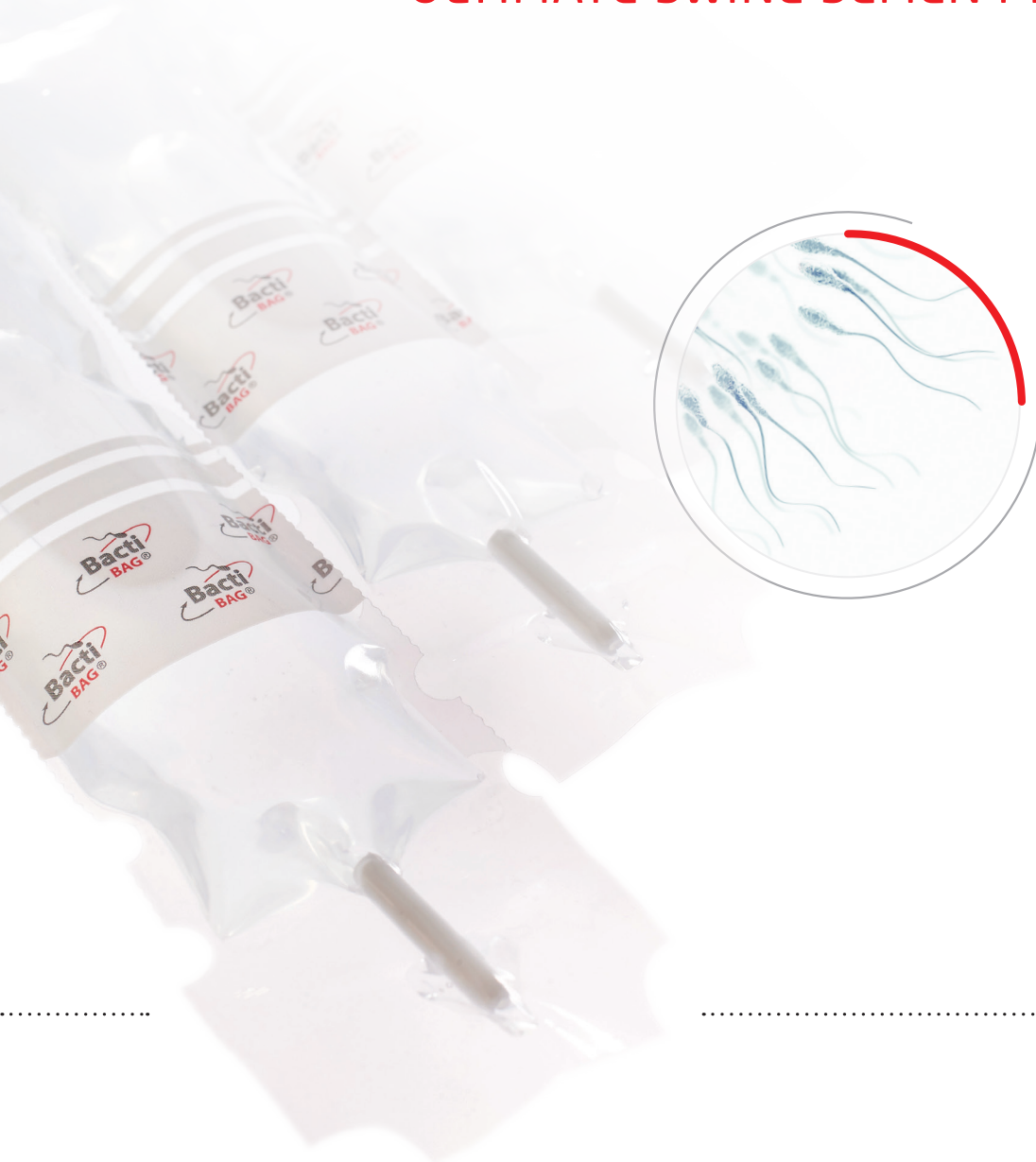




NEXT-GENERATION PACKAGING FOR
ULTIMATE SWINE SEMEN PROTECTION





INTRODUCING...

