



Expression of Interest (EOI)

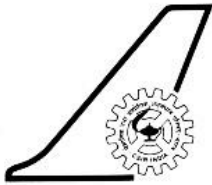
For

Out-Licensing of

**HANSA-3(NG) Two-seater Trainer Aircraft
Know-How for Manufacturing & Commercialization**



**National Aerospace Laboratories
Council of Scientific & Industrial Research
HAL Airport Road, Kodihalli
Bengaluru-560 017**



Council of Scientific and Industrial Research
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ISO: 9001:2008 Certified

8th July 2024

EXPRESSION OF INTEREST

CSIR- National Aerospace Laboratories (NAL), Bengaluru, India is one of the premier laboratories under Council of Scientific and Industrial Research, an autonomous body under Department of Scientific and Industrial Research (Government of India), New Delhi. CSIR-NAL is a Science and Knowledge based Research, Development and Consulting Organization. It is internationally known for its excellence in Scientific Research in Aerospace Engineering and other disciplines.

An Expression of Interest (EOI) is initiated at CSIR-National Aerospace Laboratories (CSIR-NAL) for Out-Licensing of **“Hansa-3(NG) Two-seater Trainer Aircraft for Manufacturing & Commercialization”** from an established aircraft and allied engineering companies.

EOI Document Number	Item Description
CSIR-NAL/PBMD/HANSA-3(NG) EOI-01/2024	Hansa-3(NG) Two-seater Trainer Aircraft for Manufacturing & Commercialization

1. The address for submission of document for obtaining further information:

Mr. R.Venkatesh
Head, PBMD
CSIR-National Aerospace Laboratories
Old Airport Road, Kodihalli
Bengaluru-560017
Tel-080-25086130
Email: rvenkatesh@nal.res.in

2. The Eoi document for submitting the offers can be downloaded free of cost directly from CSIR-NAL website <https://www.nal.res.in/en/tender>. The prospective firms willing to obtain licensing of technology shall adhere to due dates in the EOI details

3. The schedule for submission of offers and opening of the offers is as follows

Date & Time of Beginning Submission of Offers		Last Date & Time of Submission of Offers	
Date	Time (IST)	Date	Time (IST)
8th July, 2024	10.30 AM	31st Oct, 2024	5.00 PM

Note: The hardcopy of the proposal shall be dropped in the box kept at CSIR-NAL Reception before the due date.

- Date and Time for receipt of hard copy of proposals:** The proposals in hard copy should reach the address given for submission at Sr.no 1 before date and time mentioned at Sr. No.3 for submission of proposals. Late/delayed proposals will not be considered. Postal/Courier delays will not be accepted as an excuse. In case the last date and time is declared a holiday at a later date, then the due date and time for receipt, opening will be shifted to the next working date and time automatically. No corrigendum will be issued in this regard.
- A brief description of the qualification criteria is provided herewith. The Participants are requested to submit documentary evidence to prove technical capabilities, client list, experience and credentials as per formats 1-7 enclosed.
- The CSIR-NAL Committee shall scrutinize and finalize the firms meeting the qualification criteria after knowing/obtaining details about relevant/available details and R&D needs of our Laboratory.
- For evaluating the responses, CSIR-NAL, if required, may call the firms for presentation of their case. Presentation can be considered via WebEx/Skype/Video Conferencing also.
- The Director, CSIR-National Aerospace Laboratories (NAL), Bengaluru, India reserves the right to accept or reject any or all EOI notification/tenders/offers in part or full or withdraw the Notice at any stage of processing without assigning any reasons whatsoever, such an event would not cause obligation of any kind to CSIR-NAL.

Sd/-

**Head, PBMD
For and behalf of CSIR-NAL**

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1. ORGANIZATION BACKGROUND

1.0 National Aerospace Laboratories (NAL), a constituent of the Council of Scientific and Industrial Research (CSIR), India, established in the year 1959, is the only government aerospace R&D laboratory in the country's civilian sector. CSIR-NAL is a high-technology-oriented institution focusing on advanced disciplines in aerospace. CSIR-NAL has several advanced test facilities, many of them are recognized as National Facilities. CSIR-NAL has provided significant value-added inputs to all the Indian national aerospace programmes. Over the last five decades, its contributions have enabled it to create a niche for itself in advanced aerospace research and technology development. CSIR-NAL has also developed many critical technologies for the strategic sector and continues to support the mission-mode programmes of the country. CSIR-NAL's mandate is to develop aerospace technologies with strong science content, design and build small, medium-sized civil aircraft, and support all national aerospace programmes.

1.1 HANSA-3 is India's first all-composite light two seat airplane designed and developed indigenously by CSIR- National Aerospace Laboratories ideally suited for ab-initio flying training, sport and hobby flying. Certified by Directorate General of Civil Aviation under JAR-VLA in the year 2000, HANSA aircraft is lightning protected, and is cleared for Day - VFR and Night-VFR and has excellent flying qualities. HANSA-3 fleet has accumulated a total of more than 4000 hours.

1.2 In the year 2018, CSIR-NAL has initiated a program to improve the HANSA-3 aircraft to current standards & to meet India's immediate requirement of trainer aircraft for flying training. The improved HANSA-3 aircraft features full glass cockpit, powered by advanced fuel efficient Rotax 912 iSc Sports engine & electrically operated flaps to meet the user's requirements. Improved HANSA-3 aircraft with commercial name as HANSA-3 (NG) has better performance with higher range and endurance as compared to HANSA-3 and an advanced manufacturing process with better production rate, for which TCDS obtained vide: 7-12/94-RD-1 on 20th February 2023 from DGCA. Kindly refer Annexure-3 for Product Brochure)

Key Features of HANSA- 3 (NG) Aircraft

- Glass Cockpit
- Advanced Fuel Efficient Engine along with Improved Cowl Design
- Increased Endurance & Range
- Improved Cockpit Ingress/Egress
- Steerable Nose Wheel (optional)
- Electrically Operated Flaps
- Better Cockpit Aesthetics & Ergonomics
- Improved Manufacturing Process - Better Production Rate

For further details, refer to enclosed HANSA-3 (NG) Aircraft brochure (Annexure-4)

2. OBJECTIVE OF TECHNOLOGY LICENSING

The objective of this EOI is to invite proposal from suitable industry partner(s) and transfer the Hansa-3(NG) aircraft production technology within the stipulated terms of licensing. The ultimate goal of this EOI is to take the PRODUCT to market for the benefit of industry, FTOs and users. CSIR-NAL is lawfully entitled to enter into any form of **NON-EXCLUSIVE** license agreements with selected manufacturer(s) including the transfer of technology through suitable agreement.

3. BROAD SCOPE OF TECHNOLOGY LICENSING

Subject to the terms and conditions of a license agreement, CSIR-NAL shall grant a non-exclusive License to the **shortlisted firm(s)**, an one time license fee and royalty bearing right and license to use and practice the Technology and PROCESSES (“Licensed Technology”) to manufacture, sell and commercialize the Product (**as indicated in Schedule-A**) in India, including without limitation the right to use and otherwise exploit the Licensed Technology during the Term of this Agreement (“License”).

Aircraft Manufacturers shall quote above the minimum threshold value of License Fee and Royalty fixed by CSIR-NAL for the Hansa-3(NG) aircraft technology as given in **Schedule - B**.

This LICENSE shall be valid from the EFFECTIVE DATE (Date of signing of License Agreement) and subject to covenants and conditions herein contained and shall remain in force for a period of ten (10) years commencing of commercial production with an obligation to pay License fee for transfer of know-how and handholding for technology absorption and Royalty to LICENSOR, after the commercialization of the Product (the “Term”). After 10 years, royalty rate shall be reviewed and decided on mutual consent of parties in light of business experience.

4. MARKET INFORMATION

4.1 Ministry of Civil Aviation has accorded approval for 36 Flight Training Organisations across the country to promote training of young pilots to meet the exponential demand both in India & abroad. It is expected that more than 200 new 2-seater aircraft for commercial pilot training is required by these new FTO’s in the next 6-7 years. CSIR-NAL developed indigenous Hansa-3 (NG) is anticipated to fill the requirement considering its advantages vis-à-vis imported 2-seater trainer aircraft. It is anticipated that Hansa-3 (NG) will be under production for at least next 10-15 years.

