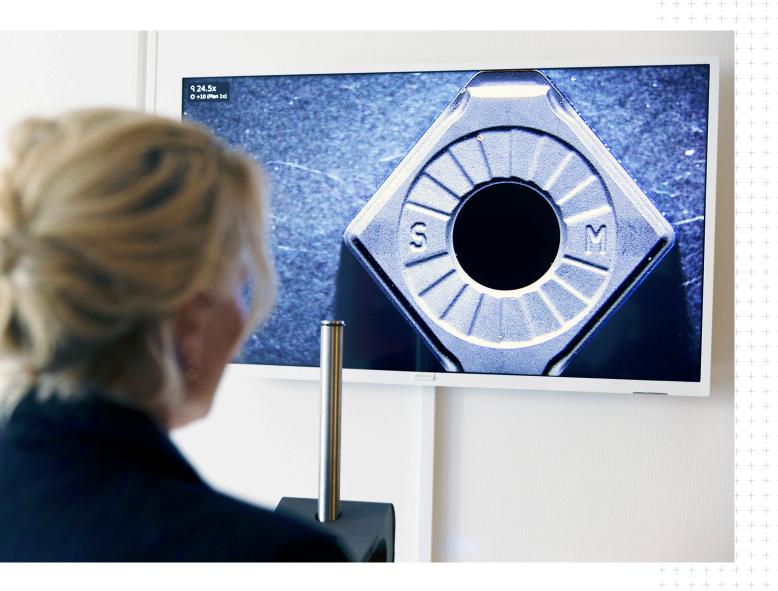
TAGARNO



INSPECT, CONNECT AND ANALYZE

Boost your efficiency with a digital microscope

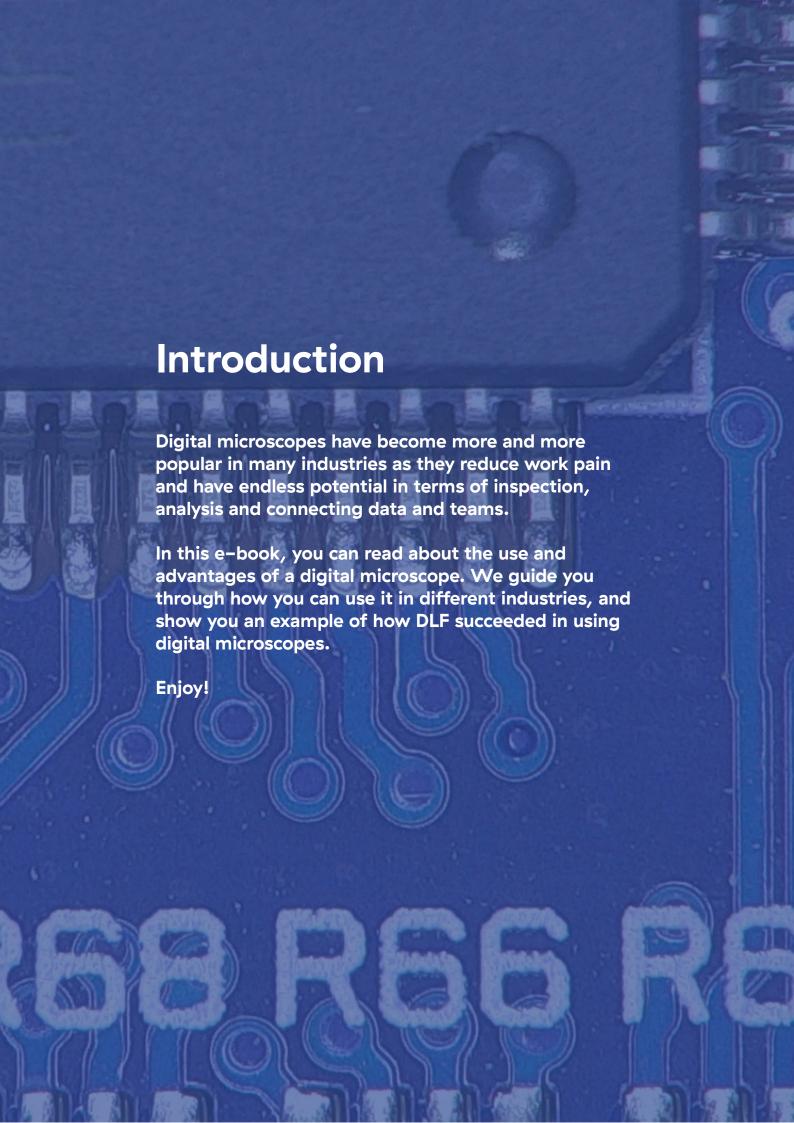


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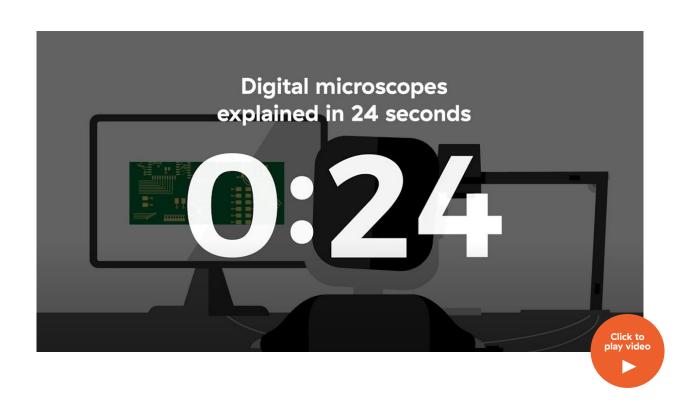
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Digital microscopes used for inspection and analysis

A digital microscope – also known as a digital scope or digital inspection system – uses a digital camera as a microscope instead of using an eyepiece.

It is used for inspection and analysis of micro objects and samples. Digital microscopy is used in different industries such as agriculture, electronics, foods, and forensics and it is used to examine e.g. metal, plastic, medical devices, etc.

On digital microscopes, companies can use specialized software as part of their visual inspection process. An example of profit optimizing software is the Measurement application.



Optimization and automation of visual inspection processes

A digital microscope is used to inspect and analyze different samples such as crops in agriculture and PCBs in electronics.

Digital microscopes use specialized software for the visual inspection process and automate and optimize many quality control processes.

How does a digital microscope work?

A classic optical microscope uses lenses viewed via an eyepiece to magnify the investigated objects. A digital microscope uses a digital camera and optics to show the small objects on a monitor.

There are different variations of digital scopes. Some of them are more or less handheld and others are very advanced microscopes with several measurement functions and observation methods.

Using modern technology, digital microscopes combined with the right software can take and edit pictures, record and edit videos, analyze 3D samples, make precise measurements, and create adequate reports.



5 advantages of a digital microscope

Find focus with autofocus

When finding focus on a stereo microscope, both eyepieces need to be adjusted according to the sample and manually by the operator. Although the process doesn't take long, it can add up if you're going through multiple samples. It also means that operators need to adjust the microscope when taking over from a different operator. All in all, it's a bit of hassle and one that you might not realize until it's no longer there.

In comparison, a digital microscope has autofocus. It means that the microscope will automatically focus on the sample underneath the microscope, independently of the operator's eye sight or eye level. It also means that the operator can keep their hands on the sample itself, turn it around while zooming in and out, either with the control box or with a foot switch.

Software creates endless potential

