

Tech Talk

Monthly Newsletter by Spectro Labs

Spectro Analytical Labs- Now a part of Eurofins

As informed earlier **Spectro** is now a part of **Eurofins** Group, the fastest growing lab group internationally.

There are tremendous growth opportunities in the Indian testing and inspection industry and **Spectro** is now globally covered under four of the leading divisions of **Eurofin Group**. These are **Environmental Group, Food and Agriproducts Test Group, the Consumer Products Testing Group and the Material Sciences Group**.

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Eurofins Group is a Large laboratory testing group. founded in 1987 and now operates a chain of 400 laboratories in 42 countries and more than 3500 employees. **Spectro** labs operating since 1995 will receive tremendous boost in technically aligning and getting support from the best lab professionals in this group.

Brief About Spectro

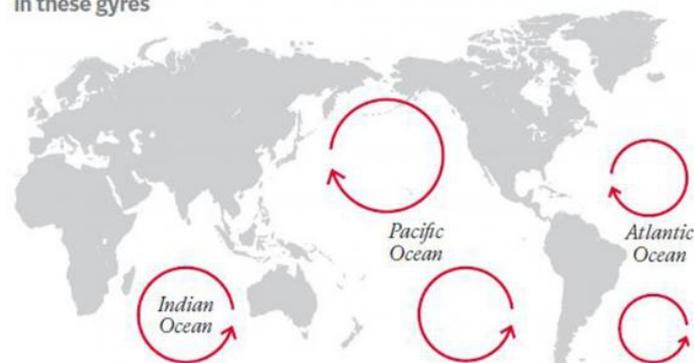
Spectro commenced to serve in the year 1995 and during the span of 23 years, **Spectro Group of companies** has created a globally recognized position in the field of Testing, Calibration, Auditing, Training, Inspection and R&D. **Spectro** holds the most prestigious accreditations from National Accreditation Board for Testing and Calibration Laboratories (NABL) in six fields, viz; **Chemical, Mechanical, Non-Destructive Testing, Biological, Electrical and Electronics and Calibration**. It has dedicated and specialized departments in **Metal, Polymers and Elastomers, Consumer Products like Toys, Textiles, Electronics and has now setup a latest state of art Fire Test facility**.

Microplastics- A threat to giant ocean animals

According to a recent research, the presence of microplastics (minute plastic particles with a diameter of less than 5 mm, in the environment coming from variety of sources like industrial processes, cosmetic, clothes, etc.) in oceans is posing a serious risk to the filter-feeding (*sub-group of suspension feeding animals feeding by straining suspended matter and food particles from water*) marine animals such as manta rays and whale sharks, specifically in pollution hotspots like Bay of Bengal. The team of researchers from Italy and Australia have highlighted that microplastics could be hazardous as they contain poisonous chemicals.

PLASTIC 'GARBAGE PATCHES' HOW TO TACKLE THEM

Plastic in our oceans concentrates in five rotating currents, called gyres. There is six times more plastic than zooplankton by dry weight in these gyres



Plastics are synthetic organic polymers, which are derived from the polymerisation of monomers extracted from oil or gas. Since the development of the first modern plastic- Bakelite, in 1907, various inexpensive manufacturing techniques have been optimized and practiced, which has resulted in the mass production of durable, inert, lightweight and corrosion-resistant plastics. Since the mass production of plastics began in the 1940s, the microplastic contamination of marine environment has been a growing problem. There exists a definite connection between microplastic ingestion and the toxic exposure for these animals.

Contd.

The pollutants and chemicals associated with plastic may pile up over the decades and transform or change the biological processes in animals which is a threat to their altered growth, development and reproduction. Consequently, the marine filter feeders are at major risk as they have to swallow 100s to 1000s cubic metres of water in a day to acquire the plankton (diverse group of organisms living in large water bodies which are unable to swim against a current). They can absorb microplastics from polluted water directly and/or through contaminated prey indirectly. The indigestible plastic can damage the digestive systems of these species.

These species tend to accumulate in habitats which overlap with microplastic pollution hotspots, including the Gulf of Mexico, the Mediterranean Sea, the Bay of Bengal and the Coral Triangle, which is the marine area comprising the waters of South East Asian countries including Indonesia.