...THE MOST-ADVANCED PACKAGING SOLUTION
ON THE MARKET TODAY



IMV Technologies has been a pioneer and a trusted market leader in reproductive technologies for the past 50 years.

Bacterial contamination remains one of the biggest challenges facing most artificial insemination (AI) centers and breeders. With that in mind, IMV Technologies has developed the BactiBag, a new bag for swine semen protection.

With breakthrough bacteriostatic technology, BactiBag is able to do what no other bag in the market today can do: keep bacterial proliferation under control.

Developed through years of research, this next-generation packaging system brings added safety to the insemination process, allowing for extended preservation period of semen doses.

Simply put, it preserves swine sperm quality better and longer.

In vitro and *in vivo* studies have demonstrated the added value of BactiBag with superior reproductive results. With greater flexibility to accommodate various insemination schedules, producers can reduce costs and streamline processes, ultimately increasing efficiency.

BactiBag is simply setting a new standard in the packaging market, by offering ultimate swine semen protection.



ADDED SAFETY

AN ACTIVE TECHNOLOGY TO PRESERVE SPERM QUALITY

BactiGuard, keeping bacteria under control

BactiBag presents an innovative solution, called BactiGuard, to prevent the proliferation of bacteria detrimental to swine semen quality.

BactiGuard exerts a bacteriostatic action to efficiently control bacterial proliferation, while posing no risk for the diluted semen.

100% sperm-safe : a new approach with the "contact effect"

The innovation lies in the active technology provided by the novel design of having the anti-bacterial agent coated on the internal surface of the BactiBag, instead of being diluted within the media.

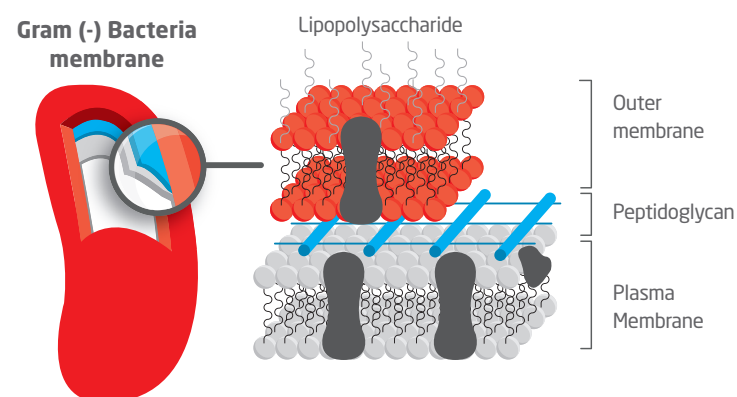
Therefore, the unique bacteriostatic action becomes effective on the diluted semen through a "**contact effect**" with the surface.

Years of research into finding the correct dosage have led to this conclusion : BactiBag contains a quantity of the coated anti-bacterial agent that is sufficient to prevent bacterial proliferation but is low enough to remain safe for swine semen.

Two mechanisms of bacteriostatic action

1. BactiGuard prevents bacterial proliferation by disrupting the cellular membrane of bacteria, stopping their growth.
2. It increases Gram(-) bacteria membrane permeability, making them more sensitive to antibiotics.

With bacterial growth prevented, BactiGuard also limits the release of endotoxins harmful to sperm.



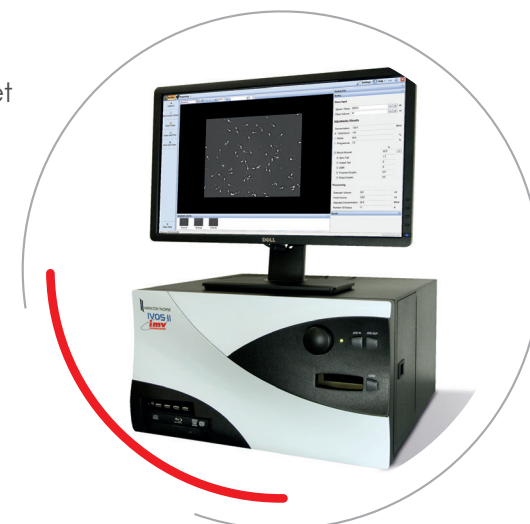
TOP-LEVEL QUALITY CONTROL

TO MEET SAFETY REQUIREMENTS

From the raw material to the finished product

IMV Technologies implements rigorous quality control measures to meet safety requirements, from raw material to the finished product.

