

TECHNOLOGY ROUNDUP

A NEWS BULLETIN

Technology Information Services Section (TIS)
Pakistan Scientific & Technological Information Centre



PASTIC

Vol.13 No 4

July-August, 2021

Editorial Board

Executive Editor

Prof. Dr. Muhammad Akram Shaikh
Director General, PASTIC

Managing Editor

Dr. Syed Aftab Hussain Shah

Composer

Kashif Farooqui

Tech News Headlines

- Pakistan Initiates Smart phone export
- 35 High Growth startups graduate from Ignite's National Incubation center Karachi
- Swarm of Autonomous Tiny Drones can localize Gas Leaks
- Woven Nanotube Fibers turn Heat Energy into Electrical Energy
- New Method Developed to Solve Plastics Sustainability problem
- New Technology will allow Important Metals to be made more Efficiently
- New Technology shows promise in detecting, blocking Grid Cyberattacks
- Developing Enhanced Fish Vaccines with Nanocellulose

Tech & Trade Offers

Pakistan Cables



Forthcoming Tech Events

- World Congress on Information Technology and Computer Science
- International Conference on Cell and Tissue Science
- International Conference on Environment and Life Science
- International Conference on Science, Engineering & Technology
- International Conference on Management and Information Technology
- International Conference on Natural Science and Environment
- World Congress on Cell & Tissue Science

PASTIC National Centre
Quaid-i-Azam University Campus
P.O. Box 1217, Islamabad

Phone: 051-9248103-4, 9248128
Fax: 051-9248113
Email: tis.pastic@gmail.com
Web: www.pastic.gov.pk

PAKISTAN INITIATES SMART PHONE EXPORT

Pakistan has initiated exporting 4G smart phones with the first shipment of its kind to the United Arab Emirates.



Courtesy: <https://www.dawn.com/news/1640737>

The first consignment of 5,500 mobile sets of 4G smartphones manufactured by Inovi Telecom has been exported to the UAE. There is need to regulate the export supportive policy thus allowing Pakistan to surpass the competitors in the Middle East region.

Inovi Telecom Pvt Ltd was issued authorisation for mobile device manufacturing in April, 2021 and it has managed to fulfil its first export order within four months. Chief Executive Zeeshan Mian Noor said that their main target was to penetrate in low-end markets of Middle East including Iraq, Iran and Afghanistan. “We are manufacturing the Chinese brands and there are a large number of expat workers in the Gulf countries,” he said, adding the hi-end consumers of Gulf countries prefer top world class mobile brands and we should not even try to get involved in that market.” The Pakistan Telecommunication Authority expects that the exports of smart phones would enhance in future.

Source:

<https://www.dawn.com/news/1640737>

35 HIGH GROWTH STARTUPS GRADUATE FROM IGNITE'S NATIONAL INCUBATION CENTER KARACHI

National Incubation Center, Karachi (NICK) organized a Startup Graduation Ceremony to celebrate the achievements of its fourth and fifth cohort startups, in which 35 high growth startups made the graduation wall.



Federal Minister for IT and Telecommunication Syed Amin UI Haque in Group Photograph during the "Ignite National Incubation Center Graduation Ceremony 2021", at NED University of Engineering & Technology, Karachi, on July 9, 2021

During the course of their incubation at NIC Karachi, startups were challenged to not only show progress in the various training programs that were organized for them as a part of their incubation, but also display growth in their businesses as well. A consultation session with 10 of NIC Karachi star startups was also held during the occasion. Federal Minister for IT & Telecom, Syed Amin UI Haque, applauded the efforts of the graduating founders. He said, "NIC Karachi has contributed tremendously in regional and national economy of Pakistan by supporting innovation & promoting entrepreneurial culture. The center is serving as a hub of innovation and entrepreneurship for Karachi and has launched many successful startups".

The ceremony was also attended by CEO Ignite Mr. Asim Shahryar Husain, VC NED University Dr. Sarosh Hashmat Lodi, Member IT Mr. Junaid Imam, Ignite Board member Mr. Danish Lakhani, GM Projects Mr. Jawad Azfar, VP LMKT, Mr. Faisal Jamil, senior officials of the ministry and Ignite teams, and other dignitaries.