4.2 At present, CSIR-NAL has received about 114 Letter of Intent (LOI) for Hansa-3(NG) from 12 FTOs. The requirement of Hansa-3 (NG) is expected to increase with the addition of more number of FTOs, replacement of old trainer aircraft and booming civil aviation market in the country. A tentative immediate requirement of about 15 aircraft for Hansa-3 (NG) is envisaged in the next two (2) years.

4.3 Other applications of Hansa-3 (NG) to be explored by Technology Licensing partner include hobby flying, Civil Survey etc.,

5. BROAD SCOPE OF HANSA-3 (NG) AIRCRAFT PRODUCTION

5.1 Procurement of all raw material, LRUs, standard parts, etc., required for manufacturing and assembly of the aircraft as per the approved SOP / BOM from vendors meeting Aerospace standards along with valid certificates / documents.

5.2 Fabrication of aircraft components as per approved drawings and Standard of Preparation (SOP) supplied by CSIR-NAL, Integration of Airframe components, Equipping & integration of Aircraft, Production flight testing, etc., with required production organization approvals from DGCA.

5.3 After-sales support, Aircraft maintenance / overhaul, Spares, etc., with required DGCA approvals.

5.4 Providing training to the maintenance and flight crew with required DGCA approvals.

5.5 Any other additional requirements for production, flight testing, marketing and after-sales support for HANSA-3(NG) aircraft

Note: A brief description of constructional features of HANSA-3 (NG) aircraft is provided in **Annexure-1**

6. REQUIREMENTS FOR PRODUCTION OF HANSA-3(NG) AIRCRAFT

6.1 Manufacturing facilities for fabrication of Composite & Metallic components

6.2 Requisite Hangar Space for integration & equipping, production flight testing

6.3 JIPREG Machine, Stores, Tool crib, Centralized vacuum facility, compressed air facility, Surface tables for fabrication, Jigs & Fixtures, Tools, Ovens, etc.,

6.4 Required Manpower for production with competence in Composites / metallic manufacturing, Quality Control, Methods, Stores, Aircraft assembly, flight testing, etc.,

6.5 Statutory approvals required for the firms: CAR-21 (Sub-part G) Production Organization Approval, CAR-145 for Maintenance Organization, CAR-147 for Training Organization, etc.,

6.6 If a firm does not have the above facilities and infrastructure, the same shall be set-up within 2 years of signing of the agreement and non-compliance will automatically result in License agreement becomes null and void and any License fee and other fees paid will be forfeited.

Note:

A brief description of Facilities & Infrastructure required for Production of HANSA-3 (NG) aircraft is provided in **Annexure – 2**

7. RESPONSIBILITIES OF CSIR-NAL & TECHNOLOGY LICENSING PARTNER

7.1 The major responsibilities of the Industry Partner as well as CSIR-NAL for this EOI are given as under:

7.1.1 CSIR-NAL's Responsibilities

- a) Handholding in establishing the facility for production, equipping & integration for Hansa-3(NG) at the identified premises of industry partner.
- b) Handholding the successful Technology Licensing firm(s) in obtain statutory approvals required for the firms: CAR-21 (Sub-part G) Production Organization Approval, CAR-145 for Maintenance Organization, CAR-147 for Training Organization, etc.,
- c) Grant of production version of drawings/documents, quality control & maintenance documents, SOPs etc., under NDA/undertaking/Indemnity to enable the Technology Licensing partner to take-on the responsibility of production of the aircraft.
- d) Demonstration of the product and training for production, equipping & integration and flight testing for 1 number of Hansa-3 (NG) aircraft to be manufactured by NAL at its facility and 1 number of Hansa-3(NG) aircraft to be manufactured by the production partner from their orders at their facility.
- e) Beyond handholding for production of 2 aircraft, the expenditure towards training, equipping, integration and flight testing will be charged extra as per CSIR guidelines.

7.1.2 Technology Licensing Partner Responsibilities

- a) The successful Technology Licensing firm(s) should comply and responsible for the clause 5 & 6 in addition the following:

- (i) shall interact and forging partnership with interested Flight Training Organizations (FTO's) in Abroad, subject to Hana-3(NG) aircraft gets international certificate, for securing Purchase Orders directly for the Hansa-3(NG) aircraft. Also workout different business model to aircraft ownership based on the market needs,
- (ii) procurement of all raw material, LRUs, standard parts, etc., required for manufacturing and assembly of the aircraft as per the approved SOP/BOM of CSIR-NAL,
- (iii) engaging & deploying skilled manpower, qualified aircraft engineers, support staff etc., for fabrication of aircraft components, integration of airframe components, equipping & integration of aircraft, production flight testing, etc.,
- (iv) obtain all statutory approvals required for the firms: CAR-21 (Sub-part G) Production Organization Approval, CAR-145 for Maintenance Organization, CAR-147 for Training Organization, etc.,
- (v) paying all taxes & custom duty etc., coordinating & obtaining all necessary certificates, insurance and registration for the produced aircraft with DGCA and other authorities, and
- (vi) delivering the aircraft to the customer/s in airworthy condition with complete after sales product support, warranty, training etc.

7.1.3 Offering CSIR-NAL Facility & Infrastructure for Initial Production of Aircraft

- (i) The offer for the CSIR-NAL facility & Infrastructure will be on **First Come First Serve basis to the firm which gets First Order.**
- (ii) It may be noted that CSIR-NAL's R&D facilities are set-up for fabrication of prototype development for testing/trials under the R&D project/programme and not meant for commercial production/exploitation and/or production supplies. Hence, CSIR-NAL's infrastructure & facilities will be offered to build initial aircraft orders as R&D products up to maximum of two (2) years. The selected firm should set-up required infrastructure and facilities within two (2) years from the date of signing of the agreement as per clause 6.6. The operation and maintenance charges for the facilities will be charged at a mutually agreed concessional rate.
- (iii) Further, initially for a period of two (2) years production tools (moulds)/jigs/fixtures available at CSIR-NAL will be provided to selected partner as mentioned in section (i) above at a mutually agreed concessional

rate. This can be extended for further period on mutually agreeable terms and conditions.

8. INSTRUCTIONS TO PROSPECTIVE TECHNOLOGY LICENSING FIRM(S)

8.1 Documents to Furnish

The Prospective Technology Licensing Firm(s) are requested to go through all pre-qualification requirements, scope of licensing for execution & requirements w.r.t technical / financial capabilities for acceptance and submission of documents for verification by CSIR-NAL.

Documents to be furnished are as follows.

- a. Authorization Letter (Format – 1)
- b. Declaration - Expression of Interest (Format – 2)
- c. Applicant Profile for Technology Transfer (Format-3)
- d. Strength & Merits of the Applicant (Format-4)
- e. Undertaking with regard to Blacklisting (Format-5)
- f. Undertaking with regard to Non-Litigation (Format- 6)
- g. Letter of Compliance for Long-term supply conformity by M/s Rotax (Format-7)
- h. Financial Offer for License fee and Royalty (Format-8)

Additional requirements

- i. EOI document with each page duly stamped and signed by the Authorized signatory.
- j. Supporting documents, as mentioned in Formats 1-8
- k. Latest Certificate of Registration of the Industry
- l. Any other information which Prospective Technology Licensing Firm may like to provide.

CSIR-NAL reserves the right to call for any clarifications confined in the broad scope, wherever such a clarification become necessary for proper judgment in evaluation.

8.2 Rejection Criteria

The application is liable to be rejected if:

- a. The proposal is not submitted as per the requirements indicated in the EOI.
- b. Not in the prescribed format.
- c. Not properly stamped and signed as per requirements.
- d. Received after the expiry of due date and time.
- e. All relevant supporting documents are not furnished with the Pre-

Qualification Criteria (PQC).

- f. The proposal shall be substantially responsive without any material deviation, failing which the proposal shall be summarily rejected.

