



Consultancy Work for Year 2021-2022

| Sr. No. | Name of Company | Test Required | No. of samples | Amount |
|------------|-----------------------------------|--|----------------|--------|
| 1 | Accura Tech Castings Pvt. Ltd. | Micro Structural Analysis | 2 | 1000 |
| _ | Tough Casting Pvt. | Micro Structural Analysis | 1 | 500 |
| 2 | Ltd. | Mirco Hardness | 3 | 1500 |
| | n. n. i | Micro Structural Analysis | 1 | 500 |
| 3 | Trio Enterpriese | Mirco Hardness | 3 | 1500 |
| | | Micro Structural Analysis | 1 | 500 |
| 1 | Tulip Casting Pvt. Ltd | Rockwell Hardness | 1 | 500 |
| | | Mirco Hardness | 3 | 1500 |
| 2 | Transa Cain I | Micro Structural Analysis of Nodular Cast Iron | 1 | 500 |
| 3 | Turno Grind | Salt Spray Test | 2 | 2000 |
| | DI 14' I destrict | Microstructural Analysis of Graphite in Cast Iron | 2 | 1000 |
| 4 | Bhakti Industries | C.P.C. | 1 | 300 |
| | | Microstructural Analysis of Graphite in Cast Iron | 1 | 500 |
| 5 | Bharat Auto Ind. | Volume Fraction of phases | 1 | 1450 |
| | | Salt Spray Test | 1 | 1000 |
| | | G.F.N. | 1 | 300 |
| 6 | Top Gear Transmission. | Micro Structural Analysis of Nodular Cast Iron | 1 | 500 |
| | | Volume Fraction of phases | 1 | 1450 |





| | To Colleg | FINAL AMOUNT | 45371/- | |
|----|--------------------------|---|---------|---------|
| | To Departn | nent: 18148/- | GST 18% | 6921/- |
| | Consultancy Am | ount Distribution | TOTAL | 38450/- |
| | | Salt Spray Test | 1 | 3000 |
| 16 | Dev Metalliks | Volume Fraction of phases | 1 | 1450 |
| | | Microstructural Analysis of Graphite in Cast Iron | 1 | 500 |
| 15 | India Engineers | Micro Structural Analysis | 2 | 500 |
| 14 | Top Gear Transmission | Micro Structural Analysis | 5 | 2500 |
| 13 | Dev Metalliks | Inclusion Rating of Steel | 2 | 1000 |
| 12 | Impel Founders Pvt. Ltd. | Inclusion Rating of Steel | 3 | 1500 |
| 11 | Ask Casting | Micro Structural Analysis of Nodular Cast Iron | 1 | 500 |
| 11 | A -1- C4: | Mirco Hardness | 15 | 7500 |
| 10 | Castings Pvt. Ltd. | Micro structural Analysis of Graphite in Cast Iron | 1 | 500 |
| 10 | Accura Tech | Mirco Hardness | 3 | 1500 |
| / | Dilakti ilidustifes | Grain Size Measurement | 1 | 500 |
| 7 | Bhakti Industries | Brinell Hardness | 2 | 1000 |



Nodal Officer

B.Voc. & Community College Unit
Vivekanand College, Kolhapur

"Valid for 3 months from the date of Issue." 30032002 For METASIS LAB hapy or Bearer DDMMYY 45371 h/ अदा करें। The Posnespal Vevelanged College हि चिश्वेश्वर सहकारी बँक लि.,पुणे (मल्टीस्टर बैंक) The Vishweshwar Sahakari Bank Ltd., Pune (MUITI-STATE BANK) LAXAIIPURHKOLHAPUR BRANCH: Nashie Complex, Kolhapur-416 002 POUSONO One Somp T. 70 Current A/c. No.: 022130100000209 KIRNO Trebore Rupees रुपये Pay

PROPRINGOR

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PAYABLE AT PAR AT ALL OUR BRANCHES

PAYABLE AT PAR AT ALL OUR BRAN
FSC - VSBL0000022

Please sign above

#085714# 418335002# 000209# 11



METASIS LAB

Chemical, Physical, Metallurgical Testing of Metals, Noise, Vibration, Surface Roughness, Salt Spray, PMI. Test, Lux Measurement

B-13, Opp. Kolhapur Axle Ltd., MIDC Shiroli, Kolhapur - 416122. **Cell: +9922437590, 7721995959,** Email: kolhapurmetasys@gmail.com, metasyslab@rediffmail.com, Website: www.metaltestinglab.net

Date: 05/10/2022

To,

The Nodal Officer

Department of Foundry Technology,

Vivekanand College, Kolhapur (Autonomous)

Subject: To provide collaborated testing and consultancy services.

Respected Authority,

We have metallurgical testing and consultancy setup in MIDC Shiroli, Kolhapur. We have collaborated with your Foundry Technology department. We have requirement of metallurgical testing at your end.

As department of Foundry technology has established a testing setup which is very useful for industrial purpose, we are requesting you to provide necessary support regarding the same. We are attaching a list of samples and details of test requirements along with this letter.

Thanking you,

1000

Yours Sincerely,

Director

Metasis Lab

• Details of work required-

| Name of Company | Test Required | No. of samples |
|--------------------------------|---------------------------|--|
| Accura Tech Castings Pvt. Ltd. | Micro Structural Analysis | 02 |
| T 1 C .: D . I . I | Micro Structural Analysis | 01 |
| 2 Tough Casting Pvt. Ltd. | Mirco Hardness | 03 |
| | Micro Structural Analysis | 01 |
| Trio Enterpriese | Mirco Hardness | 03 |
| | Ÿ | Accura Tech Castings Pvt. Ltd. Micro Structural Analysis Tough Casting Pvt. Ltd. Micro Structural Analysis Micro Hardness Micro Structural Analysis Trio Enterpriese |



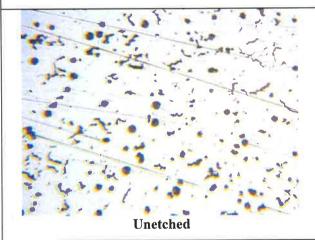


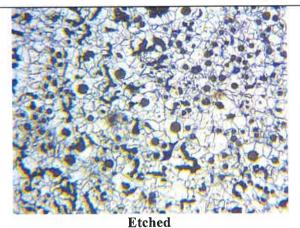
| Test Repor | t- Micro Structural Analysi | is of Nodular (| Cast Iron | |
|---|-----------------------------------|--|--|----------------------------------|
| Lab ID- CS001 Test Certificate NoVCKFT202101 Date | | | e- 06/10/2021 | |
| | Metasis Lab Shiroli MIDC | | | |
| · Name | Accura Tech Castings Pvt. Ltd | t. Ltd. | | |
| Date of Sample Received Date of Test Completion Sample Name | | | | |
| 2021 | 06/10/2021 | | Sample | |
| Challan No. | Test Method | Part No | Heat No | Grade |
| FT001 | ASTM-E-2567-16a | • | - | SG-400/18 |
| | ASTM-E-562:2011 | | | |
| | ASTM-E-1245:2016 | | | |
| | Name le Received 2021 Challan No. | Test Certificate NoVC Metasis Lab Shiroli MIDC Accura Tech Castings Pvt. Ltd Received Date of Test Completion O6/10/2021 Challan No. Test Method FT001 ASTM-E-2567-16a ASTM-E-562:2011 | Test Certificate NoVCKFT202101 Metasis Lab Shiroli MIDC Accura Tech Castings Pvt. Ltd. Received Date of Test Completion Section Column 1 | Name Metasis Lab Shiroli MIDC |

Test Results

Etchant- 4% Nital

Etching Condition- Immersion-Etching





Total Magnification-100X

| Specimen Dimension- | Sample Cut Piece |
|------------------------|---|
| Observation (Unetched) | Vermicular Graphite is present in the structure along with regular Spheroidal Graphite. |
| Observation (Etched) | Ferritic matrix is observed with following percentage of Ferrite and Pearlite. |

| Graphite Anal | ysis (Unetched Area) | P | hase Anal | ysis (Etched Area) | |
|------------------------------|-----------------------|--------------|-----------|--------------------|-----|
| Frame Area (mm²) | 0.959 mm ² | Pearlite (%) | 24.70 | Cementite (%) | =: |
| Nodularity (%) | 81% | Ferrite (%) | 75.30 | Ledeburite (%) | 125 |
| Nodule Count/mm ² | 223 | | | | |

Tested By-

For VCK Foundry Technology

---End of Report--

-- Vivekanand College, Kolhapur

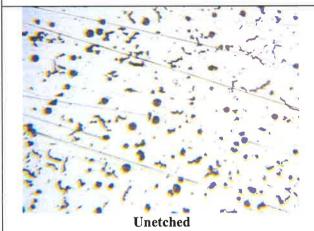


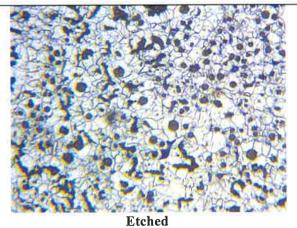


| | Test Repor | t- Micro Structural Analys | is of Nodular | Cast Iron | | |
|-------------------------|-------------|--|---------------|-----------|-----------|--|
| Lab ID- CS001 | | Test Certificate No VCKFT202102 Date- 06/10/20 | | | | |
| | | Metasis Lab Shiroli MIDC | | | | |
| Custome | r Name | Accura Tech Castings Pvt. Ltd. | | | | |
| Date of Sample Received | | Date of Test Completion | Sample Name | | | |
| 05/10/ | 2021 | 06/10/2021 | | Sample | | |
| Challan Date | Challan No. | Test Method | Part No | Heat No | Grade | |
| 06/10/2021 | FT001 | ASTM-E-2567-16a | | - | SG-400/18 | |
| | | ASTM-E-562:2011 | | | | |
| | | ASTM-E-1245:2016 | | | | |

Test Results

Etchant- 5% Nital Etching Condition- Immersion-Etching





Total Magnification-100X

| Specimen Dimension- | Sample Cut Piece | • | | | |
|---|--------------------------|---|-----------|--------------------|----------------|
| Observation (Unetched) | Vermicular Graphite is p | Vermicular Graphite is present in the structure along with regular Spheroidal Graphite. | | | |
| Observation (Etched) Ferritic matrix is observed with following percentage of Ferrite and Pearlite. | | | | | |
| Graphite Analys | is (Unetched Area) | Pl | nase Anal | ysis (Etched Area) | |
| Frame Area (mm²) | 0.959 mm ² | Pearlite (%) | 24.70 | Cementite (%) | 12 |
| Nodularity (%) | 79% | Ferrite (%) | 75.30 | Ledeburite (%) | j e |

