MATERIAL SAFETY DATA SHEET

Added to MSDS Register

MSDS Register 0 0 1 8 6 4 9 9 . 2 4 . 5 6 9 1 9 dated May, 30, 2019

Valid until May, 30, 2024

Association "Non-profit organization "Coordinating Informational Center of CIS Member States on approximation of regulatory practices"

Deputy Director _____ /N.M.Muratova/

Stamp

NAME

technical (by ND)	**FERROCHROME**
chemical (by IUPAC)	**None**
trade	**FERROCHROME of different grades**
synonims	**Ferroalloy, alloy of iron and chrome**

National product classification code 2 2 4 . 1 0 . 1 2 . 2 7 0

FEACN code 7 2 0 2 4 0 0 0 0 0

Type code and name of the regulatory, technical or information document for the Product (State Standard (GOST), Technical Requirements, Industry-specific Standard, Corporate Standard, Material Safety Data Sheet etc.)

GOST 4757-91 (ISO 5448-81) «Ferrochrome. Specification requirements and terms of delivery»

HAZARD STATEMENT

Signal word: **«WARNING»**

Short (literary) characteristics: Alloy moderately hazardous in health effects. Contactant. Under production conditions product dust can cause occupational pulmonary diseases. It presumably can have negative effect on reproduction function, cause genetic effects and cancers. It can contaminate objects of ecological interest.

Подробная: в 16-ти прилагаемых разделах Паспорта безопасности

MAIN HAZARDOUS COMPONENTS	MPC_{wz}, mg/m^3	Substance hazard category	№ CAS	№ EC
Ferrochrome	6/2	3	11114-46-8	601-052-2

APPLICANT JSC "Serov Ferro-Alloy Plant" (JSC "SFP") Serov

(name of the company) (town)

Type of applicant: Producer, Supplier, Seller , Exporter, Importer

(strike out whatever is not applicable)

RNNBO code (OKPO): 0 0 1 8 6 4 9 9 **Emergency telephone number:** (34385) 96258

Director of the applicant company: _____ / V.I.Fadeev /

(signature) (clarification of signature)

The material safety data sheet (MSDS) complies with UN recommendations ST/SG/AC.10/30 «GHS»

IUPAC – International Union of Pure and Applied Chemistry

GHS – UN Recommendations ST/SG/AC.10/30 «Globally Harmonized System of Classification and labeling of Chemicals»

OKPD 2 – Russian Classification of Products by Economic Activities

RNNBO (OKPO) – Russian National Nomenclature of Businesses and Organizations

FEACN – Foreign Economic Activity Commodity Nomenclature

№ CAS – Chemical Abstracts Service registration number

№ EC – European Chemicals Agency registration number

Working Area MAC – maximum allowable concentration of the chemical in the working area air, mg/m^3

Signal word – a word used to focus on hazard level of chemical products and selected in accordance with GOST 31340-2013

1 Identification of chemical products and information about producer and/or supplier

1.1 Identification of chemical products

1.1.1 Technical name	1.Ferrochrome[1].
1.1.2 Brief recommendations on application (including restrictions on application):	It is applied in metallurgical and foundry industry [1].

1.2 Information about Producer and/or Supplier

1.2.1 Full official organization name	Joint Stock Company «Serov Ferro-Alloy Plant» (JSC «SFP»)
1.2.2 Address (postal and legal)	624992, Russia 1, Nakhabin street., Serov, Sverdlovsk Region
1.2.3 Emergency telephone number and time limitations:	(34385)96-2-58, 10^{00} - 15^{00} MSK
1.2.4 Fax	(34385)6-42-62, 6-42-63
1.2.5 E-mail	sfap@sfap.ru

2 Hazard Identification

2.1 Substance hazard category (information about hazard classification RF statutory (GOST 12.1.007-76) and GHS (GOST 32419-2013, GOST 32423-2013, GOST 32424-2013, GOST 32425-2013)	According to GOST 12.1.007 the product belongs moderately hazardous substance (3 category). - a chemical substance which has sensitizing effect on skin; - a chemical product which has selective toxicity of repeated dose and continuous exposure 2 class; - carcinogen, 2 class; - mutagen, 2 class; - reprotoxicant, 2 class

2.2 Marking information GOST 31340-2013

2.2.1 Signal word	«Warning» [3].
2.2.2 Danger symbols	 «Danger to human health»; «Exclamation mark» [3].
2.2.3 Hazard statement (H-phrase)	H317: Upon contact with skin it can cause allergic response; H341: It presumably can cause genetic deficits; H351: It presumably can cause cancers; H361: It presumably can have negative effect on reproductive ability or on unborn child. H373: It can attack respiratory system as a result of repeated dose or continuous exposure [3].

