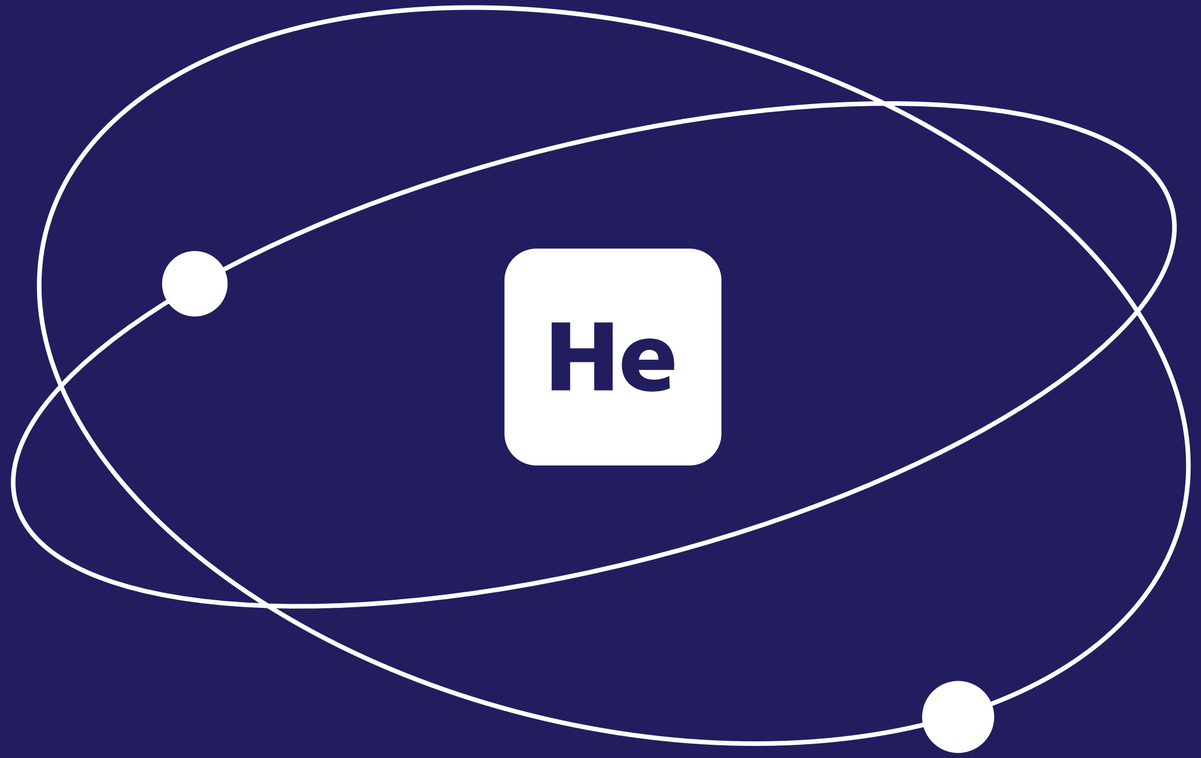

PHILIPS
Feel the freedom
with BlueSeal

Rethinking helium use in MR

Helium is a non-renewable resource, and its prices have increased in recent years for most users due to its scarcity[1]. MRI scanners are the largest consumers of helium in the world[2]. This valuable resource can be lost unexpectedly and quickly during a conventional MRI system quench. With roughly 50,000[3] mostly conventional helium-cooled MRI scanners in use around the world today, the continued use of large quantities of helium is unsustainable. Therefore, responsible management of this finite resource has been a trend over the last few years in the healthcare industry.

The question is whether there's a way to reduce our need for precious resources in the first place: **How can we keep these MRI machines going—and provide better care for more people—while reducing our environmental demands on the planet?**



Did you know?

