Dear Sir,

Please submit your quotations on rate per unit weight basis for the following job:-

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Description of job</th>
<th>Total Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Melting and fabrication of Ni-Superalloysas per specification attached in Annexure 1)</td>
<td>80 Kg</td>
</tr>
</tbody>
</table>

Notes & Terms:

1. The rates shall include charges for delivery of the materials to our stores.

2. Taxes if extra etc. to be quoted.

   i) Since the goods to be supplied are meant for the purpose of R & D use under the Department of Atomic Energy, Concessional Rate of GST @5% against exemption certificate will be applicable.

   ii) Central Excise Duty: Since the goods to be supplied are meant for the purpose of Research Institution under the Department of Atomic Energy, no excise duty is payable for the goods covered here. The excise duty exemption certificate will be issued to you, if necessary, well before the delivery date. It will, however, be your responsibility to ensure that the goods are dispatched after getting the excise duty exemption certificate from us.

   (iii) Income Tax: Income tax at the rate of 2% on the bill amount and TDS GST @2% will be deducted from your bill.

3. Delivery Terms: You shall make necessary arrangement for delivery of the materials at no extra cost to us.

4. Payment Terms: 100% Payment after the work is completed and on submission of advance stamped receipt, invoice bill and satisfactory completion certificate from user.

5. The quotation should be enclosed in an envelope and sealed. The reference number and 'The quotation not to be opened' should be written clearly on the top of the sealed envelope. The quotation should be send to the address given below through EMS SPEED-POST only. Quotation received after the due date and time will not be considered.
6. The PAN no and the GST registration no of the company should be clearly mentioned in your offer. The name of the authorized signatory person should be clearly mentioned below his signature.

Thanking you,

Yours sincerely,

(Dr. J. B. Singh)
Indenting Officer
For and on behalf of president of India

Mechanical Metallurgy Division
Bhabha Atomic Research Centre
Mod. Labs., Trombay
MUMBAI – 400085
INDIA
ANNEXURE-1

Specifications for the Melting and fabrication of Ni superalloys

<table>
<thead>
<tr>
<th>Alloy</th>
<th>Chemical Composition (in wt%)</th>
<th>Density (g/cm³)</th>
<th>Quantity* (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ni</td>
<td>Cr</td>
<td>Mo</td>
</tr>
<tr>
<td>BH1</td>
<td>Bal.</td>
<td>23</td>
<td>16</td>
</tr>
<tr>
<td>BH2</td>
<td>Bal.</td>
<td>22</td>
<td>9</td>
</tr>
<tr>
<td>BH3</td>
<td>Bal.</td>
<td>7</td>
<td>15</td>
</tr>
<tr>
<td>BH4</td>
<td>Bal.</td>
<td>29</td>
<td>-</td>
</tr>
<tr>
<td>BH5</td>
<td>Bal.</td>
<td>17</td>
<td>13</td>
</tr>
</tbody>
</table>

Melting and fabrication of Ni-superalloys of following compositions:

* Quantity refers to the weight of the final finished product.

- Alloys should be melted using elemental charge made of commercially pure metals employing a double melting route involving vacuum induction melting (VIM) followed by vacuum arc re-melting (VAR) and the composition must be controlled within very close limits.
- Solidified ingots should be forged to break the cast structure.
- Forged billets should be converted into cylindrical billets of about 60 mm diameter.
- Half of the forged billets (of BH4 and BH5 alloys) should be hot rolled to produce plates of about 10 mm thickness.
- The finished alloys should have compositions as per the above table.
- Impurity levels must be maintained as: C (~ 0.03), N (< 80 ppm) and S, P (< 0.015). Any other impurity should not exceed the ppm level.
- The finished product should be supplied along with following test certificates and reports:
  i. Chemical Analysis of finished products
  ii. Hardness and Tensile test data and their reports
  iii. Radiography tests to ascertain that final products are free from cracks, seams, laps, shrinkage and other deleterious discontinuities
  iv. Detailed reports of the raw material used, melting cycle, ingot forging details, soaking treatment and intermediate heat-treatment details during forging as rolling, post processing heat treatment and methods of cooling.
Government of India  
Bhabha Atomic Research Centre  
Mechanical Metallurgy Division  

Ref: BARC/MMD/SMS/FAB/19/  
Date: 03.10.2019  
Due Date: 25.10.2019  
Time: 04.00 PM