Tested By-

217

For VCK Foundry Technology

B Voc. Authorized Signatorye Um

---End of Report-----Vivekapand College, Kolhaput

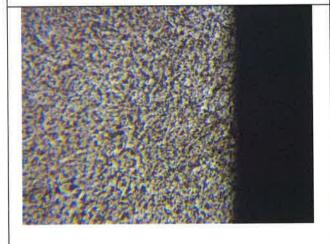
Nodule Count/mm²

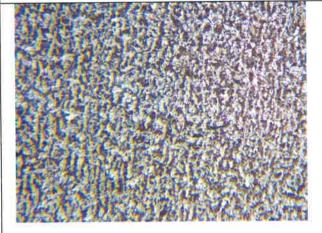




| | T | est Report- Micro Structur | al Analysis | | | |
|----------------------------|--------------|--|---------------------------------|------|-----------------|--|
| Lab ID- CS002 | | Test Certificate No VCKFT202103 Date- 09/10/ | | | ite- 09/10/2021 | |
| <u> </u> | *** | Metasis Lab Shiroli MIDC, Kolhapur | | | | |
| Custome | er Name | Tough Casting Pvt. Ltd. | | | | |
| Date of Sam | ple Received | Date of Test Completion | Sample Name | | | |
| 08/10/ | /2021 | 09/10/2021 | Tool Tech Engg-B-26-Boron Steel | | oron Steel | |
| Challan Date Challan No. | | Test Method | Heat Code | Qty. | Grade | |
| 09/10/2021 | FT002 | ASTM-E-1245:2016 ASM-Handbook-Vol9 | * | (RE) | B-26 | |

Etching Condition- Immersion-Etching Etchant- 4% Nital





| Case region-Total Magn | nification-100X | Core Region-Total Magnification-200X | | |
|----------------------------|--|--------------------------------------|--|--|
| Specimen Dimension- | Sample Cut Piece | | | |
| Type of Structure Observed | In case region Decarburization was not observed. | | | |

Core region shows EquiaxedFerrito-Pearlitic structure.

Tested By-

For VCK Foundry Technology

B. Vocuthorized signatoryllege Unit Vivekanand College, Kolhapur

---End of Report----





| | | Test Repo | ort- Mirco Ha | rdness | | |
|---------------|------------------------|-------------|--|---------------|-----------------|-------|
| Lab ID- CS002 | | Test Cert | st Certificate No VCKFT202104 Date- 09 | | ite- 09/10/2022 | |
| C | NI | Metasis Lab | Metasis Lab Shiroli MIDC, Kolhapur | | | |
| Custom | er Name | Tough Casti | ing Pvt. Ltd. | | | |
| Date of Sam | ple Received | Date of Tes | t Completion | | Sample Name | 2 |
| 08/10 |)/2021 | 09/10 | 09/10/2022 | | Steel Plate | |
| Challan Date | Challan No | . Test I | Test Method Heat Code Qty. | | Qty. | Grade |
| 09/10/2022 | 0/2022 FT002 ASTM-E-92 | | M-E-92 | - | :=: | B-26 |
| | | | Test Details | | | |
| | | | Hardness | | | |
| | Plate No | Thickness | Vickers | s Hardness HV | 1 Kg | |
| | P 4259 | 5 mm | 256 - 258 | | | |
| - | PA 5451 | 6 mm | 6 mm 265 - 267 | | | |
| | PA 5455 | 6 mm | | 260 - 262 | | |

Tested By-

For VCK Foundry Technology

B.Vocathorized Signation College Unit Vivekanand College, Kolhapur

------End of Report-----

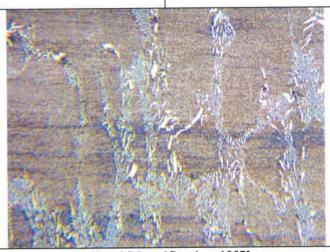




| | | Test Report- Micro Struc | ctural Analysis | | | |
|--------------------------------|-------------|---------------------------------------|-----------------|-----------------|-----------------|--|
| Lab ID- CS003 | | Test Certificate No VCKFT2105 Date- 2 | | | ate- 23/10/2022 | |
| | | Metasis Lab Shiroli MIDC | | | | |
| Customer Name Trio Enterpriese | | | | | | |
| Date of Sample Received | | Date of Test Completion Sample Name | | | | |
| 21/10/ | 2022 | 23/10/2022 Test Piece | | e-D3-Tool Steel | | |
| Challan Date | Challan No. | Test Method | Heat Code | Qty. | Grade | |
| 23/10/2022 | FT003 | ASTM-E-1245:2016 | 12 | I HAV | AISI-D-3 | |
| | | ASTM-E-562:2011 | | | | |

Etchant- 4% Nital

Etching Condition- Immersion-Etching



Total Magnification-100X

| | 100011110 | | | | | |
|-----------------------------|---|------------------------|--------------|--|--|--|
| Specimen Dimension- | Sample Cut Piece | | | | | |
| Type of Structure Observed- | Un-dissolved, medium coarse Carbides are observed in the matrix of Tempered Martensite with a small amount of Retained Austenite. | | | | | |
| | | | | | | |
| Area Fraction-Case Region | Tempered Martensite (%) | Retained Austenite (%) | Carbides (%) | | | |
| | 85.50 | 2.20 | 12.30 | | | |

Tested By-

For VCK Foundry Technology

Nodal Officer

B.Voc. & Community College Unit Viveruharized oligier (Nolhapur

-End of Report-----





| | | Test Repo | ort- Mirco Ha | rdness | | | |
|---------------|--------------|---------------|------------------------------------|-------------|-------------|---------------------|--|
| Lab ID- CS003 | | Test Cer | tificate No Vo | CKFT2106 | Da | te- 09/10/2022 | |
| | | Metasis Lab | Metasis Lab Shiroli MIDC, Kolhapur | | | | |
| Custom | er Name | Trio Enterpri | ese | | | | |
| Date of Sam | ple Received | Date of Tes | t Completion | S | ample Name | | |
| 08/10 |)/2021 | 09/10 | 0/2022 | | Steel Plate | | |
| Challan Date | Challan No. | . Test I | Method | Heat Code | Qty. | Grade | |
| 09/10/2022 | FT003 | ASTI | M-E-92 | | | B-26 | |
| | | | Test Details | | | | |
| | | | Hardness | | | | |
| | Plate No | Thickness | Vickers | Hardness HV | 1 Kg | | |
| | ST 5456 | 6 mm | | 276 - 278 | | | |
| | ST 5457 | 6 mm | | 280 - 282 | | | |
| | ST 5457 | 6 mm | | 278 - 280 | | | |
| | Fested By- | <u>)</u> | | | Nodal Offi | cer College Unit | |

-----End of Report-----

श्री स्वामी विवेकानंद शिक्षण संस्थेचे

Jr. College U.Dise No. 27341301006

विवेकानंद कॉलेज, कोल्हापूर (स्वायत्त)

२१३०, ई, ताराबाई पार्क, कोल्हापूर, ता. करवीर, जि. कोल्हापूर – ४१६ ००३ शिवाजी विद्यापीठ, कोल्हापूर संलग्नीत

नॅक मानांकन : 'A' (सी.जी.पी.ए. ३.२४) कॉलेज उईथ पोटेन्शियल फॉर एक्सलन्स, यु.जी.सी., न्यु दिल्ली स्टार कॉलेज – डी.बी.टी. – भारत सरकार आय.एस.ओ. ९००१:२०१५



(स्वायत्त) कोल्हापूर

Ph.: 0231-2658612, 2658840 | Fax: 0231-2658840 | Resi.: 0231-2653962 | Website: www.vivekanandcollege.org | E-mail: info@vivekanandcollege.org

मा. आमदार चंद्रकांत दादा पाटील

कार्याध्यक्ष

प्राचार्य अभयकुमार साळुंखे M.A. सचिव

प्राचार्या सौ. शुभांगी गावडे M.Sc., B.Ed. प्राचार्य

डॉ. आर. आर. कुंभार M.Sc. M.Phil. Ph.D.

जावक क्रमांक व्हि.सी.के. /

डॉ. बापूजी साळुंखे

संस्थापक

दिनांक :

| | | INVOICE | | | |
|-----------------|---------------------------------|---------------------------|--------------|-------------------|--|
| The Metasis Lab | | INVOICE NO. | 2201 | DATE - 30.10.2021 | |
| Shiroli M | IIDC | T.C. No As per | report | DATE - | |
| Kolhapuı | -416122 | CH. NO; | | DATE - | |
| | | P.O.NO:- | P.O.NO:- | | |
| Sr. No. | Description | Qty in Nos. | Rate | Amount | |
| 1 | Microstructure Analysis | 4 | 500 | 2000 | |
| 2 | Microhardness Test | 6 | 500 | 3000 | |
| | | Total | | 5000.00 | |
| | | CGST @ 9 % | CGST @ 9 % | | |
| | | SGST @ 9 % | SGST @ 9 % | | |
| GSTIN - | | Total Amount | Total Amount | | |
| Amount | In Words:- Five Thousand Nine H | undred Only | | • | |
| Pan No | Fo | or VCK Foundry Technology | ogy | | |

Vivekanand College, Kolhapur



METASIS LAB

Chemical, Physical, Metallurgical Testing of Metals, Noise, Vibration, Surface Roughness, Salt Spray, PMI. Test, Lux Measurement

B-13, Opp. Kolhapur Axle Ltd., MIDC Shiroli, Kolhapur - 416122. **Cell: +9922437590, 7721995959,** Email: kolhapurmetasys@gmail.com, metasyslab@rediffmail.com, Website: www.metaltestinglab.net

Date: 10/11/2021

To,

Nodal Officer

Department of Foundry Technology,

Vivekanand College (Autonomous),

Kolhapur.

Subject: To provide collaborated testing and consultancy services.

Respected Authority,

We have metallurgical testing and consultancy setup in MIDC Shiroli, Kolhapur. We have collaborated with your Foundry Technology department. We have requirement of metallurgical testing at your end.

As department of Foundry technology has established a testing setup which is very useful for industrial purpose, we are requesting you to provide necessary support regarding the same. We are attaching a list of samples and details of test requirements along with this letter.

