

## Annexure-PQR

<b>Indent No:</b>	<b>20221098</b>
<b>Material Code</b>	<b>W95311202033, W95310501304, W95310514309, <del>W95311273469</del></b>
<b>Material Grade/Specification</b>	<b>NiCr20TiAl / HW19391 REV 04</b>

**Pre-Qualification requirement HW19391:**

1. Vendor must have experience of manufacturing and supplying forgings of NiCr20TiAl or international equivalent / other precipitation hardened Nickel based alloys like Alloy 105, Alloy 115 etc. in precipitation hardened condition. Vendor must have manufactured and supplied at least 3 ring forgings in above material grade in last seven years as on date of issue of enquiry. Forging supplied in precipitation hardened condition only will be considered as experience.

In support of above, the vendor has to furnish details of 3 ring supplies in the following format.

Ring Forging	Material Grade	Dimension (in mm)			Name of Customer /Date of Supply
		Outer Diameter	Inner Diameter	Height	

In support of above vendor to submit following document like:

- Test certificates of at least one of the above forgings. Test certificates shall cover chemical composition, heat treatment, mechanical properties, dimensional report, non-destructive test report etc.
2. (a) Vendor must have in-house forging and heat treatment facility to manufacture ring forging of above grade of enquiry drawing dimension. Details of in-house manufacturing facilities for forging and heat treatment are to be submitted with offer.  
**Outsourcing of forging and heat treatment is not acceptable.**  
(b) Vendor to submit details of in house melting and refining facility as per the requirement clause 5.0 of enquiry specification HW19391 Rev 04. At least one test certificate of forging of above material with raw material made in house to be submitted  
**In case in-house melting and refining facility not available,** vendor to provide details of their raw material source with following details:
    - Details of melting and refining facility as per the requirement of clause 5.0 of enquiry specification
    - At least one test certificate of forging of material grade NiCr20TiAl or equivalent/higher grade with raw material of their raw material supplier
  3. Vendor to confirm that it has adequate testing facilities to carry out tests as per enquiry specification and drawings. In case of outsourcing of test, vendor to agree for testing at lab accredited by Government or any other national / international accreditation agency only.
  4. Vendor to confirm supply shall be as per BHEL enquiry drawing and enquiry specification.

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Indent No:	20221098
Material Code	W95310514317
Material Grade/Specification	NiCr20TiAl / HW19391, REV 04

**Pre-Qualification requirement:**

1. Vendor must have experience of manufacturing and supplying forgings of NiCr20TiAl or international equivalent/ other precipitation hardened Nickel based alloys like Alloy 105, Alloy 115 etc. in precipitation hardened condition. Vendor must have manufactured and supplied at least 3 ring forgings as per above; out of these 3 ring forgings at least one should be of inner diameter  $\geq 500$  mm in above material grade in last seven years as on date of issue of enquiry. Forging supplied in precipitation hardened condition only will be considered as experience.

In support of above, the vendor has to furnish details of 3 ring supplies in the following format.

Ring Forging	Material Grade:	Dimension (in mm)			Name of Customer /Date of Supply
		Outer Diameter	Inner Diameter	Height	

In support of above vendor to submit following document like:

- Test certificates of at least one of the ring with inner diameter  $\geq 500$  mm. Test certificates shall cover chemical composition, heat treatment, mechanical properties, dimensional report, non-destructive test report etc.
2. (a) Vendor must have in-house forging and heat treatment facility to manufacture ring forging of above grade of enquiry drawing dimension. Details of in-house manufacturing facilities for forging and heat treatment are to be submitted with offer.  
**Outsourcing of forging and heat treatment is not acceptable.**  
 (b) Vendor to submit details of in house melting and refining facility as per the requirement clause 5.0 of enquiry specification HW19391 Rev 04. At least one test certificate of forging of above material with raw material made in house to be submitted  
**In case in-house melting and refining facility not available,** vendor to provide details of their raw material source with following details:
    - Details of melting and refining facility as per the requirement of clause 5.0 of enquiry specification
    - At least one test certificate of forging of material grade NiCr20TiAl or equivalent/higher grade with raw material of their raw material supplier
  3. Vendor to confirm that it has adequate testing facilities to carry out tests as per enquiry specification and drawings. In case of outsourcing of test, vendor to agree for testing at lab accredited by Government or any other national / international accreditation agency only.
  4. Vendor to confirm supply shall be as per BHEL enquiry drawing and enquiry specification.