Helium is a non-renewable resource; price levels increased by

50-100%

due to shortage[1]

MR scanners are the world's biggest consumer of helium, accounting for

32%

Most MR operators have experienced

long and unexpected down time

due to emergency quench

A quench can cost up to

100K

euros

We address the helium scarcity through innovation

Based on a decade of innovation, Philips BlueSeal magnet is a revolutionary solution designed to overcome issues related to helium dependent MR operations, while providing clinical excellence for your department.

Get ahead
with helium-free MRI

- Lead the way with BlueSeal: the industry's first high-performance, helium-free 1.5T scanner.
- Extend care to as many patients as possible with helium-free BlueSeal.
- Lift limitations with BlueSeal: an efficient solution with cost-effective operations that will serve you and your patients for years to come.

Be confident
with outstanding clinical performance

- Capture ultra-sharp images with dual AI-powered[4] BlueSeal, with uncompromised speed and simplicity.
- Achieve precise diagnosis confidently with BlueSeal's advanced imaging and reading solution.

Feel at ease
with optimized experiences for everyone

- Lighten the load with smoother workflows and faster scans to easily manage rising patient volumes.
- Give your patients a comfortable scanning experience with BlueSeal's outstanding patient-centric solutions.

The industry's first wide bore, high-performance, helium-free 1.5T scanner[5].

Our complete 1.5T portfolio benefits from:
Leading helium-free MR operations | Automated patient-centric workflow | SmartSpeed Precise powered by Dual AI[22]

Ingenia Ambition 1.5T X

High performance system delivers superb image quality even for challenging patients.

Ingenia Ambition 1.5T S

Versatile system supports high volume departments with fast exams for all anatomies in both 2D and 3D.

MR 5300 1.5T

Efficient system with ultralight adaptable coils allows for exceptional ROI for general MRI exams.

BlueSeal Mobile 1.5T

Mobile MR system delivers fast, patient-centric MRI services where and when you need it.

Since its introduction, the innovative BlueSeal sealed magnet technology has completely transformed the MRI operating landscape, setting a new industry standard—and its growing installed base confirms this.

Get ahead with helium-free MRI

Boost performance and reliability

Lead the way with BlueSeal, the industry's first 70 cm bore, high-performance, helium-free 1.5T scanner with efficient cooling technology[5]. With ~2000 installations worldwide, it is reliable across various clinical settings, including mobile MR, and offers continuous performance with Philips e-Alerts for real-time monitoring and proactive responses. BlueSeal ensures exceptional reliability by eliminating dependence on scarce helium, ensuring you can serve patients now and in the future. BlueSeal never requires helium refill, not even after ramping, quenching or coldhead service. Designed to meet the highest productivity standards, it features high thermal stability for high throughput, allowing you to scan up to 24 hours a day. With the best-in-class magnet homogeneity[6] (1.8 ppm / 50 x 50 x 45 cm V-RMS) for excellent image quality, off-center imaging and fat suppression and ultra-large (up to 55 cm) field-of-view combined with a 70cm bore design, BlueSeal enables uncompromised coverage and imaging of large patients. The system does not lose magnetic field or auto-discharge the magnet when power or cooling is lost, thanks to best-in-class[21] ride through time of ≥ 4 hours. With high gradient strength, exceptional field stability[7], and AI-powered clinical applications, BlueSeal enables precise and confident performance, even for the most complex scans.

"We won't have any problems of refilling during the machine's lifetime and we can forget about the helium. This will save us money and help us be more environmentally friendly"

