

# CSIR Technology Awards 2017



**Council of Scientific & Industrial Research**  
Anusandhan Bhawan, Rafi Marg, New Delhi-110001



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## CSIR's Mission

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“New CSIR for New India”

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## CSIR's Vision

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Pursue science which strives for global impact, technology  
that enables innovation-driven  
industry and nurture trans-disciplinary leadership thereby  
catalysing inclusive economic development  
for the people of India

## About the CSIR Technology Awards



CSIR Technology Awards were instituted in 1990 to encourage multi-disciplinary in-house team efforts and external interaction for technology development, transfer and commercialization.

### **The category of awards are :**

- (i) Life Sciences;
- (ii) Physical Sciences including Engineering;
- (iii) Innovation;
- (iv) Business Development and Technology Marketing; and
- (v) Most Significant CSIR Technology of the Five Year Plan Period.

The last of these is awarded once in five years, previously coinciding with the erstwhile 5-year-plan periods, to a technology proven in the marketplace for at least 5 years. The award was last conferred in 2015.



## Criteria for Selection of Awards

Award	Criteria
I. The Technology Award for Life Sciences	Visible and sustained impact of a high order on the industrial/ economic/ societal activity, high scientific content, innovative character, global novelty and competitiveness of the technological development(s)
II. The Technology Award for Physical Sciences including Engineering	
III. The Technology Award for Innovation	To be awarded to the best innovation that was patented in any area
IV. The Technology Award for Business Development and Technology Marketing	Making significant contributions for enhancing the business of CSIR knowledgebase and will be given for the new business & marketing initiatives, strategies evolved and implemented, quantum of business generated and realised
V. The Technology Award for Most Significant CSIR Technology of the Five Year Plan Period	This is awarded once in five years, coinciding (previously) with the 5-year-plan periods, to a technology proven in the marketplace for at least 5 years. The award was last conferred in 2015

# CSIR Technology Award for Physical Sciences including Engineering - 2017



The 2017 Technology Award for Physical Sciences including Engineering goes to CSIR-Institute of Minerals and Materials Technology (CSIR-IMMT) for 'Technology for Recovery of Iron Values from Low and Lean Grade Iron Ore Resources'

India is bestowed with large and rich sources of iron ores by quantity and quality, which however seems to be rapidly depleting due to high usage and over exploitation. This therefore calls the need for robust technologies aimed at beneficiation of low and lean grade iron ores. CSIR-IMMT has developed and deployed economic, eco-friendly, sustainable technologies and innovative technology packages for production of iron from ordinarily rejected low grade iron ores including high goethite low grade iron ores.

The technologies involve process synthesis and plant optimizations for mineral liberation, plant scale testing, innovative pelletisation, kiln design and process flow sheets. These include basic engineering package for commercial plants to utilize low and lean grade iron ore fines with 45-58% iron.

The technologies have maximized the utilization of iron ores resources for long term sustainability. More than 14 clients, national and international, have benefited from these technologies for production of sponge iron and steels.





## CSIR Technology Award for Physical Sciences including Engineering - 2017

The 2017 Technology Award for Physical Sciences including Engineering goes to CSIR-Central Road Research Institute (CSIR-CRRI) for 'Sustainable Cold Mix Technology for Construction and Maintenance of Roads'

Hot mixed laying techniques using hot and melted bitumen as binder are used at large scale in construction and maintenance of bituminous roads, though it causes emission of greenhouse gases. To address this issue, CSIR-CRRI has developed cold mix technologies as alternative to traditional hot mix.

The new technology is green, construction labourer friendly and superior to existing ways of laying roads. The technology offers a saving of 1500 litre fuel oil per km (3500 m<sup>2</sup>) of rural road construction using cold mix technology in place of traditional hot mix technology. Cold mix technology saves 12% energy in premix construction and 20% energy in mix seal surfacing construction, eventually emissions of greenhouse gases are also reduced. Approximately 5000 kms of rural roads has been constructed using cold mix technology by CSIR-CRRI along with its licensee, M/s Bitchem Asphalt Technologies Limited.



Cold mix production



Cold mix laying and completion

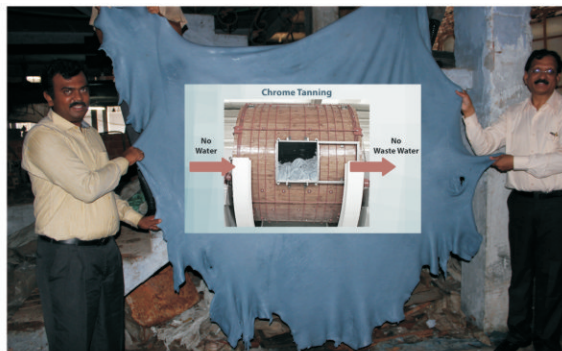
# CSIR Technology Award for Innovation - 2017



The 2017 Technology Award for Innovation goes to CSIR-Central Leather Research Institute (CSIR-CLRI) for 'Waterless Chrome Tanning Technology'

Generation of waste water containing chromium is a major challenge for the leather industry. To address this problem, Waterless Chrome Tanning technology has been developed by CSIR-CLRI. The environmental friendly technology does not need additional use of water for chrome tanning while also eliminating the need to carry out pickling process associated with the use of acid and salt.

The technology also offers the following environmental benefits: reduction of salinity and TDS in effluents by 20% and brings down the usage of chromium by 15-20%, resulting in material saving. Thus far, the technology has been absorbed by more than 50 tanneries in India. Tanneries in India, South Africa, China, Vietnam, Brazil, Sri Lanka, Bangladesh, African continent are potential markets for the present innovation.