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<b>Indent No:</b>	<b>20221817</b>
<b>Material Code</b>	<b>W95310501223, <del>W95310000050, W95310000008</del></b>
<b>Material Grade/Specification</b>	<b>NiCr20TiAl / HW19391, REV 04</b>

**Pre-Qualification requirement:**

- Vendor must have experience of manufacturing and supplying forgings of NiCr20TiAl or international equivalent/ other precipitation hardened Nickel based alloys like Alloy 105, Alloy 115 etc. in precipitation hardened condition. Vendor must have manufactured and supplied at least 3 ring forgings as per above; out of these 3 ring forgings at least one should be of inner diameter  $\geq 1500$  mm in above material grade in last seven years as on date of issue of enquiry. Forging supplied in precipitation hardened condition only will be considered as experience.

In support of above, the vendor has to furnish details of 3 ring supplies in the following format.

Ring Forging	Material Grade:	Dimension (in mm)			Name of Customer /Date of Supply
		Outer Diameter	Inner Diameter	Height	

In support of above vendor to submit following documents like:

- Test certificates of at least one of the ring with inner diameter  $\geq 1500$  mm. Test certificates shall cover chemical composition, heat treatment, mechanical properties, dimensional report, non-destructive test report etc.
- Vendor must have in-house forging and heat treatment facility to manufacture ring forging of above grade of enquiry drawing dimension. Details of in-house manufacturing facilities for forging and heat treatment are to be submitted with offer.  
**Outsourcing of forging and heat treatment is not acceptable.**
    - Vendor to submit details of in house melting and refining facility as per the requirement clause 5.0 of enquiry specification HW19391 Rev 04. At least one test certificate of forging of above material with raw material made in house to be submitted  
**In case in-house melting and refining facility not available,** vendor to provide details of their raw material source with following details:
      - Details of melting and refining facility as per the requirement of clause 5.0 of enquiry specification
      - At least one test certificate of forging of material grade NiCr20TiAl or equivalent/higher grade with raw material of their raw material supplier
  - Vendor to confirm that it has adequate testing facilities to carry out tests as per enquiry specification and drawings. In case of outsourcing of test, vendor to agree for testing at lab accredited by Government or any other national / international accreditation agency only.
  - Vendor to confirm supply shall be as per BHEL enquiry drawing and enquiry specification.

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<b>Indent No:</b>	<b>20221923</b>
<b>Material Code</b>	W95311223251, W95311202033, W95310514163, W95311202076, W95310501304, W95310606033, W95310606041, W95310514309, W95310525017, W95311223189, W95310530029, W95311202211
<b>Material Grade/Specification</b>	NiCr20TiAl / HW19391 REV 04 W95311202076 . W95310514139 . W95310514112

**Pre-Qualification requirement HW19391:**

1. Vendor must have experience of manufacturing and supplying forgings of NiCr20TiAl or international equivalent / other precipitation hardened Nickel based alloys like Alloy 105, Alloy 115 etc. in precipitation hardened condition. Vendor must have manufactured and supplied at least 3 ring forgings in above material grade in last seven years as on date of issue of enquiry. Forging supplied in precipitation hardened condition only will be considered as experience.

In support of above, the vendor has to furnish details of 3 ring supplies in the following format.

Ring Forging	Material Grade	Dimension (in mm)			Name of Customer /Date of Supply
		Outer Diameter	Inner Diameter	Height	

In support of above vendor to submit following document like:

- Test certificates of at least one of the above forgings. Test certificates shall cover chemical composition, heat treatment, mechanical properties, dimensional report, non-destructive test report etc.
2. (a) Vendor must have in-house forging and heat treatment facility to manufacture ring forging of above grade of enquiry drawing dimension. Details of in-house manufacturing facilities for forging and heat treatment are to be submitted with offer.  
**Outsourcing of forging and heat treatment is not acceptable.**  
(b) Vendor to submit details of in house melting and refining facility as per the requirement clause 5.0 of enquiry specification HW19391 Rev 04. At least one test certificate of forging of above material with raw material made in house to be submitted  
**In case in-house melting and refining facility not available,** vendor to provide details of their raw material source with following details:
    - Details of melting and refining facility as per the requirement of clause 5.0 of enquiry specification
    - At least one test certificate of forging of material grade NiCr20TiAl or equivalent/higher grade with raw material of their raw material supplier
  3. Vendor to confirm that it has adequate testing facilities to carry out tests as per enquiry specification and drawings. In case of outsourcing of test, vendor to agree for testing at lab accredited by Government or any other national / international accreditation agency only.
  4. Vendor to confirm supply shall be as per BHEL enquiry drawing and enquiry specification.

