



Green by Association...

A Brief Review of Ferrochrome in RSA

Of late Ferrochrome has been touted as a green commodity due to the fact that it is an integral component of stainless steel. Stainless steel is considered green as it is 100% recyclable and has a myriad of applications in modern society. For the Ferrochrome industry focusing on stainless steel is equivalent to putting one's best foot forward.

This association is coupled by considerations of how important chrome is to the South African economy; Approximately 13 million tons of chrome ore is produced annually with the industry directly employing over 10 800 people and additionally creating 32 000 associated jobs, in monetary terms the industry contributes approximately R2.2 billion per annum in salaries and pays significant amounts to government in royalties. This has led government to draft and implement a minerals beneficiation strategy aimed at prioritizing the downstream production of Ferrochrome, this government intervention is supported by the establishment of a controversial chrome export tax.

However, Ferrochrome processing and the subsequent primary production of stainless steel has a high impact on the environment. The consumption of electric energy required to produce 1 ton of Ferrochrome is approximately 3 500 KWh/t. Considering Eskom's carbon heavy and coal fired electricity supply, Ferrochrome production inherits a worrisome scope 1 and 2 emissions footprint. In light of the global imperative to mitigate against climate change this particular environmental impact can overshadow another equally worrisome environmental repercussion of Ferrochrome production, which is the potential generation of hexavalent chromium (Cr(VI)).

Cr(VI) forms from Cr(III) through oxidation and has serious negative effects on air, water and soil quality within its immediate environment. Numerous reports have associated Cr(VI) with lung cancer, gastro-intestinal cancer and dermatitis.

The local Ferrochrome industry is aware of the critical environmental issues that threaten the sustainability of this industry and have been proactive in finding solutions. These typically consist of transitioning to renewable energy and utilising off-gases from processing plants to generate electricity in order to replace Eskom power. With regards to their immediate environment, much progress has been made to find suitable solutions such as inducing a chemical reduction of Cr(VI), bacterial induced reduction as well as solidifying and stabilising Cr(II) using cement and lime.

The Ferrochrome dilemma highlights how all industrial activities carry environmental risks and hazards; however, these can be mitigated by implementing alternative processes and leveraging technological improvements within a holistic ESG framework.

Ferrochrome production is therefore not green, but like any industry if swept by the green revolution and under proper guidance and management, the industry could minimize its environmental impact and contribute to net zero directly - *and not just by association.*

By: [Joshua Kilani](#)

SOURCES:

https://www.miningweekly.com/article/Ferrochrome-is-part-of-the-green-revolution-glencore-2021-08-06/rep_id:3650

<https://www.miningweekly.com/article/south-africas-Ferrochrome-smelters-going-green-in-an-exemplary-manner-2022-04-01>

<https://oxpeckers.org/2021/10/chrome-mines/>

Characteristics of Ferrochrome slag aggregate and its uses as a green material in concrete – A Review: Ali Issa Fares, KMA Sohel, K Al-Jabri, Abdullah Al-Mamun

Environmental Aspects of Ferrochrome Production: Willem A Gericke Development Manager, Chrome Alloys, Samancor Ltd

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