To,  
Manager (Marketing)  
Mishra Dhatu Nigam Limited  
PO – Kanchanbagh,  
HYDERABAD – 500058  
TELANGANA, INDIA

Dear Sir,

Please submit your quotations on rate per unit weight basis for the following job:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Description of job</th>
<th>Total Qty.</th>
</tr>
</thead>
<tbody>
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Notes & Terms:

1. The rates shall include charges for delivery of the materials to our stores.

2. Taxes if extra etc. to be quoted.

   i) Since the goods to be supplied are meant for the purpose of R & D use under the Department of Atomic Energy, Concessional Rate of GST @5% against exemption certificate will be applicable.

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   (iii) Income Tax: Income tax at the rate of 2 % on the bill amount and TDS GST @2% will be deducted from your bill.

3. Delivery Terms: You shall make necessary arrangement for delivery of the materials at no extra cost to us.
4. Payment Terms: 100 % Payment after the work is completed and on submission of advance stamped receipt, invoice bill and satisfactory completion certificate from user.

5. The quotation should be enclosed in an envelope and sealed. The reference number and 'The quotation not to be opened' should be written clearly on the top of the sealed envelope. The quotation should be send to the address given below through EMS SPEED-POST only. Quotation received after the due date and time will not be considered.

6. The PAN no and the GST registration no of the company should be clearly mentioned in your offer. The name of the authorized signatory person should be clearly mentioned below his signature.

Thanking you,

Yours sincerely,

(Dr. J. B. Singh)
Indenting Officer
For and on behalf of president of India

Mechanical Metallurgy Division
Bhabha Atomic Research Centre
Mod. Labs., Trombay
MUMBAI – 400085
INDIA
ANNEXURE-1

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<th>Chemical Composition (in wt%)</th>
<th>Density (g/cm³)</th>
<th>Quantity* (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BH1</td>
<td>Ni Bal., Cr 23, Mo 16, Fe 3, Ti - , W 1.6 Cu</td>
<td>8.69</td>
<td>10</td>
</tr>
<tr>
<td>BH2</td>
<td>Ni Bal., Cr 22, Mo 9, Fe 18, Ti - , W 0.5</td>
<td>8.51</td>
<td>10</td>
</tr>
<tr>
<td>BH3</td>
<td>Ni Bal., Cr 7, Mo 15, Fe 2, Ti - , W -</td>
<td>8.97</td>
<td>10</td>
</tr>
<tr>
<td>BH4</td>
<td>Ni Bal., Cr 29, Mo - , Fe 2, Ti 0.6, W 3 Al, Nb</td>
<td>8.05</td>
<td>20</td>
</tr>
<tr>
<td>BH5</td>
<td>Ni Bal., Cr 17, Mo 13, Fe - , Ti 1.5, W 6</td>
<td>9.07</td>
<td>30</td>
</tr>
</tbody>
</table>

Melting and fabrication of Ni-superalloys of following compositions:

*Quantity refers to the weight of the final finished product.*

- Alloys should be melted using elemental charge made of commercially pure metals employing a double melting route involving vacuum induction melting (VIM) followed by vacuum arc re-melting (VAR) and the composition must be controlled within very close limits.
- Solidified ingots should be forged to break the cast structure.
- Forged billets should be converted into cylindrical billets of about 60 mm diameter.
- Half of the forged billets (of BH4 and BH5 alloys) should be hot rolled to produce plates of about 10 mm thickness.
- The finished alloys should have compositions as per the above table.
- Impurity levels must be maintained as: C (~ 0.03), N (< 80 ppm) and S, P (< 0.015). Any other impurity should not exceed the ppm level.
- The finished product should be supplied along with following test certificates and reports:
  - v. Chemical Analysis of finished products
  - vi. Hardness and Tensile test data and their reports
  - vii. Radiography tests to ascertain that final products are free from cracks, seams, laps, shrinkage and other deleterious discontinuities
  - viii. Detailed reports of the raw material used, melting cycle, ingot forging details, soaking treatment and intermediate heat-treatment details during forging as rolling, post processing heat treatment and methods of cooling.
Quotation was received from the Foundry and Forge Division, Hindustan Aeronautics Ltd., Bangalore for the melting and fabrication of Ni-Ti-Fe shape memory alloy cylindrical billets (wt. 50 Kg) and the draft PO is placed for your kind approval. As the job is proprietary in nature and a bit urgent the AO (works section) is requested to kindly pre-audit the file at the earliest.