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<b>Indent No:</b>	<b>20221923</b>
<b>Material Code</b>	<del>W95310501223</del> , <b>W95310606050, W95310606068</b>
<b>Material Grade/Specification</b>	NiCr20TiAl / HW19391, REV 04

**Pre-Qualification requirement:**

1. Vendor must have experience of manufacturing and supplying forgings of NiCr20TiAl or international equivalent/ other precipitation hardened Nickel based alloys like Alloy 105, Alloy 115 etc. in precipitation hardened condition. Vendor must have manufactured and supplied at least 3 ring forgings as per above; out of these 3 ring forgings at least one should be of inner diameter  $\geq 1500$  mm in above material grade in last seven years as on date of issue of enquiry. Forging supplied in precipitation hardened condition only will be considered as experience.

In support of above, the vendor has to furnish details of 3 ring supplies in the following format.

Ring Forging	Material Grade:	Dimension (in mm)			Name of Customer /Date of Supply
		Outer Diameter	Inner Diameter	Height	

In support of above vendor to submit following documents like:

- Test certificates of at least one of the ring with inner diameter  $\geq 1500$  mm. Test certificates shall cover chemical composition, heat treatment, mechanical properties, dimensional report, non-destructive test report etc.
2. (a) Vendor must have in-house forging and heat treatment facility to manufacture ring forging of above grade of enquiry drawing dimension. Details of in-house manufacturing facilities for forging and heat treatment are to be submitted with offer.  
**Outsourcing of forging and heat treatment is not acceptable.**  
 (b) Vendor to submit details of in house melting and refining facility as per the requirement clause 5.0 of enquiry specification HW19391 Rev 04. At least one test certificate of forging of above material with raw material made in house to be submitted  
**In case in-house melting and refining facility not available,** vendor to provide details of their raw material source with following details:
    - Details of melting and refining facility as per the requirement of clause 5.0 of enquiry specification
    - At least one test certificate of forging of material grade NiCr20TiAl or equivalent/higher grade with raw material of their raw material supplier
  3. Vendor to confirm that it has adequate testing facilities to carry out tests as per enquiry specification and drawings. In case of outsourcing of test, vendor to agree for testing at lab accredited by Government or any other national / international accreditation agency only.
  4. Vendor to confirm supply shall be as per BHEL enquiry drawing and enquiry specification.



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<b>Indent No:</b>	<b>20221991</b>
<b>Material Code</b>	<b>W95311223251, W95310514309, W95311239018</b>
<b>Material Grade/Specification</b>	<b>NiCr20TiAl / HW19391 REV 04</b>

### **Pre-Qualification requirement HW19391:**

1. Vendor must have experience of manufacturing and supplying forgings of NiCr20TiAl or international equivalent / other precipitation hardened Nickel based alloys like Alloy 105, Alloy 115 etc. in precipitation hardened condition. Vendor must have manufactured and supplied at least 3 ring forgings in above material grade in last seven years as on date of issue of enquiry. Forging supplied in precipitation hardened condition only will be considered as experience.

In support of above, the vendor has to furnish details of 3 ring supplies in the following format.

Ring Forging	Material Grade	Dimension (in mm)			Name of Customer /Date of Supply
		Outer Diameter	Inner Diameter	Height	

In support of above vendor to submit following document like:

- Test certificates of at least one of the above forgings. Test certificates shall cover chemical composition, heat treatment, mechanical properties, dimensional report, non-destructive test report etc.
2. (a) Vendor must have in-house forging and heat treatment facility to manufacture ring forging of above grade of enquiry drawing dimension. Details of in-house manufacturing facilities for forging and heat treatment are to be submitted with offer.  
**Outsourcing of forging and heat treatment is not acceptable.**  
(b) Vendor to submit details of in house melting and refining facility as per the requirement clause 5.0 of enquiry specification HW19391 Rev 04. At least one test certificate of forging of above material with raw material made in house to be submitted  
**In case in-house melting and refining facility not available,** vendor to provide details of their raw material source with following details:
    - Details of melting and refining facility as per the requirement of clause 5.0 of enquiry specification
    - At least one test certificate of forging of material grade NiCr20TiAl or equivalent/higher grade with raw material of their raw material supplier
  3. Vendor to confirm that it has adequate testing facilities to carry out tests as per enquiry specification and drawings. In case of outsourcing of test, vendor to agree for testing at lab accredited by Government or any other national / international accreditation agency only.
  4. Vendor to confirm supply shall be as per BHEL enquiry drawing and enquiry specification.

