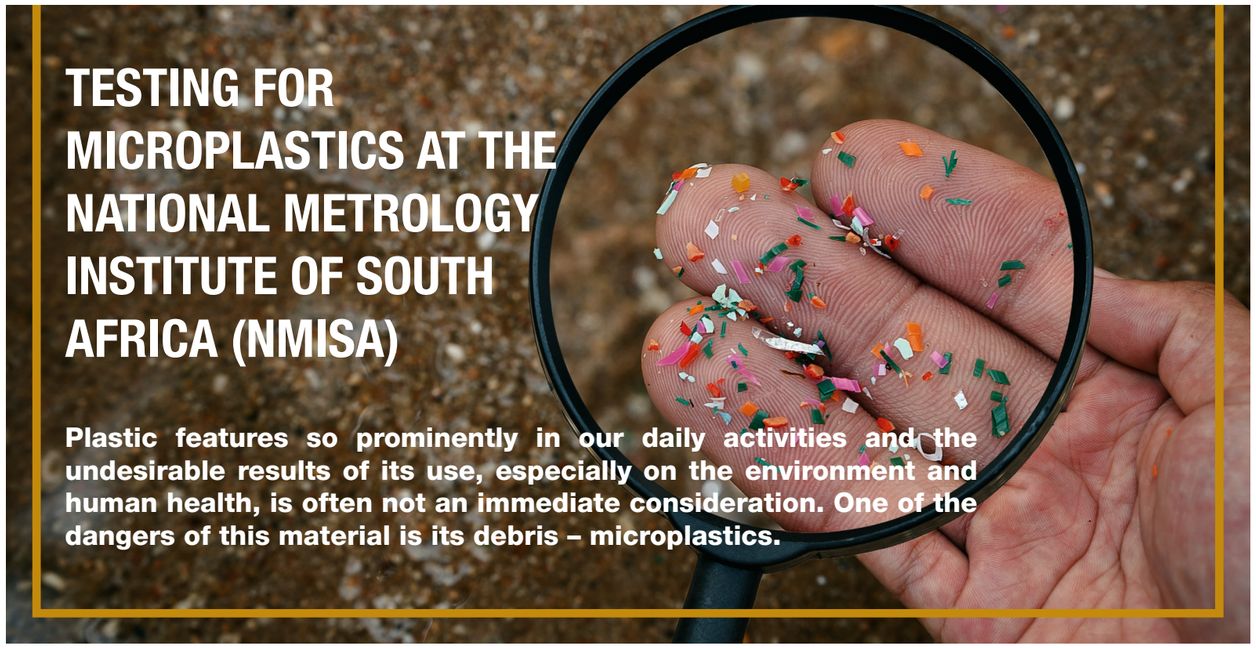
TESTING FOR MICROPLASTICS AT THE NATIONAL METROLOGY INSTITUTE OF SOUTH AFRICA (NMISA)



Plastic features so prominently in our daily activities and the undesirable results of its use, especially on the environment and human health, is often not an immediate consideration. One of the dangers of this material is its debris – microplastics.

Microplastics are defined as small pieces of plastic that measure smaller than 5 mm. These plastic pieces are found in the environment as fibres, fragments, pellets and or beads. These are the result of three major causes; when large bits of plastic break down into tiny pieces unclear to the eye, when fibres are shed from fabrics during use and washing and form microbeads. The third are types of microplastic specific to cosmetics and household cleaners.

Items in our daily lives that contain microplastics include products that contain microbeads such as some toothpaste, face and body scrubs, shampoo and or conditioners, laundry, dishwasher pods/ tablets, etc. Scientific research has also found microplastics in food and substances such as salt, seafood, honey, beer, and water, to name a few.

The manufacturing industry is generally one of the biggest exacerbators of plastic pollution globally. Through the continued production and usage of microbeads, particularly in the cosmetic industry, the intentionally added microplastics/microbeads contribute to microplastic pollution. After use, these microbeads are washed down the drain and end up in the water treatment plants and then in our waterways. To end this, some countries have already banned the usage of microbeads in cosmetics. The manufacturing of single-use plastic items such as food packaging is also considered one of the most visible contributors to microplastic pollution as the majority of these plastic items are not degradable.

Microplastics are also a result of plastic littering in the environment. Plenty of plastic items that are produced are designed for single use and thrown away almost immediately. Most of these items are not biodegradable, so with time, they break down into smaller fragments.

The exact impact of microplastics on human health has not been fully determined, despite the call from the World Health Organization (WHO) for the rigorous scientific exploration of this. The WHO has called for a further assessment of microplastics in the environment and their potential impact on human health and has highlighted the need for further research to obtain a more accurate assessment of exposure to microplastics. These include developing standard methods for measuring microplastic particles in water; more studies on the sources and occurrence of microplastics in freshwater; and the efficacy of different treatment processes.

Microplastics have become a food contaminant of growing concern and scientific data is the cornerstone of any discussions and debates around legislation and regulations of the use of intentionally added microplastics in consumer or professional use products. Scientific data may have a far-reaching effect on marine trade in the future.

The Department of Trade, Industry and Competition (**the dtic**) has launched the Aquaculture Development and Enhancement Programme aimed at stimulating investment in the aquaculture sector. The National Metrology Institute of South Africa (NMISA), in support of governments' key priorities, is implementing a project relating to the expansion of export opportunities for the fish sector under the African Continental Free Trade Area (AfCFTA).

As part of our ongoing efforts in addressing the challenge of microplastics in South Africa, NMISA, is currently developing analytical capabilities for microplastic testing in food matrices. Analytical techniques include pyrolysis gas chromatography-mass spectrometry, thermal analysis, Fourier transform infrared spectroscopy, scanning electron microscopy and particle size distribution. Method development work is currently underway for microplastics in fish and water samples, and in the next two years, the institute will expand its capabilities to other food matrices.

To date, there is very limited information on the effects of microplastics on the environment in South Africa. As with many emerging pollutants, the measurement methodologies and state of the art equipment are not readily available either in routine laboratories or relevant research facilities. However, NMISA has initiated a study to determine the status of microplastic measurements in South Africa and determine areas of concern or where no capability currently exists. Method development in this area will likely become critical and routine to ensure that South Africa meets export requirements for seafood, with the changing regulatory environment internationally.

In future, NMISA aims to support the industry by offering comprehensive microplastic measurement services.

For additional information, to collaborate on this initiative, or to start ensuring that your company considers its microplastic residue when manufacturing before legislation is promulgated, contact **Dr Nontete Nhlapo** on **+27 12 947 2833** or via email at **organic@nmisa.org**

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