

Astelion series

Minimum energy, Maximum performance

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Introduction

The “green” (ECO) addition of the Astelion series to the Toshiba CT scanners will open new possibilities in medical imaging. The Astelion (Figure 1) will be launched at the ECR 2012 in Vienna as “work in progress”.



Figure 1 The Astelion series with 0.5mm detector width equipped with a new platform for maximizing performance with minimum energy representing Toshiba's commitment to the environment.

Representing Toshiba's commitment to the environment, Astelion series is able to utilize minimum energy by:

- Minimizing power consumption
- Minimizing renovation time and cost
- Minimizing the industrial waste and the usage of toxic materials

These improvements are possible with new hardware, AIDR 3D, and ^{SURE}Exposure 3D. Furthermore, to protect the environment and improve the quality of life, Astelion series reduces carbon footprint and lowers medical radiation exposure.

Simultaneously, this system produces maximum performance by:

- Improving visualization of anatomy
- Accelerating exam throughput
- Advanced applications
- Navi mode for simplified operation

making a unique combination in CT industry.

Minimum power consumption

Comprehensive optimization of the power consumption of all system components reduces overall system power requirements, as depicted in Fig. 2.

The design of Astelion series minimizes heat generation in each unit of the CT scanner. As a result, the airflow of the fans in the cooling unit is lower, reducing standby power consumption by 40% when compared with a Toshiba 4-slice system manufactured in 2003.

AIDR 3D technology allows high-quality images to be acquired with lower X-ray exposure than in conventional systems. The patient exposure dose can be reduced by up to 75% [1] with a corresponding reduction in power consumption for X-ray generation.

With the same diagnostic accuracy as scanners of equal performance, the Astelion series allows usage of smaller generators: 72 kW equivalent (4.0 MHU with AIDR 3D, Astelion/Advance Edition), and X-ray tube: 7.5 MHU equivalent.

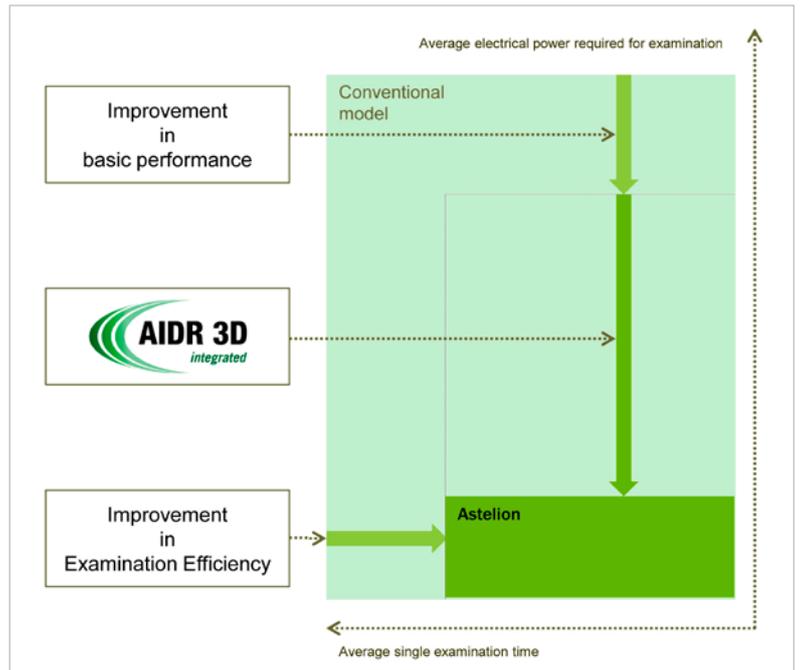


Figure 2 Example of measures for reducing power consumption of Astelion.

Minimum renovation time and cost

Systems with lightweight, compact, and power-saving design result in easier delivery and reduced installation time. Astelion series fits easily just about anywhere, even in the same space as most single-slice CT systems with smallest possible footprint of 10.4 m² (see Fig. 3).

Modification work for the power facilities and the CT room* is minimized, resulting in an installation time as short as 3 days.