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Indent No:	<b>20221991</b>
Material Code	W95310514317, W95311202262, W95311322136
Material Grade/Specification	NiCr20TiAl / HW19391, Rev 04

### **Pre-Qualification requirement:**

1. Vendor must have experience of manufacturing and supplying forgings of NiCr20TiAl or international equivalent/ other precipitation hardened Nickel based alloys like Alloy 105, Alloy 115 etc. in precipitation hardened condition. Vendor must have manufactured and supplied at least 3 ring forgings as per above; out of these 3 ring forgings at least one should be of inner diameter  $\geq 500$  mm in above material grade in last seven years as on date of issue of enquiry. Forging supplied in precipitation hardened condition only will be considered as experience.

In support of above, the vendor has to furnish details of 3 ring supplies in the following format.

Ring Forging	Material Grade:	Dimension (in mm)			Name of Customer /Date of Supply
		Outer Diameter	Inner Diameter	Height	

In support of above vendor to submit following document like:

- Test certificates of at least one of the ring with inner diameter  $\geq 500$  mm. Test certificates shall cover chemical composition, heat treatment, mechanical properties, dimensional report, non-destructive test report etc.
2. (a) Vendor must have in-house forging and heat treatment facility to manufacture ring forging of above grade of enquiry drawing dimension. Details of in-house manufacturing facilities for forging and heat treatment are to be submitted with offer.  
**Outsourcing of forging and heat treatment is not acceptable.**  
 (b) Vendor to submit details of in house melting and refining facility as per the requirement clause 5.0 of enquiry specification HW19391 Rev 04. At least one test certificate of forging of above material with raw material made in house to be submitted  
**In case in-house melting and refining facility not available,** vendor to provide details of their raw material source with following details:
    - Details of melting and refining facility as per the requirement of clause 5.0 of enquiry specification
    - At least one test certificate of forging of material grade NiCr20TiAl or equivalent/higher grade with raw material of their raw material supplier
  3. Vendor to confirm that it has adequate testing facilities to carry out tests as per enquiry specification and drawings. In case of outsourcing of test, vendor to agree for testing at lab accredited by Government or any other national / international accreditation agency only.
  4. Vendor to confirm supply shall be as per BHEL enquiry drawing and enquiry specification.



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<b>Indent No:</b>	<b>20221991</b>
<b>Material Code</b>	W95311320184
<b>Material Grade/Specification</b>	NiCr20TiAl / HW19391, REV 04

**Pre-Qualification requirement:**

1. Vendor must have experience of manufacturing and supplying forgings of NiCr20TiAl or international equivalent / other precipitation hardened Nickel based alloys like Alloy 105, Alloy 115 etc. in precipitation hardened condition. Vendor must have manufactured and supplied at least 3 ring forgings as per above; out of these 3 ring forgings at least one should be of inner diameter  $\geq 1000$  mm in above material grade in last seven years as on date of issue of enquiry. Forging supplied in precipitation hardened condition only will be considered as experience.

In support of above, the vendor has to furnish details of 3 ring supplies in the following format.

Ring Forging	Material Grade:	Dimension (in mm)			Name of Customer /Date of Supply
		Outer Diameter	Inner Diameter	Height	

In support of above vendor to submit following documents like:

- Test certificates of at least one of the ring with inner diameter  $\geq 1000$  mm. Test certificates shall cover chemical composition, heat treatment, mechanical properties, dimensional report, non-destructive test report, etc.
2. (a) Vendor must have in-house forging and heat treatment facility to manufacture ring forging of above material grade of enquiry drawing dimension. Details of in-house manufacturing facilities for forging and heat treatment are to be submitted with offer.  
**Outsourcing of forging and heat treatment is not acceptable.**
    - (b) Vendor to submit details of in house melting and refining facility as per the requirement clause 5.0 of enquiry specification HW19391 Rev 04. At least one test certificate of forging of above material with raw material made in house to be submitted.  
**In case in-house melting and refining facility not available,** vendor to provide details of their raw material source with following details:
      - Details of melting and refining facility as per the requirement of clause 5.0 of enquiry specification
      - At least one test certificate of forging of material grade NiCr20TiAl or equivalent/higher grade with raw material of their raw material supplier.
  3. Vendor to confirm that it has adequate testing facilities to carry out tests as per enquiry specification and drawings. In case of outsourcing of test, vendor to agree for testing at lab accredited by Government or any other national / international accreditation agency only.
  4. Vendor to confirm supply shall be as per BHEL enquiry drawing and enquiry specification.