Federal Secretary for IT & Telecom, Dr. Muhammad Sohail Rajput said, "Seeing young people aspire to create a positive impact through innovation is always a welcome sight. The growth shown by the graduating businesses is a testament to all the hard work that has been done by the Ministry of IT and Telecom, Ignite, and NIC Karachi." CEO Ignite Mr. Asim Shahryar Husain stated that "Startup ecosystem of Pakistan is heating up in 2021 with a growth of more than 200% in investments in Pakistani startups over the last year. Government of Pakistan's pro-entrepreneurship policies have been instrumental in playing a key role in this regard. Ignite is planning more incubators in other cities and new technology verticals in future to ignite the startup ecosystem of Pakistan."

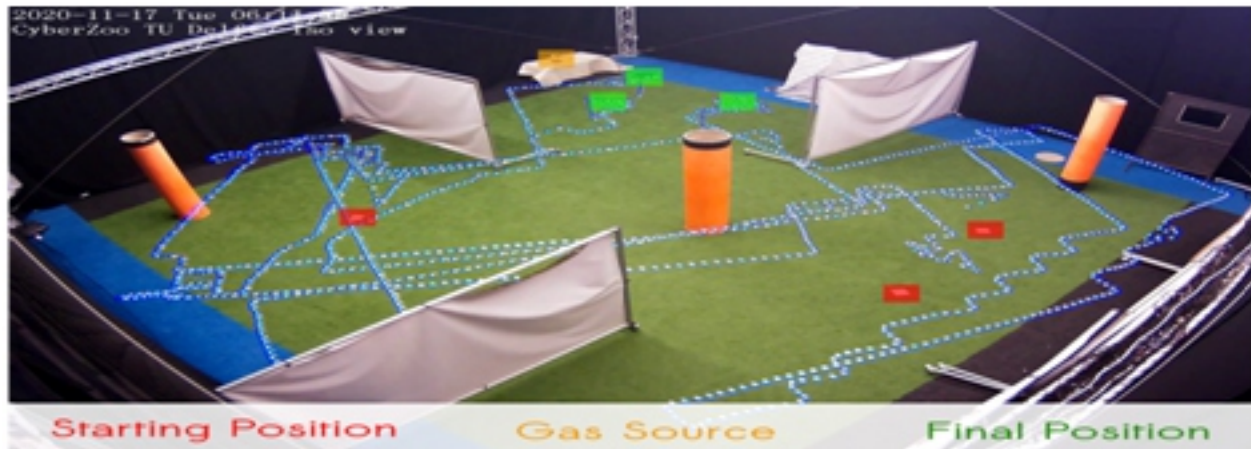
Director, NIC Karachi, Omar Abedin, thanked all the esteemed guests for attending the ceremony and encouraging the graduating startups. He shared the significant contributions of NICK startups to the economic growth and prosperity of Karachi, and the nation, through startups such as Bykea, Azcorp, Lorryz, Asani, HukumJanab, The Learning Hut, Tensorminds, Carvan, Saaya Health, QriosityNet and 160 other. At the closing of the event, a cake cutting ceremony was held to celebrate NIC Karachi's 3rd birthday as well as the recent announcement of Ignite's National Incubation Centers as a Champion project in the enabling environment category at the International Telecommunication Union's WSIS Process Prizes 2021.

Source:

www.ignite.org.pk/35-high-growth-startups-graduate-from-ignites-national-incubation-center-karachi

SWARM OF AUTONOMOUS TINY DRONES CAN LOCALIZE GAS LEAKS

When there is a gas leak in a large building or at an industrial site, human fire fighters currently need to go in with gas sensing instruments. Finding the gas leak may take considerable time, while they are risking their lives. Researchers have now developed the first swarm of tiny - and hence very safe - drones that can autonomously detect and localize gas sources in cluttered indoor environments.



