



Production machinery

Application Slides

Printing plate production machine

Simcenter SCADAS XS – Reduce time/cost for global servicing



Thanks to the Simcenter SCADAS XS, a typical intervention went from 1 week down to only 2 days.

Challenge

- How to avoid costly engineer travel time for simple troubleshooting task
- Need for mobile measurement equipment

Solution

- Application = local vibration troubleshooting by an operator, engineer stays @ HQ
- Product = Simcenter SCADAS XS with tablet and predefined test template

Benefit

- Simcenter SCADAS XS is shipped
- Operator can do the test
- Engineer only analyzes the data

Wood working machine

Modal analysis – Increase production speed + improve finishing quality



Moving from mass production to tailor-made machines requires full understanding of the dynamics.

Challenge

- Unexpected quality problems at certain operating speeds, machines run sub-optimal
- How to balance production speed vs. quality vs. energy efficiency

Solution

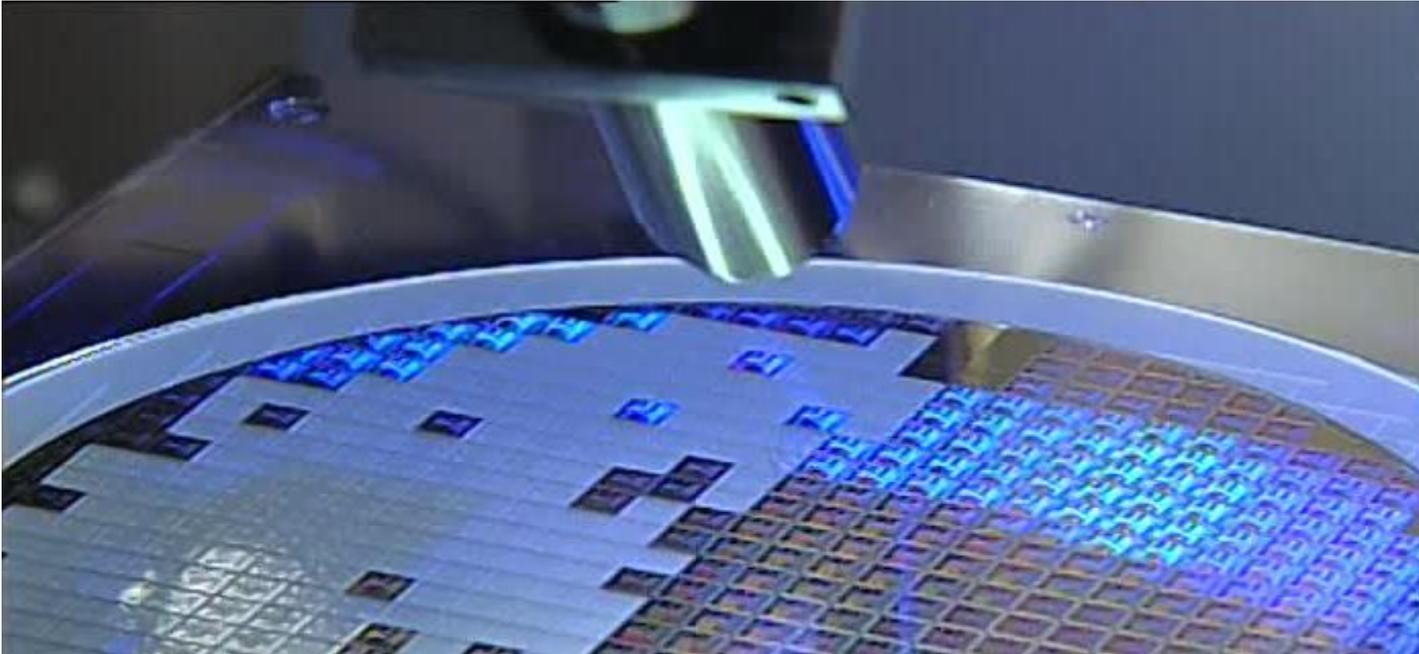
- Application = avoiding resonances that affect produced quality
- Product = Simcenter Testlab modal analysis

Benefit

- Systematic understanding of dynamics in the machine that might affect quality
- Machines run more efficient

Semiconductor chip production machine

Simcenter Testlab ODS – Limit vibrations/optimize produced quality



Thanks to the visual representation of the deflections, we can identify the critical components that introduce vibrations in the production process.