Dr. María del Mar Travieso

Head of Radiology Department, Hospitales San Roque, Spain

Philips helium-free operating MR systems around the world

~2000

BlueSeal MR systems installed*

>6m

Liters of liquid helium saved**

* At July 2025

** The amount of liquid helium saved is a calculation compared to a conventional magnet with 1500 liters of helium

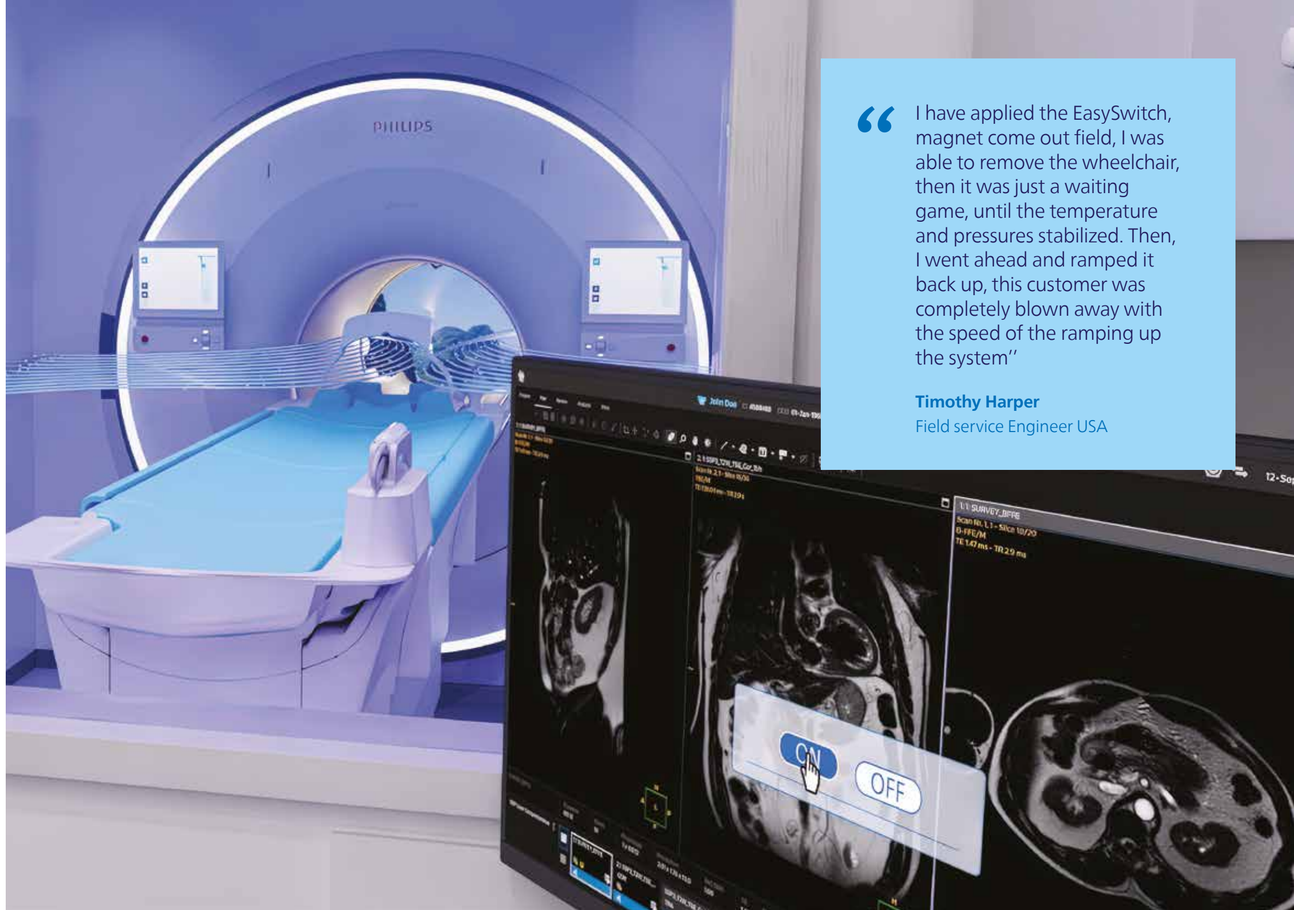
Get ahead with helium-free MRI

Broaden access to care

Despite the extreme caution exercised by MR users, most imaging facilities experienced one or two magnetic items becoming attached to the MRI magnets[3]. With conventional MR systems, when a magnetic item becomes stuck in the magnet, you need to call the service engineer to ramp down the magnet or perform a voluntary quench. Almost 30% of users report their MR machine is still not operational after 3 days[3]. In addition to the downtime of the MR system, the required refill of helium is very expensive. It's a huge waste of a vital resource, and an even bigger waste of time.

