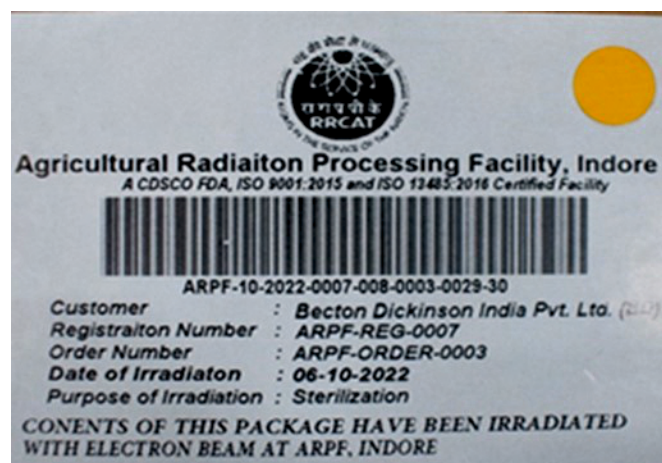
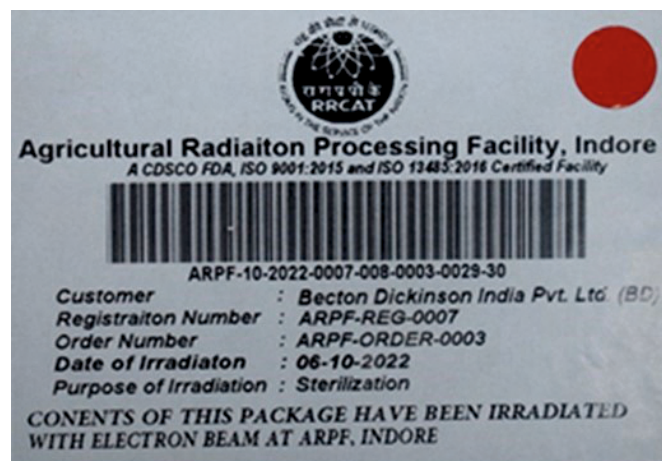


batches (32 cartons in each batch) and the traceability of each carton inside the facility was established by unique bar-code system. The non-irradiated and irradiated cartons have been stored in different, designated storage areas, and identified using irreversible radiation indicator (turned red after irradiation from yellow before irradiation).

The Linac was operated at 9.3 MeV, 6 kW beam power (effective irradiation time 22 hrs.). The average minimum dose and maximum dose delivered to the cartons were 29.5 kGy and 52.0 kGy, which is within the specified range of M/s BD (range of 25 kGy to 55 kGy). Performance qualification (PQ) for the product was done earlier this year at ARPF.



(a)



(b)

Carton barcode- (a) non-irradiated, and (b) irradiated.

The consignment has been dispatched to the customer after irradiation on 20<sup>th</sup> October 2022. The role of Incubation Centre-RRCAT was to work as a commercial wing, while whole beam processing was carried out by Industrial Accelerator Division. The above work is a milestone in the RRCAT history declaring indigenous accelerator technology irradiating medical devices at industrial scale.

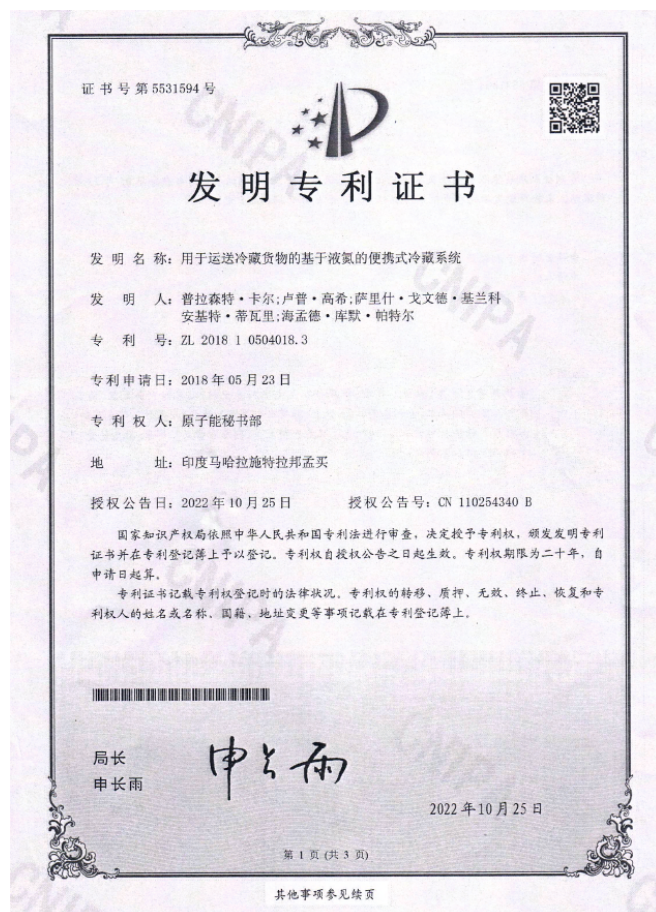
Reported by:  
C. P. Paul (incubation@rrcat.gov.in)