Perhaps the biggest differentiator from a stereo microscope is the built-in computer of the digital microscope. The advanced but userfriendly features and <u>software</u> capabilities allow companies to work more <u>efficiently</u> and eliminate the subjective analysis performed by the operator.

The built-in computer also gives users access to features as they are developed and released through regular firmwares. This ensures that the microscopes keep evolving long after they were purchased and that users get the most out of their investment.



A picture says more than a thousand words

More and more businesses need to document their findings during inspections. With a stereo microscope not having documentation capabilities, some try to take a photo with their phone through the eye pieces. Unfortunately, this doesn't always result in a very good photo. With a digital microscope, it's often as simple as pressing a button on the control box.

The photo will automatically be saved and stored to either the internal memory of the microscope or a connected USB memory stick, regular or encrypted.

As default, photos will be named with the time and date of the photo, but operators can also define a prefix for all image names in a batch or name the photos as they go.

Lastly, photos saved in a jpeg-format will be saved with meta data that can be accessed when the photos are transferred to a computer.

Vastly different buyin costs

Many rule out digital microscopes in advance because they don't know what it is and associate it with the cheap USB version that they've seen online. When they then hear about the many capabilities of an industrial digital microscope, they assume that the buy-in costs are similar or higher than a stereo microscope — which is often far from the truth.

The low entry microscopes from TAGARNO starts around \$5000. In comparison, a stereo microscope will often start around \$50,000.

Reduce work pain

Studies show that simple ergonomic improvements such as a digital microscope can have a great impact on the health of microscope operators.

The use of a monitor allows operators to look straight ahead instead of bending their neck to see through the eyepiece or straining their eyes to see the sample clearly — positions that often result in a headache and fatigue at the end of the day as well as increased sick leave.



How to use a digital microscope in different industries

Digital microscopy is used to optimize business in many different industries. In general, the results are better workflows, increased efficiency and optimized quality control.

Let's have a look at how digital microscopes are used in different industries.

Agriculture

Seed analysis in agriculture is very specialized and relies on the required image quality in combination with the operator's knowledge. A digital microscope will let you capture findings easily, collaborate with colleagues with a computer monitor, work more comfortably and optimize processes.