Human population is using oceans as their household dustbins, and microplastic is one of the common components which are not only polluting shorelines but also freshwater bodies globally. The contamination through microplastic has the potential to lower the population of filter feeding animals, mostly which are long-lived and have few offspring throughout their lives, said the researches. The microplastics are classified into two categories; primary and secondary microplastics. The primary microplastics are manufactured and are a direct result of human product use. While the secondary microplastics are microscopic plastic fragments derived from the breaking down of larger plastic debris. Both the types of microplastics are found to prevail in the environment at high levels, specifically in the marine ecosystems. Due to the fact that plastics do not break down for several years, thus they can be ingested and accumulated into the bodies and tissues of many organisms.

Microplastics can arise through four separate processes:

Deterioration of large plastic fragments, cordage and films over time, with or without assistance from UV radiation, mechanical forces in the seas (e.g. wave action, grinding by marine organisms.)

Direct release of microparticles (e.g. scrubs and abrasives in household and personal care products, shot-blasting ship hulls and industrial cleaning products respectively, grinding or milling waste) into waterways and via urban wastewater treatment. Discharge of macerated wastes, e.g. sewage sludge.

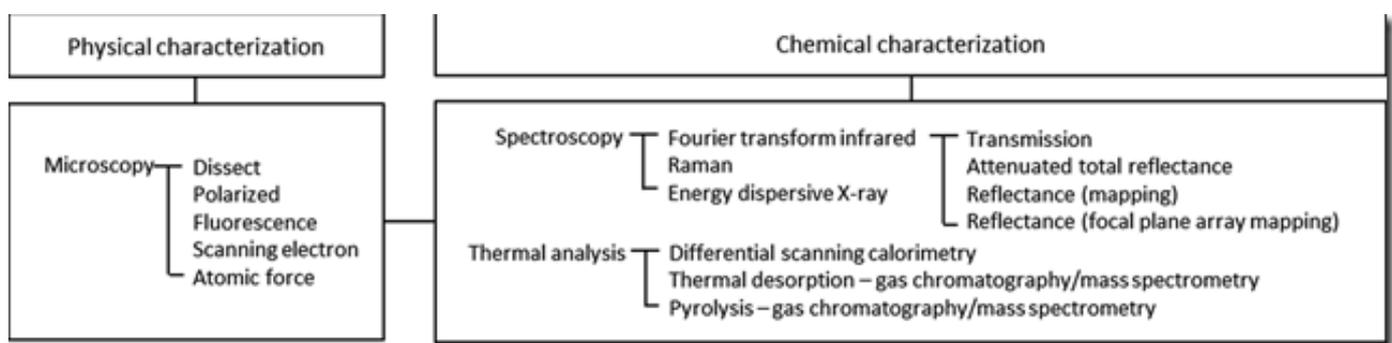
Accidental loss of industrial raw materials (e.g. prefabricated plastics in the form of pellets or powders used to make plastic articles) during transport or trans-shipment, at sea or into surface waterways.

Today, it is an issue of increasing scientific concern because these microparticles due to their small size are easily accessible to a wide range of aquatic organisms and ultimately transferred along food web. The chronic biological effects in marine organisms results due to accumulation of microplastics in their cells and tissues. The potential hazardous effects on humans by alternate ingestion of microparticles can cause alteration in chromosomes which lead to infertility and cancer. It is important to control excessive use of plastic additives and to introduce certain legislations and policies to regulate the sources of plastic litter. By setup various plastic recycling process or promoting plastic awareness programs through different social and information media, we will be able to clean our sea dustbin in coming future.

There are two major analytical techniques which have been widely used for the Identification of micro plastics are : Physical characterization of micro plastics i.e. microscopic analysis followed by the chemical characterization i.e. Spectroscopic analysis.

Scanning electron microscopy (SEM) provides extremely clear and high-magnification images of plastic-like particles.