3 Composition (information about components)

3.1 General information about the product

3.1.1 Chemical name: (acc. IUPAC)	None

3.1.2 Chemical formula: None [1].

3.1.3 General characteristics of composition:
(taking into account grade assortment and the way of production)

Ferrum-chromium alloy with the minimum content of chrome – 45% by mass and maximum – 95%, produced by recovery of appropriate raw materials and their concentrates.

Applying raw materials: chrome ores, chromic materials, coke nut, coal, quartzite, own production returns.

Ferrochrome is supplied in lumps weighing not more than 20 kg or in the form of crushed or screened fines. High-carbon ferrochrome is allowed to be produced in ingots weighing not more than 30 kg. Ferrochrome is also supplied in the form of granules, the maximum size of which is 50 mm [1].

When producing ferrochrome with a specified mass of a lump or ingot, the amount of fines passing through a screen with a screen size of 20x20 mm should not exceed 10% of the batch weight for high-carbon ferrochrome and 5% for nitrided low-carbon and medium-carbon ferrochrome [1].

3.2 Components

(name, №№ CAS and EC , mass content (100% in sum), Working Area MAC or Working Area SRLI, hazard categories, references to the data sources)

Table 1 [1]

Components (name)	Mass content, %	Hygienic standards in working area air		№ CAS	№ EC
		MPC_{wz}, mg/m^3	Substance hazard category		
Ferrochrome (ferrum-chromium alloy)	100	6/2 (a)	3	11114-46-8	601-052-2
Chrome	45-95	NE	1	7440-47-3	231-157-7
Ferrum	25	-/10	4	7439-89-6	231-096-4
Silicon	0,8-10	6/2 (a) (amorphous silicon dioxide when containing 10-60%)	3	7440-21-3	231-130-8

Note:
* – Ferrochrome according to the grade includes: 0,8-10,0 % of Si; 0,01-10,0 % of C; 0,02-0,08 % of S; 0,02-0,05 % of P as specified impurities. Aerosol of FeCr condensation includes Cr(VI) components.
«a» – aerosol
1 category - extra-hazardous
3 category – hazardous
4 category - moderately hazardous

4 First aid measures

4.1 Observable symptoms

4.1.1 Intoxication via inhalation: If inhaled aerosol causes throat irritation, cough [4].

4.1.2 In case of contact with skin	In case of contact with skin there can vesiculation, papular eruption, darter or lumpy skin be caused [4]. Dust has irritant effect.
4.1.3 In case of contact with eyes	Lacrimation, smarting in eyes, reddening as a result of mechanical effect of chrome particles. Chrome presence in production composition under chronic effect can cause the reduction of dark adaptation and eye corneal sensitivity [4]. Symptoms appear as a result of mechanical effect.
4.1.4 Intoxication by peroral way (by swallowing):	Epigastric pains, epigastric burning, foul-smelling eructation, nausea, sometimes vomiting, hypersalivation, diarrhea or constipation [4].

4.2 First aid measures

4.2.1 Intoxication via inhalation:	Fresh air, rest, warming, strong tea or coffee. There are no acute types of intoxication by ferrochrome dust. [4].
4.2.2 In case of contact with skin:	Rinse with plenty of water. If necessary contact the doctor. [4].
4.2.3 In case of contact with eyes:	Rinse immediately with plenty of water within 15 minutes with eyes wide open. In case of durable redness and pain seek for ophthalmologist help [4].
4.2.4 Intoxication by peroral way:	If ingested ferrochrome dust (aerosol) it is necessary to rinse mouth with water, drink a lot of water, activated coal, saline purge; It is recommended to drink milk and mucous brews: stomach lavage is better to be made under medical control. Symptomatic treatment follows. [4].
4.2.5 Contra-indications:	No data.