Use the digital microscope for quality control of seed or as a grain magnifier. When you are able to magnify samples in agriculture, you can easily inspect seed samples to identify fungal disease, mites, foreign varieties, etc.

Electronics

Processes like Quality assurance, Quality control as well as Repair and Rework can be improved with a digital microscope. And being able to see the PCB, solder paste and components clearly – without a hurting neck from sitting still or your hands being in the way – is crucial.

When inspecting PCBs, connectors, bare solder boards or other components, the operator is able to zoom in on the object to detect and document mistakes, defects, or verify quality.



Foods

Perform efficient analyses and quality control in the food industry with a digital scope. In a matter of seconds, quality control of fish feed, milk powder, flour, etc. can be improved. This will help the operators obtain lower claim rates and achieve higher quality.

Metal

Detect even the smallest cracks, broken edges and burrs in metal. Within metallurgy, the 60 frames per second and 1080p image quality helps you spot even the slightest defects in metal.

Plastic

Check the quality of your injection molded plastic components with a digital microscope. The high image quality of digital scopes makes it easier to approve plastic components and identify runner system wear.

Medical Devices

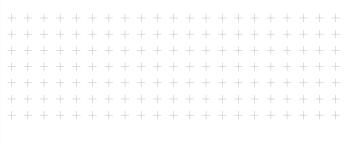
Improve overall efficiency and create consistency across inspections. By saving settings as presets, changing settings happens in a matter of seconds. The digital microscopes allow the operator to verify product shape/size and ensure that no defects go unnoticed.

Forensics

The easy documentation processes, high image quality and compatitiblity with various ring lights make digital microscopes important tools to analyze and document microscopic forensic evidence.



DLF is setting new standards with smarter seed analyses



DLF has since 2013 been using camera microscopes to perform purity analysis, variety identification and germination capacity testing of grass and beet seed in their lab work.



With their competitors still using stereo microscopes or simply loup lamps, DLF has the upper hand on seed analysis due to the many advantages of the digital equipment.

Seeing advantages such as standardizing and streamlining analyses is enabling DLF to highly advance their quality level. Benefits which are made possible by a smart and intuitive software, making it simple to recall settings, measure or compare samples and create adequate documentation.

Our most experienced technicians also switched to TAGARNO when they realized the ease of use and benefits of analyzing the magnified seeds displayed on a screen

Dot Vittrup, Head of Quality Management **DLF, Denmark**

Sharing results and advancing quality

Being able to digitally document and share the results of the analysis both live and via images are also some of the many benefits DLF are experiencing from switching to a TAGARNO microscope, Dot Vittrup, Head of Quality Management at DLF explains. When in doubt, they now have a chance to share the live view of the sample directly from the microscope.

This makes it possible for colleagues, customers or suppliers located on the other side of the world to equally analyze and discuss the magnified seed sample.

Difficult tasks are made clearer

Especially varieties such as meadow grass can be difficult to determine during variety identification analyses, according to Susanne Andersen, Laboratory Manager at DLF in Roskilde, Denmark.

That's why their TAGARNO camera microscopes come in handy, making it possible for the technicians to see every detail of the seeds clearly as well as being able to easily discuss results.

Especially when it comes to training and educating new technicians both face to face and remotely, the microscopes come in handy.

Another shift in analysis quality level

At DLF in Randers, Denmark, they are currently working with 8 TAGARNO microscopes. This has according to Birthe Krogh, Laboratory Manager at the site, made a huge difference in their analysis work.

Along the way, the labs have replaced their first generation of high definition camera microscopes with 1080i camera microscopes.

Now, Monika who is one of the laboratory technicians and a TAGARNO super user is responsible of performing online firmware updates. This provides DLF with new ways to improve their analysis performance and quality along the way. It also prevents DLF from worrying about investing in new equipment anytime soon.

About DLF

DLF is the global market leader in the grass seed industry with 2000 employees in more than 20 countries.

The company has a worldwide breeding network as well as production and sales of forage and turf seed to more than 100 countries worldwide.

Owned by 2.500 Danish farmers, the DLF group has a revenue of 1 billion Euro.

Our technicians can see every detail of the seeds clearly and easily analyze the results

Dot Vittrup, Head of Quality Management **DLF. Denmark**



Which digital microscope fits your needs?

If you're new to the world of digital microscopy, it can be hard to know which system to choose.

To help you find the right system, we in TAGARNO have created a configurator.

Use configurator at our website



QUESTIONS

Want to know more?

We hope that you found this e-book interesting.

If you want to know more about the benefits of digital microscopes, the microscopes themselves or the complimentary software, you can explore our website – or get in touch.

We'd love to hear from you.