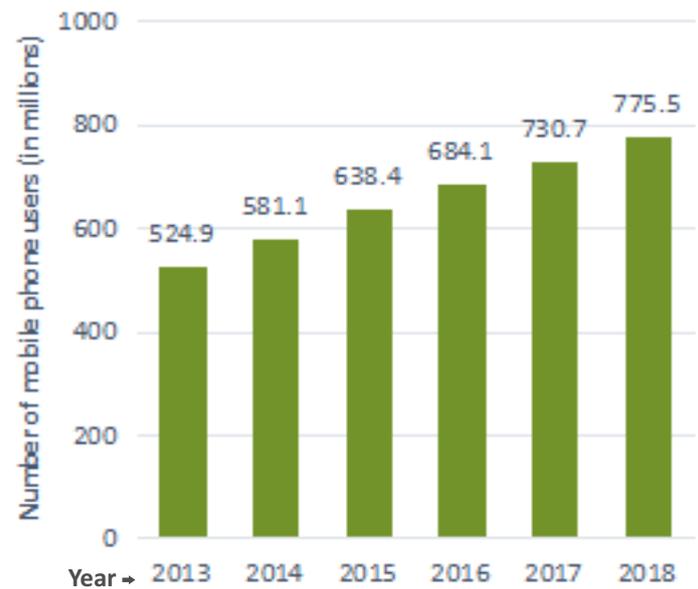
Wherein, FTIR spectroscopy provides information of the chemical bonds with polymer spectrum for the identification of specific polymer types.



Smart Phones are not actually SMART

Mobile phone manufacturers instruct to keep phones 5mm to 25mm away from body. Specific warnings mentions that phones should not be held close to the body. Not following those instructions, we risk being exposed to levels of radiation that are deemed dangerous. Significant research is showing that cell phone's radiation can damage the nervous, reproductive and immune systems. Many scientists recommend reduced exposure, especially for children who are more vulnerable. The problem is, today's cell phones are still new and we won't know the complete impact for years.

Such prevalence of mobile phones means being exposed to them on a daily basis is practically unavoidable. Personal mobile phone safety is something everyone should seriously consider.



The statistic shows the number of mobile phone users in India from year 2013 to 2018.

Carry your phone away from your body

Your phone only has to be 1.5 cm away from your body to ensure radiation levels are below maximum levels. Carry your phone in your bag and use headphones when talking on the phone for optimum mobile phone safety.

Don't let children use mobile phones

The effects that radiation is shown to have on a developing brain in and out of the womb is staggering and the effects range from higher instance of brain cancer in adult life to behavioural and emotional problems.

Install a landline in your home

Home phones are starting to become obsolete but think about how often you use your mobile in your house, making calls off a landline is a great way to cut down on your mobile usage.

Always use a protective case for optimum mobile phone safety

Mobile phone are a part of our lives whether we like it or not, but mobile phone radiation protection covers are a great way to reduce the harmful effects that come with them.

Digital Detox- Break free your devices

Technology may be incredibly useful and undoubtedly allows us to become more creative and connected. However, a true fact that it distracts you from doing what you should be doing like your job, education and it has negative effects on your relationships. When it costs you more money than you can afford, it becomes dangerous. While there's no doubt technology has made our lives easier in many ways, research suggests that our addiction to it is real. Our lives are full of screens. We wake up with them and carry them around in our pockets all day. It's very easy to see that our lives have become unbalanced as a result of being glued to our smartphones all day.

Digital Detox can be explained as a temporary period of fully disconnecting from all digital devices to focus on social interaction, reduce stress and be completely present in the world 'offline'. It is regarded as an opportunity to reduce stress, focus more on social interaction and connection with nature in the physical world. The benefits include increased mindfulness, lowered anxiety and overall better appreciation of one's environment. The best way to detox is by going into nature. Studies have shown that blood pressure, heart rate, muscle tension and the level of stress hormones like cortisol, all decrease faster in natural setting. Depression, anger and aggressiveness are reduced in green environments and ADHD symptoms in children reduce when they play in green settings.

Constant engagement with digital connecting devices at the workplace is claimed to lead to increased stress levels and reduce productivity. Certain characteristics of the technology make it more difficult to distinguish work from leisure. Moreover, being continuously connected increases the amount of interruptions at work. Allowing employees to disconnect for a part of the day in order to truly focus on their work without disturbance from colleagues is claimed to be beneficial to the productivity and work environment. The connecting devices' multitasking character has a serious impact on the learning ability. Multitasking implies operating on a surface level, which only involves the short-time memory. Using multiple connecting devices as learning platforms is therefore not beneficial. A reduction of information choices enables the brain to focus more on the quality of the information rather than the hastiness of it.

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