

*“Efficient Aircraft Decompression  
Analysis for complex projects”*

***ESONIX******II***

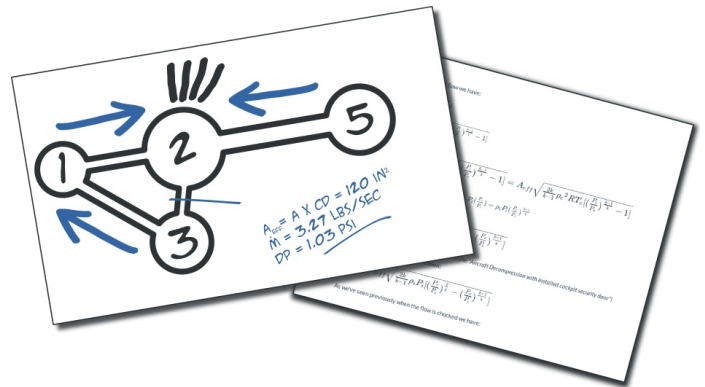
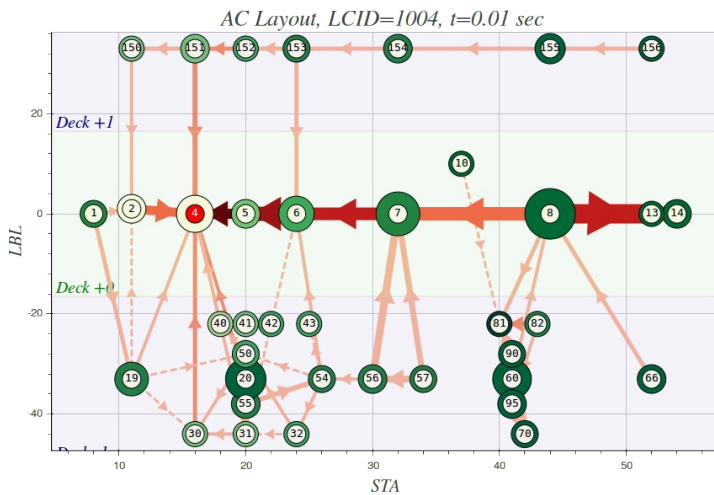
[www.aero-sonix.com](http://www.aero-sonix.com)

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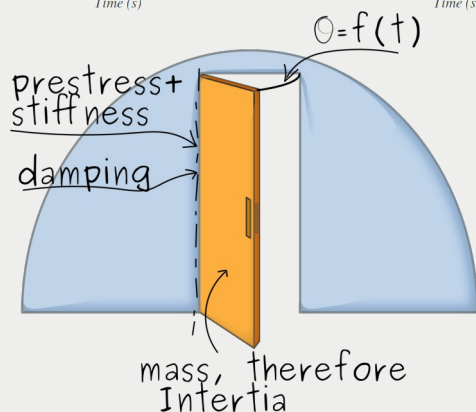
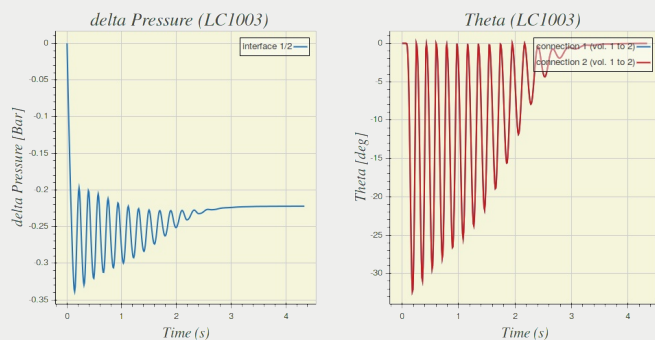
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## The first online public application to simulate Aircrafts Explosive decompressions

Decompression runs are traditionally costly with long lead time. numeric GmbH provides a flexible, highly responsive tool, with a **high post-processing added value**.



By using Esonix ([www.aero-sonix.com](http://www.aero-sonix.com)), you bring to your company a major asset to increase your productivity: you just forget the decompression loops bottlenecks!