The BlueSeal magnet helps you prepare for emergency situations and resolve small incidents and be back in operations in less than 6 hours. It is the next step towards uninterrupted, more productive daily MRI operations. **AI driven EasySwitch** is designed to minimize unexpected downtime. It allows the BlueSeal magnet to be discharged and recharged behind the MRI console, without helium loss. It is driven by AI to support a set of unique service functionalities. By using the EasySwitch function, small incidents can be resolved in less than 6 hours[8], without causing massive revenue loss and significant disruptions to the facility's MRI services. It also allows your BlueSeal magnet to be proactively discharged without service support to prepare for a natural disaster.

Additionally, BlueSeal offers an innovative solution to extend high-quality MR care to more patients, even in the most remote areas, where healthcare access is limited and where it is takes longer to deliver helium in case of a quench. Compared to existing ZBO systems, BlueSeal is up to half the weight[9], eliminating the need for a quench pipe and making installation easier in densely populated cities, commercial buildings, and sites with construction limitations. The system's flexibility enables continuous operation without helium-related interruptions, ensuring access to MR services even in challenging environments.



> "I have applied the EasySwitch, magnet come out field, I was able to remove the wheelchair, then it was just a waiting game, until the temperature and pressures stabilized. Then, I went ahead and ramped it back up, this customer was completely blown away with the speed of the ramping up the system''
>
> **Timothy Harper**
> Field service Engineer USA

Get ahead with helium-free MRI

Future-proof your MR department

BlueSeal is a high-performance, helium-free MRI system designed to prepare you for potential helium shortages* by using only a minimal amount of helium—just 0.5% of today's standard amount[9]—sealed inside during production. This innovative approach reduces operational costs and eliminates the need for helium refills, allowing you to deliver uninterrupted MRI services for years to come. Built with EcoDesign principles, BlueSeal minimizes energy consumption and helps reduce your center's carbon footprint, supporting both financial and environmental goals. With PowerSave+, the system will automatically switch to standby mode when not in use, cutting power consumption by up to 45%[10], which translates to annual savings of nearly 40 Mega Watt hours (MWh)[11] and to up to 10.5k euro in Germany. Removing the need for a vent pipe increases siting locations and eliminates cost. Installation is fast, efficient, and cost-effective, as BlueSeal requires no expensive building modifications or structural reinforcements.

"We wanted to set up the MRI in a basement. This building is surrounded by the city, not having a quench pipe was very important, also very good for the financial risk because we don't have to refill helium".

Hiroyuki SUGAYA, MD
President, Tokyo Sports & Orthopedic Clinic, Tokyo, Japan

*Helium is classified as a critical raw material by the EU due to its concentrated supply, high demand, and lack of substitutes. As global demand grows, especially with increased AI-driven computing, helium prices increases and shortages pose a risk.

Be confident with outstanding clinical performance

Capture ultra-sharp images

BlueSeal magnet would not be such a game-changer if it only revolutionized MR operations. Simultaneously, we dedicated significant effort to create a magnet design that delivers excellent clinical performance. Thanks to its highly efficient cooling properties, BlueSeal delivers high quality, homogenous images. The BlueSeal magnet has a leading homogeneous field-of-view of 55 cm for a 1.5T 70 cm system, allowing you to extend your clinical coverage from head to toe and B0-stability over time. **The resulting magnet performance is all you need from an MRI system.**

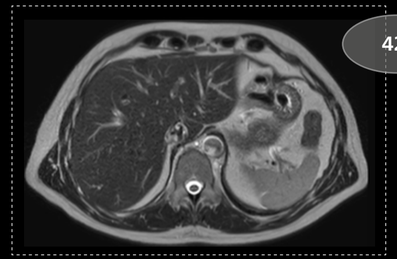
Combining the BlueSeal magnet with the AI-driven SmartSpeed Precise application can push the limits of image quality even further. This combination delivers all you need from an MR system. You can experience a remarkable acceleration in scanning speed—up to three times faster[12]—leading to a substantial boost in productivity and elevate your diagnostic confidence with up to 80% sharper images[13].