## Annexure-PQR

Indent No:	20222365
Material Code	W95311320184, W95310501452
Material Grade/Specification	NiCr20TiAl / HW19391, REV 04

### **Pre-Qualification requirement:**

1. Vendor must have experience of manufacturing and supplying forgings of NiCr20TiAl or international equivalent / other precipitation hardened Nickel based alloys like Alloy 105, Alloy 115 etc. in precipitation hardened condition. Vendor must have manufactured and supplied at least 3 ring forgings as per above; out of these 3 ring forgings at least one should be of inner diameter  $\geq 1000$  mm in above material grade in last seven years as on date of issue of enquiry. Forging supplied in precipitation hardened condition only will be considered as experience.

In support of above, the vendor has to furnish details of 3 ring supplies in the following format.

Ring Forging	Material Grade:	Dimension (in mm)			Name of Customer /Date of Supply
		Outer Diameter	Inner Diameter	Height	

In support of above vendor to submit following documents like:

- Test certificates of at least one of the ring with inner diameter  $\geq 1000$  mm. Test certificates shall cover chemical composition, heat treatment, mechanical properties, dimensional report, non-destructive test report, etc.
2. (a) Vendor must have in-house forging and heat treatment facility to manufacture ring forging of above material grade of enquiry drawing dimension. Details of in-house manufacturing facilities for forging and heat treatment are to be submitted with offer.  
**Outsourcing of forging and heat treatment is not acceptable.**  
 (b) Vendor to submit details of in house melting and refining facility as per the requirement clause 5.0 of enquiry specification HW19391 Rev 04. At least one test certificate of forging of above material with raw material made in house to be submitted.  
**In case in-house melting and refining facility not available,** vendor to provide details of their raw material source with following details:
    - Details of melting and refining facility as per the requirement of clause 5.0 of enquiry specification
    - At least one test certificate of forging of material grade NiCr20TiAl or equivalent/higher grade with raw material of their raw material supplier.
  3. Vendor to confirm that it has adequate testing facilities to carry out tests as per enquiry specification and drawings. In case of outsourcing of test, vendor to agree for testing at lab accredited by Government or any other national / international accreditation agency only.
  4. Vendor to confirm supply shall be as per BHEL enquiry drawing and enquiry specification.

## Annexure-PQR

Indent No:	20222365
Material Code	<del>W95310601031</del> , W95310514317, W95311202262, W95311322136, W95310612050 ✓
Material Grade/Specification	NiCr20TiAl / HW19391, Rev 04

### Pre-Qualification requirement:

- Vendor must have experience of manufacturing and supplying forgings of NiCr20TiAl or international equivalent/ other precipitation hardened Nickel based alloys like Alloy 105, Alloy 115 etc. in precipitation hardened condition. Vendor must have manufactured and supplied at least 3 ring forgings as per above; out of these 3 ring forgings at least one should be of inner diameter  $\geq 500$  mm in above material grade in last seven years as on date of issue of enquiry. Forging supplied in precipitation hardened condition only will be considered as experience.

In support of above, the vendor has to furnish details of 3 ring supplies in the following format.

Ring Forging	Material Grade:	Dimension (in mm)			Name of Customer /Date of Supply
		Outer Diameter	Inner Diameter	Height	

In support of above vendor to submit following document like:

- Test certificates of at least one of the ring with inner diameter  $\geq 500$  mm. Test certificates shall cover chemical composition, heat treatment, mechanical properties, dimensional report, non-destructive test report etc.
- Vendor must have in-house forging and heat treatment facility to manufacture ring forging of above grade of enquiry drawing dimension. Details of in-house manufacturing facilities for forging and heat treatment are to be submitted with offer.  
**Outsourcing of forging and heat treatment is not acceptable.**
    - Vendor to submit details of in house melting and refining facility as per the requirement clause 5.0 of enquiry specification HW19391 Rev 04. At least one test certificate of forging of above material with raw material made in house to be submitted  
**In case in-house melting and refining facility not available**, vendor to provide details of their raw material source with following details:
      - Details of melting and refining facility as per the requirement of clause 5.0 of enquiry specification
      - At least one test certificate of forging of material grade NiCr20TiAl or equivalent/higher grade with raw material of their raw material supplier
  - Vendor to confirm that it has adequate testing facilities to carry out tests as per enquiry specification and drawings. In case of outsourcing of test, vendor to agree for testing at lab accredited by Government or any other national / international accreditation agency only.
  - Vendor to confirm supply shall be as per BHEL enquiry drawing and enquiry specification.