Figure 3 Smallest possible footprint of 10.4 m² for Astelion series.

* Without epoxy floor

Minimum industrial waste and the usage of toxic materials

Using the already available cables and power supply reduces installation costs and unnecessary waste.

As a result, system mass is reduced by 6% and the amount of packing materials reduced by 10%.

Reducing carbon footprint

Compared with 2003 models, CO₂ emissions are reduced by 2.9 ton/year, and power consumption is reduced by 24%.

As medical systems are generally used for many years, CO₂ emitted during operation accounts for the majority of the CO₂ emitted over the entire life cycle of the product period.

In order to minimize the operating time, we provide medical systems that can shorten examination times while providing highly accurate diagnostic performance & improved efficiency, leading to reduced power consumption by our products.

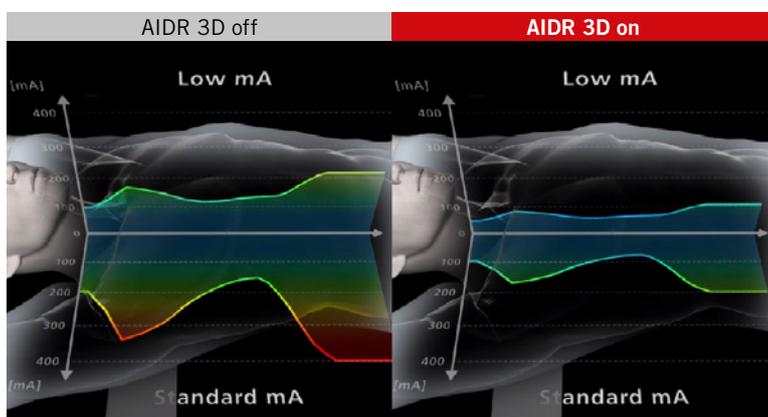


Figure 4 Integrated AIDR 3D in Toshiba's Automatic Exposure Control, ^{SURE}Exposure 3D, ensuring lowest dose exams with highest diagnostic image quality in clinical routine.

Improving the quality of life

By virtue of AIDR 3D TOSHIBA's latest dose reduction technology, radiation dose to patients is dramatically reduced, benefiting patient healthcare [1-3].

Improved visualization of anatomy

Toshiba's iterative technique, AIDR 3D, which has been described in [1] has proven to reduce dose while improving image quality. A dose saving of more than 80% has been reported by [3] for quantitative bronchial assessment in patients with pulmonary emphysema.

Accelerate exam throughput

Because AIDR 3D optimizes the tube current modulation resulting in lower exposure dose, cooling time is eliminated. Consequently, more examinations can be performed within the same time frame, maximizing exam throughput (See Fig. 5).