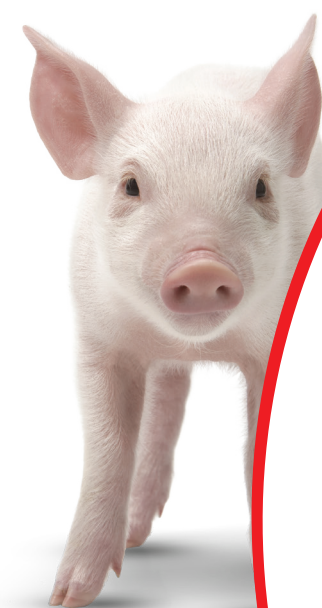
- Raw materials are controlled through the use of an infrared spectrophotometer to verify the plastic composition
- Plastic films are tested *in vitro* (7 days duration)
- Rigorous testing is carried out by an independent laboratory with the quantification of measures of BactiGuard agent.
- On the production line based in France, three cameras control each produced bag.
- Pressurized testing of finished bags to confirm seal quality.



THE NEED TO FIGHT BACTERIAL PROLIFERATION

WARNING

Bacterial contamination is an issue of great importance for AI Centers and breeders.



A detrimental impact on sperm quality

The presence of bacteria creates competition for nutrients. Endotoxins released by bacteria can harm spermatozoa by decreasing motility and its viability, by causing premature acrosome reaction, and increasing sperm agglutination.

Bacterial contamination can also stimulate the development of antibiotic resistance.

A negative impact on reproductive performance

Many studies have demonstrated the negative effect of bacterial contamination on swine reproductive results.

Decreased litter size by 2.53 to 3.35 piglets per litter (if *E. coli* > 3.5 x 10³ CFU/ml) ⁽¹⁾

Reduced conception rates by 6 to 12% ⁽²⁾

(1) : Luis O. Maroto Martina et al, 2010

(2) : C.E. Kuster, G.C. Althouse, 2015

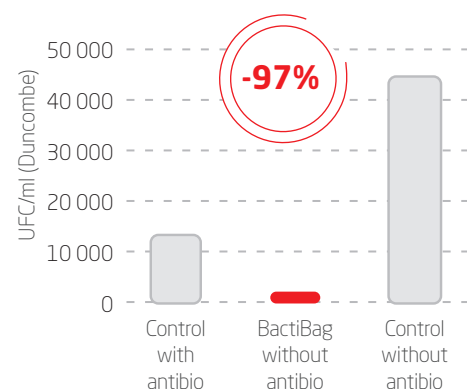


UNMATCHED PERFORMANCE FOR BETTER RESULTS

Best-in-class for preserving sperm quality

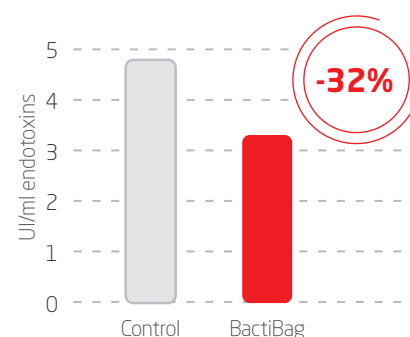
In vitro studies conducted to compare BactiBag vs. classic bag clearly show its unique profile in terms of added safety for swine semen conservation.

