

# SIEMENS

*Ingenuity for life*

Heavy equipment

## AGCO

**AGCO uses Simcenter solutions to reduce durability field data acquisition time by 50 percent**

### Product

Simcenter

### Business challenges

Customize global platform for local needs

Gain an accurate understanding of farmer usage

Save costs and time by performing efficient tests for a reduced development cycle

Improve supplied components quality

Avoid costly test re-runs and automate testing activities

### Keys to success

Rely on a durability testing solution that covers the complete development process

Use a rugged system for challenging local conditions

Use a single and complete testing platform

Increase testing efficiency

### AGCO deploys Siemens solutions to develop reliable tractors that meet tough South American field requirements

#### From global to local needs

Brazilian agricultural equipment manufacturer AGCO delivers agricultural solutions to farmers worldwide. The company offers a diversified portfolio of machines, such as Challenger®, Fendt®, GSI®, Massey Ferguson® and Valtra®, that highlight a robust catalog that features a full line of tractors, combine harvesters, hay and forage equipment, seeding and tillage implements, grain storage and protein production systems, as well as replacement parts.

Small tractors are in demand in Brazil, a trend clearly identified by AGCO. As a result, the company decided to keep producing small tractors for local needs despite gearing their business strategy toward bigger and more complex machines. One adjustment AGCO made was to meet specific local requirements. Indeed, because of the climate, field slope and area, and type of plantation that grows in Brazil, and more so in general in South America, it is tougher to farm, plant and harvest than in other parts of the world.

Working from a global platform for localization can be challenging. Customer usage and requirements can vary among locations and this poses a challenge since some use cases might not be covered by International



AGCO is recognized for its machine reliability.

## Results

Reduced product instrumentation time by two thanks to easy-to-handle hardware and software

Developed optimal product design to meet exact requirements of the marketplace

Enhanced and detailed durability load data analysis reduced to one day from one week

Organization of Standards (ISO) standards. This situation is more evident when a specific component does not meet the necessary zone/country usage conditions. For instance, in a sprayer the booms are 36 meters; some users only use one part of the boom and not the second part. Consequently, such a torsion on the machine leads to lower component durability and earlier failures.

Recognized for its machine reliability, AGCO needs to overcome these product failure issues to increase its local footprint and small tractor market share. The validation team, part of the product engineering team, oversees the root cause of machine and/or part failure and analyzes data to propose new designs. Dr. Jeovano De Lima is an engineering specialist on the validation team at AGCO Brazil and is responsible for all lab activities, investments and field data acquisition for durability and vibration analysis. Other members of the validation team oversee different certification testing topics such as machine dynamometry, structure, bolted joints, thermal and noise, vibration and harshness (NVH). On the NVH side, they perform pass by noise and human body vibration according to ISO and Brazilian regulations. Dr. De Lima says the team's responsibility is to validate all products of the AGCO portfolio and guarantee that products will meet customer expectations.

In addition, Brazil's highly competitive business environment places a premium on bringing high-quality products to market first. This puts an emphasis on Dr. De Lima and his colleagues to reduce their development cycle time.

"We have five years to develop an entire machine, but two of these five years we use for field validation," says Dr. De Lima. "Our goal is to increase our simulation and lab validation to decrease development time." This also brings the question of cost reduction to keep ahead of the competition while maintaining high quality standards. Dr. De Lima says that "it remains fundamen-

tal that the machine is reliable enough, and that leads us to the fact that we need more testing."

### A better understanding of farmer usage

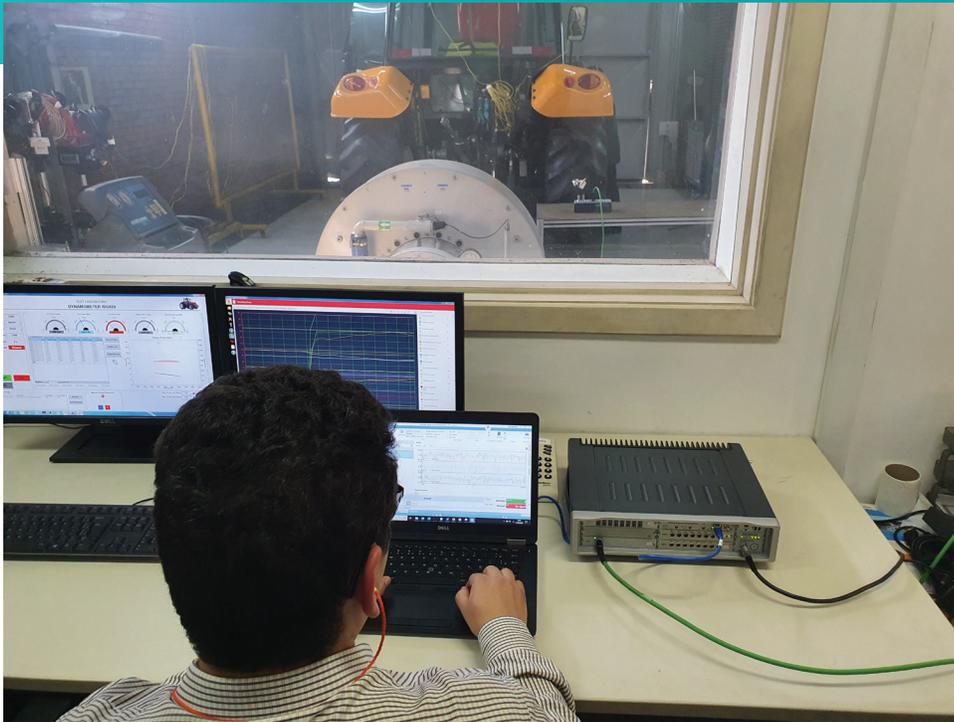
One of the important factors for manufacturers is determining a component's durability; sometimes higher field loads create stress concentrations, which affects component strength. To identify and understand the cause of a component failure, AGCO uses Simcenter™ software from Siemens Digital Industries Software, where today meets tomorrow.

