1. DESCRIPTION

FeSiMn fume is generated as a by-product during the production of ferrosilicomanganese (FeSiMn) alloy in electric arc furnaces (EAF). Manganese oxide fumes and other metal oxide fumes are captured on fabric filters in the EAF dedusting units. It is a finely dispersed brown powder consisting of extremely fine spherical particles of amorphous manganese oxide (and oxides of other elements, primarily silicon), with a smooth surface and a particle size of less than 10^{-6} m. The production process is described in PP-046-SK *Production and Storage of By-products*.

2. USE

- as a secondary raw material (original loose form, micro-pelletized, briquettes) for the production of ferroalloys,
- as a secondary raw material in the production of ferrous and non-ferrous metals.

Use is not permitted:

- for backfilling and remediation of collapse zones.

The Slovak Environmental Inspectorate, by decision No. 5765/77/2020-27815/2020/770010203/Z77 dated 27 August 2020, did not authorize the use of the by-product for backfilling and remediation of collapse zones.

3. CERTIFICATES/APPROVALS

- Integrated operation permit of OFZ, a.s., Široká plant No. 3574/2007/Jur/770010203 dated 5 May 2007 as amended (Consent that the substance is considered a by-product with the trade name "FeSiMn fume" and not waste).
- Certificate of production management system issued by the inspection certification body QUALIFORM SLOVAKIA, s.r.o., Pasienková 9 D, 82106 Bratislava.
- OFZ, a.s. is certified under quality management systems STN EN ISO 9001:2015 and environmental system STN EN ISO 14 001:2015.

4. PHYSICAL AND CHEMICAL PARAMETERS

Qualitative and quality parameters to be met:

Parameter	Value
Silicon dioxide (SiO_2)	15 – 45 % w/w
Calcium oxide (CaO)	0 – 10 % w/w
Aluminium oxide (Al_2O_3)	0 – 10 % w/w
Sodium oxide (Na_2O)	≤ 5 % w/w
Potassium oxide (K_2O)	≤ 25 % w/w
Magnesium oxide (MgO)	0 – 10 % w/w
Sulfur trioxide (SO_3)	≤ 7 % w/w
Iron(II) oxide (FeO)	≤ 5 % w/w
Manganese (Mn)	15 – 35 % w/w
Zinc (Zn)	≤ 5 % w/w
Carbon (C)	≤ 5 % w/w
Activity concentration index	≤ 1
Bulk density	400 - 1000 kg/m³

Bulk density in loose form is 400–600 kg/m³, and in compacted form is 600–1000 kg/m³.

5. QUALITY CONTROL

The qualitative properties of the product are defined by applicable STN and EN standards as well as internal manufacturing specifications. Quality control is carried out in accordance with Guideline OS-004-SK on final inspection and is ensured by the Quality Management Department. Analytical testing of parameters is performed at least once per month during production in the company's in-house operational laboratory (excluding the activity concentration index and bulk density), and once per year in full scope by an accredited laboratory. Records of analytical control are retained for a minimum of five years.

Registration number	Name of the Work Procedure
PP-009-SK	Incoming, In-Process and Dispatch Quality Control
PP-012-SK	Material Analysis by X-ray Fluorescence (XRF) Method
PP-013-SK	Determination of Carbon and Sulfur Content Using ELTRA CS 800 Analyzer
PP-014-SK	Quality Control of By-products
PP-016-SK	Methods for Determining Physical and Chemical Parameters of Materials
PP-017-SK	Material Analysis by Photometric Method and Atomic Absorption Spectrometry (AAS)
PP-088-SK	Material Analysis by Thermogravimetric Analysis (TGA)

During the final quality control, a QUALITY CERTIFICATE is issued, which includes the following information: Company name, Material name, Chemical composition, Batch class, Delivery number Gross and net delivery weight, Purchase contract number, Stamp, Date and signature of final inspection.

The delivery note shall include: Manufacturer´s name, Place of manufacture, Type of material - product name, fraction – particle size, Delivery method, Delivery note number, Quantity [kg, t].

The packaging shall include: Manufacturer´s name, Place of manufacture, Type of material - product name, fraction – particle size, Quantity [kg, t], Date of manufacture.

6. PACKING

Packing: Large-capacity bags (big-bags), tankers, drums
Form: Free-flowing – natural loose state, compacted form (micro-pelletized), briquettes
Weight: Max. 1200 kg per big-bag; according to permitted load capacity for other containers and transport vehicles

7. TRANSPORT

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In closed containers, sealed large-capacity bags loaded in enclosed transport vehicles, or in tankers. The material must not be transported in bulk in any transport vehicle other than tankers or specially designed closed containers.

8. STORAGE

Stored in silos, sealed containers, or large-capacity bags in enclosed storage areas, or as loose material in enclosed storage buildings. These buildings must have a roof and four walls with closable entry points to prevent the dispersion of material due to air flow, except for the time strictly necessary for the passage of handling equipment.

9. SAFETY DATA

Safety information is provided in the Material Safety Data Sheet (MSDS) issued by the manufacturer under registration number KBU-007-EN issued on 10 March 2025.
The current revision of the MSDS is available upon request from the manufacturer or for download at: **www.ofz.sk.**

10. OTHER

Information is available at https://siroka.ofz.company/sk/simat.html

Replaces document: **TL-OFZ-01/19 issued on 12.05.2020**

Prepared by: Róbert Zrnčík, Head of Ferroalloy Production - signed

Approved by: Milan Kelbel, Director of Production Services - signed