97% reduction in bacteria level ⁽¹⁾



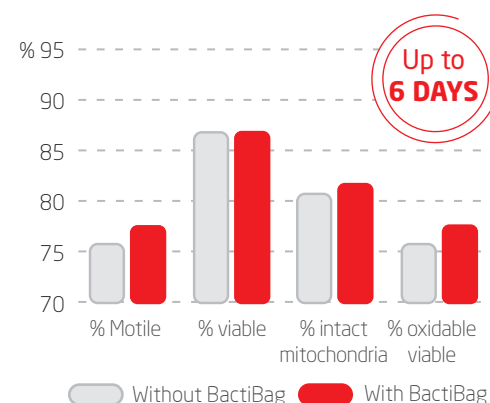
It allows for longer preservation period. Bacterial proliferation is considerably reduced (up to 6 days).

32% reduction in endotoxins level ⁽²⁾



Endotoxins are harmful to sperm and released by dead bacteria.

Up to 6 Days protection of spermatozoa ⁽³⁾



All sperm quality criteria (motility, viability, intact mitochondria, oxidizable viable) are preserved and even higher (up to 6 days).

Best proven reproductive results

In vivo observations from IMV Technologies and field studies demonstrate superior reproductive results.

+6,6%
Average gain in fertility index

IMV Technologies field study
on 424 sows (France)

3% to 6%
Average gains in fertility index

Field confirmation studies
on 3.376 sows (Germany, Russia)

1. Efficacy of BactiBag compared to standard bag, without the use of antibiotics, study conducted on 6 boars, January 2014.
2. Measurement tests of endotoxins released by bacteria during its life and multiplication, study conducted by R&D at IMV Technologies, 2016.
3. *In vitro* data of BactiBag compared to standard bag at day 6. Storage with antibiotics. Quality control with CASA system (IVOS II) and a flow cytometer (EasyCyte II Plus). Study conducted on 48 samples. January 2014."

Artificial insemination outcomes may vary from site to site.

FIVE UNIQUE BENEFITS FOR OVERALL IMPROVED PERFORMANCE

BactiBag brings added value and clear benefits to artificial insemination centers and breeders with longer preservation of sperm quality, yielding **overall improved performance**.

Added safety

Keeping bacterial contamination under control means **better preservation** of sperm quality

Extended storage period

Less contamination allows for **longer preservation** of sperm quality

Superior reproductive results

Preventing bacterial proliferation leads to **gains in fertility index**

AI schedule flexibility

Longer preservation of semen allows easier planning of AI schedules

Reduced costs and greater profitability

Streamlined AI processes



THE CHOICE OF BREEDERS

SETTING A NEW STANDARD

With over 10 million bags sold in more than 10 countries, BactiBag has an excellent track-record. Its performances are unrivaled in the market, no wonder BactiBag gets high satisfaction marks from breeders.

"The BactiBag allows us to extend semen conservation times compared with what we had with traditional semen bags. The biggest change we've seen is litter size. We've gained one piglet per sow and per litter".

Marc Touchais
"La Petite Fontenelle" pig farming facility (France)
(520 sows, traditional insemination)



"We now work with the BactiBag to secure our performances and control bacterial contamination of semen doses. For the deliveries received on Friday, the BactiBag enables us to have a constant semen quality until Monday, even Tuesday. The BactiBag allows us to be more confident in the equipment we use and the results we will obtain.

Jérôme Debroize
"Debroize" pig farming facility (France)
(320 sows, traditional insemination)



QUALITY AND TECHNOLOGY

MADE IN FRANCE



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...
... Label certification ISO 9001:2015





GTB BAG ULTRA



ALWAYS SAFER
& NOW CONNECTED !

A TRUSTED MARKET LEADER IN SWINE SEMEN PRESERVATION BAG

With the launch of GTB Bag in 2005, IMV Technologies established a new standard for swine insemination, helping breeders updating from tubes and bottles to bags.

Since then, 250 million GTB Bags have been sold in over 45 countries. This result is placing IMV Technologies as the leader of the bag market, with a track record of excellence for the safe preservation of swine semen.



250 million

GTB Bags manufactured
and sold since launch

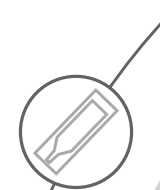
45

countries in which
GTB Bag has been
distributed

1 billion

healthy pigs produced
with GTB Bags

GTB Bag



THE REFERENCE FOR SEMEN PRESERVATION GETS EVEN BETTER !

