

# PROVENTIA EMISSION CONTROL OY

Designing and simulating intelligent emissions control solutions with SolidWorks



*Proventia uses SolidWorks Premium with SolidWorks Simulation Professional, SolidWorks Professional, and SolidWorks Flow Simulation software to design and simulate emissions control solutions for mobile and stationary heavy diesel machinery.*

Headquartered in Oulunsalo, Finland, Proventia is an international environmental technology group working to promote clean air by developing solutions that reduce emissions from machinery, vehicles, power plants, and ships, both in the OEM and retrofitting markets.

The company got its start in the 1990s manually designing catalytic exhaust systems for go-carts, a niche market where Proventia quickly became a leading supplier in Europe. From a narrow and volatile go-cart market, the company shifted the business into diesel engines: heavy-duty machines and vehicles and stationary engines, and realized they needed a professional 3D CAD system for design and simulation. SolidWorks® software was their choice.

"In the beginning our main target group was the retrofitting market. Gradually, regulatory demands for environmentally friendly emission control systems grew, and existing exhaust systems had to be replaced with new ones that were better able to reduce emissions. For the retrofitting market, we often use 3D CAD models from engine manufacturers as the basis for our designs. They are made in a number of different CAD systems, but we have never had any problem converting them to SolidWorks via STEP or IGES. For us, SolidWorks was the perfect choice. It has excellent data exchange capabilities with other systems and a very intuitive and practical user interface that made it easy to be productive fast," notes Jukka Klemetilä, vice president, Research & Development at Proventia.

## Challenge:

The company wanted to expand the business into heavy-duty off-road and stationary diesel machines. They needed a professional 3D CAD system for effective design and simulation.

## Solution:

Implement SolidWorks Premium with SolidWorks Simulation Professional, SolidWorks Professional, and SolidWorks Flow Simulation.

## Results:

- Significantly increased productivity
- Reduced physical prototypes
- Eased workflow with superb data exchange capabilities
- Saved time and money with simulations

### Simulations guarantee the right fit in tight spaces

"Our emissions control systems are more complex and also bigger than bare mufflers. That means we have to be sure they will fit into the physical space under the hood or on top of the roof where they will be placed. We can check that easily using collision detection in the online phase. We also run vibration and strength analyses to be sure our systems will withstand the loads and the harsh environment for a relatively long period of time. Finally, we do flow simulations to be sure the gas flow inside the exhausts runs smoothly without obstacles to reach the optimal air cleaning level," Klemettilä explains.

The emissions control systems are manufactured by a number of subcontractors in Europe and the US. In Finland, the company has a small manufacturing plant where they make prototypes for lab testing.

### Saving time and money

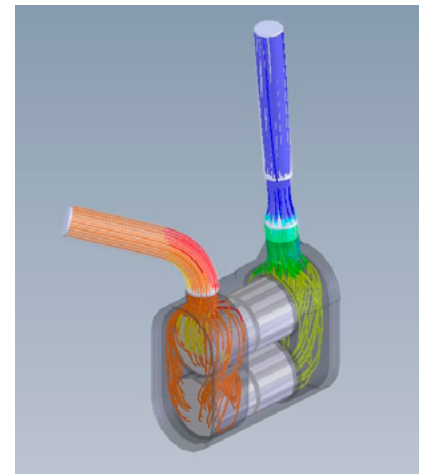
"There is no question about it. We do save both time and money thanks to the computer simulations in SolidWorks. It reduces the number of prototypes we need to make and we can verify the computer simulation in real life in the test lab. The two almost always match perfectly, so we know the SolidWorks simulations are accurate," adds Klemettilä.

For obvious reasons, the retrofitting market is declining, while the OEM market is growing. That means in the future, the company's emissions control systems will be manufactured in longer series, which will have a positive impact on Proventia's bottom line.

"We still need to customize our designs for every manufacturer, every engine, and every model to be able to fit and to offer top performance. It helps a lot that it is easy to make design variations in SolidWorks," says Klemettilä.

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Jukka Klemettilä  
Vice President, Research & Development



Proventia saves time and money thanks to SolidWorks simulations that guarantee parts fit into tight spaces and SolidWorks Flow Simulations' ability to efficiently simulate smooth gas flow inside exhausts.



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