8.3 Disclaimer

- a. CSIR-NAL may at its discretion or as a result of a query, suggestion, comment of the offerer, may modify the EOI documents by issuing an amendment or a corrigendum at any time before opening the EOI. Any such amendment or corrigendum will be uploaded on CSIR-NAL's website www.nal.res.in and the same will be binding on the all the proponents, as the case may be.
- b. CSIR-NAL at its discretion may extend the due date of submission of EOI and the decision of CSIR-NAL in this respect would be final and binding on the respondents. In the event of changes in the time schedule, CSIR-NAL shall notify the same only through its website www.nal.res.in. Interested respondents are advised to check the above website regularly for corrigendum/addendum, if any which will be published only in the website.
- c. If at any time during the examination, evaluation and comparison of EOI, CSIR-NAL at its discretion can ask the firms for the clarification of its EOI. The request for clarification and the response shall be in writing/email.
- d. All cost and expenses associated with the preparation and submission of EOI response shall be borne by the proponents. CSIR-NAL shall not be responsible for any late receipt of applications for any reasons whatsoever.
- e. No agent/agents or third party/parties are engaged by CSIR-NAL in this process. It is advised to deal directly with CSIR-NAL representative who is signatory to this document.
- f. Conditional offers will be summarily rejected. EOI which is found to be incomplete in content and/or attachments and/or authentication etc., is liable to be rejected. CSIR-NAL reserves the right to reject all applications without assigning any reasons thereof.
- g. CSIR-NAL may relax or waive any of the conditions stipulated in this document as deemed necessary in the best interest of the CSIR-NAL without assigning any reasons thereof.

- h. The Director, CSIR-NAL, Bengaluru reserves the right to accept or reject any or all the prospective EOI Responses in full or part thereof without assigning any reason.

9. EVALUATION METHODOLOGY

Screening of EOIs shall be carried out by a CSIR-NAL Committee constituted by the Director, CSIR-NAL as per Pre-Qualification criteria mentioned in the EOI document and based on verification of documents submitted. Shortlisted Prospective Technology Licensing Firm(s) shall be sent the draft License agreement and sample material for further evaluation.

10. PRE-QUALIFICATION CRITERIA (PQC)

The following will be the minimum PQC. Responses not meeting the minimum PQC will be summarily rejected and will not be evaluated further:

Sl. No.	Pre-Qualification Criteria	Supporting copy of documents Required <i>(All documents must be self- attested by the Authorized person of the Prospective Technology Licensing Firm(s))</i>
1	The Prospective Technology Licensing Firm(s) shall be a legal entity, registered as a Company/LLP/Society/ partnership firm/ proprietorship firm under respective acts in India.	Company Incorporation Certificate from ROC/Partnership deed etc.
2	The Prospective Technology Licensing Firm(s) must be registered in India with taxation and other administrative authorities.	GST Registration or GST exemption certificate/ PAN Card
3	The Prospective Technology Licensing Firm(s) should have manufactured the relevant products for at least in three (3) immediate preceding years.	Pamphlet / brochure of the product
4	The Prospective Technology Licensing Firm(s) has to be financially sound in three (3) immediate preceding years.	Certificate from the Chartered Accountant of the Organization/ Audited Balance sheets for last three financial years or Income Tax return.

5	The Prospective Technology Licensing Firm(s) should have a registered office and a manufacturing Unit in India	Registration copies of both
6	Capacity & skill set to produce, market and after sales support	Applicant profile for Technology Transfer (Format -3)
7	Strength & Merits of the Prospective Technology Licensing Firm(s)	As per Format -4
8	The Prospective Technology Licensing Firm(s) should not be involved in any major litigation that may have an impact of affecting or compromising the conditions required under this EOI and in the agreement.	Undertaking on Prospective Technology Licensing Firm Letter Head, duly signed and stamped by the Authorized Signatory (As per format – 6)
9	Obtaining letter of compliance from Engine OEM M/s Rotax for long term supply of engine to the Firm	Prospective Technology Licensing Firm shall submit the letter of compliance for long term supplies of engine to the firm for production of Hansa-3(NG) from M/s Rotax (As per format – 7)
10	License Fee and royalty for the use of technology	Prospective Technology Licensing Firm shall maintain the dignity of threshold value given for the authorized use of technology and shall quote considering these benchmark values. (As per format – 8)
11	Any accredited & ISO certifications	Respective certifications copies to be submitted

In case of any clarification required, please contact:

1. Mr. R Venkatesh
Head, PBMD
CSIR-National Aerospace Laboratories
HAL Airport Road, Kodihalli
Bengaluru-560017
Tel-080-25086130
Email: rvenkatesh@nal.res.in
2. Mr Abbani Rinku
PD- Hansa
CSIR-National Aerospace Laboratories
HAL Airport Road, Kodihalli
Bengaluru-560017
Tel-080-25086813
Email: rinku@nal.res.in

Authorization Letter

(To be submitted on Firm's Letter Head)

To,

Director,
CSIR-NAL, HAL Airport Road,
Kodihalli, Bangalore- 560017.

Subject: Letter for Authorized Signatory

Ref. No. Ref: EOI No.dated 2024

Sir,

This has reference to your above mentioned Expression of Interest (EOI)
for

Mr./Miss/Mrs/Dr _____ is hereby
authorized to submit the EOI documents and participate in the processing on
behalf of M/s _____(Firm
Name).

The specimen signature is attested below:

Name: _____

(Specimen Signature of Representative)

Yours faithfully,

(Signature of the Authorized
signatory)

Name:

Designation:

Seal :

Date:

Place:

Expression of Interest

(To be submitted on Firm's Letter Head)

To

Director,

CSIR-NAL, HAL Airport Road,

Kodihalli, Bangalore- 560017.

Subject: Submission of Expression of Interest (EOI) for Transfer of
technology on.....

Ref: EOI No.dated

Sir,

The undersigned having read and examined in detail all the EOI documents pertaining to your transfer of technology, do hereby express the interest to undertake the manufacture of the product as mentioned in the EOI document. The details of the Company and contact person are given below:

1	Name of the Proponent	
2	Address	
3	Name, designation & address of the person to whom all references shall be made	
4	Telephone No. (with STD code)	
5	Mobile No. of the contact person	
6	Email ID of the contact person	

The following documents are enclosed:

Sl. No.	Documents required	Type of document attached	Page No.
1	Company Incorporation Certificate from ROC/start up/Partnership deed		
2	GST Registration or GST exemption certificate/ PAN Card.		
3	Pamphlet or Brochure		
4	Certificate from the Chartered Accountant of the Organization/Audited Balance sheets for last three financial years, Income Tax return.		
6	Proof of a registered office and a manufacturing Unit in India.		
7	Authorization Letter	As per format – 1	
8	Expression of Interest	As per format – 2	
9.	Applicant Profile for Technology Transfer	As per format – 3	
10.	Strength & Merits of the Applicant	As per format - 4	
9	Undertaking on the Letter Head regard to black listing	As per format – 5	

10	Undertaking with regard to Non-Litigation	As per format – 6	
11	Letter of Compliance for Long-term supply conformity by M/s Rotax	As per format - 7	
12	Financial Offer for License Fee and Royalty Offer	As per format – 8	
13	Any accredited & ISO certifications (If applicable)		

I/we hereby declare that my/our EOI is made in good faith and the information contained is true and correct to the best of my/our knowledge and belief.

Thanking you,

Yours faithfully,

(Signature of the Authorized signatory)

Name:

Designation:

Seal:

Place:

Applicant Profile for Technology Transfer*(To be submitted on Firm's Letter Head)*

1. Organizations interested in seeking technology from the laboratory may kindly provide background information on their organization/experience. This information will help CSIR-NAL to identify the suitable industry partner for technology transfer.
2. Kindly attach copies of **annual report, product brochures/ pamphlets** and any other relevant information along with this form. Add additional sheets if needed.

Sl. No	Organization Background & Experience/Expertise/Facilities
1.	Please state nature and details of business carried out at present (please add separately, if needed)
2.	Major products/brands with market share
3.	Company's marketing set-up and plans for marketing the products (domestic & exports)

4.	Company's manufacturing set-up/strength with brief description of facilities/equipment/processes handled
5.	Company's human resources and highlight qualification/experience of key technical and managerial
6.	Company's R&D set-up/strength/technology tie-up with other organizations
7.	Company's experience in commercializing technology/technology absorption
8.	Company's experience in aircraft manufacturing and allied technologies

9.	Company's set-up on technical assistance & after sales support to clients
10.	Please highlight any other relevant information such as synergy in technology or marketing of the product on offer

I/we hereby declare that information given above is true and correct to the best of my/our knowledge and belief.

Thanking you,

Yours faithfully,

(Signature of the Authorized signatory)

Name:

Designation:

Seal:

Date:

Place:

Strengths & Merits of the Applicant

(To be submitted on Firm's Letter Head)

The following details may be submitted by the applicant to highlight the strength and merits of applicant. Attach additional sheet, if required.

