

Design and development of ITO coating on flat/ curved acrylic windows

Acrylic material is generally used in aircraft as position light covers, optical windows for EOTS dome, canopy, windshield etc. Acrylic windows are transparent in visual and RF spectrum. Due to the RF transparency, the light panels/ sub-systems inside the light covers are prone for radar scattering. In order to reduce the radar reflection, it is necessary to coat the acrylic window with radar reflecting/absorbing material and consequently minimal impact on the optical performance. Indium Tin Oxide (ITO) is one of such material which is getting used as optically transparent radar reflecting/absorbing material. This innovation provides fabrication process of ITO based thin film on acrylic substrate. It will be used as radar reflecting/ absorbing structure for airborne applications. The ITO coated acrylic panels may have applications as aircraft light covers, optical windows for EOTS dome, canopy, windshield etc. of low observable UAVs/Fighter jets.

1. Requirements of Technology Absorption Certificate (if any) and accordingly number of samples/ product/ prototype required to issue certificate. Cost of sample and testing & evaluation cost to be borne by ToT recipient industry.

- i. Firm shall have following facilities: Clean room meeting ISO class 8 or better, HHV magnetron or equivalent, Mass Flow Controller (MFC): 0 – 200 sccm Bronkhorst & MFC controller (Nishko) or equivalent, Substrate holder (0 - 500 mm) or equivalent, Advanced energy 2.4kW DC power supply for magnetron or equivalent, Turbo molecular pump or equivalent, Four probe sheet resistance meter, Humidity chamber: ESPEC or equivalent, Salt fog chamber: KORROX – III Corrosion test chamber or equivalent, Temperature cycling chamber: TEMPSON 4 pocket oven or equivalent, Optical spectrophotometer or equivalent
- ii. Firm shall realize ITO coated acrylic sheet as per specifications (1 No. of ITO coated flat acrylic sheet and 1 No. of ITO coated curved acrylic sheet to be realized). Firm shall follow QAP document for the realizing the coated acrylic sheet.
- iii. The coated acrylic sheet shall meet durability tests and final inspection criteria as per requirement. Final inspection of coated acrylic sheet will be witnessed by ADE.

2. Any special terms & conditions lab to specify (if any) Arial 12 font

The other Terms and conditions for industry seeking ToT are the following:

- i. DRDO reserves the right to reject any offer or proposal without assigning any reasons.
- ii. Submission of EOI does not guarantee ToT to applicant industry.
- iii. A committee of experts constituted by DRDO may visit the company manufacturing sites and facilities for assessing the strength and capacity as furnished by the respective company before shortlisting for ToT.

Interested industries are requested to forward their Expression of Interest (Eoi) (with attachments of supporting documents) to **Director, Aeronautical Development Establishment (ADE)** with a copy to **Director DIIQM, DRDO HQ** (no attachments are required to be forwarded to DIIQM) on following address:-

The Director

Aeronautical Development Establishment (ADE)

Defence Research & Development Organisation

Suranjan Das Road PO, New Tippasandra, Bengaluru - 560075

Phone: 080-2528 3404

Fax : 080-2528 3188

E-mail : director.ade@gov.in

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

The Director

Directorate of Industry Interface & Quality Management (DIIQM)

Room No 447, DRDO Bhawan, DRDO HQrs, Rajaji Marg, New Delhi – 110011

Phone: 011-23013209/ 23015291

Fax: 011-23793008

Email: director-diiqm-hqr@gov.in

All Industries interested in seeking ToT are requested to furnish details in the format given in Part-1 & Part-2 below. 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 also. The list of documents to be attached is provided in Annexure-I.

Application cum Industry Assessment 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

Annexure-I

List of Supporting 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 from 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 from 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 industrial license for defence manufacturing be provided by the industry seeking ToTs.
- (s) Duly filled Application cum Industry Assessment Form