By tailoring technology and clinical capabilities to meet your needs, BlueSeal helps you respond to demanding requirements.

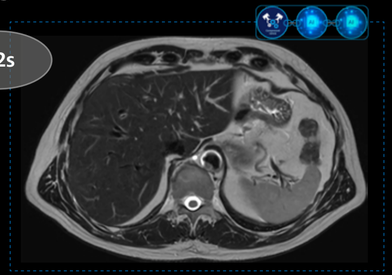
“In selecting an MRI machine, we wanted state-of-the-art technology that was easy to install, easy to use, and that would be easy on the patient. But most definitely, it had to give us high quality images. That’s how we how we settled on the BlueSeal magnet”

Constantino Peña, MD
Interventional Radiologist, Miami Cardiac and Vascular Institute, Miami, Florida

Smart Productivity with Dual AI



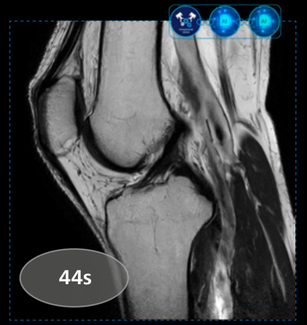
42s



Liver T2 TSE Non-AI
Recon 0.75x0.75x 5mm

Liver T2 TSE SmartSpeed Precise
Dual AI Recon[22] 0.75x0.75x 5mm

2:12min



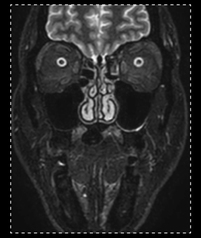
44s

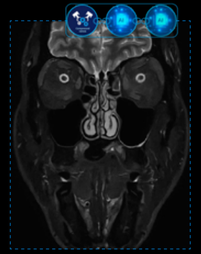
Knee T2 Non-AI
Recon 0.5x0.6x 3mm

Knee T2 SmartSpeed Precise
Dual AI Recon[22] 0.5x0.6x 3mm

Up to **3x** faster scans[12]

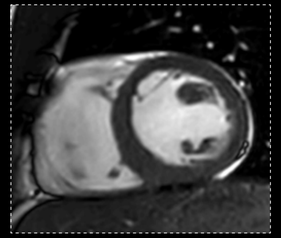
High Clinical Confidence with Dual AI

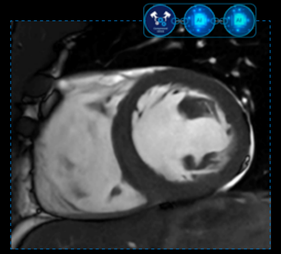




Brain STIR Non-AI
Acq 1.0x1.1x2mm
Recon 0.3x0.3x2mm

Brain STIR SmartSpeed Precise
Acq 0.5x0.5x2mm
Dual AI Recon[22] 0.22x0.22x2mm





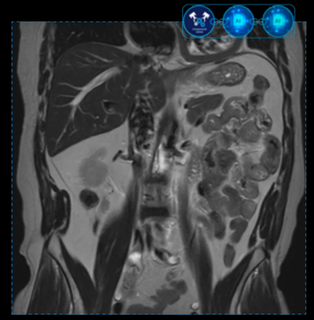
Cardiac BTFE Non-AI
Recon 0.9x0.9x8mm

Cardiac BTFE SmartSpeed Precise
Dual AI Recon[22] 0.65x0.65x8mm

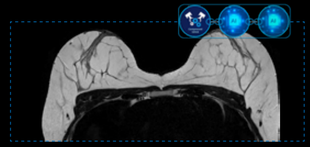
Up to **80%** sharper images[13]