1. Do you have the necessary/related manufacturing facility that may be required for the technology/product selected? Yes / No

If yes provide details

2. If No, what is your strategy for manufacturing set up with time limit as specified in EOI?

Provide infrastructure & facility setting-up plan within 2- years from the date of signing the agreement

4. Do you have any experience in manufacturing and/or marketing of products of this kind? Yes /No

5. If Yes, kindly share the details

6. If No, kindly share your plan of action in accomplishing the technology commercialization of this technology.

7. What is your plan for scaling up?

8. How will the after sales & MRO will be undertaken?

9. What support do you anticipate from CSIR-NAL?

I/we hereby declare that information given above is true and correct to the best of my/our knowledge and belief.

Thanking you,

Yours faithfully,

(Signature of the Authorized signatory)

Name:

Designation:

Seal:

Date:

Place:

Undertaking with regard to blacklisting

(To be submitted on Firm's Letter Head)

To,

Director,
CSIR-NAL, HAL Airport Road,
Kodihalli, Bangalore- 560017.

Subject: Undertaking regarding Blacklisting / Non-Debarment

Ref. No. Ref: EOI No.dated..... 2024

Sir,

It is hereby confirmed and declared that M/s _____ is
Not blacklisted/debarred by any Government Department/Public Sector
Undertaking/Private Sector/or any other agency for which
works/assignments/services have been executed / undertaken.

Yours faithfully,

(Signature of the Authorised signatory)

Name:

Designation:

Seal:

Date:

Place:

Undertaking with regard to Non-Litigation

(To be submitted on Firm's Letter Head)

To,
Director,
CSIR-NAL, HAL Airport Road,
Kodihalli, Bangalore- 560017.

Subject: Undertaking regarding Litigation

Ref. No. Ref: EOI No.dated.....2024

Sir,

It is hereby confirmed and declared that M/s -----,
does not have any litigation / arbitration history with any Government
department/ Public Sector Undertaking/ / or any other public authority with
which any MoU was / has been executed / undertaken.

Yours faithfully,

(Signature of the Authorized signatory)

Name:

Designation:

Seal:

Date:

Place:

Letter of Compliance for Long-term supply conformity by M/s Rotax

(To be submitted on Firm's Letter Head)

To,

Director,
CSIR-NAL, HAL Airport Road,
Kodihalli, Bangalore- 560017.

Subject: Undertaking and submission LOC from M/s Rotax

Ref. No. Ref: EOI No.dated..... 2024

Sir,

It is hereby confirmed and declared that M/s Rotax has been contacted for long term supply of engine to Hansa-3(NG) aircraft as a Technology Licensing partner. M/s Rotax has issued Letter of Compliance (LOC) dt.. _____ is attached herewith for your consideration

Yours faithfully,

(Signature of the Authorized signatory)

Name:

Designation:

Seal:

Date:

Place:

Note: For any clarification required on Format-7, kindly contact Head-PBMD.

Financial Offer to License Fee and Royalty

(To be submitted on Firm's Letter Head)

To,
Director,
CSIR-NAL, HAL Airport Road,
Kodihalli, Bangalore- 560017.

Subject: Undertaking for License Fee and Royalty

Ref. No. Ref: EOI No.dated.....2024

Sir,

It is hereby confirmed that M/s -----, agrees to pay a License feeand Royalty of --- % (in words---) on Net Sales to the CSIR-NAL, as per the terms for the Transfer of Technology for Hansa-3(NG) aircraft.

Yours faithfully,

(Signature of the Authorized signatory)

Name:

Designation:

Seal:

Date:

Place:

Note: Refer Schedule B for threshold limit of License Fee & Royalty

SCHEDULE – A

Annexure -1

TECHNOLOGY PROFILE OF HANSA-3 (NG)

1.	Title of Technology (Product/Process/Design/Equipment)	HANSA-3 (NG) All composite Aircraft Refer to enclosed HANSA-3 (NG) Aircraft brochure
2.	Brief Description	HANSA-3 (NG) is a two seat, all composite, low wing monoplane (single-piece wing), single engine light aircraft designed for ab-initio flying training with maximum All-Up Weight of 750 kg, type certified by DGCA under JAR-VLA category & cleared for Day - VFR and Night - VFR operations.
3.	Year of Certification	2023
4.	Application/Uses in various sectors	Ab-initio pilot training, Hobby flying, Reconnaissance survey, disaster management, etc.,
5.	Unique Technical Features	<ul style="list-style-type: none">a) Glass Cockpitb) Advanced Fuel Efficient Engine along with Improved Cowl Designc) Increased Endurance & Ranged) Improved Cockpit Ingress/Egresse) Electrically Operated Flapsf) Better Cockpit Aesthetics & Ergonomicsg) Improved Manufacturing Process - Better Production Rate
6.	TRL	8

7.	Major Plant Equipment and Machinery Required	<ul style="list-style-type: none"> a) Manufacturing facilities for fabrication of Composite & Metallic components b) Requisite Hangar Space for integration & equipping production flight testing c) JIPREG Machine, Stores, Tool crib, Centralized va facility, compressed air facility, Surface tables for fabrication, Jigs & Fixtures, Tools, Ovens, etc., d) Required Manpower for production with competen Composites / metallic manufacturing, Quality Cont Methods, Stores, Aircraft assembly, flight testing, e e) Statutory approvals required for the firms: CAR-21 part G) Production Organization Approval, CAR-14 Maintenance Organization, CAR-147 for Training Organization, etc.,
8.	Market size / volume	Estimated to be about 200 aircraft in India plus overseas market to be explored
9.	Major Raw Materials to be Utilized	Polymeric epoxy resin system, PVC foam, Glass fabric, Carbon fabric, aircraft plywood, Aluminium 2024 T3, etc.,
10.	Commercialization and Type of License (exclusive or non-exclusive)	Non-exclusive License for sale of product in India as per Govt. of India guidelines.
11.	Existing Product/Process (Available in Market)	Diamond DA20, AQUILLA A211, Tecnam P2002-JF, TECNAM P-Mentor, Sonaca S-200
12.	Techno-Economics (Benefits) in comparison to existing product/process.	<ul style="list-style-type: none"> a) Marks its presence in the Small aircraft market in India which is currently dominated by foreign players b) Caters to the ever-increasing demand for pilot training c) Excellent replacement for old aircraft currently in use at various FTOs in India. Catalyzes the development of wide variety of small and medium scale private entrepreneurs for producing airworthy components apart from creating job opportunities in various disciplines of aircraft building and AME training. d) Cost-effective and affordable trainer aircraft.

HANSA-3 (NG) Aircraft Developed at CSIR-NAL





Brief description of constructional features of HANSA-3 (NG) aircraft

1.1 HANSA-3 (NG) AIRCRAFT OVERVIEW:

HANSA-3 (NG) is a two seat, all composite, low wing monoplane (single-piece wing), single engine light aircraft designed for ab-initio flying training with maximum All-Up Weight of 750 kg under JAR-VLA category.

1.2 Details of Aircraft Structure & Components

HANSA-3 (NG) airframe is of sandwich construction with PVC foam core and bi-directional 4MIL glass layer face sheets along with the use of unidirectional carbon layer at high stress areas such as wing spar caps, fuselage longerons, etc. A state-of-the-art technology of Just-in-time Prepreg (JIPREG) manufacturing process with controlled resin & hardener application is used for composite fabrication. The aircraft is equipped with a fixed one-piece spring steel main landing gear strut and a free caster / steerable type nose landing gear (NLG). There are two separate side-by-side seats for the pilot and the occupant with a full bubble canopy opening towards the front and a rear window on either side. The aircraft is powered by an advanced, fuel-efficient, 4-cylinder, 4-stroke liquid/air cooled engine along with a propeller. A single non-metallic tank is provided at the aft of pilot seats in the fuselage with 95 litres of usable fuel capacity. The primary control surfaces, viz, elevator, aileron and rudder are manually operated whereas, the flaps and elevator trim-tabs are electrically controlled.

All the mechanical systems (viz., flight controls, electrical system, fuel & power plant system installations) components are made out of typical aircraft materials like Aluminum 2024 alloy & CM steel and are formed/machined/welded.

The three-view diagram of HANSA-3 (NG) aircraft is shown in **Figure-1**. The constructional features of the aircraft are summarized in **Figure-2**.