## Dynamic Opening

**New in Esonix2!**

Starting from rev.2, Esonix now integrates dynamical opening behaviour for hinged and translational decompression panels.

**Esonix takes care of opening times for you**

Certification authorities are more demanding than before about decompression panels opening times.

Given a few data for the opening feature (e.g. mass, length x width, and even hinge stiffness, prestress and damping if required), **Esonix will dynamically compute for each time step the resulting venting area**, depending on the actual pressure differential applied to it!

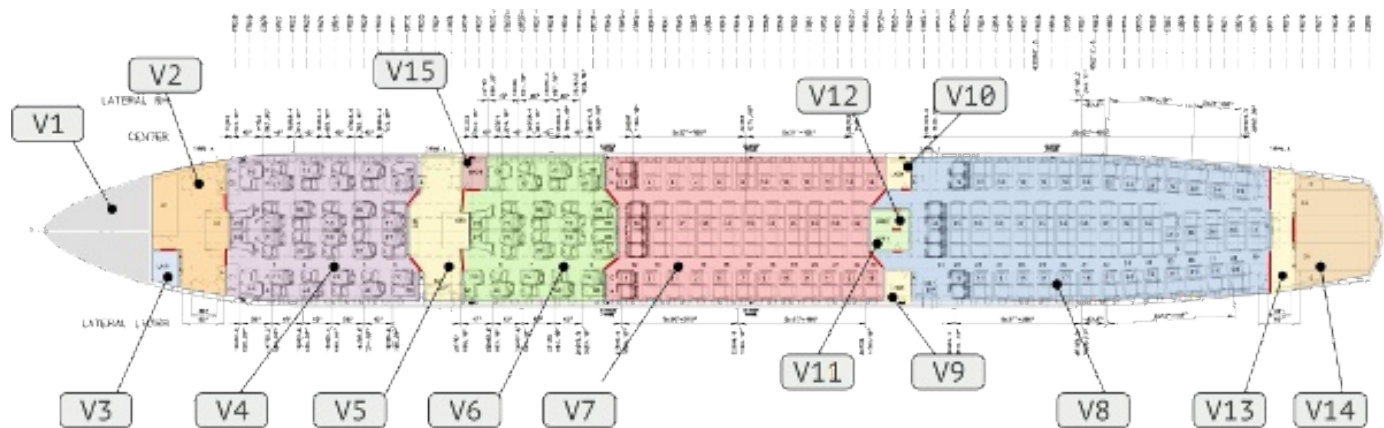
Opening angles area available in the output for a

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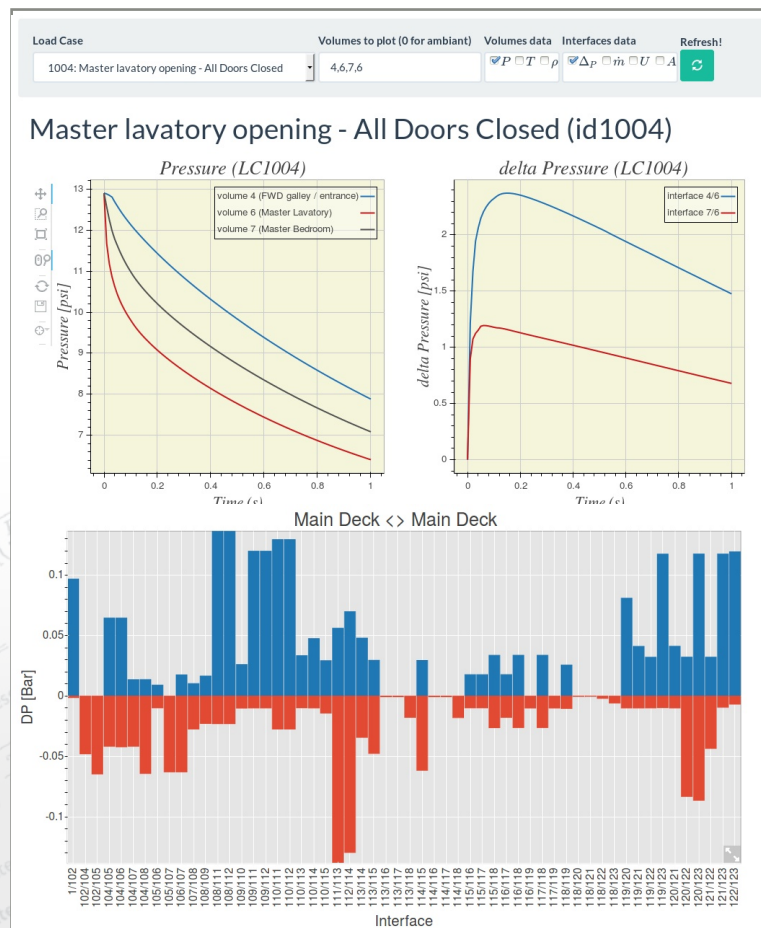
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## Easy to learn, easy to use

