

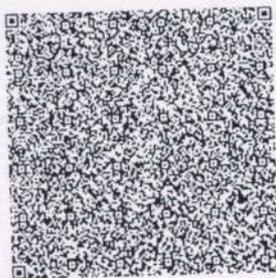


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INDIA NON JUDICIAL Government of Jharkhand

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Certificate Issued Date	: 15-Sep-2016 02:53 PM
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Unique Doc. Reference	: SUBIN-JHJHDOPJC07044463751955500
Purchased by	: MANISH KUMAR SINHA
Description of Document	: Article 5 Agreement or memorandum of an Agreement
Property Description	: JOINT RESEARCH AGREEMENT
Consideration Price (Rs.)	: 0 (Zero)
First Party	: TATA STEEL LTD
Second Party	: NA
Stamp Duty Paid By	: TATA STEEL LTD
Stamp Duty Amount(Rs.)	: 100 (One Hundred only)



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RESEARCH AGREEMENT

BY AND BETWEEN

Tata Steel Limited, an existing Public Limited Company within the meaning of the Companies Act, 2013, having its Registered Office at 24, Homi Mody Street, Fort Mumbai - 400001, and Works at Jamshedpur in the district of Singhbhum (East), Jharkhand State India, hereinafter referred to as "Tata Steel" (which term shall unless repugnant to the

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JOINT AGREEMENT BETWEEN TATA STEEL AND NIFFT

context include its successor, representatives, administrators and permitted assign) of the ONE PART.

AND

National Institute of Foundry and Forge Technology, Khunti Road, Hatia, Ranchi, Jharkhand – 834003, herein referred to as "NIFFT" (which term shall unless repugnant to the context include its successor, representatives, administrators and permitted assign) of the OTHER PART

The Tata Steel and the NIFFT are collectively referred to as "Parties" and individually as "Party".

Whereas both Parties hereto have agreed to jointly work on Project in topics of mutual interest as defined below and develop Products under terms and conditions mutually agreed upon by the Parties and

Whereas the Parties desire to record the broad terms and conditions that are jointly accepted and agreed to in this Agreement as contained hereunder.

1. DEFINITION

- a. **Tata Steel Limited –NIFFT Research Programme** shall mean and include the Project under the Agreement, the terms and conditions for execution of which shall be jointly agreed upon, in writing as per this agreement and **Schedule A** of this agreement.
- b. **Tata Steel Limited know-how** shall mean and include all know-how of methods, material, software, designs, patterns, formats, proprietary technical literature, and information developed, owned and provided by Tata Steel Limited, which are required for the Project.
- c. **NIFFT know-how** shall mean and include all know-how of methods, material, software, designs, patterns, formats, proprietary technical literature, and information developed, published or otherwise owned and provided by NIFFT, which are required for the Project.
- d. **Tata Steel Limited Personnel** shall mean the personnel or research and development engineers of the Tata Steel Limited deputed for the Project.
- e. **NIFFT Personnel** shall mean the faculty members and / or scientists and / or students and / or staff of NIFFT working for the Project.
- f. **Principal Investigators** shall mean persons having the responsibility of conducting and supervising the Project under this agreement.

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- g. **Products** shall mean the results, software, hardware or other deliverable generated as a result of work to meet the objectives of the Project funded by Tata Steel Limited.
- h. **Material** means all materials in any form including all data, information, records, documents, databases and software (including source code and object code), other works and material and the subject matter of any category of Intellectual Property Rights.
- i. **Affiliate (s)** means any subsidiaries of Tata Steel, sister concerns such as Tata group of companies, a company or organization in which Tata Steel has a stake.

2. Areas of Collaboration

The parties agree to collaborate in the following areas/domains:

- a) Development of pig iron with high phosphorus content variations
- b) Characterization and property evaluation of the pig iron castings

3. SCOPE OF AGREEMENT

Tata Steel Limited and NIFFT shall work jointly to carry out Project in the above said items of developing Products and with specific objectives, terms & conditions to be jointly agreed and as defined Schedule A of this agreement.

