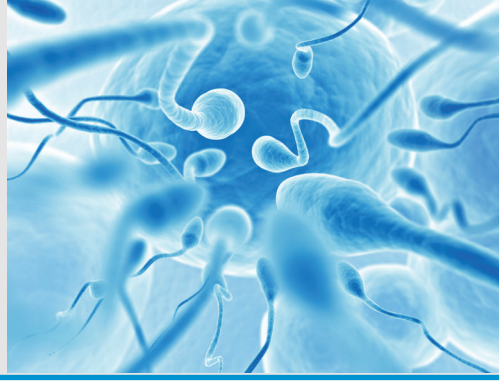
AndroVision®
MORE THAN CASA



AndroVision® CASA system with Zeiss AxioScope optics and automated ScanStage

Computerized semen analysis

AndroVision® is a **highly precise CASA* system** for standardized, interactive semen analysis. AndroVision® not only provides **classical analyzes** of motility, concentration and morphology, but also various **fluorescence based assessments** of sperm functionality. The basic system with PC and accessories is complemented by optional software modules.

*CASA= Computer Assisted Sperm Analysis

Basic system

AndroVision® software
with PC and accessories — REF.: 12500/0000

AndroVision® color camera
high speed and high resolution — REF.: 12500/4400

Product features

- Very easy to use: only 3 mouse clicks from start to result
- Real time analysis of live images and video files
- Very high sperm count per field (>1000)
- Analysis of up to 4 fields in 20 seconds (without AutoMorph) or 30 seconds (with AutoMorph)
- Highly efficient particle filter for accurate sperm differentiation
- Lightmeter for illumination control
- Analysis profiles for many species
- Flexible display of results
- Adjustable analysis parameters and user created profiles
- Fluorescence based motility and concentration analysis (optional)
- Data base with analysis results, including AVI video files
- Data export to MS Excel and other programs
- Individually designed analysis reports with photos
- Languages: English, German, Spanish, Chinese, Portuguese, Russian, French
- Network compatible

Microscopes

AndroVision® can be combined with a series of microscopes, preferably:

- **Zeiss AxioLab and AxioScope**
- **Olympus CX43 and BX Series**

Each microscope requires a negative phase contrast objective and a heated stage. The software modules Viability, Acrosome Integrity, Mitochondria Activity and DNA Integrity require fluorescence equipment.

Microscope with fluorescence equipment

Portable AndroVision®

The portable hardware configuration for AndroVision® consists of a laptop with accessories and transport cases for the microscope and related accessories.

AndroVision® CASA system

with laptop and accessories	REF.:	12500/0010
Transport case for accessories	REF.:	12500/9100
Transport case for microscope	REF.:	12007/0312

Portable AndroVision®

Touchscreen and barcode scanner

This optional hardware configuration for AndroVision® consists of a touchscreen and barcode scanner. Since this system needs neither keyboard nor mouse, AndroVision® becomes even more efficient to use. This hardware configuration prevents errors through a barcode based donor choice for production and quality control.

AndroVision® CASA system

with touchscreen and barcode scanner	REF.:	12500/0001

AndroVision® with touchscreen and barcode scanner

ScanStage

The automated microscope stage has an integrated heating system and can be used with a variety of different microscopes. Analysis points within a counting chamber are automatically approached always using the same path of the microscope stage. Thus, the analysis time is reduced. The ScanStage can also be used with slide and cover glass.

ScanStage with heating system	REF.:	12048/0000
Controller HT 300 W	REF.:	12055/0302

ScanStage

Software modules

AutoMorph

Module for the automated recognition of proximal and distal plasma droplets as well as bent tails of porcine and bovine semen. AutoMorph is integrated in the analysis of motility and concentration. The semen sample should be diluted in clear extender.

Plasma droplets are symptoms of a defective maturation of sperm which can be attributed to various causes such as stress or disease.

Module AutoMorph REF.: 12500/1000

Dose Calculation

Automatic calculation of the number of doses which can be prepared from an ejaculate and of the volume of extender to add to the ejaculate.

Module Dose Calculation REF.: 12500/1100

Lab Software Link

Link of AndroVision® with lab software (e.g. IDA/IDEE).