Credit: Time lapse image of one of the experiments. The red squares represent the starting points of the drones that were equipped with blue lights. The yellow square is the gas source location. The green squares are the final positions of the drones. The blue-white dots are the robots captured by the camera over time.

<https://www.tudelft.nl/en/2021/tu-delft/swarm-of-autonomous-tiny-drones-can-localize-gas-leaks>

The main challenge the researchers needed to solve was to design the Artificial Intelligence for this complex task that would fit in the tight computational and memory constraints of the tiny drones. They solved this challenge by means of bio-inspired navigation and search strategies. The scientific article has now been made public on the ArXiv article server, and it will be presented at the IROS robotics conference later this year. The work forms an important step in the intelligence of small robots and will allow finding gas leaks more efficiently and without the risk of human lives in real-world environments.

The development of this type of technology to a fully functioning product still requires further work. For instance, the current work does not yet tackle moving in three dimensions to locate gas sources at a height. Furthermore, the robustness of navigation should also be improved before deploying the drones in a real emergency scenario.

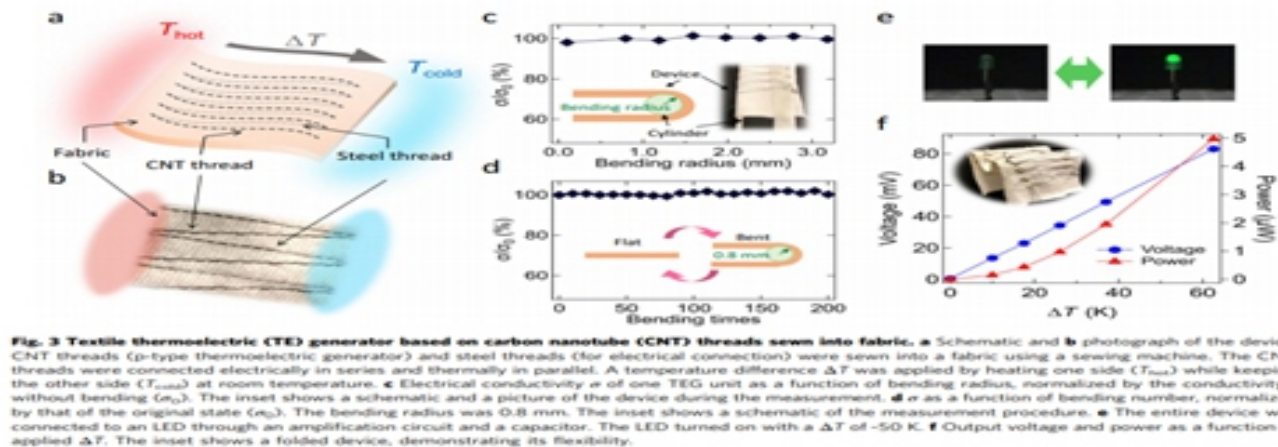
However, the current work is very promising. The developed algorithms are not only useful for detecting gas leaks in buildings, but also for scientific missions such as detecting methane on Mars or economical use such as the early detection of diseases or pests in greenhouses.

Source:

www.sciencedaily.com/releases/2021/07/210714110540.htm

WOVEN NANOTUBE FIBERS TURN HEAT ENERGY INTO ELECTRICAL ENERGY

Carbon nanotubes woven into thread-like fibers and sewn into fabrics become a thermoelectric generator that can turn heat from the sun or other sources into other forms of energy.



Credit: <https://www.nature.com/articles/s41467-021-25208-z.pdf>

The Rice University lab of physicist Junichiro Kono led an effort with scientists at Tokyo Metropolitan University and the Rice-based Carbon Hub to make custom nanotube fibers and test their potential for large-scale applications. Their small-scale experiments led to a fiber-enhanced, flexible cotton fabric that turned heat energy into enough electrical energy to power an LED. With further development, they say such materials could become building blocks for fiber and textile electronics and energy harvesting.

The same nanotube fibers could also be used as heat sinks to actively cool sensitive electronics with high efficiency.