4. Activities and obligations of Tata Steel:

Tata Steel Limited shall be responsible for providing the funds required for the project. Tata Steel Limited may depute appropriate Tata Steel Limited personnel to participate in the project, as per mutual agreement and define in **Schedule A** of this agreement.

- a. Tata Steel Limited will share its facilities, unavailable in NIFFT, for carrying out the experimental and computational works necessary for the Project.
- b. Tata Steel Limited and NIFFT will share know-how which may be deemed necessary for the Project.

5. ACTIVITIES AND OBLIGATIONS OF NIFFT

- a. NIFFT shall complete the activities in the said items and deliver the Products to Tata Steel Limited as per the objective and schedule agreed upon and defined in **Schedule A** of this agreement.
- b. NIFFT will also share its facilities, unavailable in Tata Steel, for carrying out the experimental and computational works necessary for the Project.

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- c. During the term of any Project taken up under this Research Agreement or any of its extensions thereof, NIFFT personal participating in such Research Project and the personal sponsored by the Tata Steel Limited shall not involve themselves in any research activity sponsored or supported or commissioned by one or more commercial or commercially associated party other than the Tata Steel Limited or its Affiliate if the research activity is substantially the same in scope, objective and content as pursued in the Project in which the NIFFT personal are participating.

6. FINANCIAL AND OTHER ARRANGEMENTS

The consideration payable to NIFFT for the Research Program cost and the schedule of payment would be as mutually agreed upon for the Project and as defined in **Schedule A** of this agreement. Financial arrangements related to Intellectual Property Rights sharing will be as spelt in clause 11.

- a. The Project will be fully funded by the TATA Steel Ltd subject to maximum amount of INR 6,50,000/-. The total cost of the Project, including consultancy, training, overhead charges, and service taxes will be INR 7,50,000.
- b. The payments schedule is linked with completion of different phases/deliverables of the project as defined in **Schedule A** of this agreement.

7. AFFILIATES

Tata Steel Limited may involve one or more of its Affiliates in fulfilling the objective of this Research Agreement. As defined hereinabove an Affiliate shall have the meaning ascribed to it in clause 1(j) hereof with the proviso that Tata Steel Limited remains responsible for its Affiliates compliance with the terms of this Research Agreement and any ancillary agreement hereunder in which such Tata Steel Limited Affiliate participates.

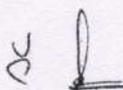
8. ASSIGNMENT

Except as otherwise expressly provided in this Agreement, the Parties hereto shall not transfer or assign any of their rights and obligations under this Agreement to any other party without obtaining prior consent in writing from other Parties hereto.

9. TERM / DURATION

This Agreement shall be initially valid for a period of 2 years from the date of signing of this agreement. The Parties may extend the term of this Agreement for additional periods as desired under mutually agreeable terms and conditions which shall be reduced to writing and signed by the Parties.

10. TERMINATION



JOINT AGREEMENT BETWEEN TATA STEEL AND NIFFT

Any of the Parties may terminate this Agreement by serving a written notice on the other Parties six months prior to the intended date of termination provided that the termination by either of the parties shall not relieve that party of its obligations accrued prior to such termination.

11. NOTICES

All communications by Tata Steel Limited involving financial, administrative and other matters shall be sent to Dr. K.K.Singh of NIFFT. All information of scientific and technical nature may be exchanged directly between the Principal Investigator from NIFFT and Principal Investigator from Tata Steel Limited, for the Project concerned.

