

CERTIFICATE OF ANALYSIS

Thermo Fisher Scientific's Quality System has been found to conform to Quality Management System Standard ISO9001:2015 by TUV SUD America Inc.
 Certificate Number. 951001163

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|---------------------------|-----------------------------------------------------------------|
| Catalogue Number | 045130 |
| Lot Number | T03L010 |
| Description | Manganese pieces, 10mm down, ultrapure, 99.9998% (metals basis) |
| CAS Number | 7439-96-5 |
| Quality Test/Release Date | 03/Jul/2025 |
| Suggested retest date | 03/Jul/2055 |
| Country of Origin | Poland |

| Result Name | Units | Specifications | Test Value |
|---------------------------|-------|--------------------------------------------------------|---------------|
| Assay from Suppliers CofA | ppm | Zn < 0.2 ppm (Spark Source Mass Spectrometry). | <0.20 |
| Assay from Suppliers CofA | % | Spark Source Mass Spectrometry \geq 99.9997% | 99.99995 |
| Assay from Suppliers CofA | ppm | Si \approx 0.8 ppm (Spark Source Mass Spectrometry). | \approx 0.8 |
| Assay from Suppliers CofA | ppm | S < 0.07 ppm (Spark Source Mass Spectrometry). | <0.07 |
| Assay from Suppliers CofA | ppm | P < 0.1 ppm (Spark Source Mass Spectrometry). | <0.10 |
| Assay from Suppliers CofA | ppm | Ni < 0.1 ppm (Spark Source Mass Spectrometry). | <0.10 |
| Assay from Suppliers CofA | ppm | Na < 0.03 ppm (Spark Source Mass Spectrometry). | <0.03 |
| Assay from Suppliers CofA | ppm | Mg < 0.06 ppm (Spark Source Mass Spectrometry). | <0.06 |
| Assay from Suppliers CofA | ppm | Li < 0.05 ppm (Spark Source Mass Spectrometry). | <0.05 |
| Assay from Suppliers CofA | ppm | K < 0.08 ppm (Spark Source Mass Spectrometry). | <0.08 |
| Assay from Suppliers CofA | ppm | Fe < 0.5 ppm (Spark Source Mass Spectrometry). | <0.50 |
| Assay from Suppliers CofA | ppm | F < 0.1 ppm (Spark Source Mass Spectrometry). | <0.10 |
| Assay from Suppliers CofA | ppm | Cu < 0.2 ppm (Spark Source Mass Spectrometry). | <0.20 |
| Assay from Suppliers CofA | ppm | Cr < 0.08 ppm (Spark Source Mass Spectrometry). | <0.08 |
| Assay from Suppliers CofA | ppm | Cl < 0.1 ppm (Spark Source Mass Spectrometry). | <0.10 |
| Assay from Suppliers CofA | ppm | Ca < 0.08 ppm (Spark Source Mass Spectrometry). | <0.08 |
| Assay from Suppliers CofA | ppm | C < 0.1 ppm (Spark Source Mass Spectrometry). | <0.10 |

Note: The data listed is valid for all package sizes of this lot of this product, expressed as an extension of the catalogue number listed above.

| | | | |
|---------------------------|-----|------------------------------------------------|------------------|
| Assay from Suppliers CofA | ppm | B < 0.01 ppm (Spark Source Mass Spectrometry). | <0.01 |
| Assay from Suppliers CofA | ppm | Al ≈ 0.5 ppm (Spark Source Mass Spectrometry). | ≈ 0.5 |
| Form | | Granules, ≥10mm. | Granules, ≥10mm. |

John Astarita

John Astarita
 Director, Quality

Products are processed under ISO 9001:2015 quality management systems and samples are tested for conformance to the noted specifications. Certain data may have been supplied by third parties. We disclaim the implied warranties of merchantability and fitness for a particular purpose, and the accuracy of third-party data or information associated with the product. Products are for research and development use only. Products are not for direct administration to humans or animals. It is the responsibility of the final formulator or end user to determine suitability, and to qualify and/or validate each product for its intended use.

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