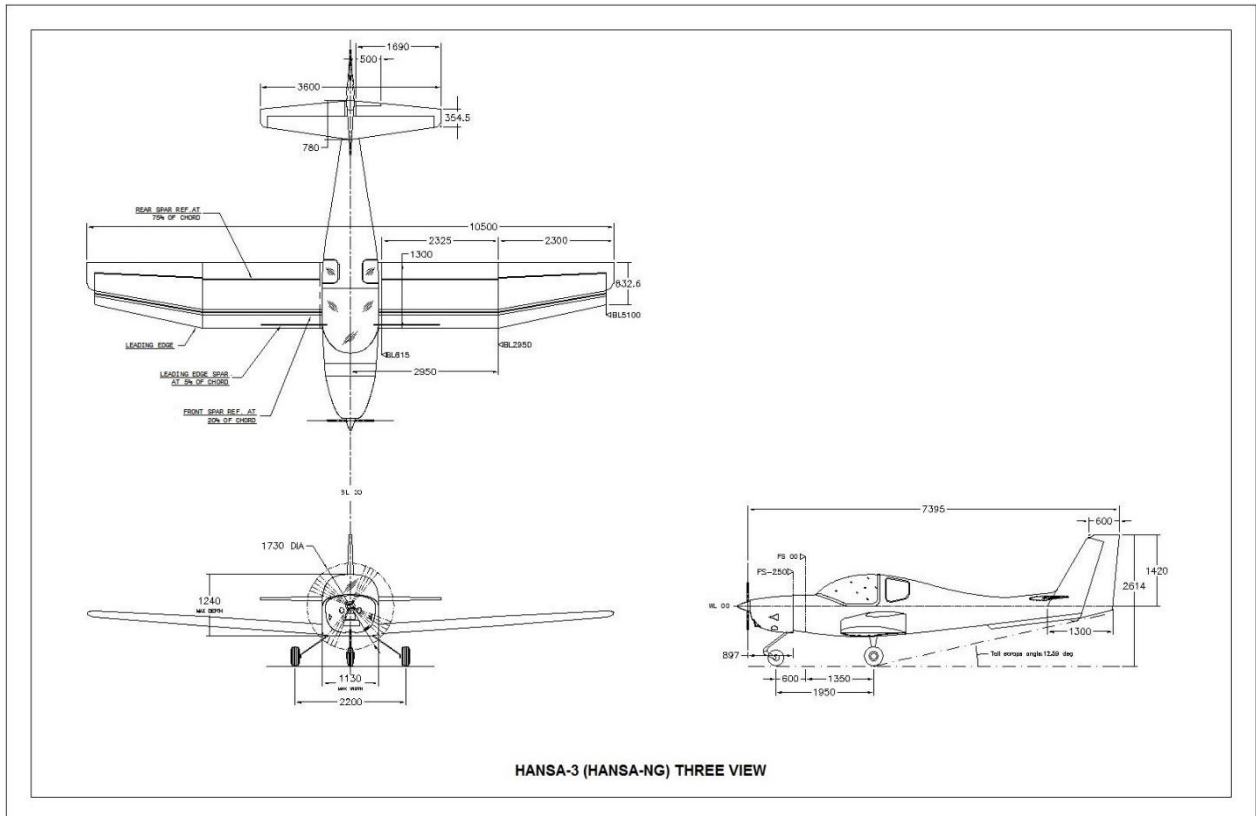


Figure-1: HANSA-3 (NG) three view drawing

<p>WINGS</p> <ul style="list-style-type: none"> * SINGLE PIECE * THREE SPAR STRUCTURE * SANDWICH SPAR SHEAR WEBS * SANDWICH SKINS 	<p>AILERONS</p> <ul style="list-style-type: none"> * PIANO-HINGED * GLASS-EPOXY SANDWICH SKIN * SINGLE SPAR * SANDWICH SHEAR WEB & RIBS 	<p>LANDING GEAR</p> <ul style="list-style-type: none"> * NON-RETRACTABLE TRICYCLE
<p>MAIN SPAR</p> <ul style="list-style-type: none"> * I-SECTION * CARBON SPAR CAPS 	<p>FUSELAGE</p> <ul style="list-style-type: none"> * COMPOSITE SANDWICH SHELL + BULKHEADS & FRAMES 	<p>MAIN GEAR</p> <ul style="list-style-type: none"> * SINGLE STEEL SPRING MOUNTED ON WING WITH HYDRAULIC BRAKES.
<p>REAR SPAR:</p> <ul style="list-style-type: none"> * FOAM SANDWICH SHEAR WEB * ATTACHMENT: ONE BOLT TO FUSELAGE BULKHEAD 		<p>NOSE GEAR</p> <ul style="list-style-type: none"> * FREE CASTER TYPE NOSE GEAR MOUNTED ON FIREWALL
<p>LEADING EDGE SPAR</p> <ul style="list-style-type: none"> * FOAM SANDWICH SHEAR WEB * ATTACHMENT: ONE BOLT TO FUSELAGE BULKHEAD 		<p>RUDDER AND ELEVATOR</p> <ul style="list-style-type: none"> * GLASS-EPOXY SKIN * SINGLE SPAR * SANDWICH SHEAR WEB & RIBS
<p>FLAPS</p> <ul style="list-style-type: none"> * GLASS - EPOXY SKIN * SINGLE SPAR * HINGED, SLOTTED FLAP 	<p>COWLING</p> <ul style="list-style-type: none"> * GLASS-EPOXY PANEL 	<p>FIN AND STABILIZER</p> <ul style="list-style-type: none"> * TWO SPARS * SANDWICH SPAR WEBS, SKIN & RIBS. <p><i>NOTE: SANDWICH HAS PVC FOAM CORE</i></p>
	<p>FAIRINGS</p> <ul style="list-style-type: none"> * GLASS-EPOXY PANEL 	

Figure-2: Constructional features of HANSA-3 (NG) Aircraft

The main features of airframe components like Fuselage, Wing and Empennage are highlighted below:

1.2.1 Fuselage Structure

The HANSA-3 (NG) fuselage is of sandwich construction with PVC foam core and bi-directional 4MIL glass layer face sheets. It consists of 12 Bulkheads distributed across the length as shown in **Figure-3**. Wing is attached to the centre fuselage while, HT and VT are attached at the rear fuselage. The engine and nose landing gear (NLG) are attached at the front fuselage. The fuselage also supports the fuel tank. The canopy opens to the front. Four longerons (Two per side), made of carbon composite, are located along the length of the fuselage.

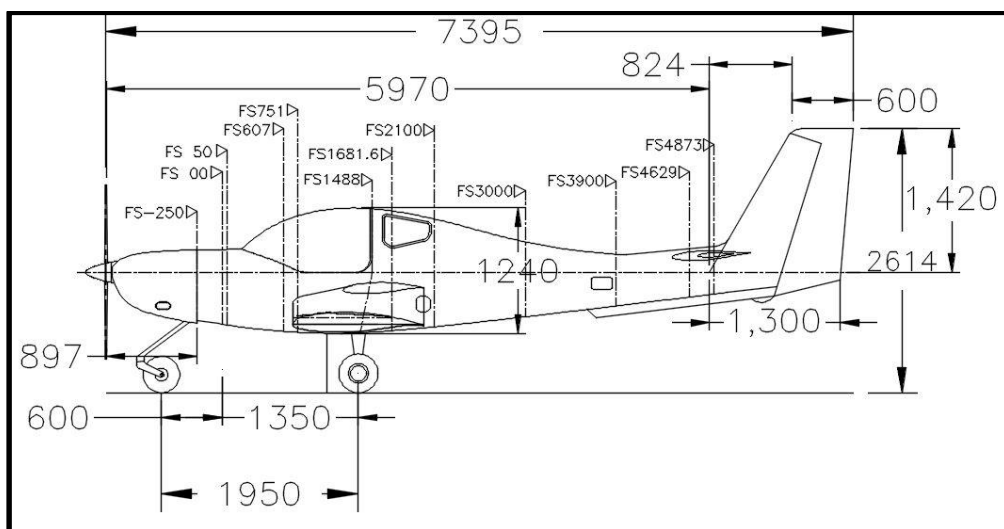


Figure-3: HANSA-3 (NG) Fuselage structure

1.2.2 Wing, Aileron & Flap Structures

HANSA-3 (NG) aircraft wing is a multi-spar, multi-rib structure with completely bonded construction. The total length of the wing is ~ 10.5 meters. Constructional features of the wing are shown in **Figure-4**.