Module Lab Software Link REF.: 12500/1910

Quality Control

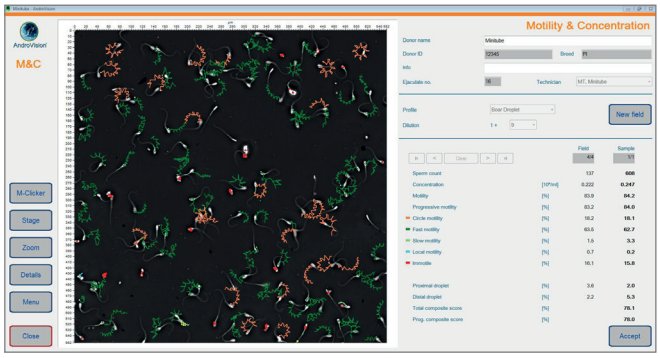
Analysis of samples post thaw and in holding. Link to native ejaculate analysis. Possibility to analyze samples during production: samples of one ejaculate can be analyzed more than once and can be compared with the native ejaculate values.

Module Quality Control REF.: 12500/1200

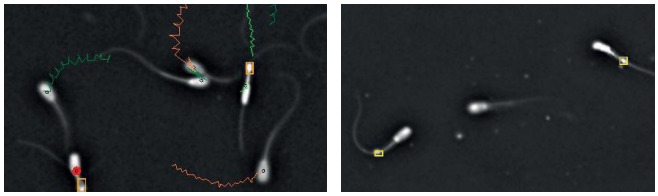
Morphology and Morphometry

Interactive system for analysis of sperm morphology and morphometry. Identifies sperm of stained and unstained samples and measures length and width of the sperm head, head shape and midpiece asymmetry of each single sperm cell (acc. to Kruger). Results can be classified into a large range of morphologic abnormalities.

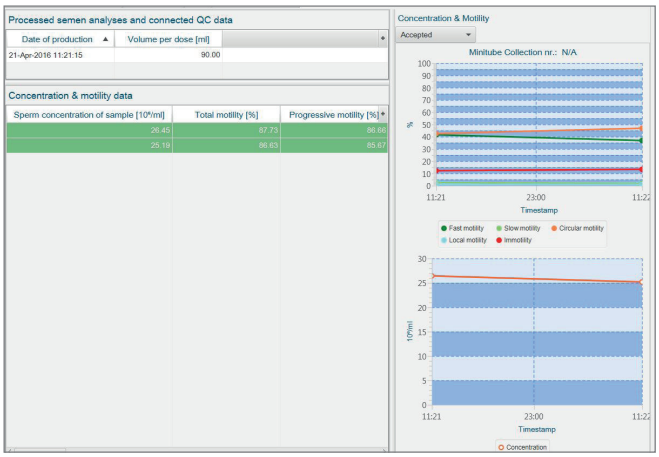
Module Morphology & Morphometry REF.: 12500/1300



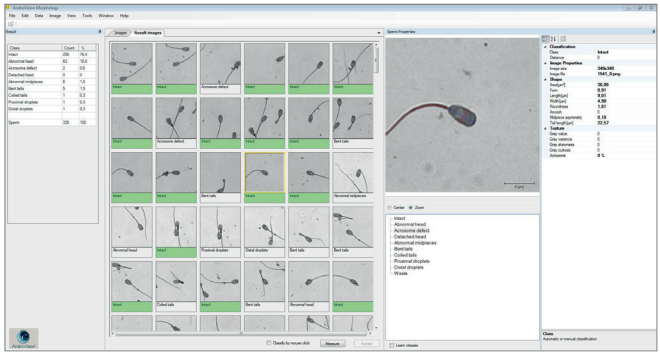
Proximal droplet	[%]	6.5	**5.6**
Distal droplet	[%]	2.8	**2.5**
Bent tail	[%]	6.5	**5.0**
Total Automorph defects	[%]	15.8	**13.1**



AutoMorph: Automatic recognition of proximal/distal plasma droplets and bent tails



Quality control: Regular quality analyzes during sperm processing



Morphology and Morphometry

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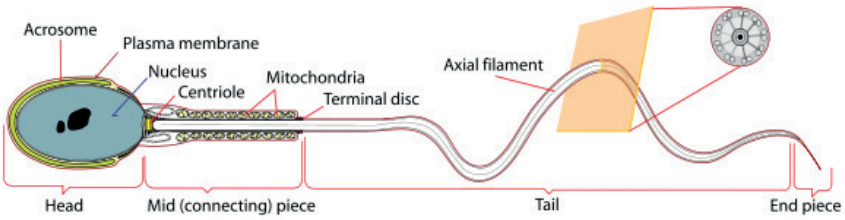
FLUORESCENCE ANALYZES

How do fluorescence analyzes work?