5 Measures and means for providing fire and explosion safety

5.1 Fire and explosion hazard description (according GOST 12.1.044-89)	Ferrochrome is a fire-flame-proof substance broken into lumps and crushed. Powders are combustible [1].
5.2 Fire/explosion hazards (set of parameters acc. GOST 12.1.044-89 and GOST 30852.0-2002)	Self-ignition temperature: aerogel - 400°C, aerodispersions - 580°C; lower explosive limit concentration - 230 g/m3; maximum explosion pressure - 410 kPa; pressure rise max speed - 35 MPa/s; minimum ignition energy - 140 mJ; МВСК - 14% (об.) [19].
5.3 Danger caused by combustion products and/or thermal degradation products	It is not exposed to thermal degradation in the seat of fire.
5.4 Recommended fire-extinguishing means	Solid-extinguishing agents [19].
5.5 Prohibited fire-extinguishing means	No data [19].
5.6 Fire protection equipment: (PPE of firefighters)	Apply fire-protection suit in complex with self-rescue device СПИ-20 [13].
5.7 Specificity of fire-extinguishment:	Initially transport packages can be involved into the fire [13].

6 Measures on prevention and liquidation of emergency and extreme situations and their consequences

6.1 Measures on prevention of harmful influence on people, environment, buildings, constructions, etc. at emergency and extreme situations

6.1.1 Necessary actions of general nature at emergency and extreme situations	Isolate dangerous area within a radius of 200 m. Remove unauthorized persons and personnel unengaged in response to ES from the dangerous area. Enter a dangerous zone in protective means. Take fire precautions. No smoking. Remove fire and fire flakes sources. Give first aid to injured or send them for health examination [13].
6.1.2 Individual protective means: (for emergency brigades)	For chemical reconnaissance and the manager – PDU-3 for as long as 20 minutes. For emergency brigades – isolating protective suit KIH-5 completed with isolating gas mask IP-4M. If there is no above means: battledress overgarment L-1 or L-2 completed with a small-size industrial gas mask PFM-1. Dust protective clothes, protective glasses, gloves, respirators like “Lepestok”, dust protective masks or half-masks. In the seat of fire fire-protection suit completed with a self-rescue device SPI-20 [13].

6.2 Operation procedure when liquidating emergency and extreme situations

6.2.1 Actions if leaks, flood, scatterings (including recovery measures and safety measures providing protection of environment)	Inform the state sanitary-epidemiological expertise center. Don’t touch the spillage. The spillage must be blocked off by an earth wall. Prevent from entering into water reservoirs, basements, canalization. The spillage must be collected with precautionary measures and in concern with a producer be sent to its destination or for reprocessing. Remaining residue should be whelmed by inert material; collected including the surface soil into dry metallic containers, closed hermetically, marked and sent to the liquidation places agreed upon with territorial bodies of the Russian Federal Consumer Rights Protection and Human Health Control Service. Cuts should be backfilled, soil should be turned over. Transport surface and the area should be cleaned carefully and treated with weak acid solution. [13].
6.2.2 Fire procedure:	It is non-combustible. It is recommended to apply powders in the seat of the fire. Isolate the dangerous area. Evacuate personnel unengaged in fire-extinguishing. Use PPE and protection suits. Neutralize fire and sparks source [13].

7 Rules of storage of chemical production and its treatment while cargo handling works

7.1 Safety measures during chemical products treatment

7.1.1 Engineering measures system:	Supply and extract fans or natural ventilation in working rooms, applying of technological processes with a minimal dusting and dust collectors, applying of sealed apparatus and package, use of personal protection means [21]. Implementation of fire safety regulations for ironworks, equipping the workplaces with firefighting primary equip-

ment, well-timed works for cleaning of metal structures, equipment, rooms and fume hoods from dust [1,4].

7.1.2 Environment protection measures

Core requirements providing environmental preservation are:

- Periodic check of harmful substance content in working area air;
- Applying of gas and dust cleaning constructions during processing of production;
- Plant effluents analysis for permissible level of harmful substances content;
- Cleaning of work area air down to established norms before vent to atmosphere;

Keep ferrochrome away from getting into sanitary drain and storm water system, underground and surface waters, soil [4].