Wing structure is basically a composite sandwich structure. PVC foam is used as core material with glass-epoxy composite as face sheet to form the sandwich construction. Spar caps are made of carbon-epoxy composite material with monolithic construction. Wing structure consists of top shell and bottom shell held together with spar and rib sub-structure. Totally two main spars, three auxiliary spars and 9 ribs are on each wing. Flaps and Ailerons are attached on the trailing edge of the wing. Flap and aileron structure also consists of top shell and bottom shell held together with spar and rib sub-structure similar to main wing. Main landing gear (MLG) is attached near the wing root.

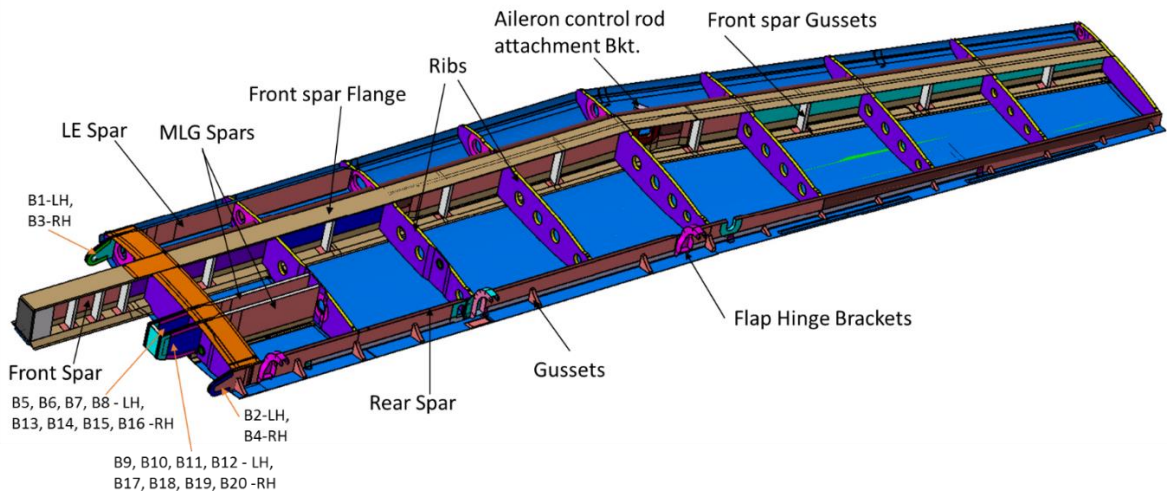


Figure-4: Wing constructional details

(one half of the wing is shown for ref. details are typical on other half of wing)

1.2.3 Empennage Structure

The empennage of HANSA-3 (NG) aircraft consists of Horizontal Tail (HT) and Vertical Tail (VT). HT contains Horizontal Stabilizer (HS) and Elevator whereas VT contains Fin and Rudder. These are multi-spar, multi-rib structures, wherein PVC foam is used as core material with glass epoxy composite as face sheets. The total length of HT is ~ 3.6 meters. The total height of VT is ~ 1.6 meters. The constructional features of HS and Fin are shown in **Figure-5 & Figure -6**.

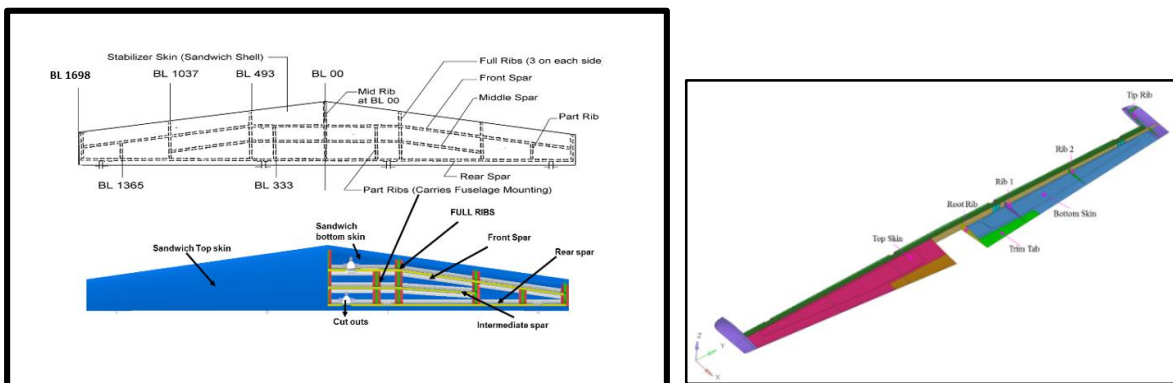


Figure-5: Schematic of Horizontal Stabilizer (HS) & Elevator

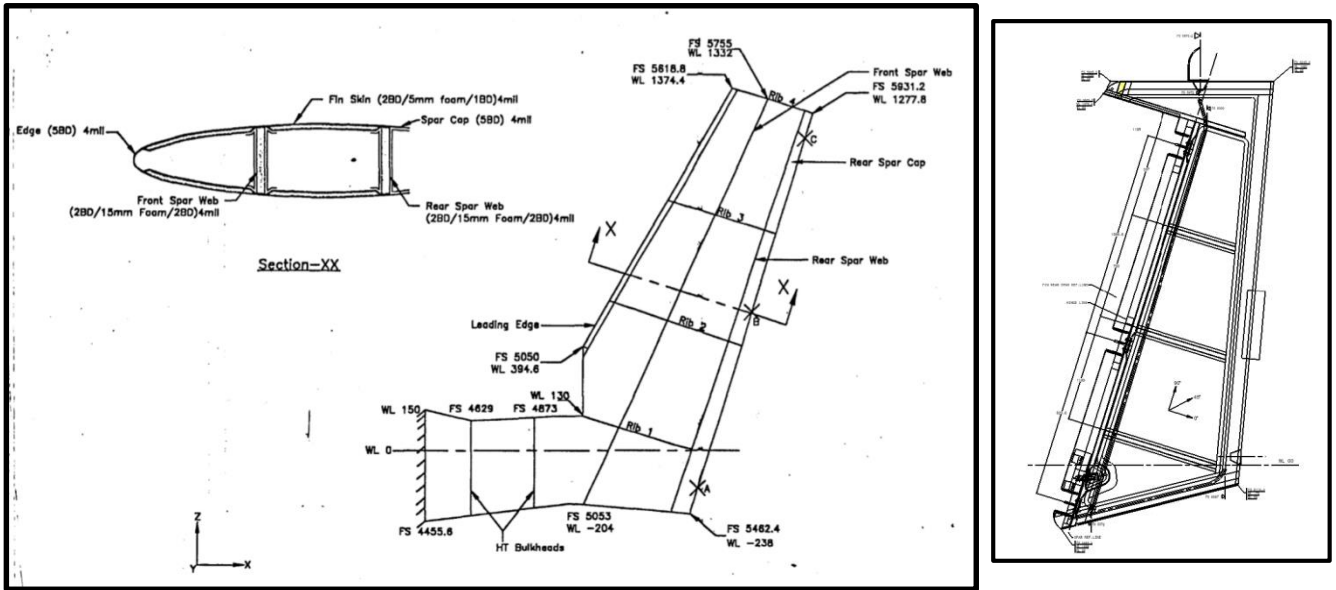


Figure-6: Schematic of Fin & Rudder

1.3 Aircraft systems

1.3.1 Landing Gear & Brake System

HANSA-3 (NG) aircraft is equipped with a fixed tricycle type landing gear. Main landing gear (MLG) is of leaf spring strut type formed out of low alloy steel, which functions as a shock absorber. The main wheels attached to leaf spring strut are fitted with hydraulic powered, manual toe-operated external caliper-type disc brakes. Free caster type / steerable Nose landing gear (NLG) is made out of CM steel.

1.3.2 Flight Control Systems

The primary flight controls are of dual control type, all-mechanical, maintenance-friendly and manually operated. The displacement of pilot controls in the cockpit is transmitted to the respective control surface through a combination of torque tube, bell crank levers and push-pull rod system. Single slotted flaps provided at the inboard end of the wings are electrically operated. Flight control system parts are made out of CM steel/ Aluminium alloys.

1.3.3 Power Plant & Fuel System Installations

Engine mount assembly which supports the engine, is a welded tubular structure made up of standard CM steel. A single non-metallic tank is provided at the aft of pilot seats in the fuselage with 95 litres of usable fuel capacity. The components like, fittings, installation brackets, pipe lines etc. of the power plant and fuel system are made out of Aluminium alloy/CM steel. The air-intake, coolant ducts and cowling are of monolithic composite construction using bi-directional 4MIL glass layers and vinyl ester resin system.

