

Invited Tender notification for the procurement of CMSX-4 alloy powder for use in Direct Energy Deposition (Last date:31.03.2023)

Dear Sir/Madam,

In order to accomplish the goals of a ARDB funded project we plan to acquire CMSX-4 alloy for additive manufacturing using the direct energy deposition process. In the following we list the specifications regarding the size, shape of the powder and the composition range of the elements.

- a) Size classification of powder +50/-90 micrometers
- b) Shape of the powder particles should be spherical
- c) The composition of the elements should be within the range mentioned in Annexure 1
- d) Quantity: 5 Kgs

Terms and conditions

1. Two-bid system (separate technical and financial bids) in sealed tenders.
2. The technical bid must clearly specify the prescribed technical specifications without including the prices. Please provide in detail the specifications under each subhead and bullet point. Unique characteristics may be highlighted.
3. Vendors who include price information in the technical bids will be automatically disqualified.
4. Technical bids will be opened first. IISc may seek clarifications after opening of technical bids and may ask vendors to perform some example experiments on the samples given by IISc to demonstrate the promised technical specifications. Vendors may be required to give presentations.
5. There are several items that require detailed information to be provided by the supplier. If information is not provided against any of these items, this will disqualify the supplier.
6. After technical evaluation by a committee, vendors may be asked to re-quote in a specific format to facilitate comparison of prices.
7. Price bids of only technically qualified vendors will be considered.
8. The price bids must offer CIF Bangalore prices.
9. IISc also reserves the right to cancel the tender at any time without assigning any reason whatsoever.
10. Indicate delivery period.
11. Order will be placed on lowest bid from technically qualified vendor.
12. The tender documents can be sent at the following address:
The Chairman
Department of Materials Engineering
Indian Institute of Science, Bangalore 560012
Karnataka (INDIA)
Attn: Prof. Abhik Narayan Choudhury

Annexure 1: Alloy composition

Alloy CMSX4, 100% Virgin

1. **Chemical Compositions:** The detailed chemical composition is given as below

i) **Alloying Elements:**

S. no.	Element	Minimum (wt.%)	Maximum (wt%)
01.	Al	5.45	5.75
02.	Cr	6.4	6.6
03.	Co	9.3	10.0
04.	Hf	0.07	0.12
05.	Mo	0.5	0.7
06.	Re	2.8	3.1
07.	Ta	6.3	6.7
08.	Ti	0.9	1.1
09.	W	6.2	6.6
10.	Nickel	Balance	

ii) **Residual Elements:**

S. no.	Element	Maximum (wt.%)	S. no.	Element	Maximum (ppm)
01.	Cu	0.005	07.	C	60
02.	Fe	0.15	08.	Cl	< 1
03.	Mn	0.01	09.	N	2
04.	Nb	0.10	10.	O	2
05.	Si	0.04	11.	P	2
06.	V	0.10	12.	S	2
			13.	Zr	75

iii) **Trace Elements:**

S. no.	Element	Maximum (ppm)	S. no.	Element	Maximum (ppm)
01.	Ag	2	11.	Na	20
02.	As	2	12.	Pb	2
03.	Au	2	13.	Sb	2
04.	Bi	0.2	14.	Se	0.5
05.	Cd	2	15.	Sn	10
06.	Ga	15	16.	Te	0.2
07.	Ge	2	17.	Th	5
08.	Hg	2	18.	Tl	0.3
09.	In	2	19.	U	5
10.	K	10	20.	Zn	5