Thanking you,

Yours Sincerely, Subhadas

Director

Metasis Lab

• Details of work required-

| Sr. No. | Name of Company | Test Required | No. of samples |
|---------|------------------------|--|----------------|
| | | Micro Structural Analysis | 01 |
| 1 | Tulip Casting Pvt. Ltd | Rockwell Hardness | 01 |
| | | Mirco Hardness | 03 |
| 2 | Turno Grind | Micro Structural Analysis of Nodular Cast Iron | 01 |
| 2 | Turno Grina | Salt Spray Test | 02 |
| 3 | Bhakti Industries | Microstructural Analysis of Graphite in Cast Iron | 02 |
| 3 | Bliakti fildustries | C.P.C. | 01 |
| | | Microstructural Analysis of Graphite in Cast Iron | 01 |
| 4 | Bharat Auto Ind. | Volume Fraction of phases | 01 |
| | | Salt Spray Test | 01 |

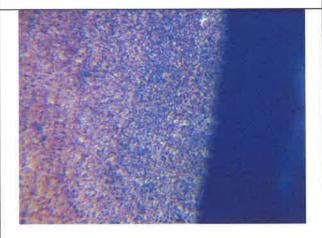


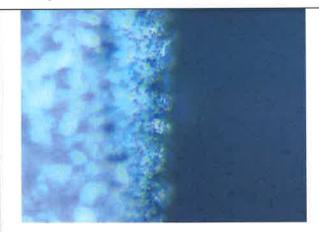


| | T | est Report- Micro Structui | al Analysis | | |
|--------------------------------------|--------------|----------------------------|---|---------------|-------|
| Lab ID- CS004 | | Test Certificate NoVCl | Test Certificate NoVCKFT202107 Date- 11/11/20 | | |
| a . | N | Metasis Lab Shiroli MIDC | | | |
| Customer Name Tulip Casting Pvt. Ltd | | | | | |
| Date of Sam | ple Received | Date of Test Completion | etion Sample Name | | е |
| 11/11 | /2021 | 11/11/2021 | T | elcon Pin-X-9 | 66 |
| Challan Date | Challan No. | Test Method | Heat Code | Qty. | Grade |
| 11/11/2021 | FT004 | ASTM-E-1245:2016 | | * | :#/ |
| | | ASTM-E-562:2011 | | | |
| | 1 | Test Details | | | |

Etchant- 4% Nital

Etching Condition- Immersion-Etching





| Coco | rogion | Total | Magni | fication | _100 Y |
|------|----------|----------|---------|----------|---------------|
| Case | 1 CZIOII | - i Utai | MIARIII | IICAUVII | -1007 |

Case Region-Total Magnification-500X

| Specimen Dimension- | Sample Cut Piece | | | | | |
|----------------------------|----------------------------|---|--------------|--|--|--|
| Type of Structure Observed | and less than 10% Retained | In case region, Tempered Martensite is observed some amount of Carbides and less than 10% Retained Austenite. Grain Boundary Oxidation was observed (Avg15 µm) in the structure. | | | | |
| Area Fraction-Case Region | Tempered Martensite (%) | Retained Austenite (%) | Carbides (%) | | | |
| | 92.95 | 5.20 | 1.85 | | | |

Tested By-

For VCK Foundry Technology

Authorized Siguatory

--End of Report-

B.Voc. & Community College Unit Vivekanand College, Kolhapur





| | | Test Report- Rockwell H | ardness | | | |
|---------------|--------------|------------------------------------|-------------|-------------|------------------|--|
| Lab ID- CS004 | | Test Certificate No VCKFT202108 | | | Date- 09/10/2022 | |
| Customer Name | | Metasis Lab Shiroli MIDC, Kolhapur | | | | |
| Custom | er Name | Tulip Casting Pvt. Ltd | | | | |
| Date of Sam | ple Received | Date of Test Completion | Sample Name | | | |
| 08/10 | 0/2021 | 09/10/2022 | | Plate | | |
| Challan Date | Challan No. | Test Method | Heat Code | Qty. | Grade | |
| 09/10/2022 | FT004 | ASTM-E-92 | - | :€: | EN8 | |
| | <u> </u> | Test Details | | | | |
| | | | | | | |
| | | | | | | |
| | | 22.5 - 23.4 | | | | |
| | | | | 1 | | |
| | | | | | | |
| | Tested By- | | For VCI | K Foundry T | echnology | |
| | [] | | For VCI | Josh | | |
| | Tested By- | | | Notal Of | <u>'</u> | |





| | | Test Repo | ort- Mirco Ha | rdness | | |
|---------------|------------------------------------|---------------|------------------------------------|---------------|-----------------|-------|
| Lab ID- CS004 | Test Certificate No VCKFT202109 Da | | | | ate- 09/10/2022 | |
| 0 -1 | NT | Metasis Lab | Metasis Lab Shiroli MIDC, Kolhapur | | | |
| Custom | er Name | Tulip Casting | g Pvt. Ltd | | | |
| Date of Sam | ple Received | Date of Tes | t Completion | S | ample Name | e |
| 08/10 | /2021 | 09/10 | 0/2022 | | Shaft | |
| Challan Date | Challan No | . Test I | Method | Heat Code | Qty. | Grade |
| 09/10/2022 | FT004 | ASTI | M-E-92 | - 1 | - | |
| | Ni . | | Test Details | 1 | - | |
| | | | Hardness | | | |
| | Sr. No | Thickness | Vickers | s Hardness HV | 1 Kg | |
| | S4355 | 6 mm | 280 - 282 | | | |
| | S4356 | 6 mm | | 278 - 280 | | |
| | | | | | | |

Tested By-

S4357

6 mm

For VCK Foundry Technology

241 - 243

Authorizett Sigifatoer B.Voc. & Community College Unit Vivekanand College, Kolhapur

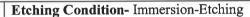


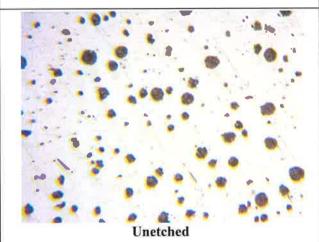


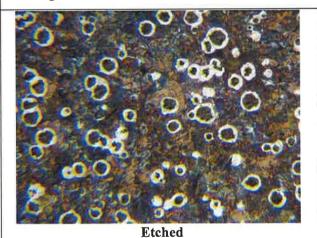
| | Test Repor | t- Micro Structural Analy | sis of Nodu | ılar Cast Iron | | |
|---------------|-------------|--|---------------------|------------------|----------------|--|
| Lab ID- CS005 | | Test Certificate NoVCKFT2110 Date- 19/11/2 | | | te- 19/11/2021 | |
| | | Metasis Lab Shiroli MIDC | | | | |
| Custome | r Name | Turno Grind | | | | |
| Date of Samp | le Received | Date of Test Completion | Sample Name | | | |
| 14/11/ | 2021 | 19/11/2021 | | AT-50 (18ID) Gea | r | |
| Challan Date | Challan No. | Test Method | Part No | Heat No | Grade | |
| 19/11/2021 | FT005 | ASTM-E-2567-16a | (200 1) | PE-122-11-A-19 | SG-500/7 | |
| | | ASTM-E-1245:2016 | | | | |

Test Results

Etchant- 4% Nital







Total Magnification-100X

| Specimen Dimension- | Sample Cut Piece | | | | | |
|------------------------------|-----------------------------------|--|-----------------|--|--|--|
| Observation (Unetched) | Regular spheroidal Graph | Regular spheroidal Graphite is present in the structure. | | | | |
| Observation (Etched) | Pearlitic matrix is observe | earlitic matrix is observed with following percentage of Ferrite and Pearlite. | | | | |
| Graphite Analysis | Graphite Analysis (Unetched Area) | | s (Etched Area) | | | |
| Frame Area (mm²) | 0.959 mm ² | Pearlite (%) | 84.20 | | | |
| Nodularity (%) | 94% | Ferrite (%) | 15.80 | | | |
| Nodule Count/mm ² | 145 | Carbide (%) | | | | |

Tested By-

For VCK Foundry Technology

-End of Report-------Vivekanand-Gollege, Kollnapur





| | | | Test Repor | rt- Salt Sp | ray Test | | | |
|---------------------------|---------|------------------|-----------------|-------------|-----------|----------------------|-----------|------|
| Lab ID- CS005 Test Certif | | | | ficate No | VCKFT2111 | Da | te- 19/11 | /202 |
| Customer Name | | Metasis Lab Shir | roli MIDC | | | | | |
| | | Turno Grind | | | | | | |
| Date | of Samp | le Received | Date of Test Co | mpletion | | Sample Name | | |
| | 14/11/ | 2021 | 19/11/20 | 21 | M 1 | 2 x 160 Stud, Zing (| Coating | |
| Challa | n Date | Challan No. | Test Metl | hod | Part No | Heat No | Quan | tity |
| 19/11 | /2021 | FT005 | ASTM-E-256 | | ** | PE-122-11-A-25 | 2 | |
| | | | ASTM-E-1245 | | | | | |
| | 1 | | | est Results | | | | |
| | | | Salt Spra | y Corrosi | on Test | | | |
| | Salt Sp | ray Solution- | 5 % NaCl | pН | | - 6.82 (6.5- 7.5) | | |
| | Temp | - 3 | 35 ° C | RH | | - 99 % | | |
| | Duratio | on - 1 | 100 Hrs. | Fog Coll | lection | - 1.63 ml / Hour | | |
| | | | | Result | | | | |
| | Upto 24 | 4 Hrs | | | No White | rust observed | | |
| | Upto 4 | 8 Hrs | | | No White | rust observed | | |
| | Upto 72 | 2 Hrs | | | No White | rust observed | | |
| | Upto 9 | 6 Hrs | | | No White | rust observed | | |
| | Upto 1 | 00 Hrs | | | No White | rust observed | | |

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------End of Report-----





| Test Report- Micro Structural Analysis | | | | | | | |
|--|-------------|---------------------------------------|----------------|------|----------------|--|--|
| Lab ID- CS006 Customer Name | | Test Certificate NoVCKFT2112 Date23/1 | | | Date23/11/2021 | | |
| | | Metasis Lab Shiroli MIDC | | | | | |
| | | Bhakti Industries | | | | | |
| Date of Sample Received | | Date of Test Completion | Sample Name | | | | |
| 22/11/ | 2021 | 23/11/2021 | 1 | | | | |
| Challan Date | Challan No. | Test Method | Heat No | Qty. | Grade | | |
| 23/11/2021 | FT006 | ASTM-E-1245:2016 | PE-122-11-A-25 | 2 | 45C8 | | |
| | | IS-4748:2009 | PE-122-11-A-26 | | | | |

Etchant- 4% Nital

Etching Condition- Immersion-Etching



| Total Magnification-100X | | | | | | |
|-----------------------------|---|--------------|------------------|--|--|--|
| Specimen Dimension- | Sample Cut Piece | | | | | |
| ASTM Grain Size No | 8.0-8.5 | | | | | |
| Type of Structure Observed- | Equiaxed-Ferrito-Pearlitic-structure is observed. | | | | | |
| | Decarburization is not observed in the sample. | | | | | |
| Area Fraction- | Ferrite (%) | Pearlite (%) | Other Phases (%) | | | |
| | 37.60 | 62.40 | Nil | | | |