The effect seems simple: If one side of a thermoelectric material is hotter than the other, it produces usable energy. The heat can come from the sun or other devices like the hotplates used in the fabric experiment. Conversely, adding energy can prompt the material to cool the hotter side. Until now, no macroscopic assemblies of nanomaterials have displayed the necessary "giant power factor," about 14 milliwatts per meter kelvin squared, that the Rice researchers measured in carbon nanotube fibers.

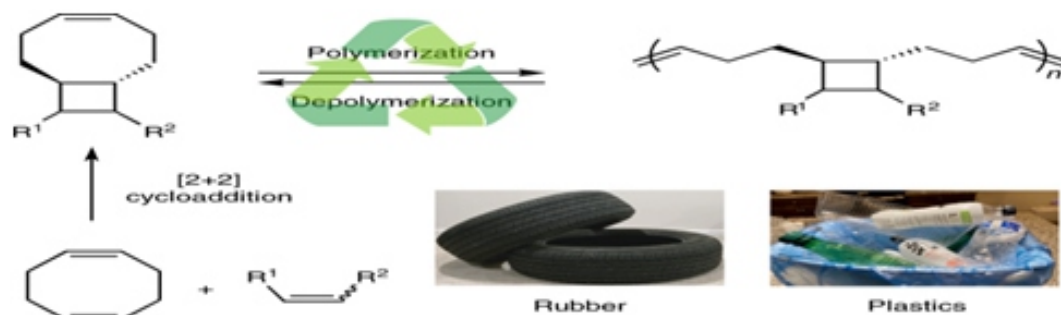
The Department of Energy Basic Energy Science program, the National Science Foundation, the Robert A. Welch Foundation, the Japan Society for the Promotion of Science, the U.S. Air Force and the Department of Defense supported the research.

Source:

www.sciencedaily.com/releases/2021/08/210816091557.htm

NEW METHOD DEVELOPED TO SOLVE PLASTICS SUSTAINABILITY PROBLEM

A research group is developing polymers that can be broken down into their constituent parts; thus, when the catalyst for depolymerization is absent or removed, the polymers will be highly stable and their thermal and mechanical properties can be tuned to meet the needs of various applications.



Credit: <https://www.nature.com/articles/s41557-021-00748-5#Sec41>

Plastics sustainability has come a long way in recent years thanks in large part to scientific advances. But even as plastics become more and more environmentally friendly, the world continues to be polluted as many industries rely on them for their widely used products. The latest research from Dr. Junpeng Wang, Assistant Professor in UA's School of Polymer Science and Polymer Engineering has a solution to reduce such waste and clear a scientific pathway for a more sustainable future that can appeal to the rubber, tire, automobile and electronics industries. Although this work is supported by UA, Wang recently earned a National Science Foundation CAREER Award that will support future developments from this research.

The problem at hand: Synthetic polymers, including rubber and plastics, are used in nearly every aspect of daily life. The dominance of synthetic polymers is largely driven by their excellent stability and versatile mechanical properties. However, due to their high durability, waste materials composed of these polymers have accumulated in the land and oceans, causing serious concerns for the ecosystem. In addition, since over 90% of these polymers are derived from finite natural resources, such as petroleum and coal, the production of these materials is unsustainable if they cannot be recycled and reused.