12. INTELLECTUAL PROPERTY AND COMMERCIAL RIGHTS

- a. "Intellectual Property" means the legal rights relating to inventions, patent applications, patents, copyrights, trademarks, mask works, trade secrets, and any other legally protectable information, including computer software, first made or generated during the performance of this Agreement.
- b. Tata Steel Limited and NIFFT shall meet from time to time and discuss matters relating to obtaining legal protection for invention(s) or any other work which may have to be protected by any form of Intellectual Property Rights (the "IPR") generated/created during the tenure of project under this Agreement. In the event any inventions are made which may be protected by any form of Intellectual Property Rights, the same shall remain the Joint Property of Tata Steel Limited and NIFFT. Tata Steel Limited, shall have 50% rights and NIFFT shall have remaining 50%. If any of the parties is not interested in such IPR, they may confirm their disinterest in writing within 6 months from the date of ascertaining of the invention and in such event, other Party would be free to register the IPR in its own name.
- c. **Patent Prosecution and Expenses.** Unless the parties agree in writing otherwise, the filing, prosecution, defense and maintenance of all Patents for Joint Inventions will be conducted jointly in the name of both parties and controlled by them jointly, acting reasonably and in good faith. Both the parties Tata Steel and NIFFT will bear the cost of filing a patent/Trademark, drafting, paying the maintenance fees on a mutual sharing basis.
- d. Tata Steel will have all the rights to commercially exploit any development of the research for its own purpose and for Tata group of companies. Tata Steel will not be sharing any commercialization benefit in such cases with NIFFT.
- e. NIFFT will have all the rights to use the development of the research for teaching and further research projects.

JOINT AGREEMENT BETWEEN TATA STEEL AND NIFFT

- f. Tata Steel will keep all the rights to commercially exploit the development resulting out of the research conducted under this agreement to any third parties. Benefits arising out of such commercialization shall be shared between Tata Steel Limited and NIFFT under mutually agreed terms to be finalized in a separate agreement not withstanding to this Agreement.
- g. In the event that Tata Steel Limited is not willing to commercially exploit the said development externally to any third parties within this specific time period of six years from the date of first written disclosure of the Intellectual Property, then NIFFT will be free to license the development, know how to any third parties. The terms and conditions of the license will be negotiated between the parties and all benefits accruing from such assignments will be shared between NIFFT and Tata Steel Limited. Any license to third parties shall be entered into as a tripartite agreement between NIFFT, Tata Steel and the third party.
- h. In the case of joint Intellectual Property between Tata Steel Limited and NIFFT, neither party may assign any rights to any third parties without the consent of the other party, which shall however not be unreasonably withheld. The terms and conditions of the license to the third party shall be negotiated between the parties and all benefits accruing from such assignment will be shared between IIT and Tata Steel. Any license agreement with third parties shall be entered into as a tripartite agreement between NIFFT, Tata Steel and the third party.
- i. **Background Intellectual Property** Should any of the party possess rights in background intellectual property, that is, intellectual property not otherwise subject to this Agreement, which would be useful or essential to the practice or commercialization of the results of this Agreement, should be disclosed and defined in Schedule A of this agreement. Should NIFFT Background Intellectual Property be required for commercialization of the result or used in Tata Steel's business, the parties shall enter into an license agreement for this purpose upon payment of license fees/compensation to NIFFT in a value mutually agreed between the parties. Except to the limited extent required to perform a party's obligations under this Agreement, neither party receives any right, title, or interest in or to any Research Materials provided to it by the other party or any technology, works or inventions of the other party that are not Research Program Inventions, or any patent, copyright, trade secret or other proprietary rights in any of the foregoing.
- j. **Maintaining the Laboratory Notes** Each party agrees that research efforts will be well documented in the form a laboratory notes with accurate data disclosed for each experiments performed therein, during the course of this agreement.