Now comes the GTB Bag Ultra with additional features for superior protection of swine semen doses.

Always safer, now even better, and connected !

GTB Bag Ultra



GTB
BAG ULTRA

MULTILAYER FILM TECHNOLOGY

FOR SUPERIOR PROTECTION OF THE SWINE SEMEN DOSE

Designed for protection

We carefully selected the different plastic components of the multilayer structure to optimize swine semen preservation. As with the appropriate PE materials to ensure **robust welding** during our manufacturing process and by the GTB 1000.

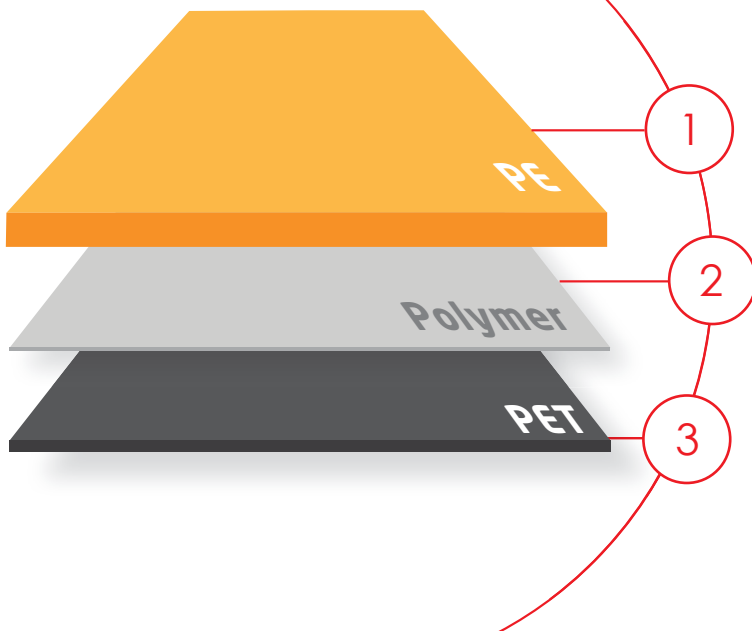
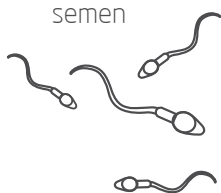
Over the course of 15 years, our multilayer film technology has proven its efficacy.

Not only did it quickly establish itself as **a reliable and superior solution** over bottles and single-layer tubes for conservation of swine semen, but it has also become **a technology of choice** for the swine insemination industry.

IMV Technologies' bags are free of BADGE, PVC, BPA and cyclin lactone which may have a toxic impact on semen.



semen



1

The PE film is in contact with the semen and has specific **non-spermicidal properties**. Our specific PE material allows a robust welding of bags.

2

The polymer is an intermediary layer to serve as a binder between the two other layers and **to avoid delamination**.