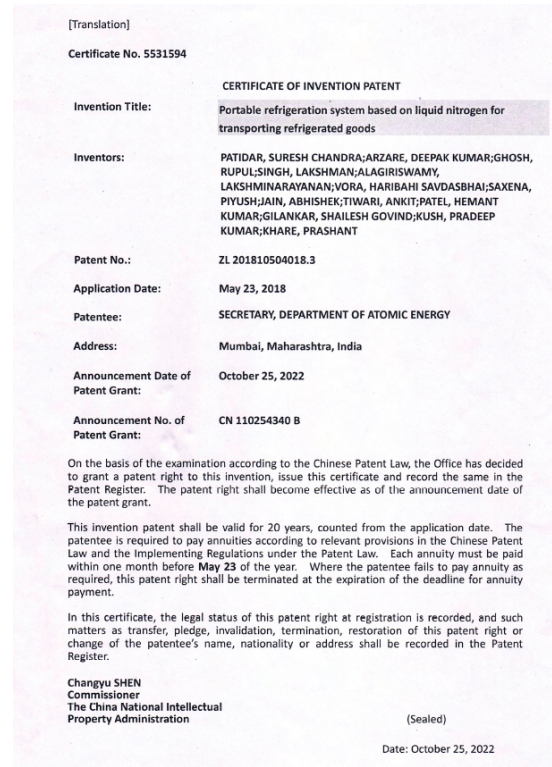
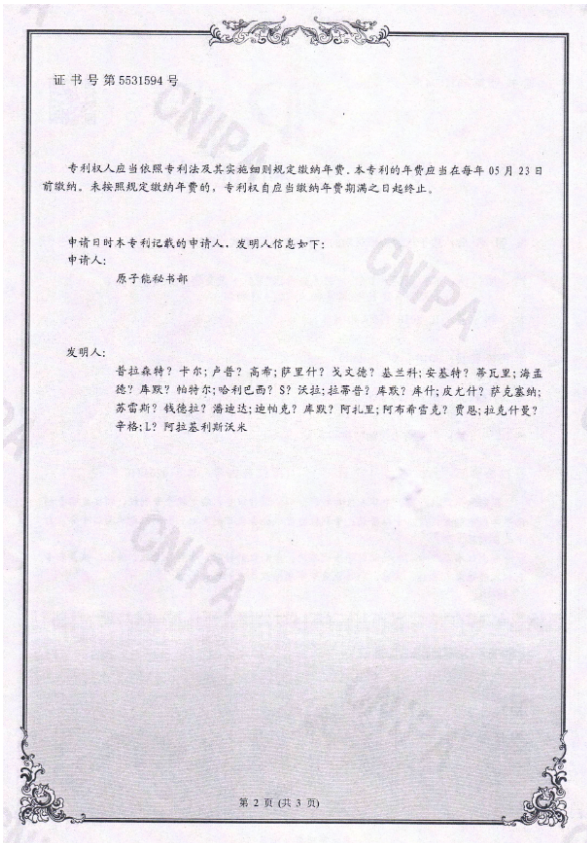
### N.5: Chinese patent on portable refrigeration system based on liquid nitrogen for transporting refrigerated goods

This invention relates to a liquid nitrogen based refrigeration system for storage and transportation of perishable goods/food, at controlled temperature and humidity levels. The invention provides means for storage and transport of goods requiring controlled temperatures in the range of -40 °C to +20 °C maintained inside vacuum insulated container. The system maintains temperature and humidity levels inside container with the help of specially designed heat exchanger for cooling the air inside the storage container. The system also includes a LN<sub>2</sub> storage container, circulation pumps/fans, control system and batteries. The container is designed such that it can be supported on truck, trolley, railway wagons, ships or as a standalone stationary system.

