operation T° range

Pressure range

Flow rate range

Hydraulic connectors

Power requirements

Power consumption

Control

Communication

0-25% homogeneously aerated oil
0-75% for scavenge systems simulation

0% to 100% air

10 to 400 L

0°C to 180 °C (on request)

Up to 10 bars

From 1 to 200 L/min

Metric, JIC, NPT, BSP or Wiggins

Standard electrical power supply 50 - 60 Hz

Depending on specifications

LabVIEW software or remote control

CAN, Profibus or Modbus

Air-X

Oil flow in aeration measuring chamber

Accuracy in terms of aeration results

Measurement

0,5 L/min to 80 L/min

At 10 s (100 s) acquisition time: 0.5% (0.2%)

On-board or on test benches (tilted)





: YOUR RELIABLE PARTNER FOR THE DEVELOPMENT OF ENGINES & LUBRICANTS

For 20 years, DSi has supplied industrial equipment to offer accurate engine and lubricant testing.

DSi is a range of innovative services designed to enhance your R&D and is a world leader in the use of radiotracer techniques.

Our customers are from the automotive, lubricant, and aeronautic industries. We work as R&D partners for the development of new products and for a quick solving of your technical problems.



We supply industrial equipment and measurement services worldwide such as :

- Engine oil consumption
- Oil Aeration measurement
- Engine wear measurement
- Fuel dilution measurement
- After treatment systems
- Test rigs and ancillary equipment
- Tribology and aeronautics
- Valvetrain and cylinder head test stand

Our R&D programs are presently carried out in cooperation with the following research centres:



UNIVERSITY OF
BIRMINGHAM



UCLouvain



UNIVERSITÉ
LIBRE
DE BRUXELLES



LIÈGE
université

DSi offers industrial products for engine and lubricant testing.

Why should you work with DSi ?

- ✓ Selecting DSi is choosing a fully independent contract service centre with modern engine test equipment associated to innovative radiotracing tools.
- ✓ The real-time results produced by our equipment offers a significant reduction of your development time and associated testing costs.
- ✓ Our highly qualified and experienced technical staff always keep informed our customers continuously during every project.
- ✓ The strength of DSi is the motivation generated by our passion and shared with our customers.
- ✓ The advanced technology and flexibility of our company creates new possibilities to our clients by developing customised and unique solutions.



CUSTOMER SATISFACTION



INNOVATION



PASSION



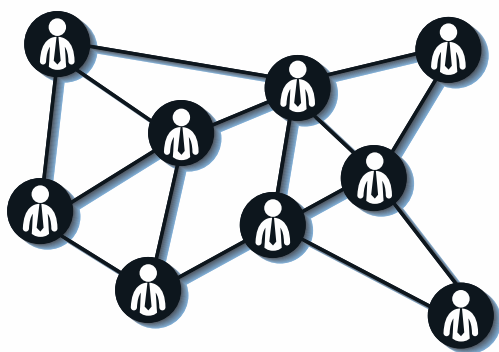
QUALITY



TEAM SPIRIT



MISSION



STAY CONNECTED TO



AT ANYTIME, ANYWHERE !



DELTA SERVICES INDUSTRIELS (DSI) SPRL



3 RUE MONT D'ORCQ (TOURNAI-OUEST),
B-7503 FROYENNES - BELGIUM



PHONE : +32 69 64 06 04



E-MAIL: INFOS@DELTABEAM.NET