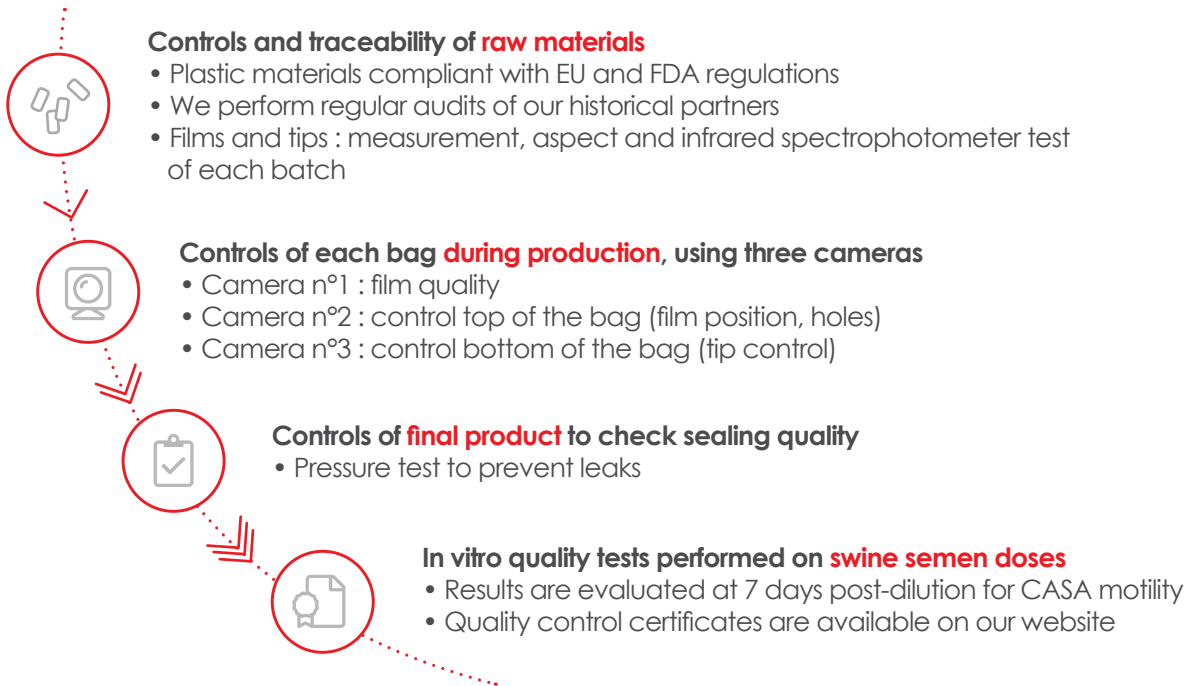
3

The PET material is 50 times more impermeable than other types of plastic materials. It is limiting air penetration and therefore oxygen, **protecting semen from oxidation**.

UNIQUE QUALITY CONTROL AND TRACEABILITY FOR GREATER SAFETY

Quality control from the raw material to the finished product

At IMV Technologies, **safety is our main priority**. It is no wonder that no toxicity problems have ever been reported for the GTB Bag.



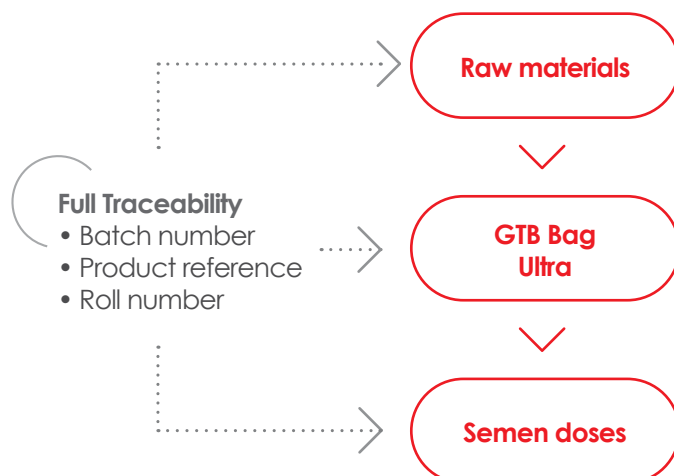
A unique traceability feature

An RFID tag now allows digital identification for **perfect traceability of bags**, from the production lines to the final dose on the farm.

With **automatic data transfer and unique identification of product references**, batches and rolls numbers, our GTB Bags Ultra can now be traced throughout production, delivery, and use during the artificial insemination (AI) process.

Digitalisation and data automatization allow for **easier in-house batch tracking** by your own laboratories.

This comprehensive traceability system brings a new level of quality assurance for breeders.



Automatic Data transfer



PRACTICAL, COMPACT AND EASY TO USE

MAKING THE INSEMINATION PROCESS EASIER

Using bags over tubes and bottles presents **great advantages**. That's why so many AI centers are switching to bags to offer breeders a **more reliable and practical solution**.

More practical and easier to use

In addition to its specific features, the GTB Bag Ultra makes the AI process more practical and easier than by using tubes or bottles.