1.3.4 Electrical & Avionics System Installations

The main instrument panel which houses the glass cockpit instruments (PFDs, EMU, NAV/COM/GPS, AMU, Transponder, Compass, Switches, CBs, etc.) is made out of Aluminium alloy sheet reinforced with stiffening angles on aft side. Brackets and fittings for other installations viz., battery, lights, ELT, relay panel, etc. are formed sections and are made out of Aluminium alloy.

For further details, refer to enclosed HANSA-3 (NG) Aircraft Brochure

1. Manpower for Production (Indicative purpose only, firm to assess the manpower requirement)

Execution of Hansa-NG production program involves different type of functions to be performed by experienced and skilled manpower. Majority of human resources identified are to be earmarked in relevant areas and facilitate with specific training in order to build appropriate ecosystem in place. The human resources identified are mandatorily to be qualified by DGCA to perform the assigned task. Though, four key managers are identified

at top level of project execution team, the associated chains of responsibilities shall be clearly established to enable the whole team to focus on their defined task. Manpower requirement envisaged for the production of Hansa-NG, **6 - 8 a/c per year** is summarised below.

Sl. No	Area / Domain	Projected Manpower	
		Executives	Technicians
Production:			
1	MR(Production)	01	-
2	DLME	02	04
3	IMM & Sourcing	01	01
5	Fabrication - Composites	03	25
6	Fabrication - Metallic	02	05
7	Machining - Metallic components		03
8	Quality - Composites	03	-
9	Quality - Metallic		-
10	Subassemblies	01	02
11	Progress & Stores	01	01
Equip & Integration:			
14	Airframe & Controls	03	02
15	Powerplant		02
16	Avionics		02
17	Electrical		02
18	Landing Gear & Brake System		02
19	Inspectors		04
20	Ground Run	01	-
21	Test Pilot	01	-
Quality & Training:			
20	Quality Control - MR(QC)	01	-
21	Quality Assurance - MR(QA)	01	-
Total		21	55

Personnel involved in various functions of production will be trained by NAL. A special training on chargeable basis will be provided to personnel associated for preparation of POA. This training is based on CAR-21 requirements to cover following.

- Human Factors
- Safety Management System
- Production Readiness
- Preparation of Department Manuals
- Preparation of process specifications
- Vendor assessment and approval
- Audit documents
- Certificate of Airworthiness (COA)
- Role of AME's post award of COA

Facilities & Infrastructure required for HANSA-3 (NG) Production

2.1.1 Composite Manufacturing Facility:

The minimum major facilities with Production Organization Approval (POA) from the Directorate General of Civil Aviation (DGCA) for manufacture of HANSA-3 (NG) Airframe is provided below.

The major facilities are listed below:

- (1) JIPREG facility where prepregs are produced “just-in-time”, for fabrication purpose. (Fig 1)
- (2) Fabrication facility/Hangar spaces along with all the airframe moulds related to HANSA-3 (NG), where the prepregs are laid on the moulds and cured under vacuum (Fig. 2).
- (3) Large Air circulating oven to post cure the HANSA-3 (NG) airframe components (Fig.3).
- (4) Assembly jig for integration of HANSA-3 (NG) Airframe components (Fig.4).
- (5) Storage Facility viz., Bonded Stores for Raw materials and Tool-crib for requisite tools.
- (6) Centralized compressed air facility to cater to JIPREG machine, pneumatic tools etc.
- (7) Centralized vacuum facility for composite fabrication.
- (8) Miscellaneous facilities such as measuring and monitoring equipment, Woodpecker NDT equipment, process area, utility plant, electrical substation, effluent treatment plant, firefighting system etc.



Figure 1: JIPREG Facility

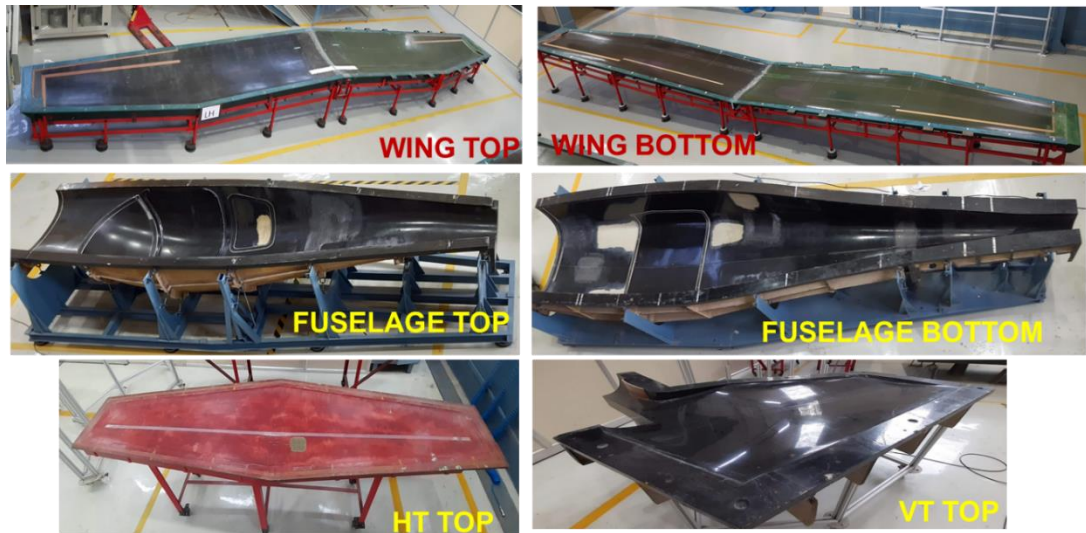


Figure 2: Moulds for Composite Part Fabrication



Figure 3: Oven for Post curing

Chamber dimensions 11.5 M x 2.5 M x 2.0 M



Figure 4: Assembly Jig

2.1.2 Assembly, Integration and Equipping Facilities

- a) Aircraft Hangar with a floor area of ~ 800 Sq. meters (which can accommodate 3 HANSA aircraft assemblies at a time).
- b) Jigs & Fixtures for various mechanical systems
- c) Supporting Fixtures for airframe assembly
- d) Tool-crib
- e) Bonded Stores to store finished parts
- f) Storage space for raw materials
- g) Pneumatic facility for assembly

SCHEDULE – B

Threshold Limit of License Fee & Royalty Fixed by CSIR-NAL

Sr.No	Title of Technology	Threshold License Fee and Payment Schedule	Threshold Royalty	Other Terms of Licensing
1	Hansa-3(NG) Two-seater Trainer Aircraft for Series Production, Marketing & After Sales Support for Flight Training & Allied Applications	Rs. 765 Lakhs plus applicable taxes	Royalty at 2 % of sale price of the aircraft plus applicable taxes	<p>i. Non-Exclusive Licensing</p> <p>ii. Background IP rights rests with CSIR-NAL</p> <p>Payment Schedule of License Fee:</p> <p>a. 20% on or before signing of the license agreement</p> <p>b. 30% on or before handing over of Technology Licensing documents</p> <p>c. 30% before training and handholding for 2 aircraft (1 a/c at CSIR-NAL facility & 1 a/c at Technology Licensing partner facility)</p> <p>d. 20 % on mutually agreeable terms and conditions linked to sale of aircraft</p>

Note:

1. Applicant shall quote not below the threshold limits in their offer in Format 8
2. All royalty payment shall carry applicable taxes.

Hansa-3(NG) TC&TCDS



सत्यमेव जयते

नागर विमानन महानिदेशालय

भारत

Directorate General of Civil Aviation
India

टाइप प्रमाणपत्र /TYPE CERTIFICATE

7-12/94-आरडी-1/7-12/94-RD-1

वायुयान नियमावली, 1937 के नियम 49 तथा नागर विमानन अपेक्षाएँ 21 के उप भाग 'बी' के आलोक में यह प्रमाण पत्र निम्नलिखित को जारी किया जाता है/ Pursuant to Rule 49 of The Aircraft Rules, 1937 and CAR 21, Subpart B this Type Certificate is issued to

राष्ट्रीय वांतरिक्ष प्रयोगशालाएँ (एनएएल), बेंगलूर National Aerospace Laboratories (NAL), Bengaluru

हंस-3 के टाइप डिजाइन के लिए/ for type design of Hansa-3

वायुयान का मॉडल/ Airplane Models:

(a) हंस-3/ Hansa-3

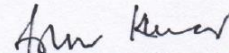
(b) हंस-3 (एनजी)/ Hansa-3(NG).

