

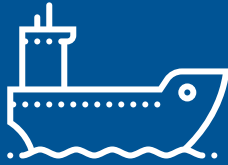


# Rupture Disc Placement Evaluation

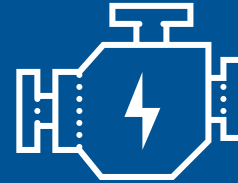
*for marine vessel exhaust pipe designers*

## *Rupture Disc Placement Evaluation*

*Guaranteed delivery time with global service*



**For shipbuilding industry**



**For marine vessel gas engine manufacturers**

## Methodical approach with quick results

Exhaust pipe flow simulation can be time-consuming. Without proper evaluation, non-optimal placement or the amount of rupture discs may lead to unnecessary construction costs.

Rupture Disc Placement Evaluation is a service that delivers simulation results and design recommendations promptly. When running a tight schedule, a full report can be retrieved in two weeks for cost estimations and inspection authority approval.

Elomatic flow simulations estimate exhaust pipe pressure levels under predefined gas-leakage and explosion scenarios in the exhaust system. The simulations provide insights that are used in the evaluation of valve and rupture disc positioning. If necessary, more optimal locations are suggested for burst discs.

The evaluation is a quick and safe way to verify exhaust designs. It avoids expensive testing and prevents design errors, while providing safe designs and transparent audit trails.

In the design phase, benchmark data can be used to complement the current design and to understand the costs. Elomatic cooperates with many equipment manufacturers, saving you the time and effort of searching for the parameters needed for the simulation.

We offer cost-efficient simulations of single or bi-fuel exhaust systems. One simulation can also be used for multiple ships with identical designs.

We deliver our services to shipyards around the world. Our simulation offering is based on broad expertise of marine and many other industrial applications.

## What are the key benefits of evaluation?

- *Designed to meet your schedule and safety requirements*
- *Optimised and cost-efficient placement recommendations for rupture discs*
- *Smooth delivery of information to inspection authorities*
- *Existing scrubber and other equipment configurations for multiple manufacturers*



## Why two simulations?



### Scenario 1: Blackout

In a total blackout simulation, the exhaust pipe is filled with gas, e.g., due to the engine unexpectedly shutting down. The simulation is designed to evaluate and optimise the impact of the worst-case scenario.



### Scenario 2: Misfire

In a misfire simulation, one cylinder malfunctions, allowing some gas to leak into the exhaust pipe. It is suitable for optimising rupture disc placement and measuring if misfiring potentially ruptures or opens the discs (depending on the disc design).



# Standard or custom evaluations for all designs

We offer a cost-efficient solution for the most common configurations. If the predefined packages do not meet requirements, we are happy to customize the simulations to meet specific design needs.

*Guaranteed delivery in 2 weeks*

	<b>Light</b> <i>For designs requiring one simulation only</i>	<b>Full</b> <i>For typical designs with both misfire and blackout simulations</i>	<b>Fast-track</b> <i>For companies requiring quick results, e.g. for cost estimates</i>
<b>Delivery time</b>	8 weeks	8 weeks	2 weeks
<b>Documentation</b>	✓	✓	✓
<b>Report for authority approval</b>	✓	✓	✓
<b>Blackout simulation</b>	✓	✓	✓
<b>Misfire simulation</b>		✓	✓
<b>Piping configuration</b>	Exhaust pipe only	With SCR, economizer, and silencer	With SCR, economizer, and silencer
<b>Manufacturer communications</b>		✓	✓
<b>Design recommendations</b>		✓	✓

*We manage design specifications directly with SCR, silencer or economizer manufacturers if needed. Default values are used for equipment with no design available.*





## What does our evaluation report offer?

- *Flow field 3D schematics showing the distribution of fuel gas*
- *Peak pressure values on exhaust pipe walls*
- *Analysis of individual rupture disc burst probabilities*
- *Rupture disc position assessment*
- *Suggestions for rupture disc placement improvements*

## What are the key phases of the evaluation project?



### 1. Select

Based on the schedule and design requirements, select a suitable Elomatic service package.



### 2. Define

Send drawings and extra equipment information (e.g., SCR) to Elomatic and let us do the simulation.



### 3. Design

We produce a 3D model and report evaluating the design and include our suggestions (if applicable).



### 4. Deliver

Deliver the report to inspection authorities and include the results in the ship documentation.

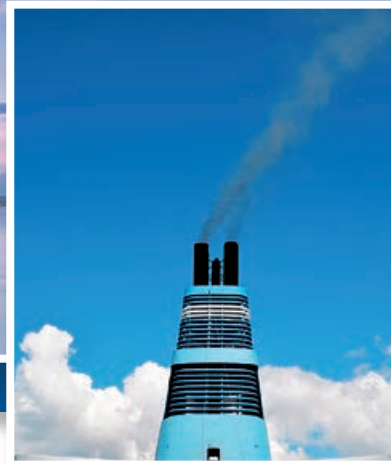
*Delivery in 2 weeks (Fast-track) or 8 weeks (Light, Full)*



### Contact Information



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## Cost-efficient service packages

Depending on the package, one or two simulations per exhaust pipe are performed. Similar piping may not require separate testing (e.g., mirror-imaged pipes for port and starboard side engines).

	Light <i>8-week delivery Blackout simulation only</i>	Full <i>8-week delivery With SCR Both blackout and misfire simulations</i>	Fast-track* <i>2-week delivery With SCR Both blackout and misfire simulations</i>
 <b>One pipe</b>	€ 3,900	€ 6,300	€ 10,500
 <b>Two pipes</b>	€ 5,500	€ 8,500	€ 15,200
 <b>Four pipes</b>	€ 10,200	€ 13,700	€ 22,800

\* **Fast-track guarantee:** If Elomatic does not deliver results in two weeks, we charge only the Full service package fee.



Elomatic is a leading European consulting and engineering company. Our close to 1000 professionals work in machinery and equipment manufacturing, pharmaceutical, process, energy, offshore and marine industry projects.

We offer consulting, engineering, product development and project management services as well as products and turnkey solutions to industrial and public sector customers.

The cornerstones of our success are customers that are leaders in their respective fields and professional, customer-oriented and motivated personnel.

- Technical Consulting
- Engineering
- Project Management
- Product and Service Development
- Products & Turnkey Solutions
- Software Development
- Design Software Solutions

## Key customer segments

- Marine & Offshore
- Oil & Gas
- Pharmaceuticals
- Process Industries
- Energy
- Foodstuffs industry
- Starch and Potato Processing
- Machinery and Equipment Manufacturing

## Contact information

We operate globally and have clients in over 80 countries. Our offices are located in Finland, China, India, Italy, Kazakhstan, the Netherlands, Poland, Russia and the UAE.

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