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JOINT AGREEMENT BETWEEN TATA STEEL AND NIFFT

13. CONFIDENTIALITY

- a. It may be necessary for NIFFT and Tata Steel Limited to disclose to or exchange with each other proprietary information relating to NIFFT know-how and Tata Steel Limited know-how, which are confidential and proprietary. The disclosing party shall advise authorised personnel of the receiving party appropriately regarding the confidential nature of the information disclosed. The Party receiving such confidential or proprietary information shall not, unless specifically permitted in writing by the Party providing the said information, disclose in whole or part any such confidential or proprietary information or divulge any information thereon to any person other than its Personnel for fulfilling the purpose of this Agreement. The disclosure to any such Personnel as aforesaid, of any such confidential or proprietary information, shall be in confidence and only to the extent necessary for carrying out the obligations herein.
- b. The obligations of confidentiality set forth above shall be survived even after termination of the Agreement.
- c. The obligations of confidentiality however shall not apply to information that:
 1. is not disclosed in writing or reduced to writing and marked with appropriate confidentiality legend within thirty (30) days after disclosure;
 2. is already in the recipient party's possession at the time of disclosure;
 3. is or later becomes part of the public domain through no fault of the recipient party;
 4. is received from a third party having no obligations of confidentiality to the disclosing party;
 5. is independently developed by the recipient party; or
 6. is required by law or regulation to be disclosed.
- d. Each party may disclose Confidential Information of each other party only to employees, and Students who:
 1. are aware and agree that the Confidential Information of each other party must be kept confidential; and
 2. either have a need to know (and only to the extent that each has a need to know), or have been specifically approved by that other party.

JOINT AGREEMENT BETWEEN TATA STEEL AND NIFFT

14. PUBLICATION

- a. Parties shall consult in writing with each other before any publication in respect of the Products. In all publications (papers, reports etc.), dealing with the Products it will be duly acknowledged that the work has been carried out by NIFFT and TATA STEEL under a project supported by TATA STEEL. Any/all such publication to be done on the Products by either party shall be done with mutual consent in writing.
- b. NIFFT and Tata Steel agree that before publication of any material under this AGREEMENT both NIFFT and Tata Steel shall jointly agree in writing prior to publication, the contents thereof.
- c. Tata Steel and NIFFT agree that outcome of the research can be kept as 'Trade Secret' depending upon the strategic importance of the outcome of the research. Both parties will sign a Trade Secret agreement in such case and will not disclose the research outcome in any form.
- d. The obligations of this Clause shall survive even after termination or expiry of this Agreement.

15. USE OF NAME

Neither party shall use the name or sign or trade mark of the other party without the consent of the other party in writing. NIFFT may however disclose the existence of this Agreement in its list of collaborations or research projects.

16. ARBITRATION, APPLICABLE LAW AND JURISDICTION

- a. Any disputes between the parties shall be resolved by mutual discussions. Unresolved disputes, if any, shall be subject to resolution by a panel consisting of the NIFFT, and Chief R&D AND Scientific Services, Tata Steel Limited, who shall represent Tata Steel Limited. If the dispute cannot be resolved by the said panel, the matter shall be resolved by arbitration in accordance with the Arbitration and Conciliation Act, 1996. The venue of arbitration shall be Jamshedpur. The decision of the arbitrator shall be binding on both parties.
- b. This Agreement shall be construed, governed and enforced in accordance with the law of India and subject to the jurisdiction of Courts in Jamshedpur.

17. Use of Research Materials. Any Research Materials of one party transferred to the other in connection with the Research Program may only be used as stated in the Research Program. Unless the parties agree otherwise, Research Materials are to be considered the "Confidential Information" of the party providing them.

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JOINT AGREEMENT BETWEEN TATA STEEL AND NIFFT

18. FORCE MAJEURE

Neither party shall be held responsible for non-fulfillment of their respective obligations under this Agreement due to the exigency of one or more of the force majeure events such as but not limited to acts of God, War, Flood, Earthquakes, Strikes not confined to the premises of the party, Lockouts beyond the control of the party claiming force majeure, Epidemics, Riots, Civil Commotions etc. provided on the occurrence and cessation of any such event the party affected thereby shall give a notice in writing to the other party within one month of such occurrence or cessation. If the force majeure conditions continue beyond six months, the parties shall jointly decide about the future course of action.

19. GENERAL

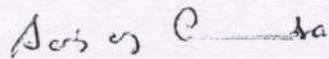
- a. Any addition, deletion and / or alteration to this Agreement may be effected with a written agreement of all the Parties to this Agreement concerning the amendments. A document containing the additions, deletions and/or alterations, and signed by all Parties hereto, shall form an annexure to and be deemed to be a part of this Agreement.
- b. The headings of various clauses herein are inserted for convenience of reference and are not deemed to affect the meaning or construction of relative provisions.
- c. This Agreement and its Appendices constitute the entire agreement among the Parties' and supersede all other representations, understandings or communication whether written or verbal, with respect to the subject matter hereof.
- d. Nothing contained in this agreement or any actions taken by or arrangements entered into between the parties shall be construed as or deemed to create any partnership, agency or joint venture between the parties. Neither party shall have authority to commit on behalf of the other party contractually or otherwise, to any obligations to third parties.