Challenge

- How to limit the vibrations entering the machine and guarantee produced quality
- Unexpected quality problems at certain operating speeds

Solution

- Application = avoiding resonances that affect produced quality
- Product = Simcenter Testlab operational deflection shapes animation

Benefit

- Most optimal modifications to limit vibrations
- Systematic understanding of dynamics in the machine that might affect quality

Cigarette production and packaging machine

Sound intensity & animation – Reduce noise & keep quality @ high speed



Using a single system allows tackling both noise and vibration problems.

Challenge

- When increasing production speed, cigarette box is often only partly filled
- Mastering the relation between production speed & quality and vibrations & generated noise levels

Solution

- Application = reduce noise while increasing speed and production quality
- Product = Simcenter Testlab Intensity testing and animation of vibrations

Benefit

- Better filling at higher speeds
- Combined noise-vibration test gives much more insight and control
- Quantifying exposure to noise

Industrial printing

Modal analysis – Increase printing speed while maintaining printing quality



Simcenter Testlab helps quickly investigating vibration issues anywhere in the world.

Challenge

- How to avoid paper jam at higher printing speeds
- Organize efficiently worldwide servicing of printing machines

Solution

- Application = worldwide service troubleshooting + validation of FE models
- Product = Simcenter SCADAS Mobile + Testlab Modal analysis & Signature

Benefit

- Machines can run at higher speeds
- Typical test takes minutes instead of hours
- Feedback to validate simulation models

CNC machining clamping mechanism

Modal analysis – Reduce machining time while improving surface finishing



Simcenter Testlab allows to perform faster testing, avoiding delays and mistakes.

Challenge

- Provide optimal piece clamping for each specific machining task
- Assure better surface finishing and less tool passes

Solution

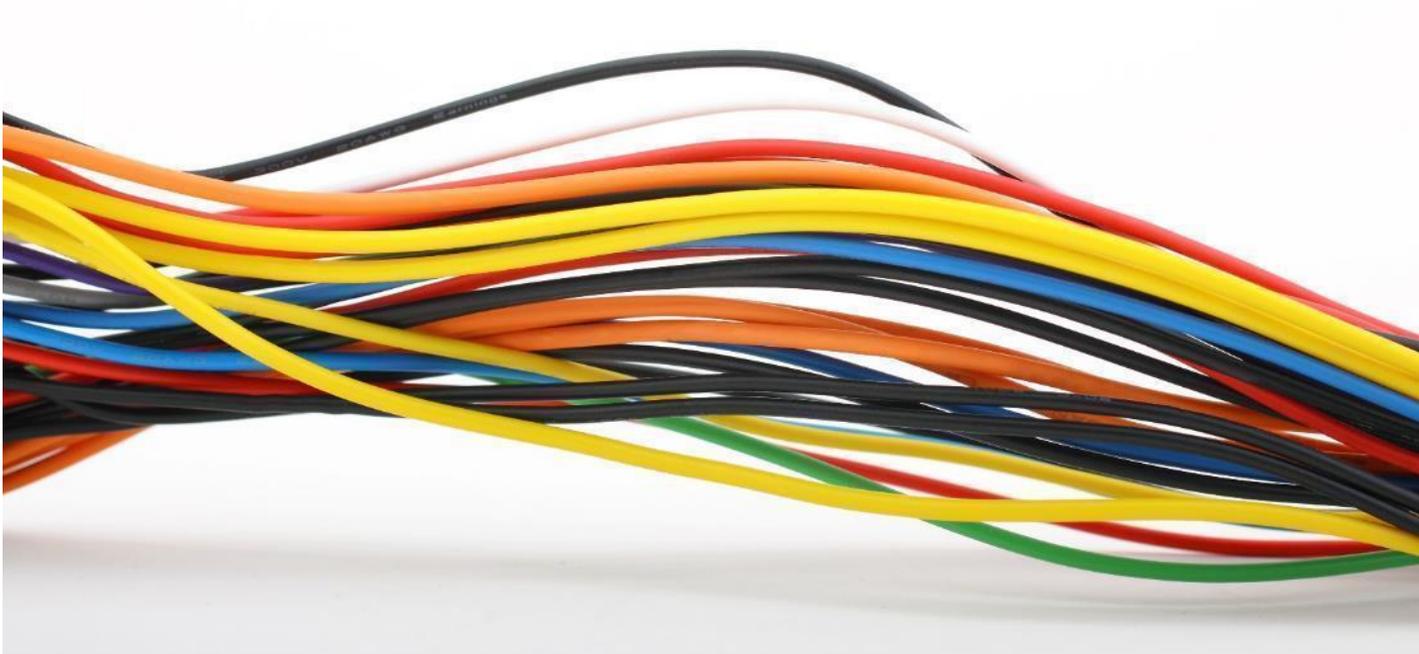
- Application = reduce machining vibrations through tuned piece clamping
- Product = animation of vibrations, Simcenter Testlab modal analysis