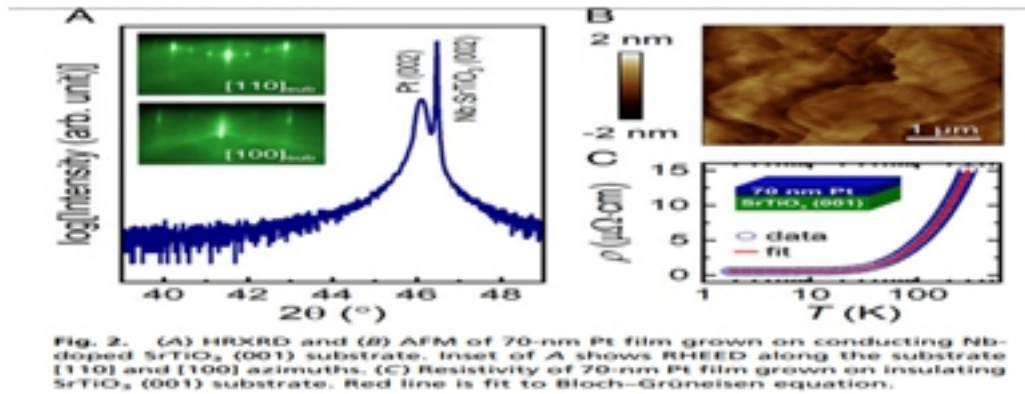
A promising solution to address the challenges in plastics sustainability is to replace current polymers with recyclable ones in order to achieve a circular use of materials. Despite the progress made thus far, few recyclable polymers exhibit the excellent thermal stability and high-performance mechanical properties of traditional polymers. The recyclable materials Wang and his team have developed are unique in the superior thermal stability and versatile mechanical properties. The key in the design of chemically recyclable polymers is to identify the right monomer. Through careful computational calculation, the researchers identified a targeting monomer. They then prepared the monomer and polymers through chemical synthesis, using abundantly available starting materials. "The chemically recyclable polymers we developed show excellent thermal stability and robust mechanical properties and can be used to prepare both rubber and plastics," says Wang. Next for Wang's research group is to expand the scope of the chemically recyclable polymers and to develop carbon-fiber reinforced polymer composites. The team will also analyze the economic performance of this industrial process and life-cycle analysis for commercialization of the polymers.

Source:

www.sciencedaily.com/releases/2021/08/210817193022.htm

NEW TECHNOLOGY WILL ALLOW IMPORTANT METALS TO BE MADE MORE EFFICIENTLY

University of Minnesota Twin Cities College of Science and Engineering researchers have invented a cheaper, safer, and simpler technology that will allow a "stubborn" group of metals and metal oxides to be made into thin films used in many electronics, computer components, and other applications. This patented technology will improve production of many electronic and computer components



Credit: <https://www.pnas.org/content/pnas/118/32/e2105713118.full.pdf>

The researchers worked with the University of Minnesota's Technology Commercialization Office to patent the technology and have already garnered interest from industry.

Many metals and their compounds must be made into thin films before they can be used in technological products like electronics, displays, fuel cells, or catalytic applications. "Stubborn" metals, however -- which include elements like platinum, iridium, ruthenium, and tungsten, among others -- are very difficult to convert into thin films because they require extremely high temperatures (usually more than 2,000 degrees Celsius) to evaporate.

Typically, scientists synthesize these metal films using techniques like sputtering and electron beam evaporation. The latter consists of melting and evaporating metals at high temperatures and allowing a film to form on top of wafers. But, this conventional method is very expensive, uses a lot of energy, and may also be unsafe due to the high voltage used.

Now, University of Minnesota researchers have developed a way to evaporate these metals at significantly lower temperatures, fewer than 200 degrees Celsius instead of several thousands. By designing and adding organic ligands -- combinations of carbon, hydrogen, and oxygen atoms -- to the metals, the researchers were able to substantially increase the materials' vapor pressures, making them easier to evaporate at lower temperatures. Not only is their new technique simpler, but it also makes higher quality materials that are easily scalable. "Bringing down the cost and complexity of metal deposition while also allowing for deposition of more complex materials like oxides will play a large role in both industrial and research efforts.

Source:

www.sciencedaily.com/releases/2021/08/210806155858.htm

NEW TECHNOLOGY SHOWS PROMISE IN DETECTING, BLOCKING GRID CYBERATTACKS

Researchers from Idaho National Laboratory and New Mexico-based Visgence Inc. have designed and demonstrated a technology that can block cyberattacks from impacting the nation's electric power grid.