Tested By-

For Atlanta Metallurgical Services

Nodal Officer

B. Voð uth Otized Signy College Unit

Vivekanand College, Kolhapur

-End of Report----- Vivekanand College, Kolhapui





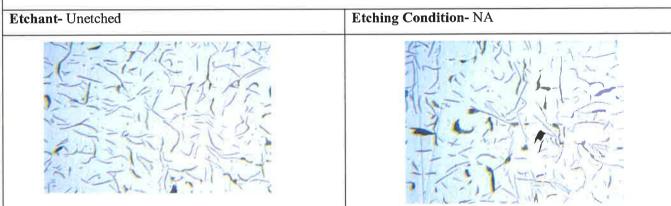
| | Test Certifica | 4 - BT | | | |
|---------------|-----------------------------------|--|---|------------------------------|---------------------|
| | | Test Certificate No VCKFT2113 | | Date 23/11/202 | |
| Customer Name | | oli M | IDC | | |
| Name | Bhakti Industries | | | | |
| Received | Date of Te | st | Ï | Sample Name | 2 |
| | Completio | n | | C.P.C. | |
| 21 | 23/11/202 | 1 | | | |
| Challan No. | Test Metho | od | Heat No | Qty. | Grade |
| FT006 | ASTM-E-1245: | 2016 | 0 | -5/I | 25 |
| | IS-4748:200 |)9 | | | |
| | Test I |)etai | s | | • |
| | Test I | Resu | ts | | |
| Carbon : | 97.2 % | B) | V. M. Content : | | 1.8 % |
| itent : | 1.0 % | | | | |
| By- | | | An | anta Metallur | gical Services |
| 3 | Challan No. FT006 Carbon: tent: | Completio 21 23/11/202 Challan No. Test Metho FT006 ASTM-E-1245: IS-4748:200 Test I Test I Carbon: 97.2 % tent: 1.0 % | Completion 21 23/11/2021 Challan No. Test Method FT006 ASTM-E-1245:2016 IS-4748:2009 Test Details Test Resul Carbon: 97.2 % B) | Completion 21 23/11/2021 | Completion C.P.C. |

-----End of Report-----





| | Test Repo | rt- Microstructural Analy | sis of Graphit | e in Cast Iron | | |
|--|-------------|---------------------------------|-------------------------------|--------------------|------------------------|--|
| Lab ID- CS009 Test Certificate NoVCK Metasis Lab Shiroli MIDC Bharat Auto Ind. | | Test Certificate NoVO | Test Certificate NoVCKFT14 | | Date- 29/11/202 | |
| | | Metasis Lab Shiroli MIDC | | | | |
| | | | | | | |
| Date of Samp | le Received | Date of Test Completion | f Test Completion Sample Name | | | |
| 26/11/ | 2021 | 29/11/2021 | Escort Bearing Cap | | p | |
| Challan Date | Challan No. | Test Method | Part No | Heat No | Grade | |
| 29/11/2021 | FT007 | IS-7754:2018 ASTM-E-562:2011 | | (20): | FG 260 | |



Total Magnification-100X

Predominantly Form I-Distribution A type of Graphite flakes are observed along with some amount of Form I-Distribution B type.

| Sample-1 | | ASTM | Class | | |
|----------------------------|-----------|-----------|-----------|-----------|-----------|
| Average | 3-5 | | | | |
| Graphite type distribution | Type A(%) | Type B(%) | Type C(%) | Type D(%) | Type E(%) |
| Average | 90 to 92 | 8 to 10 | /座 | = | 9 |

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For VCK Foundry Technology

B.Voc. & Community College Universal College, Kolhapur

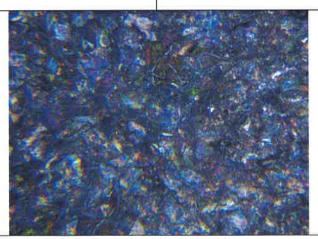




| | | Test Report- Volume Fr | action of ph | ases | |
|---------------|-------------|--------------------------------|--------------------------------|---------------|-------------------------|
| Lab ID- CS009 | | Test Certificate No VC | Test Certificate No VCKFT15 Da | | Date- 29/11/2021 |
| G . | N T | Metasis Lab Shiroli MIDC | | | |
| Customer Name | | Bharat Auto Ind. | | | |
| Date of Samp | le Received | Date of Test Completion | Sample Name | | |
| 26/11/2 | 2021 | 29/11/2021 | Escort Bearing Cap | | Сар |
| Challan Date | Challan No. | Test Method | Part No | Heat No | Grade |
| 29/11/2021 | FT007 | ASTM-E-1245:2016 | X 44 : | 348 .0 | FG 260 |

Etchant- 4% Nital

Etching Condition- Immersion-Etching



Total Magnification-100X

Pearlitic matrix is observed with following percentage of Ferrite and Pearlite.

Ternary Phosphorus Eutectic is observed in Pearlitic matrix with following percentages.

| Sample-1 | Frame Area(mm) | Pearlite (%) | Ferrite (%) | Steadite (%) |
|----------|----------------|--------------|-------------|--------------|
| Average | 0.936 | 98.60 | 1.40 | (SER) |

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For VCK Foundry Technology

-End of Report---

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Vivekanand College, Kolhapur





| | | Test Report- Salt Sp | ray Test | | |
|---------------|--------------|--------------------------|-----------------------------------|---|-----------------|
| Lab ID- CS009 | | Test Certificate No | Test Certificate No VCKFT16 | | ate- 29/11/2021 |
| | | Metasis Lab Shiroli MIDC | | | |
| Custome | r Name | Bharat Auto Ind. | | | |
| Date of Samp | ole Received | Date of Test Completion | on Sample Name | | , |
| 26/11/ | 2021 | 29/11/2021 | M 12 x 160 Impeller, Zing Coating | | ng Coating |
| Challan Date | Challan No. | Test Method | Part No Heat No Qua | | Quantity |
| 29/11/2021 | FT007 | ASTM-E-2567-16a | | * | 1 |
| | | ASTM-E-1245:2016 | | | |
| | .1 | Test Results | 711 | | |
| | | Salt Spray Corrosic | on Test | | |

| Salt Spray Corrosion Test | | | | | | |
|-------------------------------|---------------------------------|--|--|--|--|--|
| Salt Spray Solution- 5 % NaCl | pH - 6.82 (6.5- 7.5) | | | | | |
| Temp - 35 ° C | RH - 99 % | | | | | |
| Duration - 100 Hrs. | Fog Collection - 1.63 ml / Hour | | | | | |
| Result | | | | | | |
| Upto 24 Hrs | No White rust observed | | | | | |
| Upto 48 Hrs | No White rust observed | | | | | |
| Upto 72 Hrs | No White rust observed | | | | | |
| Upto 96 Hrs | No White rust observed | | | | | |
| Upto 100 Hrs | No White rust observed | | | | | |

Tested By

For VCK Foundry Technology

Authorized Signatory B.Voc. & Community College Unit Vivekanand College, Kolhapur

------End of Report-----

श्री स्वामी विवेकानंद शिक्षण संस्थेचे

विवेकानंद कॉलेज, कोल्हापूर (स्वायत्त)

२१३०, ई, ताराबाई पार्क, कोल्हापूर, ता. करवीर, जि. कोल्हापूर – ४१६ ००३ शिवाजी विद्यापीठ, कोल्हापूर संलग्नीत

> नॅक मानांकन : 'A' (सी.जी.पी.ए. ३.२४) कॉलेज उईथ पोटेन्शियल फॉर एक्सलन्स, यु.जी.सी., न्यु दिल्ली स्टार कॉलेज – डी.बी.टी. – भारत सरकार आय.एस.ओ. ९००१:२०१५

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Estd.: June 1964

(स्वायत्त) कोल्हापूर

Ph.: 0231-2658612, 2658840 Fax: 0231-2658840 Resi.: 0231-2653962 Website: www.vivekanandcollege.org E-mail: info@vivekanandcollege.org

अध्यक्ष मा. आमदार चंद्रकांत दादा पाटील

Я

कार्याध्यक्ष प्राचार्य अभयकुमार साळुंखे सचिव प्राचार्या सौ. शुभांगी गावडे

प्राचार्य विडे डॉ. अ

M.Sc., B.Ed.

दिनांक :

डॉ. आर. आर. कुंभार M.Sc. M.Phil. Ph.D.

जावक क्रमांक व्हि.सी.के. /

डॉ. बापूजी साळुंखे

संस्थापक

INVOICE DATE - 30.11.2021 INVOICE NO. 2202 The Metasis Lab DATE -T.C. No.- As per report Shiroli MIDC CH. NO: DATE -Kolhapur-416122 DATE -P.O.NO:-Qty in Nos. Rate Amount Description Sr. No. 2500 5 500 Microstructure Analysis 1 1500 3 500 Microhardness Test 2 500 500 Rockwell Hardness 1 3 3000 300 10 Salt Spray Test Hrs 4 300 300 CPC 1 5 1450 1450 Volume Fraction 1 6 9250.00 Total 832.50 CGST @ 9 % 832.50 SGST @ 9 % 10915 **Total Amount** GSTIN - 27APEPS8440R3ZX Amount In Words:- Ten Thousand Nine Hundred Fifteen Only For VCK Foundry Technology Pan No.-

Authorised Right Wollege Unit

Vivekanand College, Kolhapur

Nodal Officer



METASIS LAB

Chemical, Physical, Metallurgical Testing of Metals, Noise, Vibration, Surface Roughness, Salt Spray, PMI. Test, Lux Measurement

B-13, Opp. Kolhapur Axle Ltd., MIDC Shiroli, Kolhapur - 416122. **Cell: +9922437590, 7721995959,** Email: kolhapurmetasys@gmail.com, metasyslab@rediffmail.com, Website: www.metaltestinglab.net

Date: 02/12/2021

To,

The Nodal Officer

Department of Foundry Technology,

Vivekanand College, Kolhapur (Autonomous)

Subject: To provide collaborated testing and consultancy services.

Respected Authority,

We have metallurgical testing and consultancy setup in MIDC Shiroli, Kolhapur. We have collaborated with your Foundry Technology department. We have requirement of metallurgical testing at your end.

As department of Foundry technology has established a testing setup which is very useful for industrial purpose, we are requesting you to provide necessary support regarding the same. We are attaching a list of samples and details of test requirements along with this letter.