Benefit

- Optimal clamping for each task
- Reduced machining time -30%
- Surface finishing quality +70%
- Reduce # tool passes -50%

Production machine for cables

Simcenter SCADAS XS + Testxpress – Balance speed with quality



Operators can tune the machine parameters so that they run at maximum speed, maintaining the produced quality.

Challenge

- More and more variants of cables - which machine parameters to set ?
- Machines run at reduced speed
- No (full) control of quality

Solution

- Application = tune machine parameters based on measured vibrations to guarantee constant thickness of the produced cables
- Product = Simcenter SCADAS XS in combination with Testxpress analyzer

Benefit

- Machines run at highest speed
- Full understanding of influence from vibrations on quality

Paper production machine

Simcenter SCADAS Recorder – Worldwide servicing + troubleshooting



Better understanding the vibrations, allows to increase the paper speed from 2000m/min to 3000m/min (or 180km/h !)

Challenge

- Avoid paper thickness variation at higher production speeds
- Understand and control vibrations of high-speed rotating components

Solution

- Application = worldwide service troubleshooting + increase speed and quality
- Product = Simcenter SCADAS Recorder

Benefit

- Higher speed with good quality
- Less machine downtime

Steel production

Simcenter Testxpress analyzer – Better control of steel production



Thanks to the flexibility of the system, a typical maintenance job goes 3 times faster than before.

Challenge

- Control quality of produced steel
- Predict bearing failure to avoid costly production downtime

Solution

- Application = predict failures and control vibrations & produced quality
- Product = Simcenter SCADAS Mobile + Testxpress noise & vibration analyzer

Benefit

- Predict defects before failure
- Control vibrations & quality
- Single analyzer system for vibration and environmental noise

Heavy duty CNC machine

Full Simcenter Testlab suite – Reduce # interventions and complaints



Tackling problems during design instead of handling end user complaints means a huge cost saving.

Challenge

- Reduce number of interventions and complaints to be handled
- Understand relation between vibrations and surface finishing quality
- Address noise complaints of operators

Solution

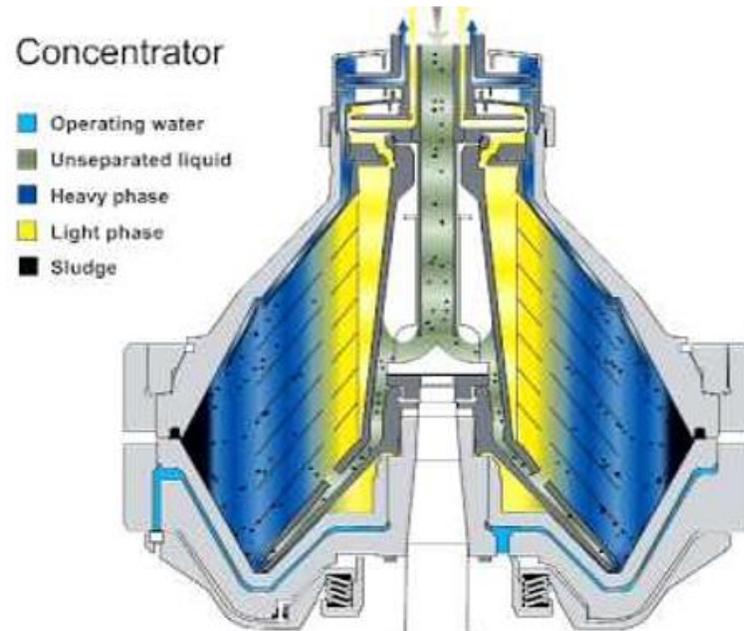
- Application = reduce noise while increasing speed and production quality
- Product = full Simcenter Testlab: torsional analysis, modal, intensity, balancing

Benefit

- Reduced noise – no complaints anymore
- Avoid problems during design phase by correlating test and simulation results

Fluid separator and concentrator

Tokens + modal analysis with Polymax – More advanced insight



The possibility to test out advanced analysis tools using tokens gives complete new insights.