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JOINT AGREEMENT BETWEEN TATA STEEL AND NIFFT

IN WITNESS THEREOF NIFFT and Tata Steel hereto cause this Agreement to be executed by their duly Authorized representative on the day, month and the year first above written.

SIGNED FOR AND ON
TATA STEEL LTD


Name:

Designation: Chief R&D and SS
Designation:
(Authorized Signatory)

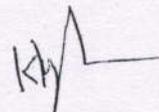
SIGNED FOR AND ON
On Behalf of NIFFT

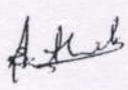

Name:
R. P. Chattopadhyay.

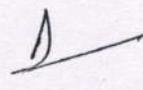
Director, NIFFT
(Authorized Signatory)

WITNESSES

1) Signature 
Name: MONOJIT DUTTA
Address: R&D, Tata Steel

1) Signature 
Name: Prof. K. K. Singh
Address: Foundry Tech., NIFFT

2) Signature 
Name: Abhishek Pathak
Address: Tata steel

2) Signature 
Name: PROF. ANIL KUMAR SINGH
Address: NIFFT, Foundry Tech, I
RANCHI.

Schedule A – Tata Steel Ltd and NIFFT
Research Agreement – “Development and characterization of High phosphorus cast iron”

1. Introduction

High phosphorus cast iron exhibits properties of high wear and corrosion. As a drawback of phosphorus addition, the ductility of material is lost due to formation of low melting point intermetallic compound segregating at the grain boundaries. The project work is intended to add phosphorus in the range of 0.1 wt.% to 15 wt.%. The microstructure, porosity, segregation, hardness and other properties will be tested for the material along with wear and corrosion.

2. Background

High phosphorus cast iron material can be produced from steel plant waste and scrap material. To check the value added properties in this material, different properties need to be tested.

3. Objectives

The main objective of the project is to produce cast iron different phosphorus contents. Determination of mechanical and microstructural properties, wear and corrosion properties will be carried out to understand any value addition in this project.

4. Methodology

Tata Steel Ltd. will provide high phosphorus cast iron (HPPI) material with approx. 1 wt.% phosphorus to NIFFT Ranchi along with ferro phosphorus (65 wt.% phosphorus). NIFFT Ranchi will be responsible for using scrap cast iron material to reduce phosphorus content, as per requirement.

The composition of high phosphorus cast iron supplied by Tata Steel to NIFFT Ranchi is: C – (3.4 to 3.8) wt.%, Si – (2.25 to 3.1) wt.%, Mn – (0.6 to 0.7) wt.%, P – (1 to 1.4) wt.% and S – (0.019 to 0.028) wt.%.

Following 6 composition variations (wt.%) of phosphorus will be done at NIFFT Ranchi.

1. 0.1% (require dilution of originally supplied HPPI)
2. 0.5% (require dilution of originally supplied HPPI)
3. 2% (Requires addition of ferro phosphorus)
4. 5% (Requires addition of ferro phosphorus)
5. 10% (Requires addition of ferro phosphorus)
6. 15% (Requires addition of ferro phosphorus)

**Schedule A – Tata Steel Ltd and NIFFT
Research Agreement – “Development and characterization of High
phosphorus cast iron”**

- NIFFT Ranchi will perform the necessary mass balance calculations to add scrap cast iron / ferro phosphorus material to the original HPPI material to produce the different phosphorus variations. All the casting of different samples will be carried out at NIFFT Ranchi.
- NIFFT will arrange to send samples to TSL or any other local agency for composition analysis, once the heat with a particular phosphorus variation is prepared.
- Tata Steel will supply original HPPI material to NIFFT Ranchi, as per the need of the project work. Initially, 185 kg HPPI and 15 kg ferro phosphorus will be made available to NIFFT.
- From each heat of phosphorus variation different samples will be prepared for property evaluation as listed below in Table 1:

Table 1 Sample details for each phosphorus variation and their use for property evaluation

Type of sample	No. of samples	Use for property evaluation	Place of property evaluation
Wedge	1-2	Cooling rate determination, microstructure – white and grey	NIFFT
Step bar	1-2	Casting will be made in different thickness steps to determine soundness of casting, porosity, segregation and hardness	NIFFT
Tensile	3-4	Tensile and elongation testing, microstructure studies	NIFFT
Impact test	3	Impact testing	NIFFT and TSL
Corrosion	3	Different accelerated corrosion testing	NIFFT and TSL
Wear	2	Wear testing	NIFFT and TSL

**Schedule A – Tata Steel Ltd and NIFFT
Research Agreement – “Development and characterization of High
phosphorus cast iron”**

- NIFFT will also study the effect of inoculant addition in ladle and micro-shrinkage.
- NIFFT will perform all the property evaluation, except corrosion, wear and impact test for the original HPPI material also.
- TSL will perform wear and corrosion for all variations of phosphorus material. NIFFT will make necessary arrangement to send the samples to TSL.
- The dimensions for corrosion testing sample are: 30 mm x 30 mm x 4 mm
- The dimensions for wear testing sample are: 75.6 mm x 25.4 mm x 12.7 mm.

The remaining wedge, step bar and tensile sample dimensions are given in Figure 1.