Thanking you,

Yours Sincerely

J. H. CO.LO.

Metasis Lab

• Details of work required-

| Sr. No. | Name of Company | Test Required | No. of samples |
|------------|--------------------------------|---|----------------|
| | | G.F.N. | 01 |
| 1 Top Gear | Top Gear Transmission. | Micro Structural Analysis of Nodular Cast Iron | 01 |
| | | Volume Fraction of phases | 01 |
| 0 | | Brinell Hardness | 02 |
| 2 | Bhakti Industries | Grain Size Measurement | |
| | | Mirco Hardness | 03 |
| 3 | Accura Tech Castings Pvt. Ltd. | Micro structural Analysis of Graphite in Cast Iron | 01 |

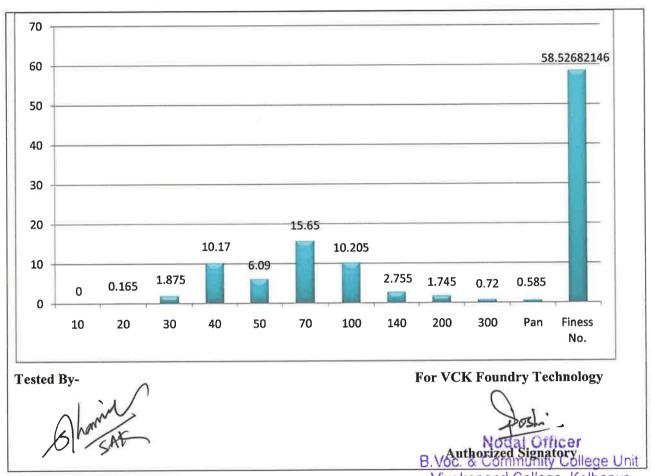




| | | Test Rep | ort- G.F | `.N. | | | |
|--|----------------|---------------------|-----------------------|----------|-----------------|------------------|--|
| Lab ID- CSC | 013 | Test Certifica | te NoV | CKFT2117 | D | Date- 04/12/2021 | |
| | | Metasis Lab Shiroli | MIDC | | | | |
| Customer Name Top Gear Transmission Date of Sample Received Date of Test Completion Sample Name | | Top Gear Transmi | Top Gear Transmission | | | | |
| | | 2 | | | | | |
| 02/ | 12/2021 | 04/12/2021 | Return Sand | | | | |
| Challan Da | te Challan No. | Test Method | Test Method Part No | | Heat No | Quantity | |
| 04/12/2021 | FT008 | ASTM-E-2567-16 | 5a | | = | - | |
| | | ASTM-E-1245:20 | 16 | | | | |
| | | Test | Results | | | | |
| | | Test | Results | | | | |
| A) Tota | Clay Content: | 11.3 % | B) | Active | Clay Content : | 7.8 % | |
| C) Dead | Clay Content : | 3.5 % | D) | Volati | le Matter Conto | ent: 3.6 % | |
| E) Loss | On Ignition : | 5.8 % | F) | Finess | e No. : | 58.53 | |







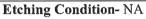
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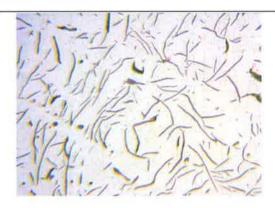


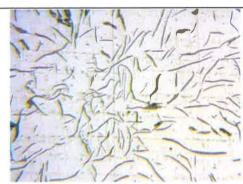


| | Test Repor | t- Microstructural Analysi | s of Graphite | in Cast Iron | |
|-------------------------------|-------------|---|---------------|--------------|------------------|
| Lab ID- CS0013 Customer Name | | Test Certificate No VCKFT2118 Date- 04/12/20 Metasis Lab Shiroli MIDC | | | Date- 04/12/2021 |
| | | | | | |
| | | Top Gear Transmission | | | |
| Date of Sample Received | | Date of Test Completion | Sample Name | | |
| 02/12/2 | 2021 | 04/12/2021 | Cover for Oil | | |
| Challan Date | Challan No. | Test Method | Part No | Heat No | Grade |
| 04/12/2021 | FT008 | IS-7754:2018 ASTM-E-562:2011 | 59/774 | 19A11C | ** |

Etchant- Unetched







Total Magnification-100X

Observation-Predominantly A types of Graphite flakes are observed with some B type are observed.

| Sample-1 | | | ASTM Class | | | | |
|--------------------------------------|--|-----|---|--|-----------|-----------|-----------|
| Average | | 2-5 | | | | | |
| Graphite type distribution Type A(%) | | | raphite type distribution Type A(%) Type B(%) | Type B(%) | Type C(%) | Type D(%) | Type E(%) |
| Average 92 to 94 | | # | :(**) | * | | | |
| | | | 2-5 Type A(%) Type B(%) Type C(%) | 2-5 Type A(%) Type B(%) Type C(%) Type D(%) | | | |

Tested By-

For VCK Foundry Technology

B.Voc. & Community College Un Vivekanand College, Kolhapur

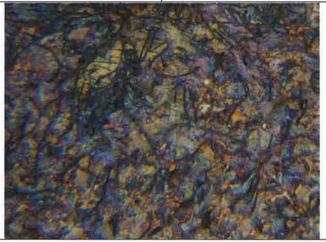




| | | Test Report- Volume Frac | tion of phases | | | | |
|----------------|--------------|-------------------------------------|---|---------------|-------|--|--|
| Lab ID- CS0013 | | Test Certificate No | Test Certificate No VCKFT2119 Date- 04/12/2 | | | | |
| | N.T. | Metasis Lab Shiroli MIDC | | | | | |
| Custome | er Name | Top Gear Transmission | | | | | |
| Date of Sam | ple Received | Date of Test Completion Sample Na | | Sample Name | | | |
| 02/12/2021 | | 04/12/2021 | (| Cover for Oil | | | |
| Challan Date | Challan No. | Test Method | Part No | Heat No | Grade | | |
| 04/12/2021 | FT008 | ASTM-E-1245:2016 ASTM-E-562:2011 | 59/774 | 19A11C | | | |

Etchant- 4% Nital

Etching Condition- Immersion-Etching



Total Magnification-100X

Observation- Pearlitic matrix is observed with following percentage of Ferrite and Pearlite.

| Sample-1 | Frame Area(mm) | Pearlite (%) | Ferrite (%) | Steadite (%) |
|----------|----------------|--------------|-------------|--------------|
| Average | 0.936 | 98.90 | 1.10 | 744 |

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For VCK Foundry Technology

--End of Report--

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Voc. & Community College Un
Vivekanand College, Kolhapur





| | | Test Report- Brinell Ha | ardness | | | |
|---------------|--------------|--------------------------|------------|------------------|-----------|--|
| Lab ID- CS006 | | Test Certificate NoVo | Da | Date- 10/12/2021 | | |
| | | Metasis Lab Shiroli MIDC | | | | |
| Custom | er Name | Bhakti Industries | | | | |
| Date of Sam | ple Received | Date of Test Completion | S | Sample Name | e | |
| 07/12 | 2/2021 | 10/12/2021 | 1 | Plate | | |
| Challan Date | Challan No. | Test Method Heat Code | | Qty. | Grade | |
| 10/12/2021 | FT009 | ASTM-E-92 | | | FG-200 | |
| | | Test Details | | | li . | |
| | | Hardness In BH | N | | | |
| | Part No | (250 Kg x | 5 mm Ball) | | | |
| | 11 E 376 | 196 | i - 198 | | | |
| | 3 M 27 | 187 | ' - 189 | | | |
| L | ested Ry- | | For VCI | C Foundry T | achnology | |

Tested By-

For VCK Foundry Technology

B.Voc. & Community College Unit Vivekanand College, Kolhapur

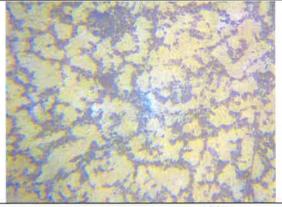




| | | T | est Re | eport- Grai | n Size Mea | surement | | | | |
|----------------------|-------------------------|-----|------------|-------------------------|-------------|----------|-----------------------|-----------|--------------|--|
| Lab ID- CS006 | | | Т | est Certifica | te No VCK | FT2121 | | Date- | - 10/12/2021 | |
| G . | | | Meta | sis Lab Shire | oli MIDC | | | | | |
| Custome | er Name | | Bhak | ti Industries | | | | | | |
| Date of Sam | Date of Sample Received | | | Date of Test Completion | | | n Sample Name | | | |
| 07/12/2021 | | | 10/12/2021 | | | 4 | 4X600-GTV Body-C-Side | | | |
| Challan Date | Challan N | lo. | | Test Met | hod | Heat No. | Heat L | ot No. | Grade | |
| 10/12/2021 | FT009 | | | ASTM-E-11 | 2:2013 | B-10923 | S-613 | | ASTM A216 | |
| | | | | | | | P-6 | 14 | WCC | |
| Qualifying Heat Nos. | B9948 | В | 9925 | B9917 | B9925,B9951 | B9916 | B9951 | B-9951 | B9925 | |
| Qualifying Part | 8X600-GTV | 122 | X300- | 00- 4X600-GTV 20X150- 2 | | | 20X150- | 12X300- | 12X300- | |
| | Body | P | lug | Body | Lower Cap | Body | Upper Cap | Upper Cap | Lower Cap | |

Etchant- 4% Nital

Etching Condition- Immersion-Etching



Total Magnification-100X

| Specimen Dimension- | Replica-B-Side |
|-----------------------------|---|
| Type of Grain Determined- | Equiaxed-Ferrito-Pearlitic-Type-A Grains, No Widmanstatten Ferrite. |
| Grain Size Analysis Method- | Manual Comparison Method |
| ASTM Grain Size No | 8.0-8.5 |

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For VCK Foundry Technology

Authorized Signatory

-End of Report--

B.Voc. & Community College Unit Vivekanand College, Kolhapur





| | | Test Repo | ort- Mirco Ha | rdness | | | | |
|---------------|--------------|-------------|---------------------------------|---------------|--------------|-------|--|--|
| Lab ID- CS001 | | Test Cer | Test Certificate NoVCKFT2122 Da | | | | | |
| | | Metasis Lab | Shiroli MIDC | | | | | |
| Custom | er Name | Accura Tech | Castings Pvt. L | td. | | | | |
| Date of Sam | ple Received | Date of Tes | t Completion | S | Sample Name | e | | |
| 15/12 | 2/2021 | 18/12 | 2/2021 | | R.A. Support | | | |
| Challan Date | Challan No | . Test I | Method | Heat Code | Qty. | Grade | | |
| 18/12/2021 | FT010 | ASTI | ASTM-E-92 | | | | | |
| | | !! | Test Details | | | | | |
| | | | Hardness | | | | | |
| | Sr. No | Thickness | Vickers | s Hardness HV | 1 Kg | | | |
| | Н 1722 | 5 mm | | 256 - 258 | | | | |
| | Н 1723 | 6 mm | | 265 - 267 | | | | |
| | Н 1724 | 6 mm | | 260 - 262 | | | | |

Tested By-

For VCK Foundry Technology

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-----End of Report------



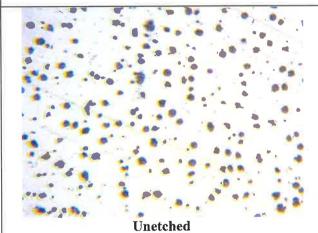


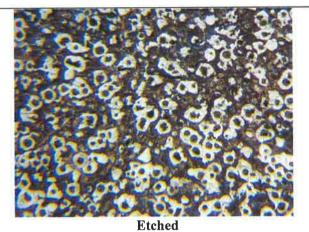
| | Test Repor | t- Micro Structural Analy | sis of Nodular C | ast Iron | |
|---------------|-------------|-----------------------------|---------------------------------|-------------|-------|
| Lab ID- CS001 | | Test Certificate No | VCKFT2123 Date- 18/12/20 | | |
| G . 1 | D.T. | Metasis Lab Shiroli MIDC | | | |
| Custome | r Name | Accura Tech Castings Pvt. I | _td. | | |
| Date of Samp | le Received | Date of Test Completion | Sample Name | | |
| 17/12/ | 2021 | 18/12/2021 | R | .A. Support | |
| Challan Date | Challan No. | Test Method | Part No | Heat No | Grade |
| 18/12/2021 | FT010 | ASTM-E-2567-16a | R 542513 | 264 | |
| | | ASTM-E-562:2011 | | | |
| | | ASTM-E-1245:2016 | | | |
| | | Toet Results | | | |

