

Study on Tundish Modification And Improved Performance In Production

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Abstract- Present project was carried at Continuous Casting plant of Steel Making Shop, and study was focused to reduce the operating cost of tundish about Tundish by using alternative tundish fixtures in Tundish preparation.

Efforts have been done to amalgamate both theoretical and practical aspects of continuous casting process and equipment in a very simple form which is understandable by beginners. Sincere effort has been made in preparing this training manual to impart knowledge and know-how to persons working in Caster in particular and Steel making zone in general.

Continuous plant involves the production of flat products i.e. slabs of different width and lengths' as per requirements of customers, and these slabs are sent to Hot Strips Mill for hot rolling of coil. Continuous Casting has become the most cost effective process for the production of semi-finished products like Slabs, blooms, rounds etc.

I. INTRODUCTION

Introduce extend was conveyed at Continuous Casting plant of SMS-1, and study was engaged to decrease the working expense of tundish about Tundish by utilizing elective tundish apparatuses in Tundish readiness. Casting plant includes the generation of level items i.e. sections of various width and lengths' according to prerequisites of clients, run from 800-1600mm width of standard thickness 220mm in SMS - I , and these chunks are sent to Hot Strip Mill for hot moving of curl of various gage .SMS - I comprise of 4 casters . Constant Casting has turned into the most savvy prepare for the generation of semi-completed items like Slabs, blossoms, rounds and so forth.

Endeavors have been done to amalgamate both theoretical and useful parts of consistent throwing procedure and gear in an exceptionally basic frame. Earnest exertion has been made in setting up this instructional guide to confer information and know-how to people functioning in Caster specifically and Steel making zone when all is said in done.

In India according to the established records, Canara Workshop at Mangalore, Karnataka state set up India's first continuous casting machine in 1965 to cast 90mm square billets. Since then the process picked up fairly fast with a number of ministeel plants adopting the electric arc furnace and continuous casting route to produce billets and blooms. From the above studies, it is learnt that, by modifying the tundish, there is lot of scope for improvement in production and cost reduction. Hence it is proposed to modify the tundish.

Problems identified in Old Tundish Equipment

- High Tundish dissemination time
- Short Sequence throwing time.
- Tundish spouts chocking.
- Casting speed variety
- High wastage of throwing powder

Proposed Modification in Tundish Equipment & its Advantages

- Configurations Changes
- Increments in Volume
- Increments in Thickness

Advantages

- Reduction in scoop slag convey to tundish
- Reduction in scale cleaning lessening
- Reduction in Operation cost
- Increase generation rate
- Reduces handling time

II. LITERATURE REVIEW

Present expand was passed on at Continuous Casting plant of SMS-1, and study was locked in to diminish the working cost of tundish about Tundish by using elective tundish contraptions in Tundish status.

Steady Casting has transformed into the wisest get ready for the era of semi-finished things like Slabs, blooms, adjusts et cetera.

Attempts have been done to amalgamate both hypothetical and valuable parts of reliable tossing system and apparatus in a particularly essential casing. Sincere effort has been made in setting up this instructional manual for present data and know-how to individuals working in Caster particularly and Steel making zone when all is said in done.

In India as indicated by the built up records, Canara Workshop at Mangalore, Karnataka state set up India's first ceaseless throwing machine in 1965 to cast 90mm square billets. This was a vertical caster. Later Mukund Ltd., Mumbai had taken after this and set up a two strand, S - sort Concast throwing machine to create 80mm and 100mm square area billets. From that point forward the procedure got genuinely quick with various ministeel plants receiving the electric bend heater and persistent throwing course to deliver billets and blossoms.

From the above examinations, it is learnt that, by altering the tundish, there is parcel of degree for development underway and cost diminishment. Henceforth it is proposed to alter the tundish

III. METHODOLOGY

Continuous Cast Process, to move completed steel diminish from a spoon to the shape in an incessant tossing machine, a transitional vessel, called tundis. A tundish is a rectangular colossal breeze up, unshakable lined vessel, which may have a refractory lined cover on the best. The tundish base has no less than one gush port with slide entryway or fitting post for plotting the metal stream.

The vessel is segregated into two fragments: a delta territory, which generally has a pour box and where Steel relaxes, is supported from the spoon; and an outlet section from which break up is energized into the shape. Diverse stream control framework, for instance, dams, weirs, bewilders with holes et cetera. May be sorted out along the length of the tundish. The course of action point of view of different tundis shapes is showed up. Seen lines in figure show condense path from bay to outlet of the tundish. Longer way is flawless to draw out break down living plan time to grasp lightness of vast scale contemplations Tundish is foreseen to pass on the fluid metal to the moulds and at a laid out all through and temperature without causing infectivity by contemplations. The condense release rate into the shape is held unfaltering by charge the disintegrate significance in the

tundish predictable. Tundish goes about as a store amid the scoop change periods and keeps on providing steel liquefy to the shape when internal dissolve is halted up, making consecutive throwing by various spoons conceivable. The fundamental driver for incorporation development and infectivity of the soften incorporate oxidation of the dissolve via air and continued oxidizing scoop slag, entrainment of tundish and spoon slag, of this current slag's into the liquefy. These incorporations ought to be glide out of the liquefy amid its stream all through the tundish before being overflow into the shape. Exactly when spoon metallurgy was not totally developed, the tundish was obvious to fill in as a refiner of the deoxidized melts trade from the scoop where contemplations were not totally cleared.