## CSIR Technology Award for Innovation - 2017

The 2017 Technology Award for Innovation goes to CSIR-Central Mechanical Engineering Research Institute (CSIR-CMERI) for 'Development of Community Level Iron Removal Plant & their Implementation in Rural Areas to Supply Iron Free Drinking Water'

In India groundwater of about 22 states is contaminated with excess iron leading to health issues. To render water safe for human consumption, CSIR-CMERI has developed a water purification technology that reduces excess iron in potable water to a safe limit. Based on this technology, community level iron removal plants have been set up which are durable, chemical free, and as well as user friendly. Groundwater contaminated with iron is manually pumped to aeration chamber of the iron removal plant attached with the usual Mark-II hand pump.



The novelty of the present invention lies in the ability of the device to deliver instantly iron free safe drinking water without affecting water quality parameters and that too without electricity. 52 Nos. of improved iron removal plants (IIRP) have been implemented in the Bankura district of West Bengal thus serving the needs of about 26,000 rural population.



# CSIR Technology Award for Business Development and Technology Marketing - 2017



The 2017 Technology Award for Business Development and Technology Marketing goes to CSIR-Central Institute of Mining and Fuel Research (CSIR-CIMFR) for 'Significantly Enhancing the Business and Marketing of their Knowledgebase'

CSIR-CIMFR has emerged as an industry sensitive and internationally acclaimed research institute in the area of mining and coal based fuel science. It has introduced technology partnerships and collaborative business models to address the energy security issue of the country.

CSIR-CIMFR has standardized its diverse services, specialized facilities and has adopted smooth business mechanisms through timely delivery of the goods. CSIR-CIMFR has realigned its technical activities enhancing business bandwidth in the emerging areas like coal bed methane, underground coal gasification, coal to chemicals, potash mining, etc. The laboratory's effort for coal quality assessment has a precise impact in the field of power generation in India. This has not only enhanced plant performances but also reduced imports of power coal considerably.



The existing specialized infrastructural facilities of the institute are strengthened in public interest, which has led to a sustainable and consistent growth of over 400% in its External Cash Flow in a period of five years.



## Certificate of Merit CSIR Technology Awards - 2017

The “Certificate of Merit” under the CSIR Technology Awards 2017 goes to CSIR-Central Glass and Ceramic Research Institute (CSIR-CGCRI) for ‘Technology for Manufacturing Special Glass Beads for Nuclear Waste Immobilization’

Glass beads nodules are used for immobilization of radioactive wastes from nuclear plants. The borosilicate glass beads developed and implemented by CSIR-CGCRI is a precarious material required for management of radioactive waste in a closed nuclear fuel cycle that is followed by India. It is of preferred sizes with stringent physical, chemical and mechanical properties which immobilize radioactive wastes. The innovation also assists in recovery and recycles of valuables during nuclear waste immobilization and is of significant importance for nuclear power programs.



The entire process of the invention is completely non-hazardous to the operating personnel. The technology has been transferred to a company and about 56.5 MT of glass beads of varying specifications has been delivered to Department of Atomic Energy (DAE). The development and implementation of the technology for its intended use is a significant step towards country’s self-reliance in this important strategic sector.

# CSIR Portal - E-Compendium of its Knowledgebase/Technologies



Council of Scientific & Industrial Research (CSIR) covers a wide spectrum of science and technology and provides significant technological interventions in many areas. A Digital Platform for showcasing CSIR technologies and knowledgebase has been created and can be found at:

<http://techindiacsir.anusandhan.net/>

A screenshot of the CSIR Tech India website. The header features the CSIR logo and '75 Years of CSIR Touching Lives'. A central banner reads 'Single Point Window to CSIR Intellectual Property, CSIR Technology, CSIR Knowledgebase and Services'. Below the banner is a navigation menu with links: Back, Home, Success Stories, Social Interventions, Technologies for Transfer, Active Patent Portfolio, Search, and Contact. The main content area is divided into two columns. The left column is titled 'Socially Relevant S &amp; T Interventions' and features a card for 'System for detection of adulteration in milk (KSHEER - SCANEER)'. This card includes an image of a blue device, the text 'The system is capable such as urea, salt, detergents, boric acid, caustic soda, Lye (NaOH), acids, hydrogen peroxide and many more unknown adulterates in raw milk. Real time automated system, Scan raw milk samples at sources level i.e.', and the institute 'CSIR-CSIRII' and category 'Food and Nutrition'. The right column features a card for 'Swaraj Tractor', including an image of a blue tractor, the text 'The Swaraj Tractor developed by CSIR-CSIRII and perfected the same to its present level of efficiency. The Swaraj Tractors shows the technological strength of CSIR. The Swaraj Tractors appropriately mechanize their business and provide better services to the farmers. When independent business is required, CSIR-CSIRII provides the services.', and the institute 'CSIR-CSIRII' and category 'Farm Machinery'. On the far right, there is a sidebar titled 'Opportunities@CSIR' with a list of services: Collaboration Opportunities, New Inventions, Start-up Opportunities, Funding Opportunities, and Consultancy Services.

# CSIR Pan India Presence

## Theme Directorates

- ▶ Aerospace, Electronics and Instrumentation & Strategic Sector
- ▶ Civil Infrastructure & Engineering
- ▶ Mining, Minerals, Metals and Materials
- ▶ Chemicals (including leather) and Petrochemicals
- ▶ Energy (conventional and non-conventional) and Energy devices
- ▶ Ecology, Environment, Earth & Ocean Sciences and Water
- ▶ Agri, Nutrition & Biotechnology
- ▶ Healthcare



## Council of Scientific & Industrial Research

Research, Project Planning and Business Development Directorate  
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