C Spine T1 SmartSpeed Precise[3]
Dual AI Recon[22] 0.35x0.35x3mm

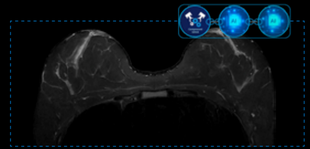
C Spine STIR SmartSpeed Precise
Dual AI Recon[22] 0.4x0.4x3mm



Abdomen Ssh T2 SmartSpeed Precise
Dual AI Recon[22] 0.7x0.7x5mm



Breast T2 TSE SmartSpeed Precise
Dual AI Recon[22] 0.5x0.5x3mm



Breast STIR TSE SmartSpeed Precise
Dual AI Recon[22] 0.5x0.5x3mm

Be confident with outstanding clinical performance

Achieve precise diagnoses

Achieve precise diagnoses confidently with BlueSeal's, quantitative and seamlessly[14] integrated imaging and reading solutions. With SmartQuant, a cutting-edge quantitative imaging application you can generate high-quality, quantitative images quick and easy, enhancing your exams without extending routine scan times. Powered by AI, it allows you to gather deeper insights by integrating quantitative imaging techniques seamlessly into your exa

Automatically generate reports that adhere to the latest clinical guidelines with Smart Reading, the industry's first seamless integration[14] of validated cloud-based AI-reading and reporting applications directly on the MR console. With a an efficient zero-click workflow[15] Smart Reading enables AI-driven report generation, optimized protocol settings and immediate scan quality feedback, all tailored for specific clinical needs like prostate cancer and chronic neuro diseases like Alzheimer's disease or Multiple Sclerosis. In partnership with computer-aided diagnostics company icometrix for neurological indications and imaging biomarker specialist Quibim for prostate cancer, Smart Reading drives precision to a new level.

Feel at ease with optimized experiences for everyone

Manage patient workloads

Improve the technologist's experience and streamline backlog management with SmartWorkflow, an end-to-end workflow solution designed for efficiency at every step. With VitalScreen and VitalEye, patients can be set up in under one minute[16]. Technologists can also benefit from SmartFit coils—ultra-lightweight and extremely flexible—for complete freedom in coil positioning.

Efficiency is further supported in the control room by MR Workspace DayManager that allows the technologist to prepare the complete schedule in advance with the AI Protocol Assistant, which recognizes preferred protocols and suggests the most-used ones for consistent, streamlined scanning. Technologists can further automate up to 80% of procedures using SmartExam[17].

With BlueSeal's Advanced Visualization Workspace, relevant clinical insights are easily extracted, cutting down reporting time and integrating seamlessly into the radiologist's workflow.

Finally, the Philips Remote Operating Command Center provides real-time expert support across departments, helping technologists make confident decisions while the patient is on the table—improving efficiency and reducing the overall cost of care.