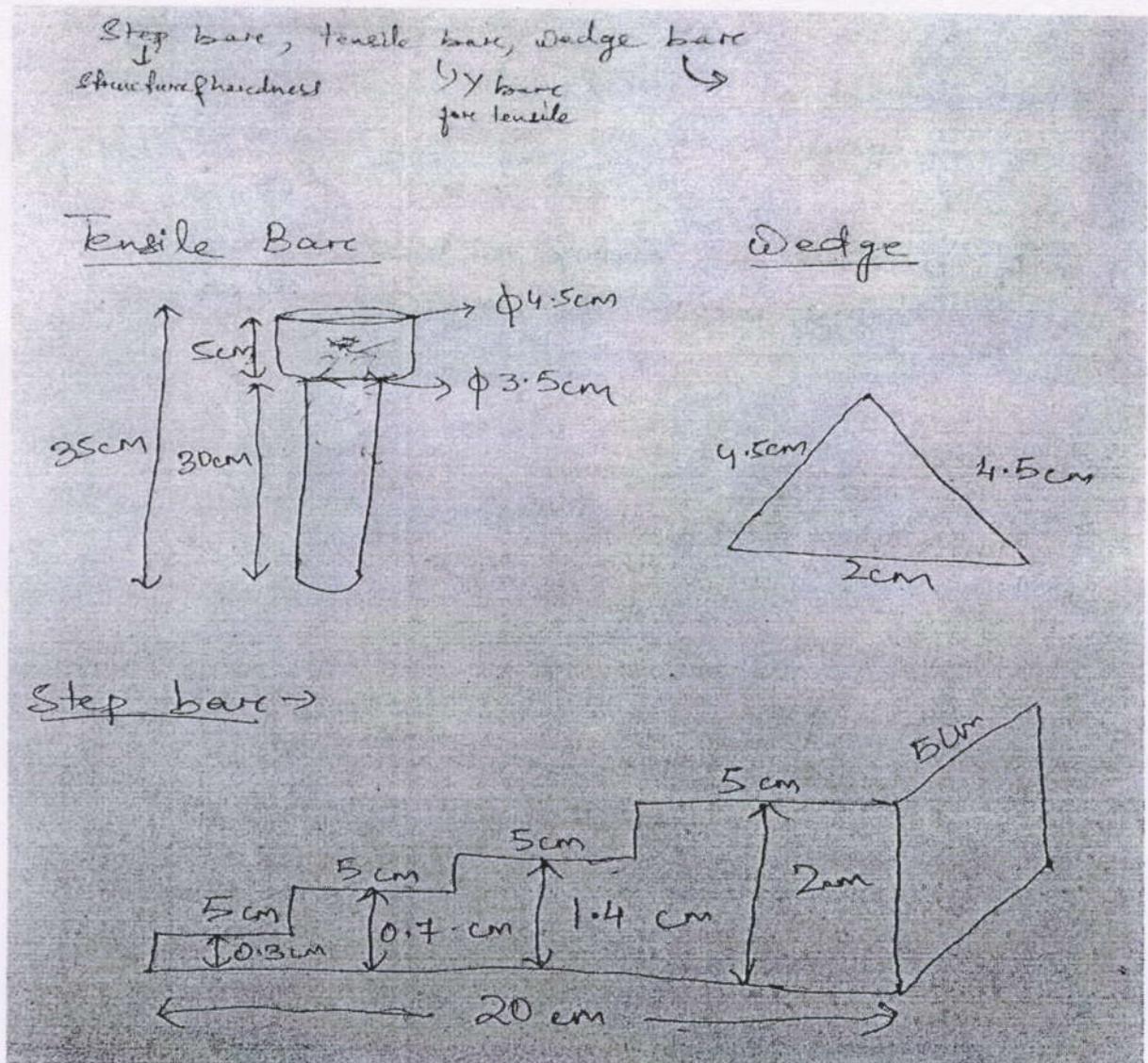


Figure 1 Wedge, Step bar and tensile specimen dimensions

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**Schedule A – Tata Steel Ltd and NIFFT
Research Agreement – “Development and characterization of High
phosphorus cast iron”**

5. SCOPE OF THE RESEARCH PROGRAM-

Tata Steel Limited and NIFFT shall work jointly to carry out projects in the above said items of developing high phosphorus cast iron material and its property evaluation, terms & conditions to be jointly agreed under the Agreement.

Activities and obligations of Tata Steel Limited:

- a. Tata Steel Limited shall be responsible for providing the funds required for the Project, as identified. Tata Steel Limited may depute appropriate Tata Steel Limited personnel to participate in the Projects, as per mutual agreement
- b. Tata Steel Limited will also share its facilities, unavailable in NIFFT, for carrying out the characterization and testing works necessary for the Project.
- c. Tata Steel Limited and NIFFT will share know-how which may be deemed necessary for the Projects.

6. ACTIVITIES AND OBLIGATIONS OF NIFFT:

- a. NIFFT shall complete the activities in the said section 4 and will deliver timely update report / presentation for review of the work and will supply the samples for corrosion and wear testing.
- b. NIFFT shall take reasonable steps to prevent Tata Steel Limited know-how, which are meant only for the purpose of conducting the Project(s), from unauthorized usage or falling into unauthorized hands. NIFFT shall ensure that NIFFT personnel and the Project Investigator Team (and student) working on Projects are aware of the confidentiality obligations of NIFFT under these agreements.
- c. NIFFT will provide project completion report with title “DEVELOPMENT AND CHARACTERIZATION OF HIGH PHOSPHORUS CAST IRON” within 7 days, after the third review is completed.

**Schedule A – Tata Steel Ltd and NIFFT
Research Agreement – “Development and characterization of High
phosphorus cast iron”**

7. Duration

Total duration of the work will be 6 months. (October 2016 to March 2017)

The table below shows project monitoring chart for anti-stick and pseudo coatings.

Milestones	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Responsibility
DOE, MoU / NDA between Tata Steel and NIFFT. Transport of material.							Joint
Casting of cast iron with different phosphorus variations							NIFFT
Microstructural and mechanical property evaluation							NIFFT
Wear, corrosion and composition analysis							Tata Steel
Final Report							Joint

8. BACKGROUND IPR

(A) Tata Steel Background IPR: None

(B) NIFFT Background IPR: None

9. CONTRIBUTIONS / PROJECT BUDGET

Tata Steel’s Contributions:

The consideration payable to NIFFT for Project cost and the schedule of payment would be as mutually agreed upon for the project.