Test Results

Etchant- 4% Nital

Etching Condition- Immersion-Etching





Total Magnification-100X

| Commis Cut Dises | | | | | | | |
|--------------------------|---|---|--|---|--|--|--|
| Sample Cut Piece | Sample Cut Piece | | | | | | |
| Regular spheroidal Gra | phite is present in the | structure. | | | | | |
| Pearlitic matrix is obse | rved with following pe | rcentage o | of Ferrite and Pearlite | ·. | | | |
| s (Unetched Area) | Pl | iase Anal | ysis (Etched Area) | | | | |
| 0.959 mm ² | Pearlite (%) | 61.30 | Cementite (%) | | | | |
| 96% | Ferrite (%) | 38.70 | Ledeburite (%) | - | | | |
| 236 | | | • | *** | | | |
| | Regular spheroidal Gra Pearlitic matrix is obse s (Unetched Area) 0.959 mm² 96% | Regular spheroidal Graphite is present in the served with following personal served with served with following personal served with | Regular spheroidal Graphite is present in the structure. Pearlitic matrix is observed with following percentage of section (Unetched Area) Phase Analogous Phase Analogous Phase Analogous Pearlite (%) 96% Ferrite (%) 38.70 | Regular spheroidal Graphite is present in the structure. Pearlitic matrix is observed with following percentage of Ferrite and Pearlite (Unetched Area) Phase Analysis (Etched Area) 0.959 mm² Pearlite (%) 61.30 Cementite (%) 96% Ferrite (%) 38.70 Ledeburite (%) | | | |

Tested By-

For VCK Foundry Technology

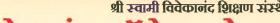
Authorized Signatory

B. Voc. & Community College Unit

Vivekanand College, Kolhapur

-End of Report--

Jr. College U.Dise No. 27341301006





विवेकानद कॉलेज,

२१३०, ई, ताराबाई पार्क, कोल्हापूर, ता. करवीर, जि. कोल्हापूर - ४१६ ००३ शिवाजी विद्यापीठ, कोल्हापूर संलग्नीत

नॅक मानांकन : 'A' (सी.जी.पी.ए. ३.२४) कॉलेज उईथ पोटेन्शियल फॉर एक्सलन्स, यु.जी.सी., न्यु दिल्ली स्टार कॉलेज - डी.बी.टी. - भारत सरकार आय.एस.ओ. ९००१:२०१५



(स्वायत्त) कोल्हापूर

Ph.: 0231-2658612, 2658840 Fax: 0231-2658840 Resi.: 0231-2653962 Website: www.vivekanandcollege.org E-mail: info@vivekanandcollege.org

मा. आमदार चंद्रकांत दादा पाटील

कार्याध्यक्ष

प्राचार्य अभयकुमार साळुंखे

सचिव

प्राचार्या सौ. शुभांगी गावडे M.Sc., B.Ed.

डॉ. आर. आर. कुंभार M.Sc. M.Phil. Ph.D.

जावक क्रमांक व्हि.सी.के. /

संस्थापक

डॉ. बापूजी साळुंखे

दिनांक :

| asis Lab | INVOICE NO. | INVOICE NO. 2203 | | |
|---------------------------------|---|---|---------|--|
| IIDC | T.C. No As per | report | DATE - | |
| -416122 | CH. NO: | | DATE - | |
| | P.O.NO:- | | DATE - | |
| Description | Qty in Nos. | Rate | Amount | |
| Microstructure Analysis | 2 | 500 | 1000 | |
| Microhardness Test | 3 | 500 | 1500 | |
| Brinell Hardness (BHN) | 2 | 500 | 1000 | |
| Grain Size Measurement | 1 | 500 | 500 | |
| Volume Fraction | 1 | 1450 | 1450 | |
| GFN | 1 | 300 | 300 | |
| | Total | | 5750.00 | |
| | CGST @ 9 % | | 517.50 | |
| | SGST @ 9 % | | 517.50 | |
| | Total Amount | Total Amount | | |
| In Words:- Six Thousand Seven F | lundred Eighty Five Only | | | |
| Fo | or VCK Foundry Technolo | gy | | |
| . A | uthorised Signature | . 2 | | |
| | Description Microstructure Analysis Microhardness Test Brinell Hardness (BHN) Grain Size Measurement Volume Fraction GFN In Words:- Six Thousand Seven F | -416122 CH. NO: P.O.NO:- P.O.NO:- Description Microstructure Analysis Microhardness Test Brinell Hardness (BHN) Grain Size Measurement Volume Fraction GFN Total CGST @ 9 % SGST @ 9 % Total Amount In Words:- Six Thousand Seven Hundred Eighty Five Only For VCK Foundry Technology Authorised Signature B VAuthorised Signature B VAuthorised Signature | CH. NO: | |



METASIS LAB

Chemical, Physical, Metallurgical Testing of Metals, Noise, Vibration, Surface Roughness, Salt Spray, PMI. Test, Lux Measurement

B-13, Opp. Kolhapur Axle Ltd., MIDC Shiroli, Kolhapur - 416122. **Cell: +9922437590, 7721995959,** Email: kolhapurmetasys@gmail.com, metasyslab@rediffmail.com, Website: www.metaltestinglab.net

Date: 04/01/2022

To,

The Nodal Officer

Department of Foundry Technology,

Vivekanand College, Kolhapur (Autonomous),

Subject: To provide collaborated testing and consultancy services.

Respected Authority,

We have metallurgical testing and consultancy setup in MIDC Shiroli, Kolhapur. We have collaborated with your Foundry Technology department. We have requirement of metallurgical testing at your end.

As department of Foundry technology has established a testing setup which is very useful for industrial purpose, we are requesting you to provide necessary support regarding the same. We are attaching a list of samples and details of test requirements along with this letter.

Thanking you,

Yours Sincerely, WSSubhadas

Director

Metasis Lab

• Details of work required-

| Sr. No. | Name of Company | Test Required | No. of samples |
|---------|--------------------------|---|----------------|
| 1 | Ask Casting | Mirco Hardness | 15 |
| | | Micro Structural Analysis of Nodular Cast Iron | 01 |
| 2 | Impel Founders Pvt. Ltd. | Inclusion Rating of Steel | 03 |
| 3 | Dev Metalliks | Inclusion Rating of Steel | 02 |





| Test Report- Mirco Hardness | | | | | | | |
|-----------------------------|--------------|---|-----------|--|-------|--|--|
| Lab ID- CS014 | | Test Certificate NoVCKFT2124 Date- 08/01/2022 Metasis Lab Shiroli MIDC, Kolhapur | | | | | |
| Custome | or Nama | | | | | | |
| Custom | ei ivaine | Ask Casting | | | | | |
| Date of Sam | ple Received | Date of Test Completion | S | Sample Name | 2 | | |
| 04/01 | /2022 | 15/01/2022 | | Plate | | | |
| Challan Date | Challan No. | Test Method | Heat Code | Qty. | Grade | | |
| 08/01/2022 | FT011 | ASTM-E-92 | 27 | 15 | | | |
| | | Test Details | | The state of the s | | | |

| Hardness | | | | | |
|----------|-----------|--------------------------|--|--|--|
| Plate No | Thickness | Vickers Hardness HV 1 Kg | | | |
| P 4259 | 5 mm | 256 - 258 | | | |
| PA 5451 | 6 mm | 265 - 267 | | | |
| PA 5455 | 6 mm | 260 - 262 | | | |
| PB 5455 | 6 mm | 244 - 246 | | | |
| PA 5456 | 6 mm | 251 - 253 | | | |
| PB 5456 | 6 mm | 276 - 278 | | | |
| PA 5457 | 6 mm | 280 - 282 | | | |
| PB 5457 | 6 mm | 278 - 280 | | | |
| PB 5458 | 6 mm | 241 - 243 | | | |
| PA 5458 | 6 mm | 257 - 259 | | | |
| PA 5459 | 6 mm | 266 - 268 | | | |
| PA 5460 | 6 mm | 270 - 272 | | | |





| PA 5603 | 6 mm | 278 - 280 |
|---------|------|-----------|
| PB 5604 | 6 mm | 272 - 274 |
| P 6223 | 4 mm | 260 - 262 |

Tested By-

For VCK Foundry Technology

Nodai Orncer B. Wutherized Signator College Unit

-End of Report-



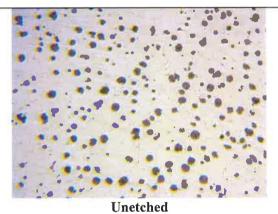


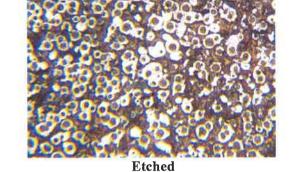
| | Test Repor | t- Micro Structural Analys | sis of Nodular C | ast Iron | | |
|---------------|---|--|------------------|----------|-------|--|
| Lab ID- CS014 | Test Certificate No VCKFT2124 Date- 08/01/2 | | | | | |
| G . t | N.T. | Metasis Lab Shiroli MIDC, Kolhapur | | | | |
| Custome | r Name | Ask Casting | | | | |
| Date of Samp | ole Received | Date of Test Completion | Sample Name | | | |
| 04/01/ | 2022 | 08/01/2022 | R.A. Support | | | |
| Challan Date | Challan No. | Test Method | Part No Heat No | | Grade | |
| 08/01/2022 | FT011 | ASTM-E-2567-16a ASTM-E-562:2011 ASTM-E-1245:2016 | R 542513 256 - | | (##) | |
| | | Tost Posults | | | | |

Test Results

Etchant- 4% Nital

Etching Condition- Immersion-Etching





Total Magnification-100X

| 1 0 to 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | | | | | | | | |
|--|---|--|----------------------------------|--|--|--|--|--|
| Specimen Dimension- | Sample Cut Piece | Sample Cut Piece | | | | | | |
| Observation (Unetched) | Regular spheroidal Gra | Regular spheroidal Graphite is present in the structure. | | | | | | |
| Observation (Etched) | vation (Etched) Pearlitic matrix is observed with following percentage of Ferrite and Pearlite. | | | | | | | |
| Graphite Analys | is (Unetched Area) | PI | Phase Analysis (Etched Area) | | | | | |
| Frame Area (mm²) | 0.959 mm ² | Pearlite (%) | Pearlite (%) 54.40 Cementite (%) | | | | | |
| Nodularity (%) | 94% | Ferrite (%) 45.60 Ledeburite (%) - | | | | | | |
| Nodule Count/mm ² | 262 | | | | | | | |