Feel at ease with optimized experiences for everyone

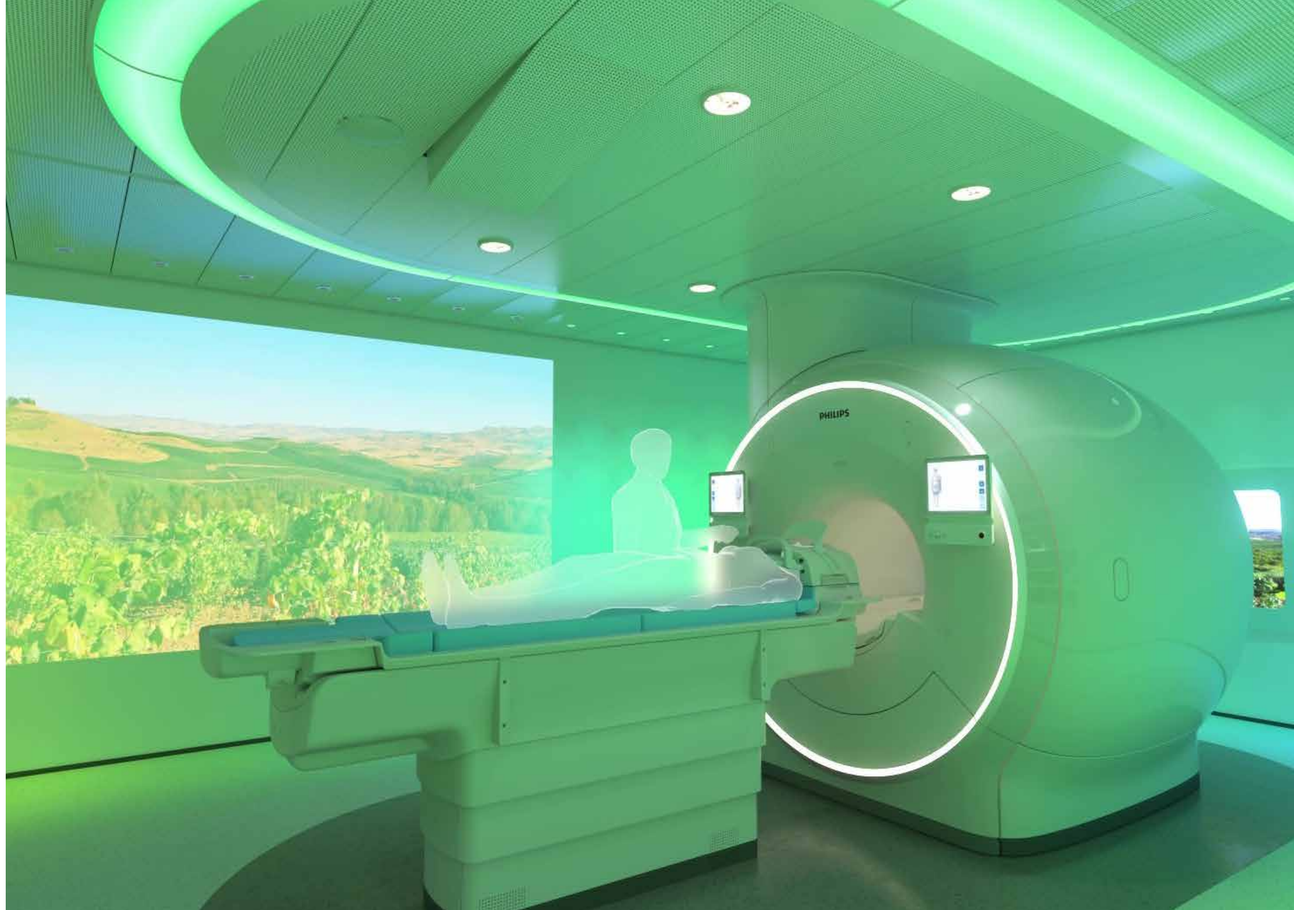
Enhance patient experiences

Keep patients calm and comfortable during the scanning process with Philips' Immersive Ambient Experience, which uses dynamic lighting, sound, and video to create a soothing environment that significantly reduces stress. This calming atmosphere can lower the need for rescans by 70% and increase awake scanning by 80%[19]. The experience is further enhanced by In-bore Connect, which guides patients step-by-step throughout the scan, helping them feel more at ease. Clear, native language instructions from AutoVoice provide timely guidance on breath holds, table movements, and scan progress, empowering patients to feel in control and minimizing motion artifacts.

Comfort is also prioritized with the ComfortPlus Mattress, on which 90% of patients[20] in severe discomfort reported ease in lying still during their exam. The ultra-lightweight, flexible SmartFit Coils further improve comfort, while ComforTone technology reduces in-bore noise by up to 80%, helping patients stay relaxed and less anxious throughout their scan.

"Now with Ambient Experience, nearly every single patient goes through without issue. In the nearly two years we've been using it, I can count on one hand the number of patients who've quit on us."