7.1.3 Recommendations for safe moving and transportation

Ferrochrome is transported by all means of transportation in bulk or in specialized containers by open means of transportation.
4th-grade class ferrochrome is transported packed into steel drums or wooden boxes.
Upon consumer demand packed ferrochrome is transported in covered transported means.
While transporting by river, sea and also by railway transport (car freights) wooden boxes and steel drums containing ferrochrome with gross weight up to 250 kg should be formed into unit loads on flat pallets using fixing arrangements.
While transporting by open means of transportation it is acceptable that packed ferrochrome is packetized.
While transporting ferrochrome containing particles less than 13 mm in size, in bulk in open railway vehicles with low discharge doors and if there are through construction splits of more than 5 mm, measures must be taken eliminate waste.
Nonperishable ferrochrome is transported by covered transportation means.
During transportation of several lots of unpacked ferrochrome of one type in one transportation means several lots are separated by a method preventing mixing [10].

7.2 Rules of storage of chemical products

7.2.1 Conditions and terms of safe storage: (Including guaranteed storage life, working life; incompatible materials)

Ferrochrome is packed, transported and kept according to international rules.
Packed ferrochrome should be stored locked up in structures according grades, size classes and years of manufacture.

	Ferrochrome transported in bulk including in specialized containers is stored at sites under cover or in closed premises, bins or hoppers according grades and years of manufacture. Storage areas can be of any design with concrete or asphalt-concrete floor and natural ventilation. Platforms should have firm covering, be even with a small bias to edges (1:100). By perimeter of platforms drainage channels should be laid. [1, 10]. Period of ferrochrome storage: - under cover 5 years; - In closed premises: 5 years [10].
7.2.2 Tare and packing (including materials used in manufacture)	Ferrochrome is packed in steel drums, wooden compact boxes, specialized and/or soft containers (big bags) or transported in bulk without package in preliminary cleaned transport means [1].
7.3 Security measures and storage rules in life	It is not applied in everyday life [1].

8 Means of control for dangerous influence and personal protective means

8.1 The parameters of the working area which are subject to obligatory control (working area MAC or working area SRLI):	working area MAC = 3/1 mg/m ^{3} - di-chrome trioxide / by chrome III, A A - allergen [2].
8.2 Measures to ensure the content of harmful substances in admissible concentration:	Supply of industrial premises with supply and extract fans, dust collectors. Applying of technological processes with a minimal dusting. Dust exhausting plants for crushing and packing of ferrochrome. Occupational exposure controls according GOST 12.1.005 and HS 2.2.5.1313-03 [1,4].
8.3 Means of individual personnel protection	
8.3.1 General recommendations	Avoid personal body contrat with the product, use protective clothes. Clean the premises and industrial sites regularly from dust and spillages by dry method. Observe personal hygiene regulations, don't smoke and don't take food at the workplace. Conduct preliminary and periodical medical examinations of the personnel engaged in ferrochrome works. Persons under the age of 18 and pregnant woman are not allowed to work. [4].
8.3.2 Protection of respiratory organs (RPE types):	"Lepestok" – 200, ShB – 1 GOST 12.4.028-76, spirotech SH GOST 12.4.191-99 [4,22].
8.3.3 Protective clothes (material, type): (working cloth, safety shoes, hand safety, eye protection):	Dust protecting working cloth: woolen suit GOST 105-0015-07, cotton suit GOST 27575-87, in winter - quilted jacket GOST 103-0015-10; Safety shoes: Russian leather combined shoes GOST 12.4.187-97, part tarpaulin boots GOST 12.4.032-77, felt boots GOST 18724-88 [1, 22].

8.3.4 Individual protection means by use in life

It is not applied in everyday life. [1].

9 Physical and chemical properties

9.1 Physical condition:
(aggregate condition, color, smell)

Solid substance [1].

9.2 The parameters characterizing basic properties of chemical production
(temperature indices, pH, solubility, factor of n-octanol/water, etc. characterizing this type of production)

Melting temperature 1890°C;
Boiling temperature 2680 °C;
Flash point – no.
Ignition temperature – no.
Aerogel auto-ignition temperature – 400°C,
Aero-dispersion auto-ignition temperature - 580°C /18/
It is insoluble in water.
Bulk density at 20° C, g/cm^3:

		Seeming	True
HC FeCr		6,9 g/cm^3	7,06 g/cm^3
MC FeCr	7,06 g/cm^3	7,16 g/cm^3	
LC FeCr	7,13 g/cm^3	7,18 g/cm^3 [8].	