Challenge

- Control vibrations in highly complex, high speed machines
- No results for their heavy damped machines

Solution

- Application = combined rotational vibration, modal and durability testing
- Product = Simcenter Testlab tokens and Simcenter Testlab Polymax

Benefit

- Single system for rotating, modal and durability testing
- Collaboration between vibration department and durability department

| Components

Linear motion guides

Reduce vibrations – higher precision guides



“Avoiding the trial-and-error approach helps us reaching the optimal solution in 30% of the time”

Challenge

- How to get more accurate results
- How to avoid signal disturbance by high electronic noise

Solution

- Simcenter Testlab modal with Polymax
- SCADAS Mobile with SCM-VD8 module with differential input to reduce noise

Benefit

- Better and cleaner results
- Higher vibration quality of linear guides for heavy and highly damped machines

Bearings

Simcenter Testxpress analyzer – More efficient servicing @ end customer



The Simcenter Testxpress software is so easy to use, customers are up and running within the hour.

Challenge

- More efficient and effective on-site interventions
- More systematic and detailed analysis of noise and vibration issues

Solution

- Application = troubleshoot noise and vibration issues in assembled product
- Product = Simcenter Testxpress FFT analyzer with envelope analysis

Benefit

- Solve conflicts with end user OEM
- Envelope analysis points out the guilty part of the bearing
- Full frequency details available

Bearings

Simcenter Testlab – solve production quality problems



Implementing a systematic approach, we could solve our production quality problems, increase our production rate and financial margin and gain market share.

Challenge

- Vibration during production affects quality
- High production cost
- End customers lose confidence and go to a (competitive) supplier of bearings

Solution

- Application = solve vibration issues during production and increase produced quality
- Product = Simcenter Testlab and Simcenter SCADAS

Benefit

- Increase produced quality – 65% less complaints and product recalls
- Increase production rate by 20%
- Higher market share: +15%

Industrial pumps Signature testing - Vibration troubleshooting



“The tokens concept allows us to offer a variety of capabilities to the industry partners we work with, as the tasks and requirements differ from project to project.”

Challenge

- Troubleshoot a wide range of noise and vibration problems on pumps, valves, actuators..
- Better understand the underlying phenomena
- Worldwide standardization of tools used

Solution

- Simcenter SCADAS Recorder & Simcenter Testlab
- Tokens based licensing for worldwide sharing of resources

Benefit

- 30% investment saving thanks to single tool for routine measurements & advanced engineering
- 40% faster insight into problem root causes
- 35% efficiency gain via collaboration worldwide

Electrical motor

Operational modal analysis – End user complaint on vibration levels



The efficiency increase is incredible – using Simcenter Testlab Polymax, operational modal and batch reporting.

Challenge

- No in-house NVH experience on how to solve customer complaints on high vibrations
- Trial and error approach
- Inefficient reporting takes 2 days

Solution

- Application = reduce vibration levels and increase lifetime of mount brackets
- Product = Simcenter Testlab operational modal + Polymax and batch reporting

Benefit

- Gain experience via ES technology transfer
- Systematic source transfer receiver approach leads to solution
- Higher efficiency via batch reporting

Marine drivetrains Simcenter SCADAS – Improve performance & faster acceptance test



“The flexibility of the multi frame measurement hardware allows us to be more efficient in the testing and highly reduces the contractual penalties.”

Challenge

- How to make tests in the factory and during acceptance test @ sea more efficient?
- Speed up acceptance test to avoid penalties

Solution

- Single system for factory and field testing
- Simcenter SCADAS for optimal mobility
- Flexible system with multi-frame setup

Benefit

- 30% faster acceptance testing
- 50% less (risk of) contractual penalties

High precision gears

Simcenter Soundbrush – Objectively compare noise of different designs



Simcenter Soundbrush helps objectively comparing noise generated by the different components.