To demonstrate the ability of the Constrained Cyber Communication device to block a cyberattack on the power grid, researchers constructed a 36-foot long mobile substation and connected it to INL's full-scale Power Grid Test Bed. Credit: <https://inl.gov/article/new-technology-shows-promise-in-detecting-blocking-grid-cyberattacks/>

During a recent live demonstration at INL's Critical Infrastructure Test Range Complex, the Constrained Cyber Communication Device (C3D) was tested against a series of remote access attempts indicative of a cyber attack. The device alerted operators to the abnormal commands and blocked them automatically, preventing the attacks from accessing and damaging critical power grid components. The C3D device uses advanced communication capabilities to autonomously review and filter commands being sent to protective relay devices. Relays are the heart and soul of the nation's power grid and are designed to rapidly command breakers to turn off the flow of electricity when a disturbance is detected. For instance, relays can prevent expensive equipment from being damaged when a power line fails because of a severe storm. However, relays are not traditionally designed to block the speed and stealthiness of a cyberattack, which can send wild commands to grid equipment in milliseconds. To prevent this kind of attack, an intelligent and automatic filtering technology is needed. The C3D device sits deep inside a utility's network, monitoring and blocking cyberattacks before they impact relay operations." To test the technology's effectiveness, researchers spent nearly a year collaborating with industry experts, including longtime partners from Power Engineers, an international engineering and environmental consulting firm. INL and the Department of Energy also established an industry advisory board consisting of power grid and cybersecurity experts from across the federal government, private industry and academia. After thoroughly assessing industry needs and analyzing the makeup of modern cyber threats, researchers designed an electronic device that could be wired into a protective relay's communication network. Then they constructed a 36-foot mobile substation and connected it to INL's full-scale electric power grid test bed to establish an at-scale power grid environment.

With the entire system online, researchers sent a sudden power spike command to the substation relays and monitored the effects from a nearby command center. Instantly, the C3D device blocked the command and prevented the attack from damaging the larger grid. The development of the device was funded by DOE's Office of Electricity under the Protective Relay Permission Communication project. The technology and an associated software package will undergo further testing over the next several months before being made available for licensing to private industry.

Source:

www.sciencedaily.com/releases/2021/07/210720160817.htm

DEVELOPING ENHANCED FISH VACCINES WITH NANOCELLULOSE

In an effort to support Maine and the nation's growing finfish aquaculture industry, University of Maine scientists seek to develop more effective, safe, sustainable and affordable fish vaccines using nanocellulose produced from Maine's renewable wood pulp industry.



Credit: <https://umaine.edu/news/blog/2021/08/17/umaine-researchers-to-develop-enhanced-fish-vaccines-with-nanocellulose/>

The U.S. Department of Agriculture's National Institute of Food and Agriculture (NIFA) awarded a team of UMaine aquaculture and engineering experts \$495,000 to investigate if novel nanocellulose vaccines protect Atlantic salmon against lethal pathogens. The project will target vaccine development to combat Infectious Salmon Anemia Virus and *Vibrio ordalii*, two globally significant Atlantic salmon pathogens. Researchers hope this project will lay the groundwork for using nanocellulose in future vaccine formulations to protect against many other types of diseases impacting aquaculture and agriculture.

UMaine researchers say injectable vaccines are presently the most effective form for protecting aquacultured fish species, but current vaccines made with adjuvants that are water and oil based are expensive to make and can cause undesired side effects resulting in decreased growth rates and adhesions and pigmentation around the injection site.

Nanocellulose is a biologically derived natural polymer found in the cell walls of wood and plants and may offer several benefits as a vaccine component. Nanocellulose is considered to be biocompatible, meaning it has no known harmful effects to tissue and is unlikely to cause cellular damage. Vaccines developed with nanocellulose may also be less expensive to manufacture than their oil-based counterparts, researchers say. Its chemical properties allow it to be easily modified and could help increase the effectiveness and longevity of the vaccine without the associated undesired side effects of traditional fish vaccine adjuvants, according to UMaine researchers. Disease among fish stocks can be costly for finfish producers, with the Food and Agriculture Organization of the United Nations reporting in 2018 that the global aquaculture industry loses more than \$6 billion per year to outbreaks. As the aquaculture industry grows, so does the risk of disease, UMaine researchers say, prompting the demand for more effective and less expensive vaccines.

ARI researchers plan to share the study results and develop licensing agreements and commercialization strategies through industry sponsorships and/or programs like the Small Business Technology Transfer program coordinated by the Small Business Administration.