Ferrochrome is supplied in lumps not more than 20 kg or in crushed and screened particles or in granules with max size 50 mm. Required granule size is agreed between the supplier and the buyer.
Range of particle sizes must comply to this table:

Size class	Size of lumps (particles), mm	Mass fraction of the product in the lot, %, not more than	
		oversized	undersized
1	Over 100 up to 315	10	20
2	» 50 » 200	10	10
3	» 5 »200	5	5
4	» 5 »100	10	10
5	» 20 »50	10	10
6	» 5 »50	10	10
7	» 5 »20	10	10

10 Stability and reactivity

10.1 Chemical stability
(to specify decomposition products for non-stable products)

The material is stable under normal conditions, dangerous polymerization does not occur [23].

10.2 Reactivity

It is low active chemically [4]. It interacts with strong acids.

10.3 Conditions which should be avoided:
(including dangerous displays while contacting with the incompatible substances and materials)

Under normal conditions it is resistant to oxygen and moisture [4].

11 Information on toxicity

11.1 General characteristic of influence (estimation of degree of danger (toxicity) of influence on organism and the most specific danger manifestation)	Aerosol ferrochrome according to hazard category is moderately dangerous and of mainly fibrogenic effect [2]. Product moderately hazardous in health effects. Contactant. Under production conditions product dust can cause occupational pulmonary diseases. It presumably can have negative effect on reproduction function, cause genetic effects and cancers.
11.2 Ways of influence: (inhalation, peroral, by ingress on skin and in eyes)	Inhalation, peroral, contact with skin and eyes [21].
11.3 Damaged human organs, tissues and systems:	Ferrochrome attacks respiratory system, gastroenteric tract, gepar, kidneys, pancreatic gland, blood, nervous system, skin covering, and conjunctiva [21].
11.4 Data on influences hazardous to health by direct contact with substance, and also consequences of such influences: (irritating action on the upper respiratory tracts; irritating action on eyes, skin; skin-resorptive action; sensitization)	Ferrochrome dust has irritating effect if it got into upper respiratory tracts. It can cause mechanical effect on skin and conjunctiva.
11.5 Data on the dangerous remote consequences of influence on an organism: (Influence on reproduction function, carcinogenicity, mutagenicity, cumulative effect and other chronic exposure).	Cumulative effect is moderate. In ferrochrome condensation aerosol there can be hexavalent chromium combinations, which are carcinogens. Chrome combinations with high intake are cancerigenic and cause malignant tumors. Chrome and its combinations have significant skin irritant action.
11.6 Indicators of acute toxicity: (DL_{50} (LD_{50}), way of ingress (v/zh, n/k), kind of animal; CL_{50} (LK_{50}), exposition time (h), kind of animal)	Indicators of acute toxicity of chromium compounds Cr (III) and Cr (VI) are close. While injections to mice for $CrCl_3$ LD_{50} =7,8±mg/kg (equivalent Cr), while inhalation $CrCl_3$ for mice LK_{50} =31 mg/m^3[4].

12 The information on influence on environment

12.1 General characteristic of influence on objects of environment: (atmospheric air, reservoirs, soil, including observable features)	In high concentrations it can contaminate different environmental objects: reservoirs and soils. It can add a foreign smell to atmospheric air, change organoleptic properties of water, have poisonous influence on reservoir inhabitants, cause showdown of biochemical oxygen demand processes and plant growth slowdown [24].
12.2 Ways of influence on environment	Emission of contaminants (dust) during crushing. When there is a violation of storage and transport regulations, uncontrolled waste dumping, dumping on ground surface and water reservoirs [24].

12.3 The most important characteristics of influence on environment

12.3.1 Hygienic standards (allowable concentration in the atmosphere, water, including fishery waters, soil):

Table 2 [5, 6, 7]

Components	MAC or SRLI in the atmospheric air, mg/m^3 (LNV[1], hazard category)	MAC in reservoir water[2] or SRLI in reservoir water, mg/l, (LNV, hazard category)	MAC fish.[3] or SRLI fish. mg/l (LNV, hazard category)	MAC or APC in soil, mg/kg (LNV)
Chrome	MAC in the atmospheric air = -/0,0015 res., 1 hazard category SRLI in the atmospheric air = 0,01 chrome trivalent compounds (equivalent Cr^{3+})	MAC in reservoir water = 0,5 s.-t., 3 hazard category	0,07 (Cr^{+3}), s.-t., 3 hazard category for seawater 0,02 (Cr^{6+}) tox. , 2 category	MAC_{soil} = 0,05(Cr^{+6}), 6,0(Cr^{+3}), gen.
Ferrum	SRLI in the atmospheric air =0,02, ferroalloy dust /on ferrum/	MAC water = 0,3 org. col. 3 hazard category	MAC fish. = 0,1 tox., 4 hazard category; For seawater: 0,05, tox.,2 category	NE

12.3.2 Indicators of ecological toxicity: (CL, EC, NOEC etc. for fishes (96 hours, Daphnias (48 hours), seaweed (72 or 96 hours), etc.)

