

Ferrochrome (FeCr)

| | | | |
|---|--|---|---|
|  | Price range in 2020 for Low Carbon Ferrochrome | 2,78 €/kg Cr – 3,77 €/kg Cr 1,49 \$/lb Cr – 1,90 \$/lb Cr | Get access to the current market prices |
| | Formula | FeCr | |
| | CAS no. | 11114-46-8 | |
| | Description | Ferrochrome, or Ferrochromium (FeCr) is a type of ferroalloy, that is, an alloy between chromium and iron, generally containing 50% to 70% chromium. It is produced in an energy intensive process in electric furnaces from chrome ore, iron ore and coal. FeCr is used in the production of stainless steel, special steel and castings. Ferrochrome is divided up in three main products which are Low Carbon FeCr, Medium Carbon FeCr and High Carbon FeCr. | |

Physical Properties

| | | | | | | |
|---------------------------------|---|--------------------------------|---------------------------|--------------------------------|----------------------------|--------------------------------|
| General | The melting point and density of ferrochrome depends on its chrome and carbon content | | | | | |
| Abrasion | good resistance to abrasion | | | | | |
| Corrosion | good resistance to corrosion | | | | | |
| Gravity | high specific gravity | | | | | |
| Magnetism | high magnetism | | | | | |
| | High carbon | | Medium carbon | | Low carbon | |
| Density _{FeCr70} | 6,7-7,1 g/cm ³ | 0,242-0,257 lb/in ³ | 7,1-7,3 g/cm ³ | 0,257-0,264 lb/in ³ | 7,3-7,35 g/cm ³ | 0,264-0,266 lb/in ³ |
| Melting point _{FeCr70} | 1350-1650 °C | 2462-3002 °F | 1360-1600 °C | 2480-2912 °F | 1580-1690 °C | 2876-3074 °F |

Source: Volkert, G. & Frank, K.-D.: Die Metallurgie der Ferrolegierungen

CO₂ Footprint

| | | |
|---------------------------|-----------|--|
| Upstream emission factors | Scope 2 * | Scope 3 ** |
| | - | 5,987 tCO ₂ / t _{FeCr} |

Source: [worldsteel association](#)

Actually requested materials based on metalshub transactions

| Designation | Material name | | Size [mm] | Composition, as percentages by mass | | | | | Packaging | Pallet |
|-------------------|---------------------|------|-----------|-------------------------------------|-----|-----|------|------|---------------|----------------|
| | | | | Cr | C | Si | P | S | | |
| Low carbon grade | LCFeCr 65 | Min. | 10 | 65 | - | | | | 1 mt big bags | One way pallet |
| | | Max. | 50 | - | 0,1 | 1,5 | 0,03 | 0,05 | | |
| High carbon grade | HCFeCr 65-75 | Min. | 10 | 65 | 6,0 | - | - | - | 1 mt big bags | One way pallet |
| | | Max. | 50 | 75 | 9,0 | 1,5 | 0,03 | 0,05 | | |

The above data are based on real data from the metalshub platform. These characteristics are the most common ones in metalshub transactions. We will update the data regularly. [12,2020]

The DIN standard of Ferrochromium and Ferrosilicochromium (DIN 17565)

| Designation | Material name | | Composition, as percentages by mass | | | | | | |
|---------------|------------------|------------|-------------------------------------|----|------|------|------|------|-----|
| | | | Cr ¹⁾ | C | N | P | S | Si | |
| Ferrochromium | Low carbon grade | FeCr70C005 | Min. | 55 | - | - | - | - | - |
| | | | Max. | 75 | 0,05 | 0,05 | 0,03 | 0,01 | 1,5 |
| | | FeCr90C005 | Min. | 75 | - | - | - | - | - |
| | | | Max. | 95 | 0,05 | 0,05 | 0,03 | 0,01 | 1,5 |
| | | FeCr70C010 | Min. | 55 | - | - | - | - | - |
| | | | Max. | 75 | 0,1 | 0,05 | 0,03 | 0,01 | 1,5 |

*Scope 2 emissions (according to greenhouse gas protocol):

Upstream emissions or credits related to procurement/delivery of electricity and steam from site. Upstream emissions of exported by-product gas considering the potential savings in electricity generation.

**Scope 3 emissions (according to greenhouse gas protocol):

Other upstream emissions or credits related to procurement / delivery of pre-processed materials / by-products from site.