Challenge

- Dispute between OEM and supplier on the “guilty component” - risk liability claims
- Quickly and objectively compare different noise sources and different designs

Solution

- Application = quickly compare noise generated by different components
- Product = Simcenter Soundbrush

Benefit

- Released from liability claims
- Real-time visual identification of different noise sources

Small combustion engines

Achieving NVH goals early in product development



“I can’t tell you how many times an engineer has said, ‘This software is really easy to use!’ We want to be best-in-class in overall sound levels, so we use Simcenter solutions to do the work.”

Challenge

- How to achieve the right NVH balance earlier in the development cycle?
- How to tryout advanced techniques without having to buy all the tools?

Solution

- Analyzing combined noise, vibration and durability in a single system solution
- Simcenter Testlab tokens concept allows to tryout new solutions

Benefit

- We became best-in-class serving over 100 countries in the world
- Reduced testing and postprocessing time during analysis by 30%

| HVAC

Industrial HVAC – reduce environmental noise

Combined noise and vibration troubleshooting – higher quality HVAC



Challenge

- How to maintain leader position in HVAC
- How to avoid trial and error
- How to build up further knowledge in noise and vibration issues

Solution

- Simcenter sound camera
- 2 x SCADAS + Testlab with tokens

Benefit

- Maintaining reputation of quiet operation
- Tokens give full flexibility in solving current (and future !) noise and

“By becoming smarter in a combined sound and vibration approach, we manage to stay Nr. 1”

Industrial refrigeration – chiller systems

ISO Sound power & modal – noise compliance & structural integrity



“We were able to reduce our full acoustic certification test from 2 days to just 2 hours”

Challenge

- How to perform the ISO sound power test more efficiently
- How to save material in the supporting frame structure without losing structural integrity

Solution

- Multi-channel Simcenter SCADAS replacing sound level meter + integrated ISO reporting
- Simcenter Testlab Modal analysis to identify influence of changes in the frame structure on the dynamic behavior

Benefit

- Standard ISO test reduced by 80%
- Saving 15% on material cost/weight without affecting the structural integrity

Cooling system for refrigeration trucks

Signature + tokens – Belt flapping and crankshaft torsional vibrations



The integrated approach allows easy investigation and understanding of the issue and helps finding counter measures.

Challenge

- Understand effect of engine vibration irregularities on cooling system performance
- Avoid noise and durability issues due to vibrations

Solution

- Application = noise and durability issues due to torsional vibrations
- Product = Simcenter Testlab signature testing with incremental encoders and RV4

Benefit

- Integrated approach combining vibrations, acoustics and durability
- Technology transfer project to learn how to solve the issues

Heat pumps

Sound source localization + material testing – Acoustic troubleshooting



Quick acoustical troubleshooting helps finding and solving last-minute problems and make product release deadline.

Challenge

- Last-minute noise issue
- Need quick fix to avoid delay in release of new product
- Lack of knowledge in acoustics

Solution

- Application = reduce noise on residential heat pumps
- Product = Simcenter Testlab sound source localization + acoustic material testing

Benefit

- Quickly finding root cause of noise helped releasing the product in time
- Systematic approach using full set of acoustical tools via ES technology transfer

Cryogenic cooling equipment

Simcenter SCADAS XS & Testxpress – Standard quality check on vibration



Standard solutions replacing in-house programming frees up engineers to improve their product.

Challenge

- Get rid of frequent reprogramming of in-house code
- Establish standard quality check that can be executed by an operator

Solution

- Application = limit vibration not to damage the cooled electronic components
- Product = Simcenter SCADAS XS with basic Simcenter Testxpress analyzer

Benefit

- Standardized check by operator
- Standard off the shelf system for all tasks

| Handheld power tools

Handheld power tools

Human body vibration and ODS – Lower hand arm vibrations



“The previous trial and error approach was expensive and inefficient without guarantee for results. Now we get a complete insight into the root cause and we can launch new innovative and competitive products assuring reduction of hand arm vibrations.”

Challenge

- Comply to hand-arm vibration standards and legislation & European directive
- Trial and error approach with multiple tools is inefficient without guarantee for results

Solution

- Application = reduce vibrations at the handle position due to new saw blade
- Product = human body vibration and ODS

Benefit

- Single tool for ISO compliance and engineering insights
- Combining noise and vibration indicates the most effective way to solve the issue