Tested By-

For VCK Foundry Technology

Nodal Officer

Authorized Signatory

B. Voc. & Community College Uni

-End of Report-

Vivekanand College, Kolhapur





| | | Te | est Repor | t- Inclus | ion Rat | ing of Steel | | | |
|-----------------|--------------|-----------|--|-----------|-----------|--------------|--------------|-------------|----------|
| Lab ID- CS024 | | | Test Certificate NoVCKFT2126 Date- 18/01 | | | | - 18/01/2022 | | |
| | | Me | Metasis Lab Shiroli MIDC | | | | | | |
| Custom | er Name | Im | Impel Founders Pvt. Ltd. | | | | | | |
| Date of Sam | ple Received | | ate of Te | st Compl | etion | | Sample | Name | |
| 12/01/2022 | | | 18/0 | 01/2022 | | ShifterF | inger-GB60 | -Smith & F | ounders |
| | | | | | | (Inv. | No557, D | ate-12/01/2 | 019) |
| Challan Date | Challan No. | . | Test | Method | | Batch Code | e Qt | у. | Grade |
| 18/01/2022 | FT012 | | IS-4163:2 | 004-Re2 | 2017 | | 3 | | 16Mn5Cr4 |
| | | | | Test D | etails | | | | |
| Etchant- N. A. | | | | | Etching | g Condition- | N. A. | | |
| | | · · · · · | | | | | | | |
| | | | | al Magnif | ication-1 | .00X | | | |
| Specimen Dime | | nple Cu | | | | | | | |
| Inclusion Ratin | <u> </u> | А Ту | | | Туре | | Гуре | | Туре |
| | Т | Γhin | Thick | Thin | Thick | Thin | Thick | Thin | Thick |
| | | 0.0 | 0.0 | 0.5 | 0.5 | 0.5 | 0.0 | 1.0 | 1.0 |
| | Tested By- | ^ | | | | 1,51 | For VCK F | oundry Te | chnology |

Authorized Signatory

B. Voc. & Community College Unit

Vivekanand College, Kolhapur -----End of Report--



Etchant- N. A.



| | | Test Report- Inclusion Ra | ting of Steel | | | |
|---------------|--------------|---------------------------|--|---------------|----------|--|
| Lab ID- CS018 | | Test Certificate NoVC | Test Certificate NoVCKFT2127 Date- 22/01/202 | | | |
| C | N | Metasis Lab Shiroli MIDC | | | | |
| Custom | er Name | Dev Metalliks | | | | |
| Date of Sam | ple Received | Date of Test Completion | n Sample Name | | | |
| 20/01 | /2022 | 22/01/2022 | Rocker Ar | m-LH-Smith & | Founders | |
| | | | (Inv. No. | 654, Date-12/ | 01/2019) | |
| Challan Date | Challan No. | Test Method | Batch Code Qty. Grad | | | |
| 22/01/2022 | FT013 | IS-4163:2004-Re2017 | - 2 45C8 | | | |
| | | Test Details | | | | |

Test Details

Etching Condition- N. A.

| D. | |
|----|--|
| | |
| | |

Total Magnification-100X

| Specimen Dimension- | Sample Cu | ıt Piece | | | | | | |
|---------------------|-----------|----------|------|-------|--------|-------|--------|-------|
| Inclusion Rating | A Ty | уре | В | Гуре | С Туре | | D Type | |
| | Thin | Thick | Thin | Thick | Thin | Thick | Thin | Thick |
| | 0.0 | 0.0 | 0.5 | 1.0 | 0.5 | 0.5 | 1.0 | 1.0 |

Tested By-

For VCK Foundry Technology

Authorized Signatory

-End of Report-

Wilekanand College, Kolhapul

श्री स्वामी विवेकानंद्र शिक्षण संस्थेचे



Jr. College U.Dise No. 27341301006

विवेकानंद कॉलेज, कोल्हापूर (स्वायत्त)

२१३०, ई, ताराबाई पार्क, कोल्हापूर, ता. करवीर, जि. कोल्हापूर - ४१६ ००३ शिवाजी विद्यापीठ, कोल्हापूर संलम्नीत

नॅक मानांकन : 'A' (सी.जी.पी.ए. ३.२४) कॉलेज उईथ पोटेन्शियल फॉर एक्सलन्स, यु.जी.सी., न्यु दिल्ली स्टार कॉलेज – डी.बी.टी. – भारत सरकार आय.एस.ओ. ९००१:२०१५



Estd.: June 1964

(स्वायत्त) कोल्हापूर

Ph.: 0231-2658612, 2658840 Fax: 0231-2658840 Resi.: 0231-2653962 Website: www.vivekanandcollege.org E-mail: info@vivekanandcollege.org

215-1101

मा. आमदार चंद्रकांत दादा पाटील

कार्याध्यक्ष

प्राचार्य अभयकुमार साळुंखे M.A. सचिव

प्राचार्या सौ. शुभांगी गावडे M.Sc., B.Ed. प्राचार्य

डॉ. आर. आर. कुंभार M.Sc. M.Phil. Ph.D.

जावक क्रमांक व्हि.सी.के. /

संस्थापक

डॉ. बापूजी साळुंखे

दिनांक ः

| INVOICE | | | | | | |
|-----------|---------------------------------|-----------------------|------------------|-------------------|--|--|
| The Met | asis Lab | INVOICE NO. | 2204 | DATE - 29.01.2022 | | |
| Shiroli M | IIDC | T.C. No As per | r report | DATE - | | |
| Kolhapur | -416122 | CH. NO: | | DATE - | | |
| | | P.O.NO:- | | DATE - | | |
| Sr. No. | Description | Qty in Nos. | Rate | Amount | | |
| 1 | Microstructure Analysis | 1 | 500 | 500 | | |
| 2 | Microhardness Test | 15 | 500 | 7500 | | |
| 3 | Inclusion Rating of Steel | 5 | 500 | 2500 | | |
| | | Total | - | 10500.00 | | |
| | | CGST @ 9 % | | 945.00 | | |
| | | SGST @ 9 % | | 945.00 | | |
| GSTIN - | <u> </u> | Total Amount | Total Amount | | | |
| Amount | In Words:- Twelve Thousand Thre | e Hundred Ninety Only | | | | |
| Pan No | BA∖v | thorised Signature | on Have | | | |
| | Vi | vekanand College, Kol | ge Unit hapur | | | |



METASIS LAB

Chemical, Physical, Metallurgical Testing of Metals, Noise, Vibration, Surface Roughness, Salt Spray, PMI. Test, Lux Measurement

B-13, Opp. Kolhapur Axle Ltd., MIDC Shiroli, Kolhapur - 416122. **Cell: +9922437590, 7721995959,** Email: kolhapurmetasys@gmail.com, metasyslab@rediffmail.com, Website: www.metaltestinglab.net

Date: 04/03/2022

To,

The Nodal Officer

Department of Foundry Technology,

Vivekanand College, Kolhapur (Autonomous)

Subject: To provide collaborated testing and consultancy services.

Respected Authority,

We have metallurgical testing and consultancy setup in MIDC Shiroli, Kolhapur. We have collaborated with your Foundry Technology department. We have requirement of metallurgical testing at your end.

As department of Foundry technology has established a testing setup which is very useful for industrial purpose, we are requesting you to provide necessary support regarding the same. We are attaching a list of samples and details of test requirements along with this letter.

Thanking you,

Yours Sincerely,

Director

Metasis Lab

• Details of work required-

| Sr. No. | Name of Company | Test Required | No. of samples |
|---------|-----------------------|--|----------------|
| 1 | Top Gear Transmission | Micro Structural Analysis | 05 |
| 2 | India Engineers | Micro Structural Analysis | 02 |
| | | Microstructural Analysis of Graphite in Cast Iron | 01 |
| 3 | Dev Metalliks | Volume Fraction of phases | 01 |
| | | Salt Spray Test | 01 |



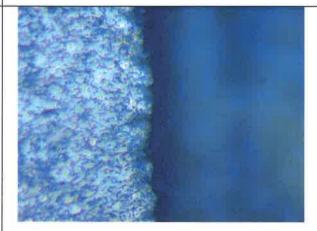


| | Т | est Report- Micro Structur | ral Analysis | | |
|---------------|--------------|---|----------------------|--|----|
| Lab ID- CS013 | | Test Certificate NoVCKFT2128 Date- 10/03/2022 Metasis Lab Shiroli MIDC | | | |
| C 4 | N | | | | |
| Customer Name | | Top Gear Transmission | mission | | |
| Date of Sam | ple Received | Date of Test Completion | n Sample Name | | |
| 08/03 | /2022 | 10/03/2022 | Telcon Pin-T-102 | | 02 |
| Challan Date | Challan No. | Test Method | Heat Code Qty. Grade | | |
| 10/03/2022 | FT014 | ASTM-E-1245:2016 ASTM-E-562:2011 | 5 | | = |
| | | T A D A H | | | |

Etchant- 4% Nital

Etching Condition- Immersion-Etching





| Case region-Total Magnification-100X |
|--------------------------------------|
|--------------------------------------|

Case Region-Total Magnification-500X

| Specimen Dimension- | Sample Cut Piece | | | | |
|----------------------------|---|--|--|--|--|
| Type of Structure Observed | In case region, Tempered Martensite is observed some amount of Carbides and less than 10% Retained Austenite. | | | | |
| | Grain Boundary Oxidation was observed (Avg20 µm) in the structure. | | | | |
| Area Fraction-Case Region | Tempered Martensite (%) Retained Austenite (%) Carbides (%) | | | | |
| | 90.60 7.10 2.30 | | | | |

Tested By-

For VCK Foundry Technology

-End of Report---

Vivekanand College, Kolhapur

B. Voc. & Community Co

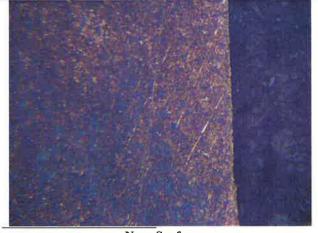




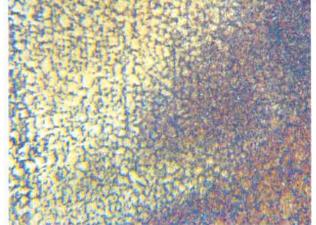
| | T | est Report- Micro Structi | ural Analysis | | | |
|---------------|-------------|---------------------------|--------------------------|------|-------------------|--|
| Lab ID- CS011 | = | Test Certificate NoV | CKFT2129 | I | Date- 10/03/2022 | |
| | | Metasis Lab Shiroli MIDC | | | | |
| Customer | Name | India Engineers | | | | |
| Date of Sampl | le Received | Date of Test Completion | Sample Name | | | |
| 08/03/2 | .022 | 10/03/2022 | Shaft B-C-Range-R-138533 | | 138533 | |
| Challan Date | Challan No. | Test Method | Batch Code Qty. Grade | | | |
| 10/03/2022 | FT015 | ASTM-E-1245:2016 | A1 U-19 | 3007 | i anna | |
| | | ASTM-E-562:2011 | | | | |