- a. The Project will be fully funded by the TATA Steel Ltd. The total cost of the Project, including all charges and service taxes will be in the tune of INR. 7,50,000.

**Schedule A – Tata Steel Ltd and NIFFT
Research Agreement – “Development and characterization of High
phosphorus cast iron”**

- b. TATA Steel Ltd shall pay the total amount to NIFFT as per the payment schedule mentioned in section 9.3

9.1.1 Cash Contribution

Tata Steel Ltd shall pay to NIFFT a total amount of INR 7,50,000 as a one-line project fee (inclusive of applicable Overheads and taxes) to the project in accordance to the payment schedule stated in Section 9.3 of this Schedule A.

9.1.2 Infrastructure Contribution

9.1.2.1 Equipment: Any equipment available at Tata Steel R&D premises can be used by for the above project, if the same is not available at NIFFT.

9.1.2.2 Manpower

The project will be led by Abhishek Pathak (Principal Researcher, Surface Engineering Research group) and Dr. Sourabh Chatterjee (Principal Researcher, Product Research group)

Consumables: Standard consumables associated with R&D equipments can be used for the project.

9.1.2.3 Other: Travel and other costs are included in the project cost.

9.2 NIFFT’s Contribution

9.2.1 Infrastructure Contribution

9.2.1.1 Equipment (NIFFT)

9.2.1.2 Manpower: As decided by NIFFT, internally.

9.2.1.3 Consumables: HPPI and ferro phosphorus will be provided by TSL. Scrap cast iron and other consumables is the responsibility of NIFFT.

9.2.1.4 Other: All other costs are included in the project cost.

**Schedule A – Tata Steel Ltd and NIFFT
Research Agreement – “Development and characterization of High
phosphorus cast iron”**

9.3 Payment Schedule and Project cost breakup

Date/Event	Amount to be Paid	Expected Deliverables	Cost (INR)
Signing date of MoU	50% of project cost	Signed MoU and Schedule A	3,75,000
2 months	25% of project cost	1 st review by TSL team on work progress with minimum two compositions completed for property evaluation (HPPI original composition, 5 wt. % phosphorus)	1,87,500
4 months	Nil	2 nd review by TSL team on work progress with minimum two compositions completed for property evaluation (10 wt.% and 15 wt.% phosphorus)	0
6 months	25% of project cost	3 rd review by TSL team on work progress with minimum two compositions completed for property evaluation (0.1 wt.% and 0.5 wt.% phosphorus)	1,87,500

Items	(In Rupees)	Remarks
Raw material charges	1,00,000	
Consultancy fees	3,90,000	
Overhead	2,27,500	
General distribution among supporting staff	32,500	
Total:	7,50,000	

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Schedule A – Tata Steel Ltd and NIFFT
Research Agreement – “Development and characterization of High
phosphorus cast iron”

10. PRINCIPAL INVESTIGATORS/PROJECT LEADERS

a) Tata Steel Principal Investigators

Abhishek Pathak
Surface Engineering Research Group
R&D, Tata Steel Limited
Jamshedpur-831001
Jharkhand, India, e-mail: abhishek.pathak@tatasteel.com
Phone No: 08092086201

Dr. Sourabh Chatterjee
Product Research Group
R&D, Tata Steel Limited
Jamshedpur-831001
Jharkhand, India, e-mail: sourabhchatterjee@tatasteel.com
Phone No: 09234550350

b) NIFFT Principal Investigator

Dr. Kamlesh Kumar Singh
Foundry Division - NIFFT,
Khunti Road, Hatia, Ranchi, Ranchi – 834003
Jharkhand, India. Email – kksingh_nifft@yahoo.com
Phone No. 9934107324

Any notices thereof during the course of the research program should be sent to the
Principal investigators of the respective party.

11. Tenure of the Agreement

The duration of the project titled “Development and characterization of high phosphorus
cast iron” will be for two years. The Parties may extend the term of this Agreement for
additional periods as desired under mutually agreeable terms and conditions which shall be
reduced to writing and signed by the Parties.

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