No data [21].

12.3.3 Migration and transformation in the environment by means of biological decomposition and other processes (oxidation, hydrolysis, etc.):

There is no transformation in the environment [21].

13 Recommendations on waste disposal (rests)

13.1 Security measures while handling with wastes formed by application, storage, transportation, etc.

Security measures while handlings with wastes are similar to ones while handling with ferrochrome (see Sec.7 and 8 of MSDS).

13.2 Information about places and ways of neutralization, recycling or liquidation of wastes of substance (material), including tare (package):

Wastes should be storage at the open suitable grounds. Put them in bulk in the form of ridges. Storage area should be located from downwind. For surface water trapping there should be envisaged interceptor drain system and storm water collectors at the storage area. And drainage system for permeation.

Disposition along with solid household waste is inadmissible. Wastes can be recovered (recycled by the consumer) [20].

Packages can be reused after being cleaned (dry cleaning). It is admissible to reuse packages, except ferrochrome destined for export, long storage, use at Extreme North regions

[1] LNV – Limiting Nuisance Value (tox. – toxicological; s.-t. – sanitary-toxicological; org. – organoleptic with the explanation of behavior of organoleptic properties of water (smell – changes water smell; mud. – increases muddiness of water; col. – gives colour to water, foam – causes formation of foam, film – forms a film on water surface, a.-t. – gives after-taste to water, op. – causes opalescence); refl. – reflective; res. - resorptive; refl.-res. - reflective - resorptive, fish. - fishery (change of saleable quality of trade aquatic organisms) ; gen. – general-sanitary).

[2] Ambient waters of drinking and household and cultural and general water resources.

[3] Ambient waters of commercial fishing importance (incl. sea waterbodies)

	and hard-to-reach regions. [10]. Wastes, spoilage from an accident place which is not subject to reworking and non-returnable tare should be sent for disposal to hazardous industrial waste ground or to places agreed with local sanitary or environmental authorities [20].
13.3 Recommendations on waste disposal -formed when applying in life:	It is not applied in everyday life. [1].

14 Information on transportation

14.1 UN number: (according to the recommendations of the United Nations about transportation of dangerous cargoes)	N/A [2].
14.2 Proper shipping and/or transport name:	Ferrochrome (grade, size category) [1, 12].
14.3 Kinds of the applied vehicles:	All types of transport according with cargo transport regulations, acting on every type of transport, and loading conditions and fastening of load conditions, approved in the established procedure. Ferrochrome is transported according international rules. Transportation in bulk including transportation in specialized containers is made by open transport means. [1,10].
14.4 Classification of cargo danger according to GOST 19433-88:	According to GOST 19433 ferrochrome is not classified as Dangerous Cargo [1,12].
- class - subclass - Classification Code (according to GOST 19433-88 and during railway transportation) - danger signs drawing numbers	
14.5 4 Classification of cargo danger according to UN Recommendations on the Transport of Dangerous Goods:	According to UN Recommendations on the Transport of Dangerous Goods ferrochrome is not classified as Dangerous Cargo. [9].
- class or subclass - additional danger - UN packaging group	
14.6 Transport marking (manipulation signs according to GOST 14192)	Transport marking: (manipulation signs and information inscriptions) according to GOST 14192 [1,11].
14.7 Emergency cards (During railway and sea transportations etc.)	Emergency cards are not applied [13,14,15].