Etchant- 4% Nital

Etching Condition- Immersion-Etching







From 1.5mm to 2.5mm

| Total Magnification-100X | | | | | | |
|-----------------------------|---|--|--|--|--|--|
| Specimen Dimension- | Sample Cut Section | | | | | |
| Type of Structure Observed- | Fine Tempered Martensite is observed near surface with 1.25 % Retained Austenite. | | | | | |
| (Case Region) | Carbides are not observed in the structure. Decarburization was not observed. | | | | | |
| 5% ITP Depth- | Intermediate Transformation Product is observed near surface at 2.20mm (around 5%). | | | | | |

Tested By-

For VCK Foundry Technology

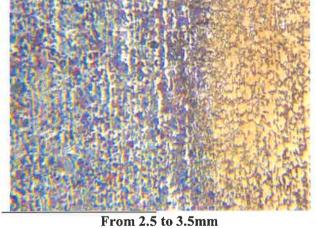
Authorized Signatory

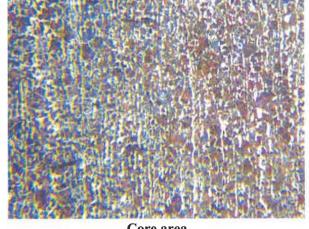
Continued on next page-





| 100 | ४३१ ४ क्रांट्यातॅऽ | 2 | Le | YUN | TECHN | DLOGY | |
|------------------|------------------------------|-------------------------|----------|--------------------------|----------------|-----------------|--|
| | Te | est Report- Micro | Structur | ral Analysis | | | |
| Lab ID- CS011 | | Test Certifica | te No V | CKFT2130 | Da | ite- 10/03/2022 | |
| | | Metasis Lab Shiro | oli MIDC | | | | |
| Custome | r Name | India Engineers | | | | | |
| Date of Samp | ole Received | Date of Test Completion | | S | Sample Name | | |
| 08/03/2022 | | 10/03/2022 | | Shaft B-C-Range-R-138533 | | | |
| Challan Date | Challan No. | Test Metho | od | Batch Code | Qty. | Grade | |
| 10/03/2022 | FT015 | ASTM-E-1245 | :2016 | A1 U-19 | | | |
| | | ASTM-E-562: | 2011 | | | | |
| | | Test I | Details | | | | |
| Etchant- 4% Nita | 1 | | Etching | Condition- Imme | ersion-Etching | 3 | |
| | | | | | | | |





Core area

| Total Magnification-100X | | Total Magnification-100X | |
|---|---|--------------------------|--|
| Specimen Dimension- | Sample Cut Section | | |
| 50% Martensitic Depth | 50% Martensitic area is observed at 2.80mm. | | |
| Type of Structure Observed- | Core region shows Banded-Ferrito-Pearlitic structure. | | |
| (Core Region) Ferrite-36.20 % & Pearlite-63.80 %. | | a & Pearlite-63.80 %. | |

Tested By-

For VCK Foundry Technology

Authorized Signatory C. & Community Co -------End of Report-------Vivekanand College, Kolhapur





| | Test Repo | rt- Microstructural Analys | sis of Graphit | e in Cast Iron | |
|-------------------------|---|---------------------------------|--------------------|----------------|------------------|
| Lab ID- CS018 | Date-Cab ID- CS018 Test Certificate NoVCKFT2131 Date- | | | | Date- 22/03/2022 |
| G . | | Metasis Lab Shiroli MIDC | | | |
| Customer Name Dev Met | | Dev Metalliks | | | |
| Date of Sample Received | | Date of Test Completion | Sample Name | | |
| 16/03/2 | 2022 | 22/03/2022 | Escort Bearing Cap | | |
| Challan Date | Challan No. | Test Method | Part No | Heat No | Grade |
| 22/03/2022 | FT016 | IS-7754:2018 ASTM-E-562:2011 | • | 5 | FG 260 |

Etchant- Unetched

Etching Condition- NA

Total Magnification-100X

Predominantly Form I-Distribution A type of Graphite flakes are observed along with some amount of Form I-Distribution B type.

| Sample-1 | ASTM Class | | | | |
|--------------------------------------|------------|-----------|-----------|-----------|-----------|
| Average | 3-5 | | | | |
| Graphite type distribution Type A(%) | | Type B(%) | Type C(%) | Type D(%) | Type E(%) |
| Average | 90 to 92 | 8 to 10 | | () Ex | |

Tested By-

For VCK Foundry Technology

B.Voc. & Community College Universal College, Kolhapur

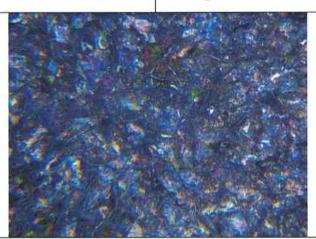




| Test Report- Volume Fraction of phases | | | | | | |
|--|-------------|--------------------------|--------------------|---------|------------------|--|
| Lab ID- CS018 | | Test Certificate No VC | KFT2132 | | Date- 22/03/2022 | |
| G . | B.T. | Metasis Lab Shiroli MIDC | | | | |
| Custome | r Name | Dev Metalliks | | | | |
| Date of Samp | le Received | Date of Test Completion | Sample Name | | e | |
| 16/03/ | 2022 | 22/03/2022 | Escort Bearing Cap | | | |
| Challan Date | Challan No. | Test Method | Part No | Heat No | Grade | |
| 22/03/2022 | FT016 | ASTM-E-1245;2016 | 88 | | FG 260 | |

Etchant- 4% Nital

Etching Condition- Immersion-Etching



Total Magnification-100X

Pearlitic matrix is observed with following percentage of Ferrite and Pearlite.

Ternary Phosphorus Eutectic is observed in Pearlitic matrix with following percentages.

| Sample-1 | Frame Area(mm) | Pearlite (%) | Ferrite (%) | Steadite (%) |
|----------|----------------|--------------|-------------|--------------|
| Average | 0.936 | 98.60 | 1.40 | 240 |

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--End of Report----

B VoAuthorized Signatory egg L.





| | | Test Report- Salt Sp | ray Test | | | |
|---------------|--|-------------------------------------|-----------------------------------|-------|-----------------|--|
| Lab ID- CS018 | Test Certificate No VCKFT2133 Date- 22/03. | | | | ate- 22/03/2022 | |
| | | Metasis Lab Shiroli MIDC | C | | | |
| Custome | r Name | Dev Metalliks | | | | |
| Date of Samp | ole Received | Date of Test Completion | Sample Name | | | |
| 16/03/ | 2022 | 22/03/2022 | M 12 x 160 Impeller, Zing Coating | | | |
| Challan Date | Challan No. | Test Method | Part No Heat No Quantity | | | |
| 22/03/2022 | FT016 | ASTM-E-2567-16a ASTM-E-1245:2016 | neuro I | san . | 2 | |
| | I. | Test Results | | | | |

| Salt Spray Corrosion Test | | | | | | |
|-------------------------------|---------------------------------|--|--|--|--|--|
| Salt Spray Solution- 5 % NaCl | pH - 6.82 (6.5- 7.5) | | | | | |
| Temp - 35 ° C | RH - 99 % | | | | | |
| Duration - 100 Hrs. | Fog Collection - 1.63 ml / Hour | | | | | |
| Result | | | | | | |
| Upto 24 Hrs | No White rust observed | | | | | |
| Upto 48 Hrs | No White rust observed | | | | | |
| Upto 72 Hrs | No White rust observed | | | | | |
| Upto 96 Hrs | No White rust observed | | | | | |
| Upto 100 Hrs | No White rust observed | | | | | |
| Upto 150 Hrs | No White rust observed | | | | | |

Tested By-

For VCK Foundry Technology

Authorized Signatory

B Yes. & Common the College Uni-Whields and College Polhage

श्री स्वामी विवेकानंद शिक्षण संस्थेचे

विवेकानंद कॉलेज, कोल्हापूर (स्वायत्त

२९३०, ई, ताराबाई पार्क, कोल्हापूर, ता. करवीर, जि. कोल्हापूर – ४१६ ००३ शिवाजी विद्यापीठ, कोल्हापूर संलग्नीत

> नॅक मानांकन : 'A' (सी.जी.पी.ए. ३.२४) कॉलेज उईथ पोटेन्शियल फॉर एक्सलन्स, यु.जी.सी., न्यु दिल्ली स्टार कॉलेज – डी.बी.टी. – भारत सरकार आय.एस.ओ ९००१:२०१५



Estd.: June 1964

(स्वायत्त) कोल्हापूर

Jr. College U.Dise No. 27341301006

Ph.: 0231-2658612, 2658840 Fax: 0231-2658840 Resi.: 0231-2653962 Website: www.vivekanandcollege.org E-mail: info@vivekanandcollege.org

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मा. आमदार चंद्रकांत दादा पाटील

कार्याध्यक्ष

प्राचार्य अभयकुमार साळुंखे M.A. सचिव

प्राचार्या सौ. शुभांगी गावडे M.Sc., B.Ed. प्राचार्य

डॉ. आर. आर. कुंभार M.Sc. M.Phil. Ph.D.

जावक क्रमांक व्हि.सी.के. /

संस्थापक

डॉ. बापूजी साळुंखे

दिनांक :

| INVOICE | | | | | | |
|-----------------------------------|----------------------------------|------------------------|--------|-------------------|--|--|
| The Met | asis Lab | INVOICE NO. | 2205 | DATE - 29.03.2022 | | |
| Shiroli MIDC | | T.C. No As per | report | DATE - | | |
| Kolhapur-416122 | | CH. NO: | | DATE - | | |
| | | P.O.NO:- | | DATE - | | |
| Sr. No. | Description | Qty in Nos. | Rate | Amount | | |
| 1 | Microstructure Analysis | 8 | 500 | 4000 | | |
| 2 | Volume Fraction | 1 | 1450 | 1450 | | |
| 3 | Salt Spray Test Hrs | 250 | 10 | 2500 | | |
| | | Total | | 7950.00 | | |
| | | CGST @ 9 % | | 715.50 | | |
| | | SGST @ 9 % | | 715.50 | | |
| | | | | | | |
| GSTIN - | | Total Amount | | 9381 | | |
| Amount | In Words:- Nine Thousand Three I | Hundred Eighty One Onl | у | • | | |
| Pan No For VCK Foundry Technology | | | | | | |
| | | Joshi. | | | | |
| | Au | thorised Signature cer | | | | |

Vivekanand College, Kolhapur