The samples dyed with the specific fluorescent stains, emit light of a specific wavelength or a specific color. The stains are also activated by the light of a specific wavelength. Fluorescent stains dye specific structures of the sperm, depending on the integrity and the functional status of these structures.

These different colors are detected and evaluated by the AndroVision® software. Due to the high speed of analysis, several hundred sperm can be analyzed in a very short time.

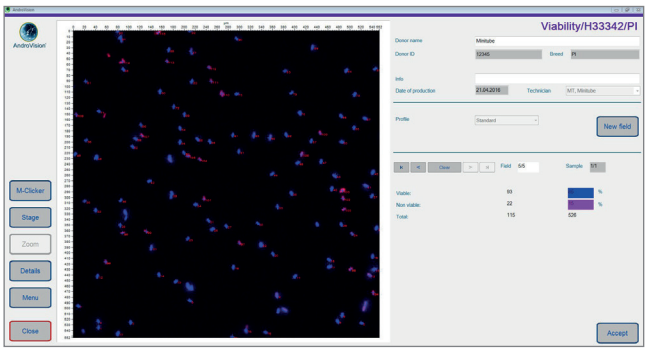


Viability

For the assay of the plasma membrane integrity, a double fluorescence stain with Hoechst 33342/PI or SYBR14/PI is used.

The stain Hoechst 33342 permeates cell membranes and binds specifically to the DNA. All sperm are marked blue. The PI stain (Propidium Iodide) only permeates damaged membranes. It overrides the blue Hoechst stain. Sperm with damaged membranes are marked red/violet. On this basis, AndroVision® determines the percentage of sperm with damaged and intact membranes.

When the dye SYBR14/PI is used, first all sperm are marked green. In addition, sperm with damaged membranes are marked red by the permeating PI dye.



Determining **sperm viability** using H33345/PI stained semen samples

Viability: Why analyze?

The plasma membrane encases the sperm completely. One of its main functions is the delineation towards outside and the selection of molecules to pass from outside to inside. A defect in the plasma membrane can easily lead to the death of the sperm.

The viability analysis is mainly used for the quality control of holding samples of fresh semen or thawed samples of frozen semen.

The viability test can help to detect fertility problems of individual donor animals or to detect ejaculates of poor quality before the semen delivery, rather than to be faced with fertility deficiency later.

Viability

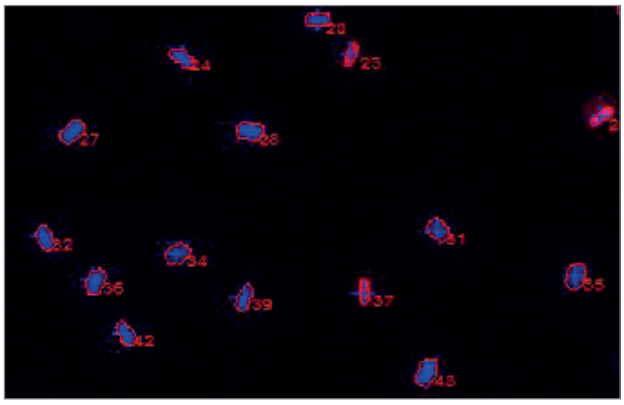
Automatic count of the percentage of membrane intact sperm, based on a double fluorescence assay.