Simcenter is a part of the Xcelerator™ portfolio, a comprehensive and integrated portfolio of software and services from Siemens Digital Industries Software. Simcenter solutions help AGCO understand how the customer used their tractor and identify new load cases during the duty cycle of its machines to develop new and more robust tractors.

"We will launch a new high technology platform of machinery from 2021 to 2024 and we have a design validation plan for each of them," says Dr. De Lima. "In this case, we have to go to the field, do the data acquisition and come back to develop the accelerated test for shakers and hydraulic test benches."

AGCO uses Simcenter SCADAS™ hardware with a distributed set up to instrument the machine and monitor the customer's application. When AGCO acquires field data it works closely with machine operators in the field to see how they maneuver the tractors and identify new load cases and usage conditions that the company did not predict.

In the future, AGCO is planning to use Simcenter SCADAS with its remote data acquisition capabilities for design control of the Sprayer Boom system. That is where AGCO will monitor strain gages, accelerometers, displacement sensors or force cells from the critical locations, and with Simcenter Testlab™ software will generate



AGCO uses Simcenter SCADAS hardware and Simcenter Testlab software to acquire durability loads in lab environment.

“We increased our efficiency with the automated processes in Simcenter Testlab for load data analysis. This allows us to spend time on more technical and valuable tasks rather than creating tedious processes each specific project.”

Dr. Jeovano De Lima  
Test Specialist  
Validation team  
AGCO Brazil

## “We are particularly focused on creating standard test procedures.”

Dr. Jeovano De Lima  
Test Specialist  
Validation team  
AGCO Brazil

an automated report that includes classified loads with innovative load analysis.

“Every day we will receive a report, and with this we are capable of more accurately identifying usage for our customer, increasing our development goals,” says Dr. De Lima.

In addition to automated reports, AGCO also uses the Simcenter Testlab Control App during field data acquisition. AGCO performs the channel configuration in the laboratory with Simcenter Testlab software and then uses the Control App to start-stop the measurement. AGCO also

checks signal levels during the test to conduct onboard validation to increase testing efficiency.

### **A complete lab for accelerated testing**

AGCO's Brazilian facility features several testing sites for each of its brands to accelerate testing in laboratory conditions and replicate the same testing conditions in a controlled environment. The testing team typically uses measured strain, acceleration, displacement and force to evaluate durability assessment on both the component (70 percent) and whole machine (30 percent) levels.



## Solutions/Services

Simcenter SCADAS  
siemens.com/simcenterscadas

Simcenter Testlab  
siemens.com/simcentertestlab

## Customer's primary business

AGCO is a global leader in the design, manufacture and distribution of agricultural equipment. AGCO delivers agricultural solutions to farmers worldwide through a full line of tractors, combine harvesters, hay and forage equipment, seeding and tillage implements, grain storage and protein production systems, as well as replacement parts.

www.agcocorp.com

## Customer location

Canoas  
Brazil

Dr. De Lima says that in a recent test case of a sugar cane machine chassis, AGCO first acquired field data, processed it with Simcenter Testlab and then defined the accelerated input loads for the entire chassis durability test. In just 10 days, AGCO was able to represent the entire life of the chassis. AGCO then correlated this test with finite element analysis (FEA) models to write a standard to be the AGCO global standard.

"We are particularly focused on creating standard test procedures," says Dr. De Lima. "Because everything is quite new in agricultural companies, there are few standards or validation procedures."

### Shortening instrumentation and load data analysis time

Simcenter SCADAS helps AGCO reduce the amount of time the company spends on test campaigns. Using Simcenter SCADAS, AGCO is able to half a two-week process for machine instrumentation and sensor checking to one week.

Instrumentation in the field is not supposed to happen because of the urgency to have it done right first time. Farming conditions (planting or harvesting) only happen once a year and the team cannot go back one year later. Fortunately for AGCO, the Simcenter support team is readily accessible.

AGCO is realizing significant efficiency gains because it does not have to convert data anymore thanks to process automation and having a single platform to cover everything.

"We used to spend a week just cleaning the data and making statistic calculations," says Dr. De Lima. "Now it takes only one day with Siemens to do all relevant load data analysis such as cleaning and analyzing the acquired data to further classify and compare the durability potential. We can even create accelerated and damage-equivalent test profiles to be used on lab tests."

*"Having a good procedure and testing standard gives us extreme confidence in the machine's design."*

Dr. Jeovano De Lima  
Test Specialist  
Validation team  
AGCO Brazil

## Siemens Digital Industries Software

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