

Diethylene Glycoldinitrate (DEGEN) and Triethylene Glycoldinitrate (TEGDN)

The subject invention relates to the development of technology for production of DEGDN & TEGDN, the liquid energetic plasticizer essential for preparation of active binder for HD1.1 rocket propellant formulation. Unlike conventional non-energetic hydrocarbon based plasticizers, DEGDN & TEGDN contain a nitrate ester group that imparts energy to the system on decomposition. Both DEGDN & TEGDN are sensitive to impact, friction, heating etc. The chemical reaction involved in preparation of DEGDN & TEGDN are highly exothermic and the also the final products are notably sensitive to that and strong acidic/alkaline condition.

The present method for preparation of DEGDN & TEGDN is a single step continuous process involving preparation of mixed acid (the nitrating mixture), nitration of respective glycols viz. Diethylene glycol & Triethylene glycol followed by washing/neutralization of the product. The final product is dried over granulated anhydrous drying agent and stored as solution in a solvent. The pure final products are slightly off-white in color and oily in nature.

At present, the process for DEGDN & TEGDN are validated at 250-300 g/hr level with process yield of about ~70-80%. Based on the bench scale process data, an engineering design of a continuous pilot plant with capacity of 1.2- 1.5 kg/hr production rate is prepared considering all safety and process related requirements. The properties of DEGDN & TEGDN developed via this continuous flow process meets desired specification for end applications.

1. Interested companies/ industries are requested to apply against this EoI to following address:-

To,

The Director

High Energy Materials Research Laboratory (HEMRL)

DRDO, Govt. of India, Ministry of Defence,

Sutarwadi, Pune 411 021

Phone No: 020- 25912101

E-mail: director.hemrl@gov.in

Fax No: 020-25869697

2. A copy of interest may be sent to the following address without any attachment:-

To,

The Director,

Directorate of Industry Interface & Technology Management (DIITM),

Room No. 447, DRDO Bhawan, Rajaji Marg, New Delhi-110 011

E-mail: diitm.hqr@gov.in

Phone No. 011-23007446

Fax-011-23793008

All industries interested in seeking ToT are requested to apply in the format given below. Kindly fill in the fields. The list of documents to be attached is provided in Annexure – I. Kindly provide the reference of page no. of supporting document in the relevant field of form.

PART-1

General Information

(Please enclose documents in support of information provided)

1.	Name of the Technology requested for Technology Transfer (Technology name and concerned Lab, Category)	
2.	Name of the industry/ organization	
3.	Complete Address and other details	
	Registered Office State Phone No Fax Email Website	
	Factory State Phone No Fax Email Website	
4.	Point of Contact Name Designation Address Mobile No Ph No Email ID	
5.	NAME OF CMD/ MD /PARTNERS/ PROPRIETOR/ etc Name Designation Address Mobile No Ph No Email ID	
6.	Date of Incorporation of company	
7.	Foreign Direct Investment in company (if any in %)	
8.	Shareholding pattern	
9.	Turn over as per Audited Balance Sheet for the preceding three years. Year _____ Year _____ Year _____	
10.	Annual budget for R&D during last three years (if any) Year _____	

	Year _____ Year _____	
11.	Income Tax returns for the preceding three years period Year _____ Year _____ Year _____	
12.	Nature of company DPSU, Private Limited, Public Limited, Partnership, Proprietary, Ex- Serviceman Unit	
13.	Category of industry Large Scale, Medium Scale, Small Scale, Micro, Startup	
14.	MSME Registration No	
15.	Certificates of registration as a manufacturing unit, if any.	
16.	If Startup, DPIIT Registration No	
17.	UDYOG AADHAR No	
18.	PAN Number	
19.	Details of Industrial license for defence manufacturing issued by DPIIT (if any)	
20.	Details of PESO license (if any)	
21.	GST Number	
22.	Nature of business Manufacturing/ Sole Selling or Authorized Agent/ Assembler/ Traders/ Dealer/ Processor/ Repacker/ Others	
23.	Details of current products and services Products and services Supplied (please specify Govt/ Domestic market/ Export)	
24.	Record of past performance (e.g., Supply orders executed against of Ministry of Defence orders, Public Sectors and Paramilitary Forces, if any).	
25.	Details of registration with NSIC / SSI, DGS&D, other Defence Department, other Govt. Dept, membership of FICCI/ASSOCHAM/CII or other Industrial Association (Attach relevant copies of registration letters)	
26.	Have you already taken any technology from DRDO (If yes, give details attaching separate sheet) Name of the Technology, Lab, Year, License number & Status	
27.	ISO/ ISI certification or any other certification (If yes, give details)	
28.	Relevant clearances form the authorities/ ministries (if any)	
29.	Capacity and capability to undertake	

	developmental work and to accept attendant financial and commercial risks.	
30.	Capacity/capability to market the product through the marketing network, sales and service network, reliability to maintain confidentiality.	