Module Viability REF.: 12500/1400

Stain-kit

Hoechst 33342/PI Membrane Integrity (Viability)
for up to 100 assays REF.: 15407/0009

SYBR14/PI PI Membrane Integrity (Viability)
for up to 100 assays REF.: 15407/0001



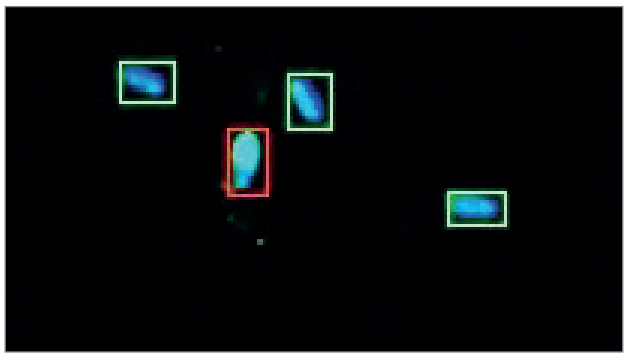
Automatic detection of sperm with **damaged plasma membrane** (marked red/violet) by means of a double fluorescence staining: H33342/PI

Acrosome Integrity

For the assay of the acrosome integrity, a double fluorescence staining with H33342/FITC-PNA is used. All sperm are marked blue (H33342). Damaged acrosomes of these cells are marked green (FITC-PNA). On this basis, AndroVision® determines the percentage of sperm with damaged and intact acrosomes.

Acrosome Integrity: Why analyze?

The acrosome reaction is a key step for a successful insemination. It enables the sperm to penetrate the ovum. Prerequisite: an intact plasma and acrosome membrane. Various stressors during semen processing can cause damage to the acrosome membrane or can provoke a premature acrosome reaction. A successful insemination is then no longer possible.



Automatic detection of sperm with **defective acrosome** (outlined in red) by means of double fluorescence staining: H33342/FITC-PNA

Acrosome Integrity

Automated count of percentage of sperm with damaged acrosome, based on a double stain fluorescence assay.

Module Acrosome Integrity REF.: 12500/1600

Stain-kit

Hoechst 33342/FITC-PNA Acrosome Integrity
for up to 100 assays REF.: 15407/0011

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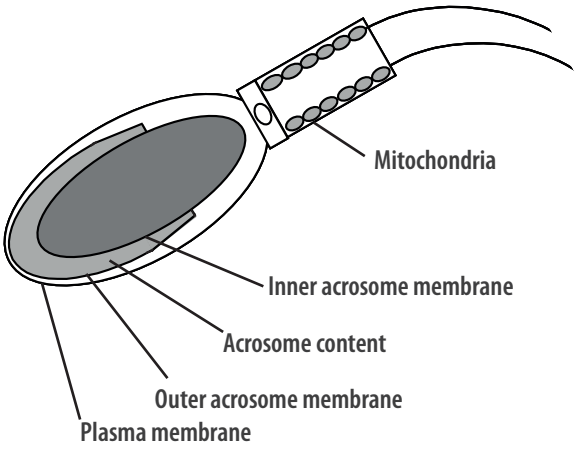
Mitochondrial Activity

For the evaluation of the mitochondrial activity, a double fluorescence staining with H33342/Rhodamin123 is used. All sperm are marked blue (H33342). In addition, the midpiece of the sperm with active mitochondria is marked green (Rhodamin123). On this basis, AndroVision® determines the percentage of sperm with high mitochondrial activity.



Mitochondrial Activity: Why analyze?

The analysis of the mitochondrial activity is a test for the assessment of the energy metabolism of the sperm.

The mitochondrial activity is among other things necessary for:

- Maintenance of the motility
- Capacitation ability of the sperm
- Maintenance of the basic cell functions

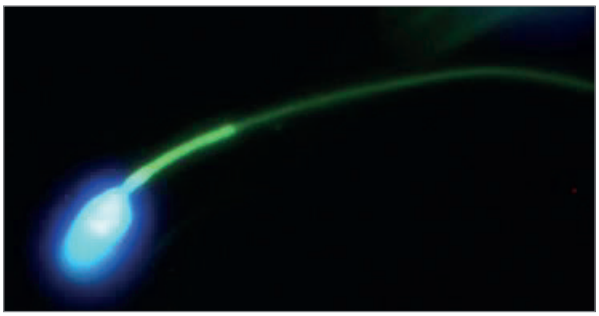
Mitochondrial Activity

Automated count of percentage of sperm with active Mitochondria, based on a double stain fluorescence assay.

