



**ACADEMICIA**  
**An International**  
**Multidisciplinary**  
**Research Journal**  
**(Double Blind Refereed & Peer Reviewed Journal)**



**DOI: 10.5958/2249-7137.2021.01716.X**

## **QUALITY IMPROVEMENT OF THE STEEL MELTING TECHNOLOGY IN AN ELECTRIC ARC FURNACE**

**Nodir Turakhodjaev\* ; Nozimjon Kholmiraev\*\* ; Shokhista Saidkhodjaeva\*\*\* ;  
Bakhtiyor Kasimov\*\*\*\***

\*D Sc. Professor,  
Tashkent State Technical University,  
Tashkent, UZBEKISTAN

\*\*Ph.D. Researcher,  
Tashkent State Technical University,  
Tashkent, UZBEKISTAN

\*\*\*Senior Teacher,  
Tashkent State Technical University,  
Tashkent, UZBEKISTAN

\*\*\*\*Assistant Teacher,  
Andijan Machine Building Institute,  
Andijan, UZBEKISTAN

### **ABSTRACT**

*This article is focused on the processes in the second step which is about melting the raw materials and achieving the desired chemical analysis and temperature of the steel required for the third step in steel production – Casting and Solidification. The temperature of the electrodes (mainly the cathode) reaches 2700-3300°C. Ionization occurs due to the high temperature of the arc. That's way, good electrical conductivity occurs between the electrode. After the liquefaction process was completed at the specified time and the furnace temperature was sufficient after the metal was liquefied, a certain amount of aluminum alloy was added to the furnace to improve the fluidity of the liquid metal, and the liquid metal sand was poured into a clay mold.*

**KEYWORDS:** *Electric Arc Furnace (EAF), Ferroalloy, Slag, Coke, Flux, Electrode, Liquefaction, Melting.*

**REFERENCES**

1. M.Sahoo and S.Sahu. PRINCIPLES OF METAL CASTING 3rd edition McGraw-Hill UK 2014. 763 r.
2. John Campbell. THE METALLURGIY OF CAST METALS CASTINGS. 2003. 334 p.
3. Turakhodjaev N. D. et al. ANALYSIS OF DEFECTS IN WHITE CAST IRON //Theoretical & Applied Science. – 2020. – №. 6. – S. 675-682.
4. Turakhodjaev N. et al. EFFECT OF METAL CRYSTALLATION PERIOD ON PRODUCT QUALITY //Theoretical & Applied Science. – 2020. – №. 11. – S. 23-31.
5. Wang Y. et al. Microstructure and mechanical properties of ultra-lightweight Mg-Li-Al/Al-Li composite produced by accumulative roll bonding at ambient temperature //Materials Science and Engineering: A. – 2020. – T. 787. – S. 139494.
6. Wang Y. et al. High-strength, ductility and modulus Al-Li/B4C composite with near nanostructure produced by accumulative roll bonding //Journal of Alloys and Compounds. – 2020. – T. 834. – S. 155105.
7. Wang Y. et al. Concurrently improving uniform elongation and strength of ultrafine-grained Al-2Li alloy //Materials Science and Engineering: A. – 2020. – T. 792. – S. 139848.
8. Wang Y. et al. Microstructural evolution, precipitation behavior and mechanical properties of a novel Al-Zn-Mg-Cu-Li-Sc-Zr alloy //Journal of Materials Research. – 2021. – S. 1-11.
9. Turakhodjaev N. et al. Analysis of technological solutions for reducing the copper concentration in slags from oxygen-flare smelting of copper sulfide concentrates //Journal of Critical Reviews. – 2020. – T. 7. – №. 5. – S. 449-452.
10. Bekmirzaev S., Saidmakhamadov N., UbaydullaevM. Obtaining sand-clay casting". Theory and practice of modern //Russia. – 2016. – №. 4 (12). – S. 112.
11. Djahongirovich T. N., Muysinaliyevich S. N. Important features of casting systems when casting alloy cast irons in sand-clay molds //ACADEMICIA: An International Multidisciplinary Research Journal. – 2020. – T. 10. – №. 5. – S. 1573-1580.
12. Kholmiraev N.B et all Quality improvement of the steel melting technology in an electric arc furnace//International scientific and scientific-technical conference on “Resource and energy-saving innovative technologies in the field of foundry “April 13-15, 2021, Tashkent
13. BekmirzaevSh., SaidmaxamadovN., UbaydullaevM. POLUCHENIYaLITEVPESChANOGLINISTYEMETODOM[OBTAINING CASTING IN SANDY-CLAY BY THE METHOD] //Teoriyaipraktikasovremennoynauki. – 2016. – №. 6-1. – S. 112-115.
14. SaidmaxamadovN. idr. General technology for the production of powders of construction materials //Ekonomikaisotsium. – 2019. – №. 4. – S. 673-680.
15. SaidmaxamadovN. idr. [TECHNOLOGY FOR PREVENTION OF PORES IN THE FLOW] //Ekonomikaisotsium. – 2019. – №. 4. – S. 661-672.
16. SaidmaxamadovN., XaydarovU., EgamberdievB. [IMPROVEMENT OF TECHNOLOGY PREPARATION BY SPECIAL DRAINING METHOD] //Ekonomikaisotsium. – 2019. – №. 4. – S. 651-660.