15 Information about the national and international legislation

15.1 National legislation

15.1.1 Laws of the Russian Federation:	Federal law ««Concerning sanitary-and-epidemiologic well-being of population»; Federal law «Concerning Technical Regulation»; Federal law «Concerning Production and Consumption Waste»; Federal law «Concerning the Industrial Safety of Hazardous Production Facilities»; Federal law «Concerning Protection of Atmospheric Air»; Federal law «Concerning Fire Safety».
15.1.2 The documents regulating requirements on protection of man and environment:	NA.
15.2 The international conventions and agreements: (whether the product is regulated by the Montreal Protocol, the Stockholm convention, etc.)	Not regulated by international conventions and agreements [17, 18].

16 Additional information

16.1 Data on revision of safety data sheet: (to be pointed: «MSDS is first developed» or «MSDS is reregistered upon the expiration. Previous MSDS № …» or «Articles … have been amended …, date of amendment …»)	MSDS was re-registered due to the change in the Commodity Nomenclature of Foreign Economic Activity. The previous MSDS № 00186499.24.46919 dated 26.06.2017.

16.2 The list of data sources used for preparation of the safety data sheet[4]

[1]. GOST 4757-91 (ISO 5448-81) Ferrochrome. Technical requirements and delivery conditions.
[2]. HS 2.2.5.1313-03 “Maximum permissible concentration (maximum concentration limit) of harmful substances in working zone air”.
[3]. GOST 31340-2013. Warning marking of chemical production. General requirements.
[4]. Lazarev N.V., Gadaskina I.D. Hazardous substances in industry. Directory for chemists, engineers and doctors. Revised and enlarged edition 7.-L.: Chemistry, 1977.
[5]. HS 2.1.6.1338-03 “Maximum allowable concentration (maximum concentration limit) of polluting substances in atmospheric air in populated areas”. Hygienic specifications.
[6]. HS 2.1.5.1315-03 “Maximum allowable concentration (maximum concentration limit) of chemical substances in water of water objects of economic-drinking and cultural and general water use”.
[7]. HS 2.1.7.2041-06 Maximum allowable concentration (MAC) of chemical substances in soil
[8]. Ferroalloys. Directory.- M.: Chemistry, 1977.
[9]. Recommendations on the Transport of Dangerous Goods. Model rules. 17th revised edition. United Nations, New-York, Geneva, 2011.
[10]. GOST 26590-85 Ferroalloys. Package, marking, transportation and storage.- M.: Publishing house of standards, 1985.
[11]. GOST 14192-96 with changes 1,2,3. Marking of cargoes.
[12]. GOST 19433-88. Dangerous cargoes. Classification and marking.
[13]. Safety rules and liquidation procedure for emergency situations with dangerous cargo during their transportation by railways. –Approved by Ministry of transportation № СМ-407 dated

[4] Sequence numbers of data sources are indicated in every section of MSDS in the form of references.

25.11.96. and Ministry of emergency situation of Russia № 9-733/3-2 dated 31.10.96. M.: Ministry of Transportation, RF, 1997.

[14]. Dangerous goods regulation shipped by motor transport. As revised by Ministry of Transportation Decree dated 11.06.1999 №37 and 14.10.1999 №77.

[15]. International Maritime Dangerous Goods Code (IMDG Code). Vol.1,2 – St-Petersburg, ZAO Central Marine Research and Design Institute, 2007.

[16]. Customs Union agreement of Republic of Belarus, Republic of Kazakhstan and Russian Federation.

[17]. Globally Harmonized System of Classification and Labeling of Chemicals (GHS). Revised edition 3. United Nations, New-York and Geneva, 2009.

[18]. Information system data EC-ESIS (European chemical Information Substances)/ Data Sheet: Result for EC.

[19]. Korolchenko A.Y. and others. Fire-hazardous / dangerously explosive substances and materials and means of suppression. Directory in two parts – M. Acc. «Pozhnauka», 2000, 2004.

[20]. HS 2.1.7.1322-03. «Hygienic requirements ¬for disposal and neutralization of wastes of production and consumption».

[21]. Information card of potentially dangerous chemical and biological substance. Chrome. Series AT № 1988 dated 17.05.2001.

[22]. Krutikov V.N. Collective and personal protective means. Protective means control. Encyclopedia «Ecometry» from reference works series on ecological and medical measurements – M. FID «Delovoy express», 2002.

[23]. Knunyants I.L. (editor-in-chief) and others. Chemical encyclopedia. – M. Soviet encyclopedia, 1990.

[24]. Grushko Y.M. Harmful inorganic compounds in industrial wastewaters. Directory. – L. «Chemistry», 1979.