The easy and intuitive interface is learned in an hour, and let you build a wide-body Aircraft model in a day.



## Faster results comprehension



Esonix is not only a decompression simulator; it is also a very powerful yet user-friendly post-processor.

Classical services around decompression calculations yield a spreadsheet as deliverable.

This output drastically limits the possibilities for the engineer to improve and optimize the Aircraft venting. Envelope values don't provide enough information to expertise a decompression analysis.

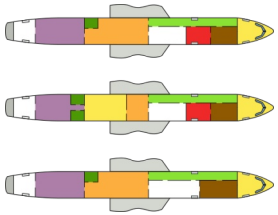
Esonix makes it easy to answer the engineering questions like:

- Why is this delta pressure happening?
- Is this unaesthetic decompression feature really opening? And what is its real influence?

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## Combine...



Decompression impact of different cabin layout can or cargo configuration can be addressed very easily with the **exclusive combination feature**.

Run several models and then combine them to get a single set of results for a quick, exhaustive and easy single envelope.

## ... or Compare

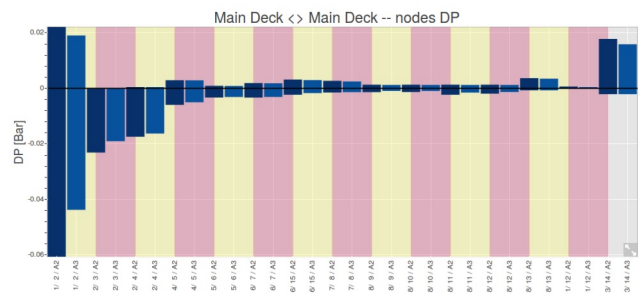
### New in ESONIX2: Sensitivity analysis

**ESonix Sensitivity analysis** let you compare "side-by-side" two or more set of results to get a fast overview and a complete analysis of the differences between two or more runs.

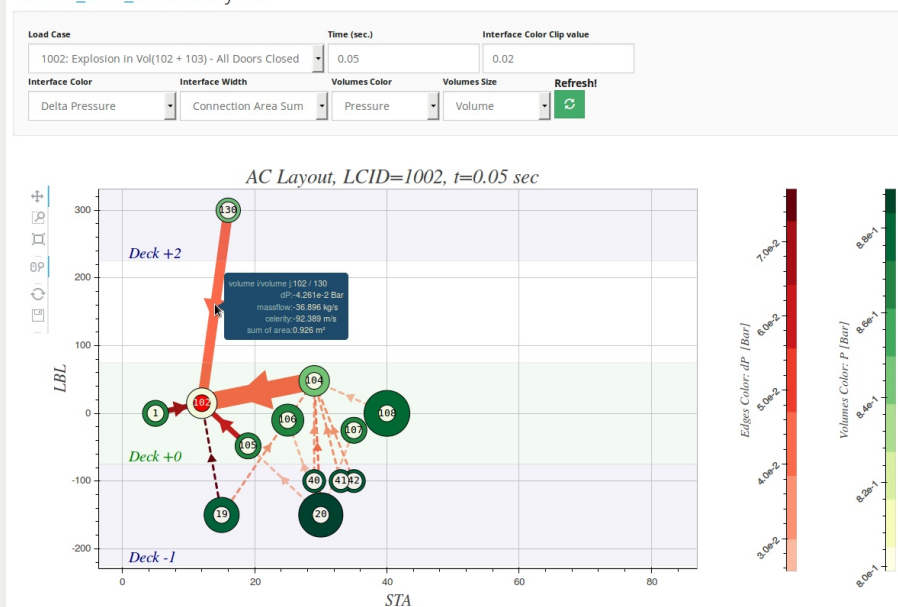
This new exclusive functionality is a powerful tool for your business by helping to decide which solution is the best to optimise your decompression layout; for example by answering to such questions:

- Should I increase this passive vent or decrease the weight and inertia of this door?
- Is this costly new decompression panel really effective to solve my issue?

Besides the help in you daily engineering job, **sensitivity analysis** is also a major asset in convincing certification authorities of the validity of your analysis by conducting analysis about uncertainties on some OEM parameters.



A330\_200\_nic /A2 layout



## Dynamic layout

### New in ESONIX2!

Starting from rev.2, ESONIX provides a handy dynamic layout allowing to map any value at any time to better understand the whole or partial Aircraft decompression behavior.

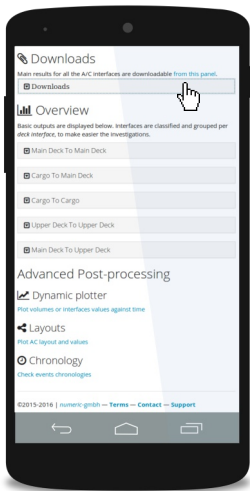
## Dynamic query

Just move your mouse over the layout, and query massflows,  $\Delta p$  (pressure differential), etc.



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## Features

- Multi-load cases
- Multi-conditions (closed/opened doors initial conditions)
- Imperial and SI units
- Full dual-way venting conditions
- Extensive and powerfull postprocessing
- Combination analysis for multi-configurations projects
- Sensitivity analysis
- Dynamical opening
- Collaborative work
- Responsive design
- And many many more...

## Facts

ESonix is actively developed and tested by using the greatest references in terms of thermodynamics. By using the ESONIX online platform, you are able to run a full Aircraft analysis and get reliable results in a few minutes! With an extensive documentation and a strong support, ESONIX will bring Decompression Analysis capacities to your company.

## High Benefits/Costs ratio

Whether you use ESONIX as certification software for your decompression analysis, or as an internal engineering tool, the time you will save to check your venting layout is incredible: "**Load, click, run and get the results**".

Calculate opening holes as per FAR 25.365e

A/C vessel diameter	Unit	Output Unit
3.73	m	m <sup>2</sup>

FAR 25.365e requires:

“(e)Any structure, component or part, inside or outside a pressurized compartment, the failure of which could interfere with continued safe flight and landing, must be designed to withstand the effects of a sudden release of pressure through an opening in any compartment at any operating altitude due to:

(1)Penetration from Engine Disintegration;

(2)Any opening up to:

$HO = P \times AS$ , where,

$HO$  = Maximum opening, need not exceed 20 Sq Ft.

$AS$  = Maximum cross-sectional area of the pressurized shell Sq Ft; and

$P = (AS / 6240) + 0.024$ ”

Having:

- Vessel diameter  $\Phi_{vessel} = 3.73$  meter
- Vessel Cross-section area  $AS = 10.927m^2 = 117.617 ft^2$

$$P = \frac{AS}{6240} + 0.024 = \frac{117.617 ft^2}{6240} + 0.024 = 0.043 ft^2$$

therefore:

$$HO = P \times AS = 0.043 \times 117.617 = 5.058 ft^2$$

$$HO = 0.47 m^2$$

## Contact

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## ESonix: a numeric-GmbH product

**numeric-GmbH**

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