| | | | | | | | | | |
|---|---------------------|------------------|------|-----------------|------|------|------|------|-----|
| | | FeCr70C010N | Min. | 60 | 0,03 | 3 | - | - | - |
| | | | Max. | 70 | 0,1 | 4 | 0,03 | 0,01 | 1,5 |
| | | FeCr70C010H N | Min. | 60 | 0,03 | 4 | - | - | - |
| | | | Max. | 70 | 0,1 | 10 | 0,03 | 0,01 | 1,5 |
| | | FeCr70C050 | Min. | 55 | - | - | - | - | - |
| | | | Max. | 75 | 0,5 | 0,05 | 0,03 | 0,01 | 1,5 |
| | Medium carbon grade | FeCr70C10 | Min. | 55 | 0,5 | - | - | - | |
| | | | Max. | 75 | 1 | - | 0,03 | 0,05 | 1,5 |
| | | FeCr70C20 | Min. | 55 | 1 | - | - | - | - |
| | | | Max. | 75 | 2 | - | 0,03 | 0,05 | 1,5 |
| | High carbon grade | FeCr70C80 | Min. | 45 | 6 | - | - | - | 2 |
| | | | Max. | 70 | 8 | - | 0,03 | 0,05 | 5 |
| FeCr70C95 | | Min. | 65 | 4 | - | - | - | - | |
| | | Max. | 70 | 9 ²⁾ | - | 0,03 | 0,05 | 2 | |
| Ferrosilicochromium | High silicon grade | FeSiCr35 | Min. | 28 | - | - | - | - | 45 |
| | | | Max. | 35 | 1,5 | - | 0,03 | 0,05 | 55 |
| | Low silicon grade | FeSiCr40 | Min. | 35 | - | - | - | - | 35 |
| | | | Max. | 40 | 0,1 | - | 0,03 | 0,05 | 45 |
| 1) The chromium content shall not vary by more than 2 % within a consignment. | | | | | | | | | |
| 2) For welding fabrication purposes, the carbon content may be up to 10 %. | | | | | | | | | |

[Click here for the ASTM standard specification for Ferrochromium \(ASTM A101\)](#)

Interesting facts

Min.
10,5 %

Steel is an alloy of iron and carbon. Stainless steels are steels containing at least 10.5% chromium, less than 1.2% carbon and other alloying elements. Stainless steel's corrosion resistance and mechanical properties can be further enhanced by adding other elements, such as nickel, molybdenum, titanium, niobium, manganese, etc. On contact with oxygen, a chromium oxide layer is formed on the surface of the material. This passive layer protects it and has the unique ability to repair itself.

High nitrogen ferrochrome is created by adding 0.75% of nitrogen to the different grades of ferrochrome. This nitrogen-rich alloy is used for manufacturing high-chromium cast steels having a coarse crystalline structure. The nitrogen content produces refined grains and adds strength to the finished product.

High
Nitrogen
Ferrochrome

Applications

- Most of the ferrochrome produced worldwide is used in manufacturing stainless steel. The chromium content present in stainless steel provides resistance to corrosion as well as gives stainless steel its customary appearance. Around 18% of chrome is used in per unit content of stainless steel.
- Ferrochrome is also used when more chromium is needed to be added to carbon steel.
- High carbon ferrochrome is used in the manufacturing of ball-bearing steels, tool steels as well as other alloy steels.
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- Apart from making stainless steel, low carbon ferrochrome is also used in the manufacturing of acid-resistant steels.
- Foundry-grade ferrochrome containing around 62-66% chromium and almost 5% carbon is used for producing cast irons.
- Ferrochrome powder is used in the field of powder metallurgy.
- Ferrochrome slag is a chemically stable substance. It is used in road construction and civil engineering as well as in the production of refractory materials.
- Ferrochrome dust is used in the leather tanning industry.

Risk and Safety Statements

Ferrochrome is not classified as hazardous under the CLP Regulation (1272/2008/EC) or as dangerous under the Dangerous Substances Directive (67/548/EEC), is not persistent bio accumulative and toxic (PBT) or very persistent and very bio accumulative (vPvB) as defined in Annex XIII of the REACH Regulation, and is not included in the ECHA candidate list of substances of very high concern.

| | | | |
|--------------------------|-------------|---|--|
| Symbols (GHS) | |  | |
| Hazard Statements | | H302 | Harmful if swallowed |
| | | H315 | Causes skin irritation |
| | | H317 | May cause an allergic skin reaction |
| | | H319 | Causes serious eye irritation |
| | | H334 | May cause allergy or asthma symptoms or breathing difficulties if inhaled |
| | | H341 | Suspected of causing genetic defects |
| | | H362 | May cause harm to breast-fed children |
| Precautionary Statements | Prevention | P201 | Obtain special instructions before use. |
| | | P202 | Do not handle until all safety precautions have been read and understood. |
| | | P280 | Wear protective gloves/protective clothing/eye protection/face protection. |
| | | P264 | Wash hands and exposed skin thoroughly after handling |
| | | P270 | Do not eat, drink or smoke when using this product. |
| | | P261 | Avoid breathing dust/fume/gas/mist/vapours/spray. |
| | | P285 | In case of inadequate ventilation wear respiratory protection. |
| | | P272 | Contaminated work clothing should not be allowed out of the workplace. |
| | P263 | Avoid contact during pregnancy/while nursing. | |
| | Response | P301 + P310 | IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician |
| | | P302 + P352 | IF ON SKIN: Wash with plenty of soap and water |
| | | P333 + P313 | If skin irritation or rash occurs: Get medical advice/attention. |
| | | P362 | Take off contaminated clothing and wash before reuse. |
| | | P305 + P351 + P338 | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |
| | | P304 + P341 | IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. |
| | | P337 + P313 | If eye irritation persists: Get medical advice/attention. |
| | P342 + P311 | If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician. | |
| | Storage | P405 | Store locked up. |
| | Disposal | P501 | Dispose of contents/container in accordance with local, regional, national, and international regulations. |

Source: DLA (Defense Logistics Agency)