

**GOVERNMENT OF INDIA, MINISTRY OF DEFENCE
DEFENCE RESEARCH AND DEVELOPMENT ORGANISATION
TERMINAL BALLISTICS RESEARCH ORGANISATION
SECTOR - 30, CHANDIGARH - 160 030**

Introduction:

TBRL has developed a continuous process for production of propellant grade fine β -HMX /fine RDX of mean particle size less than 6 micron (surface mean) and has scaled up the process to 4 kg per hour production capacity. The fine β -HMX is free from undesirable polymorphs of HMX such as α , γ and δ which are unstable and sensitive in nature.

Aim:

To find suitable industrial partners for mass production of this propellant grade fine β -HMX/RDX to meet immediate and futuristic needs of missile and space applications. DRDO along with the selected industrial partner will jointly participate in setting up of plants, optimization of process and characterisation of product and will transfer the technology to the industrial partner (called vendor hereafter) for mass production.

Future Scope:

Based on the present projections, it is anticipated that there will be a requirement of more than 200 ton of fine β -HMX/RDX explosive materials in next one decade. However DRDO does not guarantee the orders from the users. Exploring the potential market will be the responsibility of the vendor.

Process Description:

This is a novel continuous flow mixing process that gives a narrow range of particle size distribution of fine β -HMX/RDX that is free from undesirable polymorphs of HMX such as α , γ and δ .

The specifications of propellant grade fine β -HMX produced in this process are as follows:

Sr. No	Property	Value
1	Colour and nature	White crystalline powder

2	Alpha and Gamma polymorphs	Is not detectable (by FTIR)
3	Purity (wt % of total mass)	≥ 99 %, (by HPLC)
4	Total acetone insoluble material (wt %)	0.05%, max.
5	Melting Point	275±2 °C (with Decomposition)
6	RDX (wt %)	0.5% max.
7	Acidity (wt %)	0.02%, max
8	Particle Size and Distribution	Mean Dia ≤ 6µm by PSA (Laser diffraction, surface mean)

The specifications of propellant grade fine RDX produced in this process are as follows:

Sr. no	Properties	Value
1	Color and nature	White crystalline powder
2	HMX and its polymorphs	Is not detectable (by FTIR)
3	Purity (wt % of total mass)	≥ 98%, (by HPLC)
4	Total acetone insoluble material (wt %)	0.05%, max.
5	Melting Point	204±2 °C (with Decomposition)
6	HMX (wt %)	As per base RDX material
7	Acidity (wt %)	0.02%, max
8	Particle Size and Distribution	Mean Dia ≤ 6µm by PSA (Laser diffraction, surface mean)

PRE QUALIFICATION CRITERIA

1. Only Indian company or consortia of Indian companies wholly owned by Indian individuals/companies are allowed to participate in this EOI. The consortium of Indian companies has to execute an MOU/Agreement among them and define the lead company who shall be responsible for all other constituent companies of the consortium for the purpose of this EOI. A constituent firm cannot be a part of two consortia participating in this EOI.

2. Company/consortia of companies should possess valid explosives (HMX / RDX) processing and handling license from Govt. of India.

3. The company / lead company of consortium of Indian companies should have minimum annual turnover of Rs.50 Crores for the last three financial years. Fundamentals of the company, like company profile, balance sheets and income tax returns etc. for last three years will be mandatory to assess the capability of the firm to undertake the order for subsequent bulk production.

4. On receipt of EOIs, the same will be scrutinized by a committee of experts duly constituted by competent authority who shall assess the suitability of the firms for this task. If required, the committee may visit the bidders' premises for assessment.

5. DRDO at its discretion can transfer the technology to more than one vendor.

FORMAT FOR APPLICATION FOR EXPRESSION OF INTEREST**Details to be enclosed as Annexures**

1.	Name and full address of the Organization	
2.	Management Structure	
3.	Contact Person with designation	
4.	Contact telephone numbers and fax No. and Email address	
5.	Current operational areas of work	
6.	Turnover for last three years	
7.	Approval/registration with any Govt./Agency	
8.	Details of expertise available in the production of explosive materials	
9.	Regular manpower available on roll	
10.	Available in house analysis facility, quality assurance/quality control facility	
11.	Areas of work where expertise available, pl. elaborate (Explosive processing/Mechanical/ Electrical/Chemical/ etc.)	
12.	Similar work done for any government agency such as DRDO/ISRO/DAE etc	
13.	Any other credentials in the subject area	
14.	Acceptance of TBRL terms and conditions	