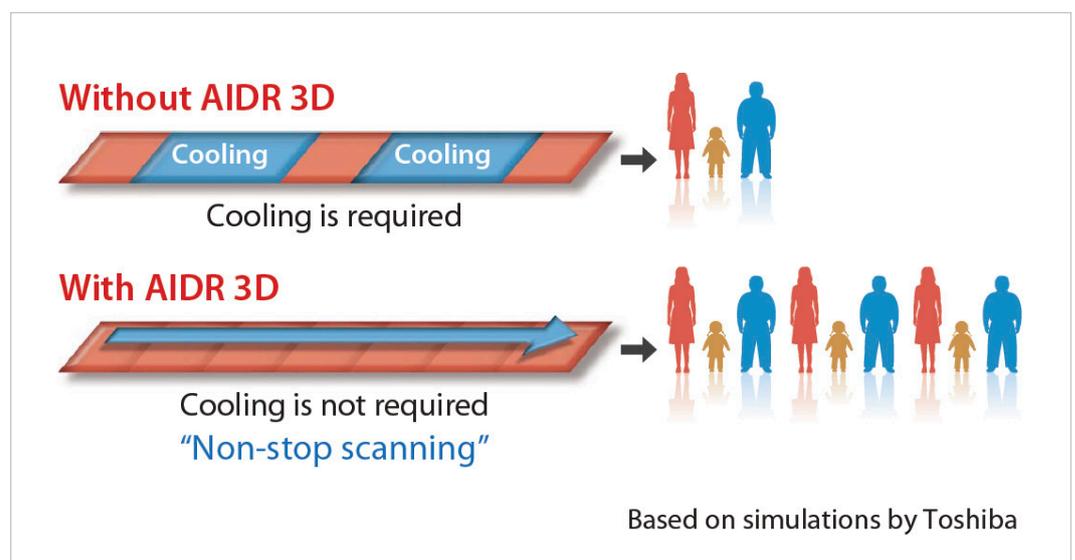


Figure 5 AIDR 3D allows higher exam throughput since tube cooling is no longer required within a certain time frame.

Advanced applications

Astelion series provides advanced applications such as Lung Volume Analysis*, Fat Index View*, Vessel View* and ^{SURE}Subtraction*.

Besides, 3D Volume rendering / MPR view, and Automatic Bone removal (Fig. 6) belong to standard package.

* Option

Navi mode for simplified operation

Unique Navi Mode operation (Fig. 7) guides the operator through every step of the exam, allowing ease of use even for relatively new users.

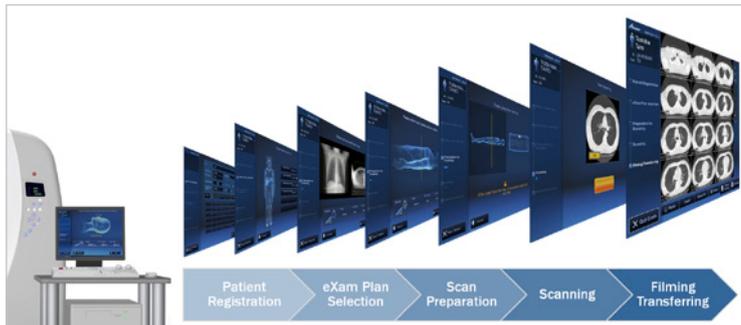


Figure 7 Navi mode operations guiding users from patient registration to filming transferring.

4. Conclusions

We have presented the relationship between Toshiba's ECO Astelion series and customer's profits which are summarized:

- 50 kVA power requirement
It requires minimum electric construction, and reduces electricity contract-cost.
- Smallest 10.4m² installation space
It can be installed at same room as single slice systems. Easy transportation and installation. Room renovation can be minimized.
- AIDR 3D is available as standard. High image quality can be achieved with lower dose. Power consumption also can be saved.



TOSHIBA MEDICAL SYSTEMS

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Model: MWPC0003EUC

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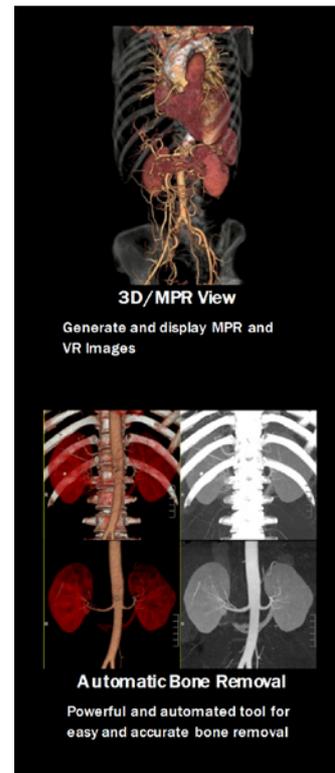


Figure 6 Standard package in Astelion series: 3D/MPR views, Automatic Bone Removal.

References

- [1] R. Irwan, S. Nakanishi, A. Blum, "AIDR 3D – reduces dose and simultaneously improves image quality", Toshiba white paper, 2012.
- [2] R. Bull, "Highest diagnostic image quality at lowest dose with AIDR 3D", Toshiba Medical Systems Journal, VISIONS 20, 2012.
- [3] H. Koyama et al., "AIDR 3D versus FPB: utility for quantitative bronchial assessment on low dose thin-section MDCT in patients with pulmonary emphysema" RSNA scientific presentation, 2012.