Tundish could diminish some piece of full scale consolidations from the modify, change substance structures, and control break up temperature to level for supporting into the shape. With the usage of the degasser, mollify cleanliness has inside and out improved during the time to meet continuously stern customer demands.

In CCP, Tundish enables us to:

- Modify the inclusions size and shape
- Improve the steel cleanliness by flow regulation,
- Improve the steel cleanliness by applying the argon through the tundish bottom.
- Acts as thermal insulator.

The components to consider the virtue of the steel, synthetic, warm homogeneity, ability to run the tundish for longer timeframes, these objectives are accomplished by plotting the keep running with uncommonly expected hard-headed frameworks coming about because of demonstrating. Basically the tundis was fixed with blocks essentially result of the inaccessibility of appropriate solid. An obstinate practice in tundish is perpetually in light of the idea of utilization of a changeless covering and a working coating so as to get the best from hard-headed materials. The liquid steel to make distinctive sorts of the liquid stream contained by the tundish relying on the extent of the tundish, kind of the caster, number of strands, kind of steel cast and the measure of the spoon warm. In the constant cast prepare,

Tundish is the vessel that the steel goes all through before toward within the form that shapes the solidified steel. Tundish assumes an extensive part in refining steel; the components to consider the cleanliness of steel, substance and warm homogeneity the capacity to run the tundis for longer timeframes, this objective are accomplished by controlling the

stream with especially outlined unmanageable frameworks coming about because of model.

Steps in Operating Sequence in Tundish

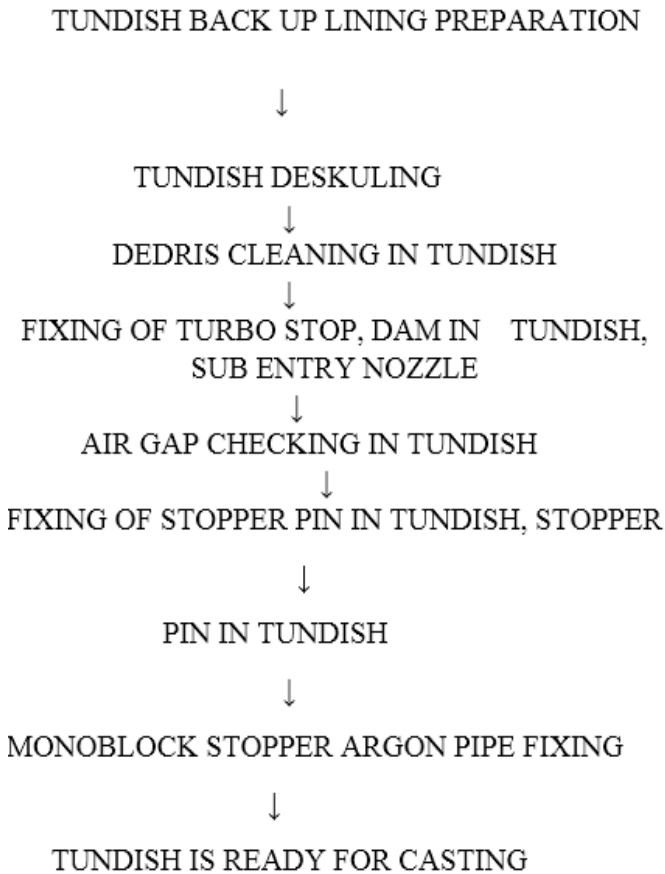


Figure 1.

TRAIL AND IMPLIMENTATION

Table 1. OLD TUNDISH SHELL TEMPRATURE DIFF

SEQ.NO	T/D NO	T/D TEMP1	T/D TEMP2	T/D TEMP3	SHELL T/D TEMP	INCREA IN T/D SHELL TEMP
1	19	1562	1562	1565	133	
2	19	1550	1546	1540	142	9
3	19	1550	1553	1555	151	9
4	19	1557	1553	1550	166	15
5	19	1557	1559	1557	179	13

Table 2. NEW TUNDISH SHELL TEMPRATURE DIFF

SEQ.NO	T/D NO	T/D TEMP1	T/D TEMP2	T/D TEMP3	SHELL T/D TEMP	INCREA IN T/D SHELL TEMP
1	16	1549	1548	1551	135	
2	16	1551	1547	1550	143	8
3	16	1545	1547	1545	148	5
4	16	1547	1544	1545	156	8
5	16	1545	1544	1541	168	12



Figure 2. Old Tundish



Figure 3. Old Tundish



Figure 4. Modified New Tundish



Figure 5. Modified New Tundish

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IV. RESULTS AND DISCUSSIONS

1. Trails taken for two tundish by changing the less cost security block in the back coating
2. Trails for elective less cost shower mass for typical tundish is arranged.
3. Application of shower mass in finished stream level of tundish diminished.
4. Proper arranging of tundish regarding succession length in silica reviews that is less number of groupings.
5. Spray mass utilization decrease to 1.2 tons for each tundish to 1 tons for each tundish

V. CONCLUSION

1. Working level of Tundish increments
2. Cost per Tundish arrangement per ton of hot metal decreased
3. Tundish life increment enemy number warms
4. Increase generation rate to plays major in steel making

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