- Insemination is controlled by the sow's uterine contractions, no more need to squeeze the dose (during conventional insemination process)
- Less backflow
- Leak-proof tip with sanitary protection until use
- Easy to open

Also available in mini size

- GTB Bag Ultra is available in standard size (90 ml) or in mini size (40 ml).
- The **mini-bag** comes in a **V-shaped format**, to facilitate the evacuation of semen when using deep insemination.

Compact and universal

- Up to 15% storage space saved over tubes
- Direct interoperability with GTB 1000 filling machine
- Compatible with most catheters and post-cervical catheters without connector

Coloured tips

- Many different colours available upon request
- To suit your brand requirements
- To differentiate breeds easily

Customize every bag with premium printing

Turn every GTB Bag Ultra into a communication opportunity for your brand.

Going further than just randomized printing, IMV Technologies is the only bag manufacturer today to offer high precision and definition printing to highlight your messages and corporate identity directly on the semen bag.



What you can print:

- Your logo
- Instructions for use
- Photos
- Other messages or information

A TEAM OF EXPERTS AT YOUR SERVICE YOU'RE NEVER ALONE !

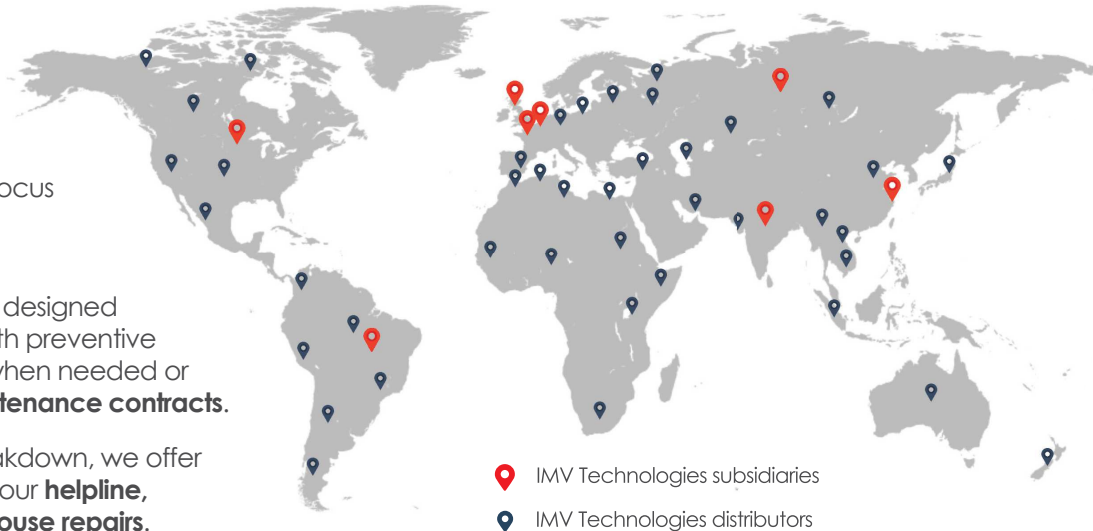
At IMV Technologies, we strive to provide you with the best customer service possible. You can always count on us. Whether for after sales support or training, you're never alone.

Delivering complete customer service

Our team of **28 experts and technicians** is deployed **all over the world** to assist you with customer service, equipment installation or after sales support. You can focus on what is important for you : your operation.

The equipment we provide is designed to last over time. We offer both preventive and curative service, either when needed or within the framework of **maintenance contracts**.

In the unlikely event of a breakdown, we offer intervention services through our **helpline**, **remote digital support** or **in-house repairs**.



Training and consulting

Because your human capital is paramount, we understand the value of building skills and providing you with the know-how and expertise to create more value for your organization.

Whether **at our head office or on-site**, IMV Technologies provides its worldwide base of clients with **training and audits** catered to their own businesses.

IMV Technologies can also help you measure and monitor progress and come up with solutions to real life problems.

Over the past 25 years, we have trained between 250 and 300 people every year. Our R&D training team can assist in auditing your production semen lab.

*Contact us to see how our global training team
can enable your people to go further.*





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