

## **Thermoplastic Ester Polyurethane (Instance): Process technology**

Instane is a class of thermoplastic Ester polyurethane. This polymer possesses a combination of attractive properties like high elongation and tensile strength, high toughness, excellent abrasion, and tears resistance. Instane is a segmented thermoplastic polyurethane elastomer with non-losing characteristics and it can be considered as multi-block copolymers, These are melt-processed and used in a wide range of product applications and finds great applications in defence as well as in civil use.

In defence application, it is a vital component for the development of pressable plastic bonded explosive (PBXs) compositions that provide excellent mechanical properties. Specifically, the developed thermoplastic polyurethane elastomer has potential application as binder in various pressable formulations for country's major defence programmes.

In the civil sector, this polymer can also widely be used in formation of fibres, prosthetic limbs, surface coating, core of golf balls and many others. This technology is not security sensitivity technology and have large commercial potential beyond Defense use.

Currently, in the defence sector, huge requirement of the same has been anticipated for the development of warheads of ongoing missile programmes. At present, the requirement has been estimated to be about 100kg per annum. Thus, the in-house R&D efforts have been made to realize this product and the process has been established at 1kg/batch on product basis. The developed product has been rigorously tested in the current formulations as import substitute. The product (instane) met all quality requirements of pressable compositions. Considering the demand, non-explosive nature and also its use in civil sector, TOT on process technology of thermoplastic polyurethane elastomer has been initiated.

The developed strategic polymer has dual use as it will find application in defence and as well as commercial sector. The spin-off technologies are not security sensitive technologies and have large commercial potential beyond Defence Use. This material is useful to manufacture the products in India/abroad and sell products in India and /or abroad and non-exclusive basis to industry.

Interested industries are requested to submit their financial bid in sealed envelope, along with relevant documents as per the list in appendix-A, through one of the following agencies only, to DRDO before the bid ending date:-

S. No	Name of the Agency	Point of Contact
1	<p><b>National Research Development Corporation</b> Address :20-22, Zamroodhpur Community Centre, Kailash Colony Extn. New Delhi - 110048</p> <p>Tel : +91-11-29240401 to 29240407 Fax: +91-11-29240409 / 29240410 General E-mail : write2[at]nrdc[dot]in</p>	<p>Shri Rajendra Gondane Sr. Manager (Business Development) National Research Development Corporation 20-22, Zamroodhpur Community Centre, Kailash Colony Extn. New Delhi - 110048 INDIA</p> <p>Mobile : +91-9910496554 EPABX : +91-11-29240401-07 (Extn. 444) Fax : +91-11-29240409 -10 Email : rgondane[at]nrdc[dot]in Website : www[dot]nrdcindia[dot]com</p>
2	<p><b>PHD Chamber of Commerce and Industry</b> Address: PHD House, 4/2 Siri Institutional Area, August Kranti Marg, New Delhi 110016</p> <p>Tel : 91-11-26863801-04, 49545454 Fax : 91-11-26855450, 49545451 Website : <a href="http://www.phdcci.in">www.phdcci.in</a> E-mail : phdcci[at]phdcci[dot]in</p>	<p>Shri Nasir Jamal Joint Secretary PHD Chamber of Commerce &amp; Industry Address: PHD House, 4/2 Siri Institutional Area, August Kranti Marg, New Delhi 110016 INDIA</p> <p>Mobile : +91-9810185714, 8210343267 Phone : +91-11-49545454, 49545400 Extn : 279 Fax : +91-11-26855450</p>
3	<p><b>Confederation of Indian Industry (CII)</b> Address: The Mantosh Sondhi Centre 23, Institutional Area, Lodi Road, New Delhi - 110 003 (India)</p> <p>Tel : 91 11 45771000 / 24629994-7 Fax : 91 11 24626149 E-Mail : info[at]cii[dot]in Website : <a href="http://www.cii.in">www.cii.in</a></p>	<p>Shri Amit Kumar Deputy Director – Defence &amp; Aerospace Society of Indian Defence Manufacturers (SIDM) C/o Confederation of Indian Industry (CII) Address: 3rd Floor, IGSSS, 28 Institutional Area, Lodhi Road, New Delhi – 110003 INDIA</p> <p>Mobile : +91-9990059163 Phone : +91-11-45772062 Fax : +91-11-45772022 Email : amit[dot]kumar[at]cii[dot]in Website : <a href="http://www.sidm.in">www.sidm.in</a></p>
4	<p><b>The Associated Chambers of Commerce and Industry of India (ASSOCHAM)</b></p>	<p>Ms Kavita Sharma Addl Director and Head - Energy and Infra Mobile : 09871801002</p>

<p>4th Floor, YMCA Cultural Centre and Library Building, 01, Jai Singh Road, New Delhi - 110001</p> <p>Phone: 46550555 (Hunting Line) Fax: 01123347008/9 Website :<a href="http://www.assochem.org">www[dot]assochem[dot]org</a></p>	<p>Tele: 0091-11-23347040 Email: <a href="mailto:kavita[dot]sharma[at]assochem[dot]com">kavita[dot]sharma[at]assochem[dot]com</a> Website : <a href="http://www.assochem.org">www.assochem.org</a> </p>
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**List of Supporting Documents to be Attached / Enclosed**

- (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.