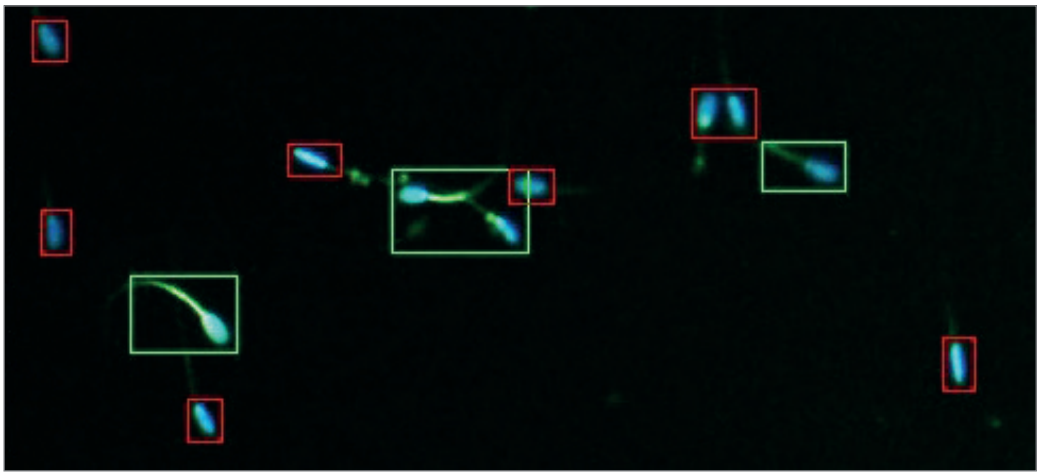
Module Mitochondrial Activity REF.: 12500/1700

Stain-kit

Hoechst 33342/Rhodamin 123 Mitochondria Activity
for up to 100 assays REF.: 15407/0012



Sperm with **high mitochondrial activity**



Automatic detection of sperm with **active mitochondria** (light green coloring) by means of a double fluorescence staining: H33342/Rhodamin123

DNA Integrity

To investigate the integrity of DNA, a halo-technique in combination with a fluorescence stain, is employed. The halo-technique distinguishes intact from defective sperm cells.

If the DNA of a sperm cell is defective, an aura of light, or halo, will form around the head of the sperm cell. In contrast, all sperm cells that do not exhibit a halo have intact DNA. The halo effect is visible when the sample has been stained with propidium iodide (PI) and exposed to fluorescent light. The percentage of sperm cells with fragmented DNA in a given ejaculate or sample can thus be determined.

DNA Integrity

Automated count of the percentage of sperm with defective DNA based on the halo-technique combined with fluorescent staining.

Module DNA Integrity REF.: 12500/1800

Stain-kit

AndroVision® DNA Integrity Test-kit, for up to 40 assays,

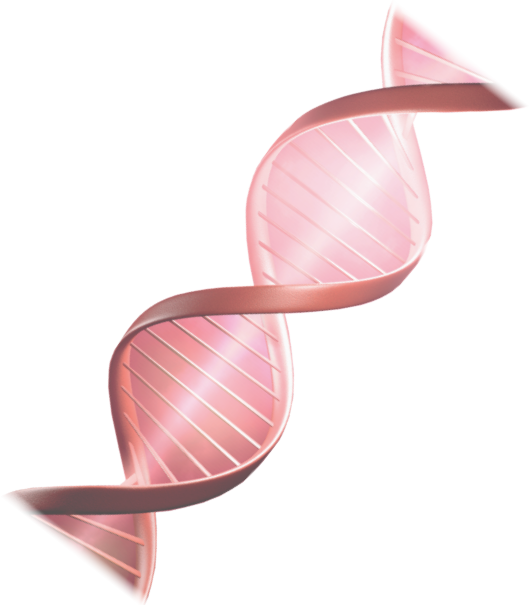
for **bovine** semen REF.: 15407/0013
for **porcine** semen REF.: 15407/0014
for **camel** semen REF.: 15407/0016