टाइप डिजाइन, प्रचालन सीमाएँ, टाइप प्रमाणन आधार एवं पर्यावरण संरक्षण अपेक्षाओं का विवरण टाइप प्रमाण पत्र डाटा शीट सं. 7-12/94-आरडी-1 में विनिर्दिष्ट है/Details of the type design, operating limitations, type certification basis and environmental protection requirements are specified in the Type Certificate Data Sheet No. 7-12/94-RD-1.

यह टाइप प्रमाण पत्र तथा टाइप प्रमाण पत्र डाटा शीट जो इसका हिस्सा है, वापस करने, निलंबित या निरस्त होने तक प्रभावी रहेगा/This certificate and the Type Certificate Data Sheet which is a part thereof, shall remain in effect until surrendered, suspended or revoked.

पुनः जारी करने की तिथि/Date of Re-issuance: 20 फरवरी/ 20 February, 2023

प्रारम्भिक जारी करने की तिथि/Date of Initial Issuance: 01 फरवरी/February, 2000


(अरुण कुमार/ Arun Kumar)

महानिदेशक/ Director General

नागर विमानन महानिदेशालय (डीजीसीए) - भारत। सर्वाधिकार सुरक्षित। मालिकाना दस्तावेज़।
Directorate General of Civil Aviation (DGCA)-India .All rights reserved. Proprietary document.

Annexure-4: Product Brochure

HANSA-NG



AIRFRAME & COCKPIT

With a full bubble canopy, offering easy cockpit ingress/egress, dual controls with control-stick, rudder pedals and push-pull rods and comfortable seats, the HANSA-NG aircraft definitely is best in its class. With excellent flying characteristics, having a sealevel climb rate of 570 fpm, a cruise of over 100 KCAS, and a take-off distance close to 1,600 feet over a 50 foot obstacle, HANSA-NG offers excellent performance. With a slow 42 KCAS stall speed, the HANSA-NG is stable and has good flying qualities.

With all Glass Cockpit and cabin width of 43 inches HANSA-NG offers comfortable seating with ergonomically designed seats to fit tall as well as shorter pilots/occupants equally well. With low wing, bubble canopy along with rear windows offers excellent view of the surroundings to pilot for comfortable flight. Ample storage space in the cockpit for baggage.

Advanced composite materials and latest manufacturing techniques offers smooth contour and excellent surface finish resulting in lower drag. Infinite airframe life, minimum maintenance & easy to repair in case of any damage. With a coat of conductive paint and lightning protection offers protection from adverse weather conditions. The airframe is modular; control surfaces to entire wings and other major assemblies can be replaced individually, in case of damage.

Rugged spring steel main landing gear and elastomeric shock nose landing gear are tough enough for flight training and are virtually maintenance free. It comes with optional steerable oleo type nose gear.

The optimized new cowling offers improved cooling in hot weather and reduces drag while improving access to the powerplant.





AVIONICS

HANSA-NG offers advanced digital display (glass cockpit) system using certified instruments. Two PFDs conveniently located along with independent sensors and inbuilt redundant power supply offers reliable flight parameters at all times. Centrally located Digital Engine Display unit offers engine parameters with inbuilt caution/warning panel ensures safe operation of engine.

NAV/COM/GPS with touch screen, moving map, FMS, ILS and ADS-B out, Secondary COM, AMU & MODE-S TRANSPONDER offers best in class avionics. Equipped with ELT to meet regulatory requirements.



PROPULSION

Advanced fuel injected Rotax 912 iSc3 Sport engine having best in class fuel efficiency along with light weight 2-bladed composite propeller. The engine installation is designed for durability and easy maintenance, easy access to filters and regular maintenance items, and quickly removable cowlings.

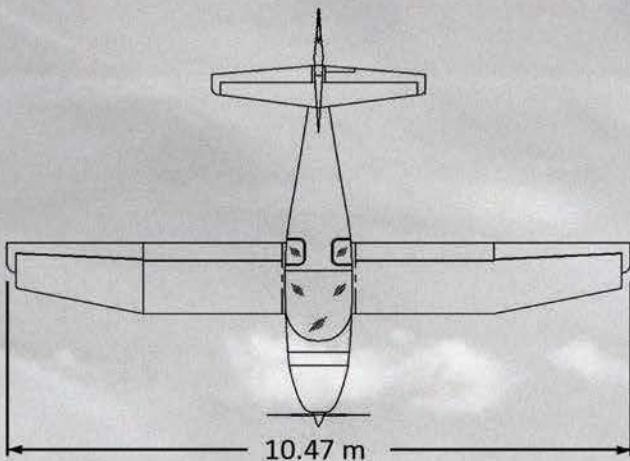
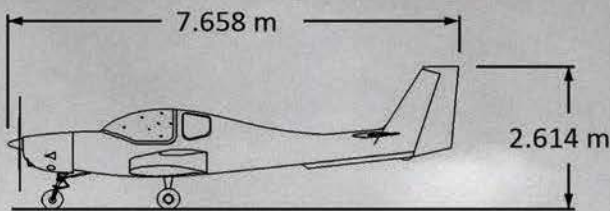


STANDARD FEATURES & OPTIONS



AIRFRAME & SYSTEMS

- All composite airframe structure
- Fixed leaf spring main landing gear
- Fixedfree castor type nose landing gear with elastomeric shock absorber
- Hydraulic Powered Disc Brakes
- Electric flap
- 43 inch wide cabin
- Bubble canopy
- Composite fuel tank
- Adjustable rudder pedals
- 13.2V Li-on batteries with integrated BMS
- Landing and taxi lights
- LED position lights
- Cabin lights
- Lightning protected
- Baggage compartment



POWERPLANT

- Rotax 912 iSc3 Sport engine
- Composite 2-bladed variable pitch MT Propeller
- Fuel: AVGAS 100 LL / MOGAS (Under Certification)
- Max. Usable Fuel: 95 lts (25.1 US Gallons)

WEIGHTS

- Max Takeoff Weight : 750 kg
- Max Landing Weight : 750 kg
- Standard Empty Weight : 550 kg
- Useful Load : 200 kg
- Max Fuel Weight : 69 kg
- Full Fuel Payload : 131 kg
- Max Baggage : 10 kg



AVIONICS

- Dual EFD 1000 Pro Primary Flight Display (PFD)
- Stock RS Flight System EMU 912 iS
- AVIDYNE IFD 440 NAV/COM/GPS with ADS-B out enabled
- GARMIN GTR 225A (Secondary COM)
- AVIDYNE AXP340 Transponder
- AVIDYNE AMX 240 Audio Management Unit
- 406 MHz ELT
- Certified to DAY & NIGHT VFR

OPTIONAL FEATURES

- Steerable Oleo Nose landing gear (Under Certification)



SPEEDS

- V_{so} : 42 KCAS
- V_{S1} : 47 KCAS
- V_{ne} : 127KCAS
- V_h : 110 KCAS
- V_A : 90 KCAS
- V_{fe} : 72 KCAS

CRUISE PERFORMANCE

Max Speed 100 KTAS @ Sea Level, ISA

Cruise Speed 85 KTAS @ 8000 ft, ISA+15°C

Max Endurance @ 8000 ft & ISA

Single Pilot : 7 hrs + 30 min reserve @ 4300 rpm

Pilot + Occupant : 5 hrs + 30 min reserve @ 4300 rpm

Max Range @ 8,000 ft & ISA

Single Pilot : 620 nm + 30 min res @ 4300 rpm

Pilot + Occupant : 440 nm + 30 min res @ 4300 rpm

RUNWAY PERFORMANCE (@ SL)

T/O Dist @ MTOW (to 50 ft)

@ ISA : 490 m (1607 ft)

@ ISA+ 15°C : 525 m (1722 ft)

LDG Dist @ MTOW (from 50 ft)

@ ISA : 450 m (1476 ft)

@ ISA + 15°C : 470 m (1541 ft)

CEILING

Certified Ceiling, Normal Ops 10,000 ft



For More Information Contact

Director, CSIR-NAL,

PB No 1779, HAL Airport Road, Bengaluru-560 017 / director@nal.res.in,

www.nal.res.in