Source:

www.sciencedaily.com/releases/2021/08/210818153735.htm

Forthcoming Tech Events

Pakistan

World Congress on Information Technology and Computer Science

1-2 October, 2021

Peshawer

www.allconferencealert.com/event-detail.html?ev_id=586581

International Conference on Cell and Tissue Science

12-13 October, 2021

Multan

www.allconferencealert.com/event-detail.html?ev_id=574247

International Conference on Environment and Life Science

22-23 October, 2021

Islamabad

www.allconferencealert.com/event-detail.html?ev_id=587831

International Conference on Science, Engineering & Technology

28-29 December, 2021

Best Western Hotel, Islamabad

www.10times.com/icset-pakistan

International

International Conference on Management and Information Technology

6-7 October, 2021

Pattaya, Thailand

www.allconferencealert.com/event-detail.html?ev_id=495106

International Conference on Natural Science and Environment

7-8 November, 2021

Tokyo, Japan

www.allconferencealert.com/event-detail.html?ev_id=505363

World Congress on Cell & Tissue Science

18-19 November, 2021

Santiago, Santiago, Chile

www.conferencenext.com/event/1395848

International Conference on Engineering & Technology

24-25 November, 2021

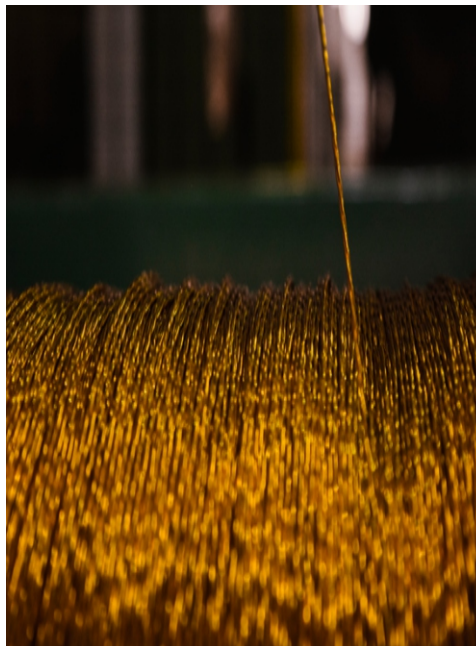
Brasilia, Brasilia, Brazil

www.conferencenext.com/event/1395834

Tech & Trade Offers

Pakistan Cables

Pakistan Cables is the premier cable manufacturer and market leader in Pakistan. Conceived in 1953 by our founder, the late Mr. Amir S. Chinoy, a well-known entrepreneur and industrialist of Pakistan, the company has continuously strived to attain excellence by maintaining quality standards par excellence. Pakistan Cables is the only cable manufacturer with a history of foreign affiliations with international cable manufacturers of stature. Between 1953 and 1993 Pakistan Cables operated under the authority of British Insulated Callender's Cables (BICC). BICC was one of the world's leading cable companies of the world during this period. During 2010-2017 General Cable, a Fortune 500 company remained a minority shareholder in Pakistan Cables holding 24.6% of the company equity.



Contact:-

Pakistan Cables, Arif Habib Center, 1st Floor,
23, MT Khan Road, Karachi.

Email Address info@pakistancables.com

Website [www.http://www.pakistancables.com](http://www.pakistancables.com)

About PASTIC

PASTIC serves as a gateway for Scientific & Technological Information for R&D by catering to the information needs of researchers, entrepreneurs, industrialists, educationists, policy makers and planners through anticipatory and responsive information services.

Technology Information Section works exclusively for support and promotion of technological information on trade and industry in the country. "Technology Roundup" is a news bulletin that provides latest and innovative technology news, forthcoming events, etc. It also promotes products, technologies and services globally in sectors such as Agro-Industry, Bio-Technology, Building Material, Business, Chemicals, Electronics, Energy, Fisheries, Food Processing, Machinery, Packaging, Mining Pharmaceuticals and Textiles.

Please give us your feedback and address queries to tis.pastic@gmail.com