Inventors of the patent are S. C. Patidar, Deepak Arzare, Rupul Ghosh, Lakshman Singh, A. Lakshminarayanan, Haribhai Vora, Piyush Saxena, Abhishek Jain, Ankit Tiwari, Hemant Patel, Shailesh Gilankar, P. K. Kush and Prashant Khare. The Chinese Patent No. is ZL201810504018.3 and patent grant date is October 25, 2022.

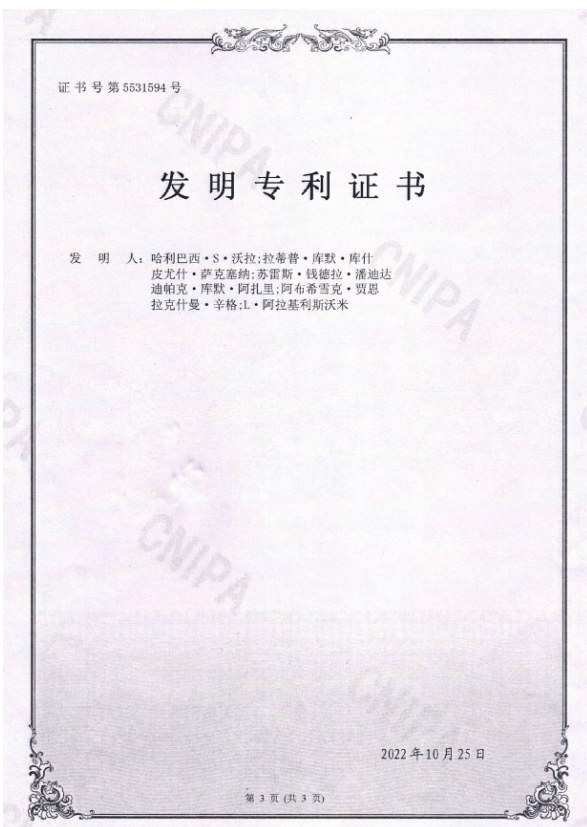
The technology has been commercialized and transferred to M/s Tata Motors under incubation mode.





Chinese patent certificate and its English translation.

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## N.6: “Azadi ka Amrit Mahotsav” celebrated at RRCAT during the DAE Iconic Week (August 22-28, 2022)

During the DAE Iconic Week (August 22-28, 2022) celebration of Azadi Ka Amrit Mahotsav, RRCAT organised various events. There was an Inaugural Function on 22<sup>nd</sup> August, 2022, which was attended by ~500 invitees including approximately 120 officials from RRCAT, students and teachers from local universities and engineering colleges. The Inauguration Function was graced by Prof. (Dr.) Rohini V. Chowgule, Founder-Director of the Foundation for Environmental Medicine (FEM) and Trustee of Impact India Foundation, Prof. U. Kamachi Mudali, Vice-Chancellor, VIT Bhopal and former Chairman and Chief Executive, Heavy Water Board, Prof. Upinder Dhar, Vice-Chancellor, Shri Vaishnav Vidyapeeth Vishwavidyalaya, and Dr. Shri Krishna Gupta, Former OSD, DAE Secretariat, New Delhi, and former Project Director GCNEP and Dr. Shankar V. Nakhe, Director, RRCAT.

A lecture by the eminent speaker Shri Jayant Sahasrabudde, National Organizing Secretary, Vigyan Bharti, was organized during the Inaugural Function on “Indian Freedom Struggle and Science”, where he spoke about the “Satyagrah” of Indian scientists during British Rule. The lecture was attended by all