What is the ROI ?

BROCKHAUS MEASUREMENTS

Identifying criteria to measure the return on investment for magnetic testing technology in laboratory or in production lines

1. **Reducing quality costs**
2. **Increasing performance**
3. **Leveraging your position in the supply chain**

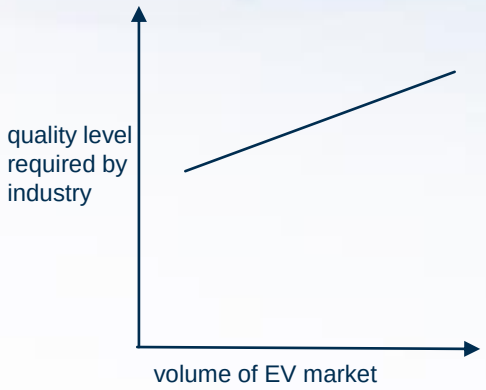
1 Reducing quality costs

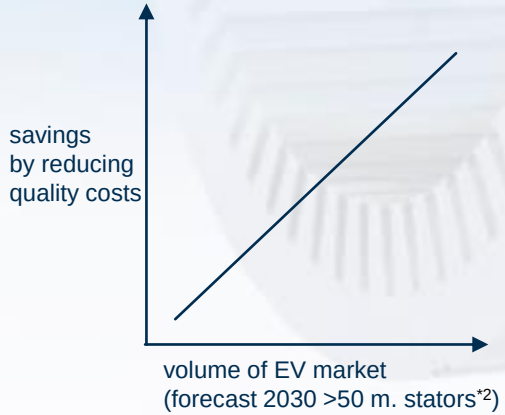
Quality costs have two variables:

1. Costs of **failure** (non-conformance, i.e. sub-par performing motors or even customer claims)
2. costs of **control** (conformance, i.e. testing 100% of stator stacks)

With stator stacks, the costs of failure are much higher than the costs of control, because testing a stator stack at the beginning of the process costs only a **few cents per piece**, whereas waiting for the motor test bench results can cost up to **1.200 EUR per piece**[*1] with many wasteful production steps performed on a poor quality stator stack

Trends to consider





Your ROI input

1. Costs of **failure**

	Costs of all production steps that come next after the completion of the stator stack, per piece
X	
	Percentage of motors not meeting quality level, either under- or overperforming, generally between 0,05% and 2%[*3] Please also consider trends, see graphs
X	
	Probability that this deviation is caused by stator, generally between 26% and 53% [*4]
=	
	Failure cost per stator

2. Costs of **control**

	Total cost of ownership of measuring equipment per month (per line)[*5]
÷	
	Number of stators produced per month Please also consider trends, see graphs
=	
	Testing cost per stator

NOTES: *1 BROCKHAUS market research *2 Source: www.statista.com *3 BROCKHAUS market research *4 BROCKHAUS market research *5 based on Brockhaus quote and experience with installed base

2 Increasing performance

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Enabling continuous process improvement

By testing your stator stacks you generate quality data that can be used for statistical process control, allowing for enhanced Kaizen and Six Sigma analyses. It also comes in handy for IATF 16949 certifications

Monitoring performance of upstream processes

Test results of the stator stacks allow to track tool wear and other quality impacting phenomena in upstream processes, such as stamping and welding

Generating data for stator design

By testing your stator stacks you generate valuable data for the R&D and product development teams that design stators.
The measurement values help to increase the car's autonomy, as well as the motor's torque

Your ROI input

Time (money) saved from process improvement initiatives that are based on stator quality data, per month

Savings from predictive maintenance (avoiding unplanned downtime, avoiding exchanging tools too early or too late), per month

+

Savings from being able to monitor the impact on quality from productivity measures in preceding processes (e.g. increasing stamping speed), per month

Potential new business due to improved motor performance
or
potential reduction of material costs with motor performance unchanged, per month

3 Leveraging position in supply chain

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☆☆☆ **Increase supplier performance**

By testing you generate quality data that can be used to challenge your steel suppliers to improve cost and / or quality

or

if you purchase already assembled stator stacks, you can challenge your suppliers to improve cost and / or quality

☆☆☆ **Strenghtening your market position / your facility's position**

By testing you become able to guarantee stator performance. This ability can set you apart from the competition

or

if you purchase already assembled stator stacks, you can guarantee stator performance for processes that follow after (could be viewed as an "internal" customer)

Your ROI input

Savings from lower variability in quality of supplied steel / stators, per month

Potential new business due to comprehensive quality guarantees, per month

Your ROI

For some of the benefits it will be difficult or even impossible to estimate the monetary value in advance. Nevertheless, **all factors will have some financial impact eventually,** so they should not be disregarded when making the decision about testing

Please contact us to discuss your specific situation and potential doubts you might have about the benefits of testing stator stacks

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Your ROI input

1 [ ] - [ ] = [ ]

Failure cost per stator — Testing cost per stator

+

2 [ ] ÷ [ ] = [ ]

Sum of all performance benefits — Number of stators produced per month

+

3 [ ] ÷ [ ] = [ ]

Sum of all supply chain benefits — Number of stators produced per month

=

ROI of testing per stator: [ ]

Personal notes