PART-2

Infrastructure and other Information

1.	Total area of factory Covered (m ²), Uncovered (m ²), Bonded space available (m ²)	
2.	Ownership of factory Self-owned, partnership, rental	
3.	Electric power Sanctioned Installed Standby (if any)	
4.	Availability of adequate infrastructure (List of machines and their production capacities) and technical expertise	
5.	Name of bank & A/c No Name of bank A/c type A/c no Address of the bank Phone: Email:	

6. Details of current products:

S.No	Type	Description	Licensed/installed capacity	Annual production for preceding 3 years

7. Details of foreign collaboration, if any

S.No	Product	Name and address of collaborator	Year	Remarks

8. Details of products developed for services

S.No	Nomenclature of stores	Order No. and date	Remarks

9. Please give details of important facilities & infrastructure as per following format for:

- (a) Production
- (b) Unconventional, special m/c
- (c) Testing & quality control facilities

S.No	Description of m/c	Make & model	Qty	Date of purchase	Remarks

10. Furnish the following details with relevant certificates and documents

- (a) R&D facilities available :
- (b) Inspection quality control of raw material components :
- (c) Assistance from central agency for testing / calibration etc.:
- (d) laboratory and drawing office facility :

11. Principal customers:

S. No	Name & address	S.O No and date	Date of last supply	Products supplied	Value

12. Future plans (if any) in respect of expansion programme/ installation of additional machines/ test facilities etc.

13. Name of the technology requested for transfer

(give self-assessment of your capability to absorb the technology)

14. Details of employee as on date on firm's pay roll

PERMANENT				
Category	Post Held	Number	Qualification	Total Service
Technical	Prod. Manager Q.C. Manager Supervisor Testing Staff (QC) Skilled workers Unskilled workers, etc			
Administrative	Purchase Manager Accounts Officer Office Superintendent Clerical Others, etc			

TEMPORARY				
Category	Post Held	Number	Qualification	Total Service
Technical	Prod. Manager Q.C. Manager Supervisor Testing Staff (QC) Skilled workers Unskilled workers, etc			
Administrative	Purchase Manager Accounts Officer Office Superintendent Clerical Others, etc			

DECLARATION:

I / we confirm that the information furnished in Part 1 & 2 above is correct. In the event of any information given by me / us is found incorrect / false at any time, I / we understand our EoI for ToT will be cancelled/ rejected without notice, beside any other appropriate action against me / us.

Industry seal

Authorized signatory

Name(s) in capital

Designation and seal of authorized signatory

Date:

Place:

List of Support documents to be attached with EoI

- (a) Memorandum and Articles of Association (Should be incorporated as per Indian Companies Act, as amended time to time)
- (b) Certificates of registration as a manufacturing unit, if any.
- (c) Audited Balance Sheet for the preceding three years.
- (d) Income Tax returns for the preceding three year period
- (e) Details of shareholding/ownership pattern especially foreign partners/ shareholders, foreign employees, directors, etc. The company must adhere to the prevailing Govt of India policies and regulations on Foreign Direct Investment (FDI)/DIPP norms as applicable.
- (f) Annual budget for R&D during last three years.
- (g) Numbers and details of IPR or patents, etc., held by the company.
- (h) Number of technically or professionally qualified personnel.
- (i) Record of past performance (e.g., Supply orders executed against of Ministry of Defence orders, Public Sectors and Paramilitary Forces, if any).
- (j) Availability of adequate infrastructure (List of machines and their production capacities) and technical expertise.
- (k) List of Testing and Support equipment's
- (l) ISO/ ISI certification or any other certification
- (m) Relevant clearances form the authorities/ ministries (if any)
- (n) Capacity and capability to undertake developmental work and to accept attendant financial and commercial risks.
- (o) Capacity/capability to market the product through the marketing network, sales and service network, reliability to maintain confidentiality.
- (p) PESO and DPIIT license for explosive handling if ToT is for high energy Material, explosives, propellants, and component/ system dealing with it etc.
- (q) Under taking form company seeking ToT that none of its Directors, Independent Directors, non-executive Directors, Key management personnel are involved in any corrupt practices, unfair means and illegal activities.
- (r) Details of the industrials license for defence manufacturing be provided by the industry seeking ToTs.
- (s) Application cum Industry Assessment Form