

УДК 504.75

EDN [WSZAH](#)



Производство литого и переработанного чугуна в текели

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Аннотация. В статье подчеркивается, что в настоящее время производство направлено на удовлетворение целевых неограниченных потребностей людей. Кроме того, производство-это переработка предметов природы для непосредственного потребления или для дальнейшего производства. Запуск Текелийского горноперерабатывающего комбината стал значимым событием для Жетысуского региона. В статье также рассматривается знакомство с чугунным литейным оборудованием, печами и автоматическими линиями. Анализируется единственный эффективный источник работ по территории Казахстана, полученный чугун предназначен как для слитков, так и для дальнейшего перераспределения в сталь (Жидкий чугун). Литой (серый) чугун предназначен для дальнейшей переработки в чугунолитейных цехах при производстве отливок. Применение доменного газа, принцип работы, сухой метод, сечение печей, принцип работы агломератора, основные части печи: колошник, шахта, печная колесница, печное плечо и горка. Шахта, печная колесница и печное плечо были построены из высококачественного шамотного кирпича, а причал и основание печи-из кирпича или блоков из углеродистой стали с высоким содержанием глинозема. ТОО "ТПГК" является собственным доменным производством, новыми конструкциями, оценкой воздействия на окружающую среду с применением современных требований. На базе Текелийского горноперерабатывающего комплекса были рассмотрены производственные мощности, современные цели и задачи, эффективность производства.

Ключевые слова: чугун, бункерная эстакада, агломашина, технология химчистки, доменные печи.

Cast and recycled iron production in tekeli

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Abstract. In the article, today, production is an activity aimed at meeting the unlimited needs of people. In addition, production is the production of natural substances for direct consumption or for further production. The launch of the Tekeli mining processing plant was a significant event for the Zhetysu region. The article also provides an introduction to cast iron equipment, furnaces and automatic lines. An analysis of the only efficient source of work used on the territory of Kazakhstan is carried out, and the received cast iron is intended for redistribution into ingots and further into steel (liquid cast iron). Pig (gray) iron is intended for further processing in foundries during the production of ingots. Using blast furnace gas calories, working principle, dry method, section of furnaces, the working principle of the glomerator, the main parts of the furnace: the furnace, the shaft, the furnace carriage, the furnace arm and the furnace. The shaft, furnace carriage and furnace arm are made of high-quality fireclay bricks, and the furnace and furnace bottom are made of high-alumina bricks or carbon steel blocks. TPGK LLP is evaluating its blast furnace production, new designs, and environmental impact using current requirements. On the basis of the Tekeli mining processing complex, production capacity, current goals and objectives, and effective aspects of production were considered.

Keywords: cast iron, bunker overpass, sinter machine, dry cleaning technology, blast furnaces.

1. Introduction

The Tekeli mining and processing complex, on the basis of which TGPC LLP is building its blast furnace production, has been one of the city-forming enterprises of the city since its foundation to the present day. The formation of the Tekeli Mining and Processing Complex LLP took place on November 1, 2006 as part of Kazzinc JSC, while the processing plant continued to work on processing technogenic waste – clinker of zinc production. Currently, a new blast furnace production with a production capacity of 400 thousand tons of pig iron per year is located on the basis of the Tekeli mining and processing complex [1].

2. Research methods and materials

On September 30, 2019, an excursion was held for undergraduates majoring in Ecology at TGPC LLP, under the guidance of associate Professor, Candidate of Biological Sciences Kanagatov Zh.Zh. Iron foundry equipment, furnaces and automatic lines were shown. The chief engineer, A.V. Slonovsky, described the principle of operation of a completely new dry cleaning technology (figure 1), which is used only in the city of Tekeli throughout Kazakhstan. When using the dry method of blast furnace gas purification, the following is provided:

- Reduction of gas purification costs due to decommissioning of the water sludge gas cleaning facilities;
- Ensuring the residual dust content of the purified gas at a level not exceeding 10 mg/m³;
- Maximum preservation of the caloric content of blast furnace gas.



Figure 1. Dry gas cleaning.

On blast furnaces (figure 2) of TGPC LLP, a single-contract cone-free loading device (CLD) is used, which will reduce energy consumption by more flexible control of the distribution of charge and gas flow along the furnace section. As a result, blast furnaces will become even more environmentally friendly compared to furnaces that do not use CLD [2].



Figure 2. Blast furnaces.

The bunker overpass (figure 3) of the blast furnace shop is intended for the storage of the charge. Bunker overpasses are metal, reinforced concrete or mixed—type structures consisting of a number of bunkers for storing an operational stock of charge materials [3].



Figure 3. Bunker overpass.

The principle of operation of the sintering machine (figures 4 and 5) is as follows. A "bed" with a height of 30-35 mm is laid on sintering trolleys through feeders from a part of a suitable agglomerate with a size of 10-25 mm and a charge consisting of fine ore, concentrate, coke, limestone and lime is placed on it. The height of the charge is 250-350 mm. A vacuum of about 7-10 kPa is created under the belt of sintering trolleys, as a result of which external air is sucked through the upper surface of the layer. Moving sequentially, the trolleys fall under the furnace, which serves to ignite the coke in the charge [4].

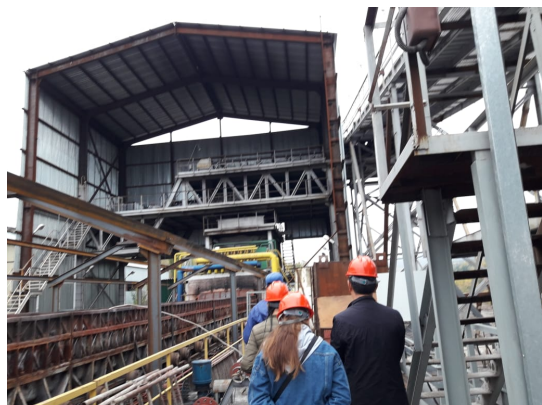


Figure 4. Sintering machine.



Figure 5. Agglomerate.

"TGPC" LLP used a new type of ball-mounted air heaters in the construction of its blast furnace. Their elimination of the internal combustion chamber and new constructions of the used superstructure made it possible to reduce the height of the former horizontal air heater by 40-50% during the nozzle. This made the air heater smaller and installed three instead of one or two simple devices, which increased the reliability of the equipment, their production capacity, and also added an additional reserve for the power and life resource of the equipment [5].



Figure 6. Air heaters.

3. Results and discussion

The main volume of water consumption (92.23%) is recycled water supply. The intake of fresh water (0.005% of total water consumption) from surface sources for household and industrial needs has been minimized. For production needs, the reuse of mine waters of the liquidated mine in the city of Tekeli. Recycled water supply will eliminate the discharge of pollutants. Industrial wastewater is not formed.

4. Conclusion

Among the products are railway concentrate, agglomerate, pig iron, cast iron. Almost 80% of the raw materials are of Kazakhstani content. Ore and limestone are present in sufficient volume in our deposits. Coke is supplied from Russia. In the future, 20-30% of the products will be supplied to the domestic market for mechanical engineering, foundry production, the rest will be exported to Russia, China and European countries.

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