

Electron Tubes for a High-Performance Fusion Reactor based on Innovative Technology

Registration No.	Number 00044		
Registration Date	October 6, 2009	Registration Category	Category 2

Name (Model, etc.)	High power gyrotron with energy recovery system		
Location	Naka-shi, Ibaraki		
	National Institutes for Quantum and Radiological Science and Technology		
Owner (Custodian)	National Institutes for Quantum and Radiological Science and Technology		
Manufacturer (Company)	Japan Atomic Energy Research Institute (now National Institutes for Quantum and Radiological Science and Technology), Toshiba Corporation (now Canon Electron Tubes & Devices Co., Ltd.)		
Year Manufactured	1994		
Reason For Selection	<p>Gyrotrons are high-powered vacuum electron tubes that emit millimeter-wave beams by getting energy from accelerated electrons. However, spent electrons generate an enormous amount of heat when they are trapped in a collector. This device employs a technique called collector potential depression (CPD) that slows down the speed of the electrons entering the collector so they generate far less heat. This substantially reduces the amount of energy that must be input to the system. This approach is called "energy recovery" by collector. The important point is that this disproves the conventional wisdom that a CPD could never work with a gyrotron. Indeed, this is the world's first successful implementation of an energy recovery type gyrotron. Thanks to this breakthrough, efforts can now focus on candidates for the main source of heat for the International Thermonuclear Experimental Reactor.</p>		
Registration Standard	1-B (Show a uniquely Japanese scientific or technological development from an international perspective.)		

Open/Closed to Public	Open to Public (Reservation Required)
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Other useful information	
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