Mr. Carlos Avila
Clinical Specialist, Miami Cardiac & Vascular Institute, Florida, Miami



BlueSeal magnet design	
Field strength	1.5T
Magnet design	Ultra compact, lightweight and sealed
Magnet weight (with cryogen)	2,050 kg* (4,520 lbs) *typical weight
Minimum siting limitation	3,700 kg (8,157 lbs)
Open bore diameter	70 cm (incl. shim, gradient & QBC)
Maximum FOV	55cm x 55cm x 50cm

BlueSeal micro-cooling system	
Type of cryogen	Liquid helium (7 liters)
Micro-cooling technology	Yes
Cryogen boil-off rate	Not applicable, fully sealed
Cryogen refill interval	Not applicable, fully sealed
Vent-pipe requirements	Not applicable, fully sealed

BlueSeal adaptive-intelligence	
Type of magnet controller	Digital, AI
Self ramp-up unit	Yes, digital
Self ramp-down unit	Yes, digital
BlueSeal EasySwitch	Yes, AI
EasySwitch innovatons	Yes, magnet UPS, air-cooled compressor and 24/7 monitored e-Alert

Experience the benefits of BlueSeal

Get ahead with helium-free MRI

Be confident with outstanding clinical performance

Feel at ease with optimized experiences for everyone

“I don’t think there is a better MR system. In so many ways the flexibility of a Philips system is such that our decision was a no-brainer.”

Raja Muthupillai , MD
Texas Medical Center, Houston, Texas

References

1. January 2022 onwards https://www.innovationnewsnetwork.com/helium-shortage-4-0-what-caused-it-and-when-will-it-end/29255/
2. Statista, Distribution of helium consumption worldwide, 2021
3. Marketech June 2017 study (across vendors)
4. via Philips SmartSpeed Precise
5. Helium-free operations. 7 liters of helium is permanently enclosed in the cryogenic circuit
6. Compared with our previous 70cm 1.5T ZBO magnets; based on actual average shim results of many magnets of both types in the Philips installed base
7. Compared with our previous 70cm 1.5T ZBO magnets; based on measured performance of many magnets of both types in the Philips installed base
8. Can vary based on system and site conditions
9. Compared to existing ZBO systems in the industry
10. Applicable to Ambition X, BlueSeal XE. Philips stand-by versus ready-to-scan mode based on COCIR. Results can vary based on system usage and system type. MR 5300, Ambition S, BlueSeal SE is 28%
11. Saving up to 37,440 kW annually vs. Philips MRI without PowerSave+, applicable to BlueSeal XE, Ingenia 1.5T. Results can vary based on system usage and system type. Results are based on typical hospital operating hours, assuming scanning hours: 10, stand-by hours: 12, long break hours: 1, short breaks of max 0.5 hour each, per day. Assuming 5 day per week and 50 working weeks
12. Compared to Philips SENSE imaging
13. Compared to Philips SENSE/ C-SENSE imaging.
14. Seamless indicates the workflow is an automatically enabled post-processing step in MR-console. Validation of the AI applications is done by the 3rd party and not by Philips
15. Workflow refers to steps after completion of data-acquisition to AI processing. No additional user-interaction is required to send data to the External application cloud and to receive reports in PACS.
16. < 1 min patient set up for routine exams, based on in-house testing. Results may vary.
17. Not available to patients with MR Conditional Implants.
18. Compared to cartesian imaging.
19. Philips MR scanners without Ambient Experience and Inbore Connect. Results from case studies are not predictive of results in other cases. Results in other cases may vary.
20. Based on one volunteer study performed at Psychiatric Hospital Zurich using ComfortPlus mattress. Results from case studies are not predictive of results in other cases. Results in other cases may vary.
21. Compared to industry 1.5T whole bore MRI magnets with sealed helium or no helium at all (dry).
22. Reconstruction technology consisting of a first AI engine applied at the source of signal (Adaptive CS-NET) and a second AI engine applied on the raw complex imaging data (Precise Image Net).

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