(Bikas C. Maji)

Indenting Officer

Forwarded:

(Dr. Madangopal Krishnan)

Associate Director,
Materials Group
B.A.R.C.

To
AO (Works)
CC, BARC
Glass & Advanced Materials Divisions

WORK ORDER

Ref: BARC/GAMD/FAB/BCM/2018/1/947    Date: 29.11.2018

To
The Deputy General Manager (Marketing)
Foundry and Forge Division
Hindustan Aeronautics Ltd.
Post Bag No. 1791
BANGALORE – 560017, INDIA

Sub : Melting and fabrication of Ni-Ti-Fe shape memory alloy cylindrical forged billets


Dear Sir,

With reference to the above subject and as per your quotation referred above, it is hereby accepted your offer for and on behalf of the President of India and the work order is being issued to you for carrying out the job as detailed below subject to terms and conditions given below:

<table>
<thead>
<tr>
<th>S. N.</th>
<th>Description of work</th>
<th>Qty.</th>
<th>Total cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Melting and fabrication of Ni-Ti-Fe shape memory alloy cylindrical forged billets as per specifications given in annexure - 1</td>
<td>50 Kg</td>
<td>Rs. 6, 75, 000 (@ Rs.13, 500/kg)</td>
</tr>
</tbody>
</table>

Person/location to be contacted: Sub-total = Rs. 6, 75, 000.00
**Terms & Conditions:**

1. **Time for completion of the work:** Within 60 days from the date of receiving the Work order.
   (a) Any delay, which is attributable to your side, is liable for penalty @0.5% per week (max. 5%).
   (b) In case any extension in delivery is required, you need to give a written request before expiry of work order justifying the reason.

2. **Delivery of goods to our stores.**

3. **Taxes**
   i) Since the goods to be supplied are meant for the purpose of R & D use under the Department of Atomic Energy, Concessional Rate of GST @5% against exemption certificate will be applicable. An undertaking (as per Annexure-II) in this regard should be submitted mentioning that the GST has been promptly deposited with the authorities.
   
   ii) Income Tax: Income tax at the rate of 2% on the bill amount and TDS GST @2% will be deducted from your bill.

4. **Entry Permit:** Prior mutually suitable date has to be fixed with the user Dr. Bikas C. Maji and the names and designations of the people coming for delivering the item have to be given in writing to the user to reach at least two days in advance for arranging their entry permit into BARC.

5. **Payment:** 100% payment will be released after satisfactory completion of work and your submission of the Invoice bill, advance stamped receipt for the total amount, satisfactory work completion certificate from the user to the undersigned. Payment will be made through ECS/RTGS only. You need to fill up the payment option form (attached with this work order) with pre-stamped receipt at the time of submitting your bill and invoice. Please mention the **PAN No and GST registration No** in your invoice bills and also furnish a copy of PAN no and GST no.
   You will not be eligible to claim any interest on account of delay in receiving any payment.

6. **Materials & Insurance:** Since all materials have to be provided by the party, no free issue materials will be issued. Hence, no insurance is involved.

7. **Warranty:** The items should be warranted for materials quality and workmanship for a period of at least 12 months from the date of supply.

8. **Confidentiality:** Please take note of the confidentiality clause attached.

---

[Table]

<table>
<thead>
<tr>
<th>Dr. Bikas C. Maji</th>
<th>GST(@5%)</th>
<th>Rs. 33,750.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>R.N.: 2-327S, D-Block, Modular lab, BARC, Ph.No.-2559 2932/2559 2443 (O)</td>
<td>Total =</td>
<td>Rs. 7,08,750.00</td>
</tr>
</tbody>
</table>

Yours sincerely,
I. **Confidentiality:-**

No party shall disclose any information to any third party concerning the matters under this contract generally. In particular, any information identified as “Proprietary” in nature by the disclosing party shall be kept strictly confidential by the receiving party and shall not be disclosed to any third party without the prior written consent of the original disclosing party.

This clause shall apply to the sub-contractors, consultants, advisers or the employees engaged by a party with equal force.

II. **“Restricted in formation” categories under section 18 of the Atomic Energy Act, 1962 and “Official Secrets” under section 5 of the Official Secrets Act, 1923:-**

Any Contravention of the above-mentioned provisions by any contractor will invite penal consequences under the aforesaid legislation.

III. **Prohibition against use of BARC’s name without permission for publicity purposes:-**

The contractor or sub-contractor, consultant, adviser or the employees engaged by the contractor shall not use BARC’s name for any publicity purpose through any public media like Press, Radio, T.V. or Internet without the prior written approval of BARC.

(Bikas C. Maji)
Indenting Officer
For and on behalf of president of India.

Approved by:

(Dr. Madangopal Krishnan)
Sub: Extension of delivery period for the outstanding quantity of Ni-Ti-Fe shape memory alloy cylindrical forged billets


M/s Foundry and Forge Division, Hindustan Aeronautics Ltd., Bangalore had requested for extending the delivery period till 31-03-2019 for the supply of the outstanding 40 Kg Ni-Ti-Fe shape memory alloy cylindrical forged billets citing delay in processing of material. The delay in delivery of this material is not going to affect the progress of our project. It should be noted that F & F, HAL has already made a partial supply of 10 Kg Ni-Ti-Fe shape memory alloy cylindrical forged billets in finished form. Thus, it is requested that the delivery period of this minor fabrication work may be extended till 31-03-2019.

(Bikas C. Maji)
Indenting Officer

Approved,

(Dr. Madangopal Krishnan)
Associate Director,
Materials Group
B.A.R.C.
To,
The Deputy General Manager (Marketing)
Foundry and Forge Division
Hindustan Aeronautics Ltd.
Post Bag No. 1791, BANGALORE – 560017
INDIA

CC: AO (Works), BARC

29th March, 2019

Sub: Extension of delivery period for the outstanding quantity of Ni-Ti-Fe shape memory alloy cylindrical forged billets


M/s Foundry and Forge Division, Hindustan Aeronautics Ltd., Bangalore had requested for further extending the delivery period till 10-04-2019 for the supply of the outstanding 20 Kg Ni-Ti-Fe shape memory alloy cylindrical forged billets due to delay in material processing. The delay in delivery of this material is not going to affect the progress of our project as 30 Kg of material has already been supplied.

Thus, it is requested that the delivery period of this minor fabrication work may kindly be extended till 10-04-2019.

(Bikas C. Maji)
Indenting Officer

Approved,

(Dr. Madangopal Krishnan)
Associate Director,
Materials Group
B.A.R.C.
To,
The Deputy General Manager (Marketing)
Foundry and Forge Division
Hindustan Aeronautics Ltd.
Post Bag No. 1791, BANGALORE – 560017
INDIA

CC: AO (Works), BARC

Government of India
Bhabha Atomic Research Centre
Glass & Advanced Materials Division
30th April, 2019

Job Completion Certificate

This to certify that M/s Foundry and Forge Division, Hindustan Aeronautics Ltd., Bangalore has successfully completed the melting and fabrication of Ni-Ti-Fe shape memory alloy cylindrical forged billets as per specifications mentioned in our work order no BARC/GAMD/FAB/BCM/2018/1/947 dated 29.11.2018. The quality of the products supplied by them is satisfactory. It may also be noted that no free issue material (FIM) was issued to the party for this job.

(Bikas C. Maji)
Indenting Officer

Approved,

Dr. Madangopal Krishnan
Associate Director
Materials Group, BARC
Ref: BARC/GAMD/BCM/2019/ 16th May, 2019

Ref: Payment for the melting and fabrication of Ni-Ti-Fe shape memory alloy cylindrical forged billets

This is in connection with the melting and fabrication of Ni-Ti-Fe shape memory alloy cylindrical forged billets as per specifications attached in our work order no BARC/GAMD/FAB/BCM/2018/1/947 dated 29.11.2018 fabricated by M/s Foundry and Forge Division, Hindustan Aeronautics Ltd., Bangalore. They have successfully completed the fabrication job and the items supplied by them meet specifications mentioned in our work order. The quality of the products supplied by them is also satisfactory. Therefore, the payment for this minor fabrication job may be released from the funds available against head of account 5401 00 201 20 03 28, CC No 512028. It may also be noted that no photo pass was issued to the party during this fabrication work.

(Bikas C. Maji)
Indenting Officer

(Dr. R.N. Singh)
Sub-project Coordinator

Approved,

Dr. Madangopal Krishnan
Associate Director
Materials Group, BARC
To
The Account Officer,
Works Section, BARC.