## Annexure-PQR

Indent No:	2022-2503
Material Code	W95311320104 . W95311223189
Material Grade/Specification	NiCr20TiAl / HW19391, REV 04

### Pre-Qualification requirement:

1. Vendor must have experience of manufacturing and supplying forgings of NiCr20TiAl or international equivalent / other precipitation hardened Nickel based alloys like Alloy 105, Alloy 115 etc. in precipitation hardened condition. Vendor must have manufactured and supplied at least 3 ring forgings as per above; out of these 3 ring forgings at least one should be of inner diameter  $\geq 1000$  mm in above material grade in last seven years as on date of issue of enquiry. Forging supplied in precipitation hardened condition only will be considered as experience.

In support of above, the vendor has to furnish details of 3 ring supplies in the following format.

Ring Forging	Material Grade:	Dimension (in mm)			Name of Customer /Date of Supply
		Outer Diameter	Inner Diameter	Height	

In support of above vendor to submit following documents like:

- Test certificates of at least one of the ring with inner diameter  $\geq 1000$  mm. Test certificates shall cover chemical composition, heat treatment, mechanical properties, dimensional report, non-destructive test report, etc.
2. (a) Vendor must have in-house forging and heat treatment facility to manufacture ring forging of above material grade of enquiry drawing dimension. Details of in-house manufacturing facilities for forging and heat treatment are to be submitted with offer.  
**Outsourcing of forging and heat treatment is not acceptable.**  
 (b) Vendor to submit details of in house melting and refining facility as per the requirement clause 5.0 of enquiry specification HW19391 Rev 04. At least one test certificate of forging of above material with raw material made in house to be submitted.  
**In case in-house melting and refining facility not available,** vendor to provide details of their raw material source with following details:
    - Details of melting and refining facility as per the requirement of clause 5.0 of enquiry specification
    - At least one test certificate of forging of material grade NiCr20TiAl or equivalent/higher grade with raw material of their raw material supplier.
  3. Vendor to confirm that it has adequate testing facilities to carry out tests as per enquiry specification and drawings. In case of outsourcing of test, vendor to agree for testing at lab accredited by Government or any other national / international accreditation agency only.
  4. Vendor to confirm supply shall be as per BHEL enquiry drawing and enquiry specification.

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Indent No:	20223475
Material Code	W95311320184, W95310501452, W95310501169, W95310501088
Material Grade/Specification	NiCr20TiAl / HW19391, REV 04

### Pre-Qualification requirement:

1. Vendor must have experience of manufacturing and supplying forgings of NiCr20TiAl or international equivalent / other precipitation hardened Nickel based alloys like Alloy 105, Alloy 115 etc. in precipitation hardened condition. Vendor must have manufactured and supplied at least 3 ring forgings as per above; out of these 3 ring forgings at least one should be of inner diameter  $\geq 1000$  mm in above material grade in last seven years as on date of issue of enquiry. Forging supplied in precipitation hardened condition only will be considered as experience.

In support of above, the vendor has to furnish details of 3 ring supplies in the following format.

Ring Forging	Material Grade:	Dimension (in mm)			Name of Customer /Date of Supply
		Outer Diameter	Inner Diameter	Height	

In support of above vendor to submit following documents like:

- Test certificates of at least one of the ring with inner diameter  $\geq 1000$  mm. Test certificates shall cover chemical composition, heat treatment, mechanical properties, dimensional report, non-destructive test report, etc.
2. (a) Vendor must have in-house forging and heat treatment facility to manufacture ring forging of above material grade of enquiry drawing dimension. Details of in-house manufacturing facilities for forging and heat treatment are to be submitted with offer.  
**Outsourcing of forging and heat treatment is not acceptable.**  
 (b) Vendor to submit details of in house melting and refining facility as per the requirement clause 5.0 of enquiry specification HW19391 Rev 04. At least one test certificate of forging of above material with raw material made in house to be submitted.  
**In case in-house melting and refining facility not available,** vendor to provide details of their raw material source with following details:
    - Details of melting and refining facility as per the requirement of clause 5.0 of enquiry specification
    - At least one test certificate of forging of material grade NiCr20TiAl or equivalent/higher grade with raw material of their raw material supplier.
  3. Vendor to confirm that it has adequate testing facilities to carry out tests as per enquiry specification and drawings. In case of outsourcing of test, vendor to agree for testing at lab accredited by Government or any other national / international accreditation agency only.
  4. Vendor to confirm supply shall be as per BHEL enquiry drawing and enquiry specification.



## Annexure-PQR

Indent No:	20223475
Material Code	<del>W95311223251</del> , W95311202033, <u>W95310514163</u> , <del>W95311202076</del> , <del>W95310501304</del> , W95310606033, <del>W95310606041</del> , <del>W95310514309</del> , <del>W95310525017</del> , W95311223189, W95310530029, <u>W95310514031</u> , <u>W95310514066</u> , <del>W95311202310</del>
Material Grade/Specification	NiCr20TiAl / HW19391 REV 04

### Pre-Qualification requirement HW19391:

1. Vendor must have experience of manufacturing and supplying forgings of NiCr20TiAl or international equivalent / other precipitation hardened Nickel based alloys like Alloy 105, Alloy 115 etc. in precipitation hardened condition. Vendor must have manufactured and supplied at least 3 ring forgings in above material grade in last seven years as on date of issue of enquiry. Forging supplied in precipitation hardened condition only will be considered as experience.

In support of above, the vendor has to furnish details of 3 ring supplies in the following format.

Ring Forging	Material Grade	Dimension (in mm)			Name of Customer /Date of Supply
		Outer Diameter	Inner Diameter	Height	

In support of above vendor to submit following document like:

- Test certificates of at least one of the above forgings. Test certificates shall cover chemical composition, heat treatment, mechanical properties, dimensional report, non-destructive test report etc.
2. (a) Vendor must have in-house forging and heat treatment facility to manufacture ring forging of above grade of enquiry drawing dimension. Details of in-house manufacturing facilities for forging and heat treatment are to be submitted with offer.  
**Outsourcing of forging and heat treatment is not acceptable.**  
(b) Vendor to submit details of in house melting and refining facility as per the requirement clause 5.0 of enquiry specification HW19391 Rev 04. At least one test certificate of forging of above material with raw material made in house to be submitted  
**In case in-house melting and refining facility not available**, vendor to provide details of their raw material source with following details:
    - Details of melting and refining facility as per the requirement of clause 5.0 of enquiry specification
    - At least one test certificate of forging of material grade NiCr20TiAl or equivalent/higher grade with raw material of their raw material supplier
  3. Vendor to confirm that it has adequate testing facilities to carry out tests as per enquiry specification and drawings. In case of outsourcing of test, vendor to agree for testing at lab accredited by Government or any other national / international accreditation agency only.
  4. Vendor to confirm supply shall be as per BHEL enquiry drawing and enquiry specification.

## Annexure-PQR

Indent No:	20230328
Material Code	W95310525017, <del>HW11202092</del>
Material Grade/Specification	NiCr20TiAl / HW19391 REV 04

### **Pre-Qualification requirement HW19391:**

1. Vendor must have experience of manufacturing and supplying forgings of NiCr20TiAl or international equivalent / other precipitation hardened Nickel based alloys like Alloy 105, Alloy 115 etc. in precipitation hardened condition. Vendor must have manufactured and supplied at least 3 ring forgings in above material grade in last seven years as on date of issue of enquiry. Forging supplied in precipitation hardened condition only will be considered as experience.

In support of above, the vendor has to furnish details of 3 ring supplies in the following format.