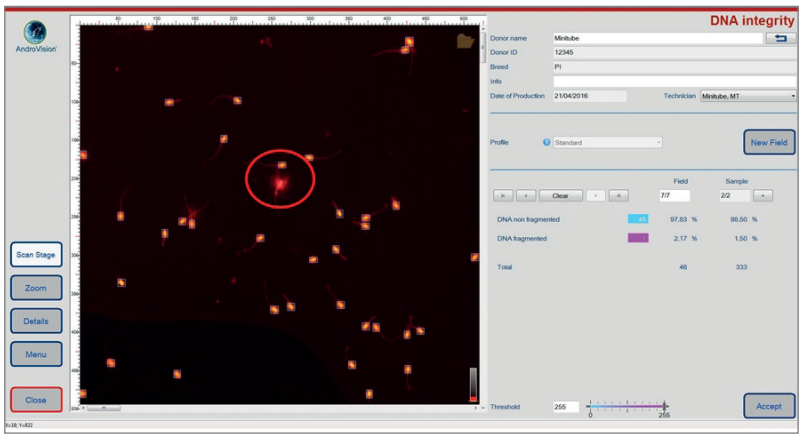
Fluorescent stain for DNA Integrity Test-kit REF.: 15407/0015

DNA Integrity: Why analyze?

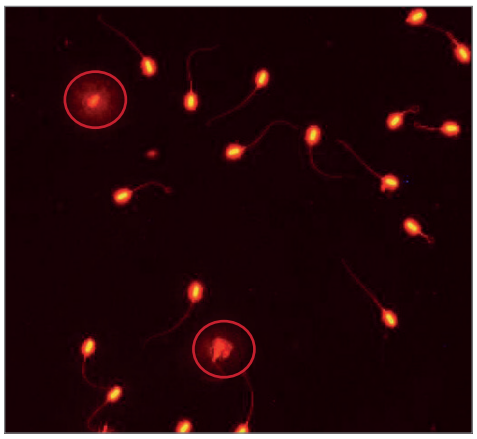
The success of insemination and embryo development is highly dependent on the integrity of the DNA in the sperm.

Consequently, the DNA structure can be used to indicate the fertility potential, or to explain sub-fertility rates, of a certain breeding animal. DNA integrity testing therefore offers a new approach to the clarification of lower fertility rates.





DNA integrity analysis using the halo-technique and fluorescent staining



Sperm with **fragmanted DNA** exhibiting halo-effect

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AndroVision®: Your benefits

Accuracy of sperm detection

A very accurate particle filter distinguishes sperm from debris and egg yolk. Agglutinated cells are excluded from evaluation. Concentration measurement has a high repeatability and is very accurate.

Precise motility assessment

Progressive motility is assessed as a sub-class of motility. Sperm cells moving in circles are correctly identified. AndroVision® provides the standard CASA motility parameters and WHO classification. Freely defined classification levels are available.

Quick analysis

AndroVision® allows for an accurate motility and concentration assessment at production line speed. Approx. 30 ejaculates can be analyzed per hour, including sample preparation.

Precision control

The combination of AndroVision® with an optimal high end microscope makes sure that the operator stays in full control.

Flexibility

AndroVision® can analyze recorded videos as well as live sperm samples. Analysing recorded videos provides great flexibility of semen assessment, both in time and location. AndroVision® can be used with a range of different counting chambers, providing the operator with flexibility in his choice of product.

Advanced analyzes

AndroVision® offers the possibility to employ advanced analyzes based on extremely sensitive indicators such as Membrane and Acrosome Integrity, Mitochondrial Activity and DNA Integrity. As part of quality control in the laboratory, these analyzes not only allow continuous fertility screening of the animals but also give the possibility for early identification of premium and standard breeding animals.

Creating **meaningful certificates** in seconds with AndroVision®

Custom made reports

AndroVision® can generate reports of all analysis results as prints or MS Excel files. Production units and analysis service labs can provide clients with a full quality report of the semen doses. Reports can easily be edited by the user.

Consistency

The objective AndroVision® evaluation criteria guarantee the application of identical standards under all circumstances. This makes it possible to compare data of technicians, labs and production days. Clearly defined threshold values allow detection of poor quality semen without a doubt and prevent processing, freezing or shipping of substandard product.

Network compatibility

AndroVision® offers the possibility to integrate a Network Attached Storage system (NAS). This system provides you a central database and file management connected to more than one AndroVision®. The data security is high and the backup-functions are more flexible. Additionally, analysis results and videos are available 24 hours a day, independent of the AndroVision® system.

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