Ring Forging	Material Grade	Dimension (in mm)			Name of Customer /Date of Supply
		Outer Diameter	Inner Diameter	Height	

In support of above vendor to submit following document like:

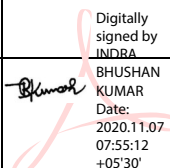
- Test certificates of at least one of the above forgings. Test certificates shall cover chemical composition, heat treatment, mechanical properties, dimensional report, non-destructive test report etc.
2. (a) Vendor must have in-house forging and heat treatment facility to manufacture ring forging of above grade of enquiry drawing dimension. Details of in-house manufacturing facilities for forging and heat treatment are to be submitted with offer.  
**Outsourcing of forging and heat treatment is not acceptable.**  
 (b) Vendor to submit details of in house melting and refining facility as per the requirement clause 5.0 of enquiry specification HW19391 Rev 04. At least one test certificate of forging of above material with raw material made in house to be submitted  
**In case in-house melting and refining facility not available,** vendor to provide details of their raw material source with following details:
    - Details of melting and refining facility as per the requirement of clause 5.0 of enquiry specification
    - At least one test certificate of forging of material grade NiCr20TiAl or equivalent/higher grade with raw material of their raw material supplier
  3. Vendor to confirm that it has adequate testing facilities to carry out tests as per enquiry specification and drawings. In case of outsourcing of test, vendor to agree for testing at lab accredited by Government or any other national / international accreditation agency only.
  4. Vendor to confirm supply shall be as per BHEL enquiry drawing and enquiry specification.



# Annexure-QP

MANUFACTURER'S NAME AND ADDRESS			STANDARD QUALITY PLAN				TO BE FILLED BY BHEL		TO BE FILLED BY BHEL			
BHEL	VENDOR'S NAME	ITEM	FORGING (NIMONIC)		QP NO.	QA/CF/QP/315 (a)						
				REV	00							
		DRG. NO.	AS PER PO									
		SPEC.	HW19391									
		REV	AS PER PO			Page 1 of 1						
SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY			REMARKS
									M	B	N	
1	2	3	4	5	6	7	8	9	D	10		11

1.	MELTING	CHEMICAL COMPOSITION	CRITICAL	CHEMICAL	100%	BHEL SPEC.	BHEL SPEC.	TC	√	P	V	-	VIM & ESR OR VIM & VAR
2.	FORGING	FORGING STEPS	MAJOR	VISUAL	100%	INTERNAL TECHNOLOGY	INTERNAL TECHNOLOGY		√	P	V	-	
3.	QUALITY HEAT TREATMENT	TIME TEMP CONTROL	MAJOR	MEASURE	100%	BHEL SPEC	BHEL SPEC	TC	√	P	V	-	
4.	TEST PIECE IDENTIFICATION	STAMPING	MAJOR	VISUAL	AS PER BHEL SPEC	BHEL SPEC. & DRG.	BHEL SPEC & DRG.		√	P	W	-	
5.	CHEMICAL TESTING	CHEMICAL COMPOSITION	MAJOR	CHEMICAL	100%	BHEL SPEC.	BHEL SPEC.	TC	√	P	V	-	
6.	HARDNESS TEST	HARDNESS	MAJOR	HARDNESS	100%	BHEL SPEC.	BHEL SPEC.	TC	√	P	W	-	
7.	MECHANICAL TESTING	MECHANICAL PROPERTIES	MAJOR	MECHANICAL	1 PER HEAT PER HT BATCH	BHEL SPEC.	BHEL SPEC.	TC	√	P	W	-	
8.	METALLOGRAPHIC TESTING	GRAIN SIZE	MAJOR	METALLOGRAPHIC	AS PER BHEL SPEC	BHEL SPEC	BHEL SPEC	TC	√	P	V	-	
9.	UT	ULTRASONIC TEST	MAJOR	UT	100%	BHEL SPEC.	BHEL SPEC.	TC	√	P	W	-	
10.	DP	DYE PENETRANT TEST	MAJOR	DP	100%	BHEL SPEC.	BHEL SPEC.	TC	√	P	W	-	
11.	MACHINING	VISUAL & DIMENSIONS	MAJOR	VISUAL & MEASUREMENT	100%	BHEL DRAWING	BHEL DRAWING	TC	√	P	W	-	
12.	MARKING PRESERVATION & PACKING	MARKING PRESERVATION & PACKING	MAJOR	VISUAL	100%	BHEL DRAWING & SPEC	BHEL DRAWING & SPEC	TC	√	P	V	-	

MANUFACTURER/SUBCONTRACTOR	 Digitally signed by INDRA BHUSHAN KUMAR Date: 2020.11.07 07:55:12 +05'30'	LEGEND: ! RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. M: MANUFACTURER / SUBCONTRACTOR    B: BHEL / NOM. INSPECTION AGENCY N: CUSTOMER INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION	FOR CUSTOMER USE	APPROVED BY
		ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER		