TCR ENGINEERING SERVICES · TCR ADVANCED ENGINEERING

Transparency. Competence. Reliability.

MAKE IN INDIA.
TEST IN INDIA.

Aerospace materials testing, inspection and engineering capabilities for forgings, castings, fasteners and machined parts

Two independent NADCAP AC7101 Materials Testing laboratories
NABL ISO/IEC 17025:2017 at both sites: 1,483 + 431 scope items · ILAC MRA
Independent since 1973 · Navi Mumbai and Vadodara, India

Industry vertical presentation · August 2026 · For OEMs, Tier-1 primes, heat treaters, forge shops, foundries and machine shops

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Every aerospace coupon that stays in India gives a fortnight back to the programme. Two NADCAP AC7101 laboratories and NABL scopes at both sites now qualify material at home, against the same slash sheets the primes audit overseas.

01

Qualify domestically, report globally.

NADCAP AC7101 at Navi Mumbai (PRI 29415245997) and Vadodara (PRI 29227245998), both Lab Type Independent, both listed on eAuditNet. NABL reports travel under the ILAC MRA to 90+ economies.

Until the coupon stays home, the schedule belongs to the freight forwarder.

02

One roof, one chain of custody.

Specimen machining (AC7101/7), mechanical, metallography, hardness and conductivity under NADCAP; fatigue, fracture, creep, chemistry, corrosion, fasteners and NDT under NABL ISO/IEC 17025:2017.

A second machining vendor is a second audit and a second handover.

03

A partner that adopts your schedule.

Test plans written from your specification, timelines aligned to your furnace-qualification and lot-acceptance calendar, same-day metallurgist-to-metallurgist conversations, audit visits the same afternoon.

The laboratory that queues you behind another continent is not a partner.

NADCAP AC7101 + NABL ISO/IEC 17025

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Source: PRI certificates 29415245997 and 29227245998 (valid to 31 May 2027); NABL certificates NABL T0726MH18640 (Navi Mumbai) and TC-6739 (Vadodara); tcreng.com Make in India, Test in India, August 2026.

India has 51 NADCAP heat-treating facilities and, until 2026, sent most of their qualification coupons abroad

NADCAP AC7101 + NABL ISO/IEC 17025

51

NADCAP HEAT TREATERS IN INDIA

Listings on eAuditNet, August 2026. Every one of them must prove material conformance through accredited testing.

2 to 4 wks

OVERSEAS COUPON ROUND-TRIP

Freight, customs and laboratory queue before a single test begins, against an overnight courier to Navi Mumbai.

2

INDEPENDENT NADCAP AC7101 LABS

Navi Mumbai and Vadodara, separately accredited, same scope, about 400 km apart. First Indian group with two.

1,914

NABL SCOPE ITEMS, BOTH SITES

1,483 at Navi Mumbai (NABLT0726MH18640) and 431 at Vadodara (TC-6739), under ISO/IEC 17025:2017 with ILAC MRA reciprocity.

WATCH

The binding constraint is not the number of qualified suppliers. It is the round-trip time of the coupon that proves a furnace run, a lot, or a first article. Aerospace rate ramps in India are paced by how fast a supplier can be qualified, and qualification runs through accredited materials testing.

PROOF

- 53 years independent, founded 1973
- 9,000+ documented failure investigations
- Samples received from 15+ countries
- 750+ people across the group, seven operating countries

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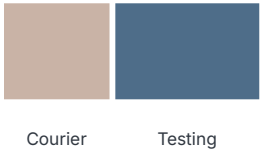
Source: eAuditNet QML as compiled on tcreng.com, August 2026 (51 heat-treating listings); PRI certificates; NABL certificate NABLT0726MH18640; Company Profile 2026 v8.5.

A qualification coupon routed overseas loses whole weeks to logistics; routed to Navi Mumbai it is on the bench the next morning

OVERSEAS ROUTE · 2 TO 4 WEEKS (INDICATIVE)

DOMESTIC ROUTE · OVERNIGHT COURIER, TESTING NEXT DAY



The testing itself takes the same time in either route. Everything else is avoidable.

What the domestic route removes

- Export documentation and international specimen shipping on every lot
- Customs delays on the return of tested specimens and cut-offs
- Time-zone gaps when a result needs discussion or a retest
- Vendor-audit travel: a facility visit is the same afternoon, not a quarter away
- Schedule rigidity: a domestic laboratory can flex to a furnace-qualification calendar

The weeks a coupon spends in transit come out of the buyer's programme schedule, not the supplier's.

Source: tcreng.com, Make in India, Test in India (August 2026): overseas transit, customs and queue of 2 to 4 weeks versus overnight domestic courier. Stage durations are indicative ranges, not measurements.

01

Accreditation architecture

What NADCAP AC7101 covers, what NABL ISO/IEC 17025 covers, and how to verify both independently

NADCAP AC7101 covers the heat-treatment verification bench; the NABL scopes carry fatigue, fracture, chemistry, corrosion, NDT and failure analysis around it

NADCAP AC7101 + NABL ISO/IEC 17025

Capability	NADCAP AC7101	NABL ISO/IEC 17025:2017
Specimen machining (Z)	✓	✓
Tensile, room and elevated temperature (A, B)	✓	✓
Impact and bend (N, XN)	✓	✓
Metallography, grain size, alpha case, case depth (L0 to L11)	✓	✓
Brinell, Rockwell, Vickers, conductivity (M1 to M4)	✓	✓
Fatigue (HCF, LCF, FCGR) and fracture toughness*	✗	✓
Creep and stress rupture*	✗	✓
Chemical analysis: OES, ICP, XRF, combustion C and S*	✗ (planned scope addition)	✓
SCC, exfoliation, IGC, salt spray, hydrogen embrittlement*	✗	✓
Fastener tensile, wedge tensile, proof load*	✗	✓
PT, MT, UT, RT*	✗	✓
Failure analysis: SEM/EDS fractography, root cause†	✗	✓ **underlying tests; interpretation†**
PAUT, TOFD, eddy current; XRD residual stress and retained austenite†	✗	✗ (QMS, non-accredited)
Radiographic film digitisation, ISO 14096 (250,000+ films scanned)†	✗	✗ (QMS, current service)
Planned: chemistry into NADCAP; LECO O, N, H; F1624; NASM 1312; E1936 digitisation practice; ISO/IEC 17020; AC7006	**Roadmap 2026-27**	**Roadmap 2026-27**

** Executed under NABL ISO/IEC 17025:2017, outside the NADCAP AC7101 scope. † Performed under the ISO/IEC 17025 management system, outside both accredited scopes.*

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Source: PRI Scope of Accreditation 29415245997 (AC7101/1, /3, /4, /5, /7, /14); NABL scope annexure to NABLT0726MH18640, 131 pages, last amended 10 July 2026; tcreng.com post on RT film digitalisation per ISO 14096.

Two PRI certificates and two NABL certificates, each verifiable by the customer on the accreditor's own register

NADCAP AC7101 + NABL ISO/IEC 17025


Nadcap
Administered by PRI

TCR Engineering Services Pvt. Ltd

VKB House, Plot No. EL-182, MIDC-TTC, Industrial Area, Electronic Zone Mahape
Navi Mumbai, MH 400710
India

This certificate demonstrates conformance and recognition of accreditation for specific services, as listed in www.eAuditNet.com on the Qualified Manufacturers List (QML), to the revision in effect at the time of the audit for:

Materials Testing Laboratories

Certificate Number: 29415245997
Expiration Date: 31 May 2027
Accreditation Length: 12 Months

Jay Solomond
Executive Vice President & Chief Operating Officer

Performance Review Institute (PRI) | 161 Thorn Hill Road | Warrendale, PA 15086-7527


Nadcap
Administered by PRI

TCR Advanced Engineering Private Limited

250-252/9, GIDC, Makarpura
Vadodara, GJ 390010
India

This certificate demonstrates conformance and recognition of accreditation for specific services, as listed in www.eAuditNet.com on the Qualified Manufacturers List (QML), to the revision in effect at the time of the audit for:

Materials Testing Laboratories

Certificate Number: 29227245998
Expiration Date: 31 May 2027
Accreditation Length: 12 Months

Jay Solomond
Executive Vice President & Chief Operating Officer

Performance Review Institute (PRI) | 161 Thorn Hill Road | Warrendale, PA 15086-7527


National Accreditation Board for Testing and Calibration Laboratories

CERTIFICATE OF ACCREDITATION

TCR ENGINEERING SERVICES PVT. LTD.

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

VKB HOUSE, PLOT NO. EL 182, MIDC TTC, INDUSTRIAL AREA, ELECTRONIC ZONE MAHAPE, NAVI MUMBAI, MAHARASHTRA, INDIA

in the field of

TESTING

Certificate Number: NABLT0726MH18640 (in lieu of TC-6905)

Issue Date: 03/03/2026 Valid Until: 02/03/2030

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.
(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Entity: TCR ENGINEERING SERVICES PVT. LTD.

Signed for and on behalf of NABL

Director

Dr. Ramanand N. Shukla
Chief Executive Officer


National Accreditation Board for Testing and Calibration Laboratories

CERTIFICATE OF ACCREDITATION

TCR ADVANCED ENGINEERING PRIVATE LIMITED

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

250-252/9, GIDC, MAKARPURA, VADODARA, GUJARAT, INDIA

in the field of

TESTING

Certificate Number: TC-6739

Issue Date: 14/10/2025 Valid Until: 13/10/2029

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.
(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Entity: TCR Advanced Engineering Private Limited

Signed for and on behalf of NABL

Director

N. Venkateswaran
Chief Executive Officer

NADCAP · TCR Engineering

AC7101 Materials Testing, Navi Mumbai. PRI certificate 29415245997. Lab Type: Independent. Valid to 31 May 2027. Listed on eAuditNet QML.

NADCAP · TCR Advanced

AC7101 Materials Testing, Vadodara. PRI certificate 29227245998. Lab Type: Independent. Valid to 31 May 2027. Separate certificate, identical scope.

NABL · TCR Engineering

ISO/IEC 17025:2017, certificate NABLT0726MH18640 (in lieu of TC-6905). 1,483 scope items. Valid 3 March 2026 to 2 March 2030.

NABL · TCR Advanced

ISO/IEC 17025:2017, certificate TC-6739, Vadodara. 431 scope items. Valid 14 October 2025 to 13 October 2029. ILAC MRA: 90+ economies.

Verify without asking us: *eAuditNet.com Qualified Manufacturers List (both PRI numbers) and the NABL certificate view at nablwp.qci.org.in.*

TCR ENGINEERING | TCR ADVANCED

Source: PRI certificates 29415245997 and 29227245998, expiry 31 May 2027, accreditation length 12 months; NABL certificates NABLT0726MH18640 (issued 3 March 2026, valid to 2 March 2030) and TC-6739 (issued 14 October 2025, valid to 13 October 2029).

The accredited AC7101 scope is identical at both laboratories, and chemical analysis is the next planned addition

NADCAP AC7101

Criteria	Category	Codes accredited at both laboratories
AC7101/3 Rev D	Mechanical testing	Room temperature tensile (A) · Elevated temperature tensile (B) · Impact (N) · Bend testing (XN)
AC7101/4 Rev F	Metallography and microindentation hardness	Metallographic evaluation (L0) · Microindentation interior (L1) · Surface case depth (L5) · Alpha case, wrought titanium (L8) · Carburisation and decarburisation (L10) · Grain size (L11)
AC7101/5 Rev E	Hardness testing, macro	Brinell (M1) · Rockwell (M2) · Vickers (M3) · Electrical conductivity inspection (M4)
AC7101/7 Rev D	Specimen preparation	Standard specimen machining (Z)
AC7101/14	Proficiency testing	Proficiency testing and internal round-robin requirements for all laboratories
AC7101/1 Rev H	General requirements	Quality system, traceability, calibration, personnel competence, job audit trail

Scope roadmap

Held now: AC7101/1, /3, /4, /5, /7, /14 at both sites.

Planned next: chemical analysis brought into the NADCAP scope, so composition and mechanical results travel under one accreditation.

Standing rule: AC7102 heat treatment is not held, not pursued and never claimed. TCR verifies; it does not process.

Alpha case on wrought titanium (L8) and conductivity for aluminium temper (M4) are the two codes most often exported from India for testing. Both are accredited at both sites.

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Source: PRI Scope of Accreditation for certificates 29415245997 and 29227245998 (t-frm-0004); scope-extension intent stated by TCR management, August 2026.

The aerospace test menu: 21 standing line items, each mapped to the NADCAP code it is reported under

NADCAP AC7101

No.	Mechanical and electrical testing	Code
1.01	Tensile testing, AC7101/3	A, B
1.02	Rockwell hardness, scale A, B or C, AC7101/5	M2
1.03	Brinell hardness, 3 indentations per location, AC7101/5	M1
1.04	Vickers hardness, 3 indentations per location, AC7101/5	M3
1.05	Bend testing, AC7101/3	XN
1.06	Impact testing, set of three specimens, AC7101/3	N
3.01	Electrical conductivity, AC7101/5	M4

‡ *Near-surface and inclusion parameters are reported with the NADCAP symbol only where the parameter falls inside the accredited code; otherwise under NABL. Coupon basis 300 mm x 300 mm; larger coupons attract cutting charges. On-site testing on request.*

No.	Metallography, AC7101/4	Code
2.01	General microstructure examination with two photographs	L0
2.02	Micro-hardness test, up to 10 indentations	L1
2.03	Carburisation or decarburisation depth, microscopic method	L10
2.04	Carburisation or decarburisation depth, hardness method	L10
2.05	Grain size, comparison method	L11
2.06	Grain size, intercept method	L11
2.07	Inclusion rating, Method A	L0 ‡
2.08	Replica microstructure analysis	L0
2.09	Oxidation or corrosion layer measurement	L10 ‡
2.10	Micro-hardness case-depth profile	L5
2.11	Nitriding layer measurement	L5 ‡
2.12	IGA and IGO depth measurement	L10 ‡
2.13	Alpha case layer, wrought titanium	L8
2.14	Macrostructure examination	L0

NADCAP symbol on parameters inside the accredited code list; anything outside it is reported under NABL ISO/IEC 17025:2017 (TC-6739 Vadodara, NABLT0726MH18640 Navi Mumbai).

TCR ENGINEERING | TCR ADVANCED

Source: TCR Advanced Engineering Research and Testing Division, Vadodara, aerospace test menu 2026 (21 line items); PRI scope AC7101/3, /4, /5 codes. Rates on request.

Five trade and business outlets reported the accreditation within a week of the 17 August 2026 release, led by Aerospace Manufacturing (UK)

NADCAP AC7101 + NABL ISO/IEC 17025


Business Standard

TCR's Nadcap nod opens aerospace doors for MSMEs

Aerospace Manufacturing, UK (aero-mag.com), lead story 21 August 2026; Business Standard print edition, 17 August 2026

Aerospace Manufacturing, UK
21 Aug 2026 · headline
"TCR secures Nadcap accreditation at two independent materials labs"

Business Standard
17 Aug 2026 · report
"In what may well be a passport into the global aerospace supply chain for critical processes, Mumbai-based TCR Engineering Services became the first independent company in India to have its two laboratories, in Navi Mumbai and Vadodara, receive Nadcap accreditation for materials testing."

Raksha Anirveda
17 Aug 2026 · headline
"TCR Engineering Becomes First Indian Group with Two Nadcap AC7101 Materials Testing Laboratories"

siliconindia
18 Aug 2026 · headline
"TCR's Nadcap Approval Gives Indian MSMEs Aerospace Supply Chain Access"

Daijiworld
18 Aug 2026 · headline
"TCR's Nadcap nod gives Indian MSMEs passport to aerospace supply chain"

Headlines and the Business Standard opening paragraph quoted as published.

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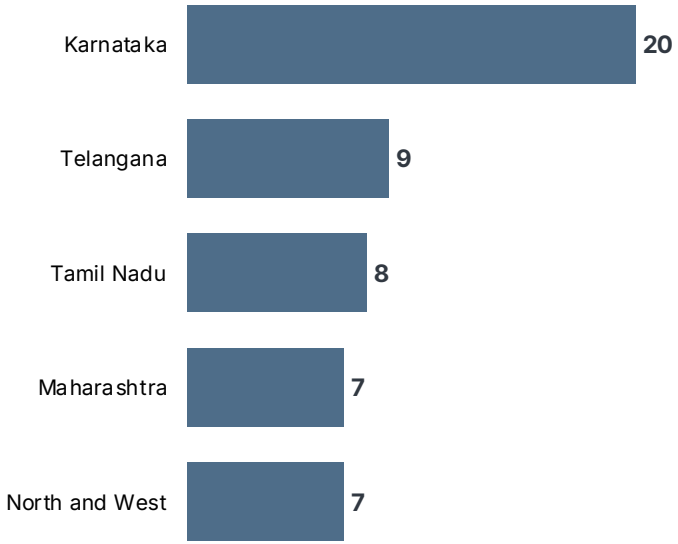
Source: TCR Newsroom index, tcreng.com/newsroom, as at 23 August 2026; aero-mag.com home page, 21 August 2026; Business Standard print edition 17 August 2026 (Deepak Patel and Shine Jacob), clipping retained as PDF.

The 51 NADCAP heat treaters sit in five clusters, each with a different testing need, and all within an overnight courier of Navi Mumbai and Vadodara

NADCAP AC7101 + NABL ISO/IEC 17025



Cluster	What is made	What it needs tested
Karnataka (20)	Aerostructures, machined assemblies, castings, forgings, fasteners, MIM	Tensile RT and ET, grain size, case depth, alpha case on titanium
Telangana (9)	Turbine airfoils, engine components, special melts, superalloys	Elevated-temperature tensile, superalloy metallography, conductivity
Tamil Nadu (8)	Aero gears, transmission parts, high-tensile fasteners, castings	Case-depth microindentation, decarburisation, macro hardness, bend
Maharashtra (7)	Heavy forgings, specialty steels, raw-material stock	Tensile and impact, grain size, decarburisation, macro hardness
North and West (7)	Stainless bar, aerospace tubing, investment castings, screws	Tensile, bend, grain size, microindentation

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Source: eAuditNet Qualified Manufacturers List, heat-treating accreditations in India, as compiled on tcreng.com (August 2026); n = 51 listings.

Every standard on the aerospace coverage matrix is placed by status: accredited, performed under the QMS, tested to the customer's specification, or on the roadmap

NADCAP AC7101 + NABL ISO/IEC 17025

Matrix group	Standards on the page	Status, verified
NADCAP and aerospace materials	ASTM E10, E18, E92, E384 hardness; E112 grain size; E45 inclusions; E1077 decarburisation; E407 etching	**NADCAP (E45, E407 via L0 under NABL)**
	SAE AMS material specifications; AMS 2750 pyrometry; AMS-H-6875; SAE J423 case depth; MIL-DTL series	Spec: verification testing to the specification; TCR does not run heat treatment or pyrometry surveys
Aerospace SCC	ASTM G47, G44 alternate immersion; ASTM G34 exfoliation; ASTM G67 NAMLT	**NABL**
Hydrogen embrittlement	ASTM F519 mechanical HE; ASTM B577; slow strain rate G129	**NABL**
	ASTM F1624 incremental step-load; API 20E	**Roadmap (F1624); Spec (API 20E)**
Aerospace prime specifications	Boeing BAC, Airbus AIPS, Pratt & Whitney PWA, GE EM&S, Rolls-Royce RPS	Spec: tested to the prime's method on request. No prime approval held yet; registration is on the roadmap
Fatigue and fracture	ASTM E466, E606, E647, E399, E1820, E1290; BS 7448; ISO 12106, 12108, 12135, 12737, 15653	**NABL**
	ASTM E561 R-curve; API 5L3 drop-weight tear	QMS (E561); NABL scope does not list 5L3, performed under QMS
Composite	ASTM D3039, D6641, D3479, D3518	**Roadmap: not yet offered; listed as future scope on the page**
Defence frameworks	JSS, Naval and Air Force material specifications; CEMILAC framework; CQAE empanelment	Spec: tested to the specification; CQAE empanelment per Profile v8.5

Key: NADCAP = AC7101 accredited · NABL = ISO/IEC 17025 accredited · QMS = under the management system, outside scope · Spec = tested to the specification on request · Roadmap = planned 2026-27

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Source: tcreng.com/industries/aerospace/ Standards Coverage Matrix, checked row by row against the PRI scope (AC7101/3, /4, /5, /7) and the NABL scope annexure (1,483 rows); Profile v8.5 §11h.4. Prime approvals: none held as at August 2026.

02

The NADCAP-accredited bench

Specimen machining, tensile to 1,100 °C, impact to minus 196 °C, metallography, microindentation, macro hardness and conductivity

Specimens are machined inside the accredited laboratory, so the customer qualifies one source and manages one chain of custody

NADCAP AC7101

In-house specimen machining, Navi Mumbai laboratory

What the shop does

- Tensile, impact, bend, fatigue and fracture specimens from coupons, forgings, castings and bar
- Lathes, CNC wire-cut, milling, surface and stress-free grinding
- Low-stress machining protocols for titanium, nickel alloys and aluminium
- Dimensional verification against the test standard before the specimen reaches the bench

Why auditors care

- One job number from raw coupon to signed report
- Traceability of every cut-off and metallographic mount
- Specimen geometry, surface finish and identification controlled under AC7101/7
- No second vendor on the supplier's approved list for this step

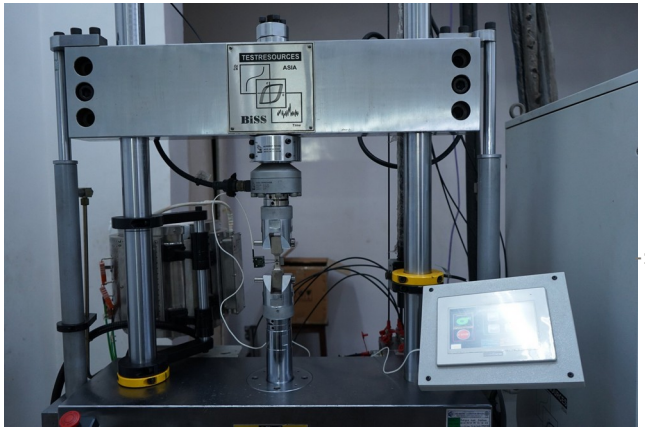
A second machining vendor is a second qualification, audit and handover. Code Z removes all three.

TR ENGINEERING | TR ADVANCED

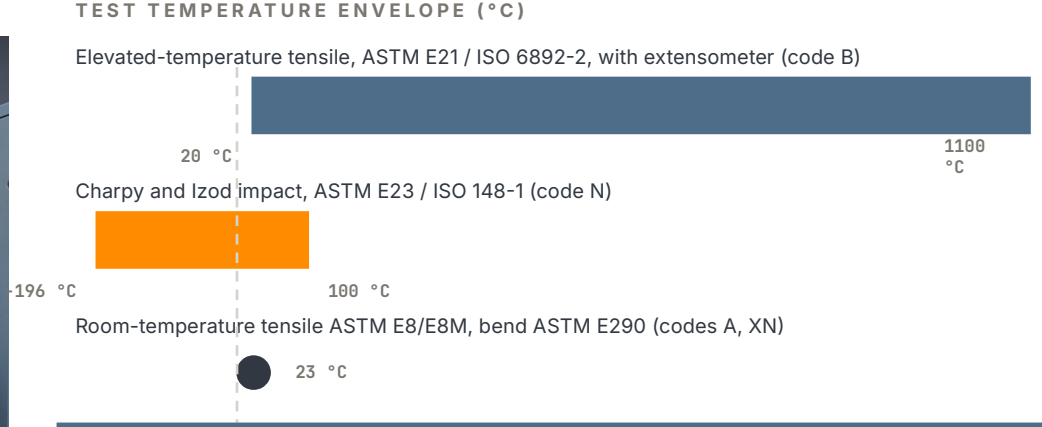
Source: PRI scope AC7101/7 Rev D, code Z (standard specimen machining); Company Profile 2026 v8.5 §4.2 (in-house machine shop: lathes, CNC wire-cut, stress-free grinding, milling, surface grinding).

Tensile to 1,100 °C and Charpy to minus 196 °C cover the full service envelope from cryogenic tankage to turbine hot sections

NADCAP AC7101



UTM with elevated-temperature furnace, Navi Mumbai



UTMs from 0.5 kN to 1,000 kN · 0.2% proof, UTS, elongation, reduction of area · Charpy lateral expansion and shear fracture · NPCIL elevated-temperature tensile approval, February 2026

TER ENGINEERING | TER ADVANCED

Source: PRI scope AC7101/3 codes A, B, N, XN; NABL scope rows for ASTM E8/E8M, E21 (to 1,100 °C), E23 (+80 to −101 °C and −196 °C), E290; Profile v8.5 §4.2 (UTMs 0.5 to 1,000 kN; extensometry).

Six NADCAP metallography codes, including alpha case on wrought titanium, are read by metallurgists who have spent careers at the eyepiece

NADCAP AC7101

Optical metallography, Navi Mumbai laboratory

L0	**Metallographic evaluation**	General structure, phases, weld macro and micro, ASM Vol. 9
L1	**Microindentation, interior**	Vickers and Knoop profiles, ASTM E384
L5	**Surface case depth**	Effective and total case by hardness traverse
L8	**Alpha case, wrought titanium**	Depth of oxygen-enriched layer after forming or heat treatment
L10	**Carburisation and decarburisation**	Depth by microscopic method, ASTM E1077
L11	**Grain size**	ASTM E112 comparison and intercept methods

Also under NABL∗: inclusion rating ASTM E45, macro-etch ASTM E381 and E340, ferrite content ASTM E562, coating thickness ASTM B487.

Alpha case is the oxygen-enriched brittle skin that forms when titanium is worked or heat treated in an uncontrolled atmosphere. Few Indian laboratories hold code L8. TCR holds it at both sites.

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Source: PRI scope AC7101/4 Rev F codes L0, L1, L5, L8, L10, L11; NABL scope rows for ASTM E112, E384, E1077, E45, E381, ASM Handbook Vol. 9; Profile v8.5 §4.3.

Brinell, Rockwell, Vickers and eddy-current conductivity verify the temper of every heat-treated lot without cutting a part

NADCAP AC7101

Macro hardness testing, Navi Mumbai laboratory

M1 · Brinell

ASTM E10, ISO 6506. Forgings, castings, bar stock and plate; 1 kgf to 3,000 kgf loads.

M2 · Rockwell

ASTM E18, ISO 6508. Regular and superficial scales (A, B, C, N, T) for finished parts and fasteners.

M3 · Vickers

ASTM E92, ISO 6507. Macro Vickers for thin sections, welds and coatings; micro Vickers under L1.

M4 · Electrical conductivity

Eddy-current conductivity in % IACS confirms the temper of aluminium alloys after solution treatment and ageing, where hardness alone is ambiguous.

Reference blocks traceable to NPL India and BAM Germany; daily verification records under AC7101/1.

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Source: PRI scope AC7101/5 Rev E codes M1 to M4; NABL scope rows ASTM E10, E18, E92, E384, ISO 6506/6507/6508; Profile v8.5 §4.2 (hardness reference blocks traceable to NPL India and BAM Germany).

03

Around the NADCAP bench: the NABL scope

Fatigue, fracture, creep, chemistry, corrosion, fasteners, NDT and electron microscopy under ISO/IEC 17025:2017

Titanium, nickel and aluminium flight alloys are each covered end to end, from bulk chemistry to the property that governs their failure

NADCAP AC7101 + NABL ISO/IEC 17025

Alloy family	Typical grades	NADCAP-accredited verification	NABL-accredited depth*	Governing failure mode
Titanium	Ti-6Al-4V (Gr 5, Gr 23 ELI), Ti-6-2-4-2, Ti-3-2.5, beta alloys	Alpha case (L8), grain size (L11), ET tensile (B)	Bulk chemistry ASTM E2994 (OES); fatigue E466/E606; fracture toughness E399/E1820	Alpha-case cracking, fatigue
Nickel and cobalt superalloys	Inconel 718, 625, Waspaloy, Hastelloy X, L-605	ET tensile to 1,100 °C (B), metallography (L0), microindentation (L1)	Chemistry ASTM E3047 (ICP) and E354; creep and stress rupture E139, E292, ISO 204; IGC ASTM G28	Creep, grain-boundary embrittlement
Aluminium	7075, 7050, 2024, 2219, 6061, Al-Li 2195	Conductivity % IACS (M4), hardness (M1 to M3), tensile (A)	Chemistry ASTM E1251 (OES); SCC ASTM G47/G44; exfoliation ASTM G34; NAMLT ASTM G67; cast tensile ASTM B557	Stress corrosion, exfoliation, temper escape
High-strength and PH steels	300M, 4340, 15-5PH, 17-4PH, maraging	Hardness (M1 to M3), decarburisation (L10), case depth (L5)	Chemistry ASTM E415 (OES); hydrogen embrittlement ASTM F519; Charpy to −196 °C; fracture toughness	Hydrogen embrittlement, fatigue

** Executed under NABL ISO/IEC 17025:2017, outside the NADCAP AC7101 scope.*

TR ENGINEERING | TR ADVANCED

Source: NABL scope rows (ASTM E2994, E3047, E1251, E415, E1086, G47, G34, G67, G28, E139, E21, E466, E606, E399, E1820); PRI scope codes L8, L11, M4, B; Profile v8.5 §11h.

Nine plant sections, from structural alloys to rocket-motor casings, and what the bench verifies on each

NADCAP AC7101 + NABL ISO/IEC 17025

Plant section	Equipment or material	What TCR verifies, and under which accreditation
Aerospace structural alloys	7xxx and 2xxx aluminium (7050, 7075, 7150, 7475, 2024, 2219); Ti-6Al-4V, Ti-6-2-4-2, Ti-15-3, Ti-10-2-3; Inconel 718, 625, Waspaloy, Rene 95; maraging; 15-5PH, 17-4PH, A286; 300M, 4340, 4330V	Tensile, hardness, conductivity, metallography (NADCAP); chemistry, fatigue, fracture, SCC, exfoliation*
Aerospace fasteners	NAS, MS and AN series; titanium fasteners; MIL-DTL high-strength bolts	Hardness, case depth, decarb (NADCAP); wedge tensile, proof load, F519 hydrogen embrittlement, coating thickness*
Defence components	Forged shafts, gears, transmission housings, RHA armour plate, naval-grade HSLA	Tensile, impact to −196 °C, hardness, grain size (NADCAP); Charpy, fracture toughness, UT, MT*
Rocket motor and launch	Solid-rocket-motor casing hardware, nozzle, igniter, propellant-grain interface, payload fairing structure	Tensile, metallography (NADCAP); fracture toughness, weld qualification, radiography, penetrant*
Satellite	Aluminium honeycomb panel, CFRP composite, Invar 36 optical-bench substrate	Metallic substrates: tensile, chemistry, metallography; composite and honeycomb methods are roadmap
Aero engine	Turbine disc, turbine blade, combustor liner, bearing components	Elevated-temperature tensile to 1,100 °C (NADCAP); creep and stress rupture, ICP chemistry, IGC*; SEM fractography†
Naval	Submarine pressure-hull plate HY-80, HY-100; hull plate E36, EH36; naval fasteners	Tensile, impact, hardness (NADCAP); CTOD, fatigue, UT lamination survey, weld qualification*
Aircraft components	Landing-gear forging, wing-spar forging, fuselage frame	Hardness, grain size, decarb (NADCAP); fatigue, fracture toughness, SCC, macro-etch, UT*
Heat-treatment verification	Coupons from NADCAP-accredited heat treaters	Hardness, microstructure, grain size, case depth, alpha case, conductivity, mechanical properties (NADCAP); retained austenite by XRD†

** NABL-accredited · † QMS, outside accredited scope · Composite and honeycomb testing is roadmap scope, not current.*

Source: tcreng.com/industries/aerospace/ Plant Sections We Inspect (nine rows); verification column checked against PRI scope codes and the NABL scope annexure; Profile v8.5 §11h.2.

Eight damage-mechanism families are investigated with the accredited test that reproduces each, and two items on the page are corrected here

NADCAP AC7101 + NABL ISO/IEC 17025

Category	Mechanism and the test that reproduces it	Status, verified
Aerospace SCC	Alternate immersion on 7xxx and 2xxx aluminium, ASTM G47 and G44; chloride SCC on stainless, ASTM G36	NABL*
Hydrogen embrittlement	Internal HE on plated fasteners, ASTM F519 and B577; environmental HE by slow strain rate, G129	NABL*; F1624 and API 20E roadmap
Fatigue	Low-cycle E606, high-cycle E466, crack growth E647, with S-N and strain-life curves	NABL*; disc burst margin not offered
Fracture toughness	KIc ASTM E399; JIc ASTM E1820; CTOD BS 7448 and ISO 15653, ambient to −70 °C	NABL*
Creep and thermal	Creep and stress rupture on disc and combustor-liner alloys, ASTM E139, E292, ISO 204	NABL*; thermal-mechanical fatigue not offered
Microstructural	Inclusion rating E45, grain size E112, decarburisation E1077; retained austenite by XRD	NADCAP (L10, L11) and NABL*; retained austenite†
Corrosion	Pitting G48, intergranular A262 and G28, salt spray B117, exfoliation G34; galvanic G71	NABL*; galvanic G71†
Heat-treatment verification	Hardness traverse, case depth (SAE J423 methods), microstructure against AMS 2750 and AMS-H-6875 acceptance	NADCAP (L1, L5, L10, L11, M1 to M4)

** NABL-accredited · † QMS, outside scope · Not offered today: disc burst (spin) testing, thermal-mechanical fatigue; F1624 is roadmap.*

TCR ENGINEERING | TCR ADVANCED

Source: tcreng.com/industries/aerospace/ Damage Mechanisms We Investigate (eight rows), each method checked against the NABL scope annexure and PRI scope; Profile v8.5 §11h.3.

Servo-hydraulic frames to 1,000 kN deliver S-N, strain-life, crack-growth and fracture-toughness data for damage-tolerant design

NABL ISO/IEC 17025:2017

Servo-hydraulic fatigue frame, Navi Mumbai

Fatigue

- High-cycle, force-controlled: ASTM E466
- Low-cycle, strain-controlled: ASTM E606, ISO 12106
- Crack growth da/dN versus ΔK: ASTM E647, ISO 12108
- S-N and strain-life curves reported

Fracture toughness

- Plane-strain KIc: ASTM E399, ISO 12737, BS 7448-2
- J-integral JIc: ASTM E1820, BS 7448-4, ISO 12135
- CTOD: BS 7448-1, ISO 15653, ASTM E1290
- Validity criteria stated on every report

1,000 kN

LARGEST DYNAMIC FRAME

with 50 kN and 250 kN frames

0.035–30 Hz

FREQUENCY RANGE

closed-loop servo-hydraulic

-70 °C

CRYOGENIC CTOD

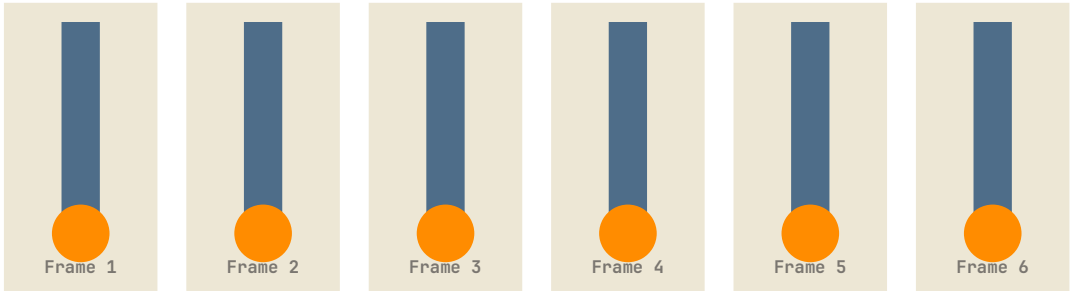
slow strain rate to 10^{-7} mm/s

TER ENGINEERING | TER ADVANCED

Source: NABL scope rows ASTM E466, E606/E606M, E647, E399, E1820, E1290, BS 7448 Parts 1 to 4, BS 8571, ISO 12135, ISO 12737, ISO 15653, ISO 12106, ISO 12108; Profile v8.5 §4.2 (50, 250, 1,000 kN servo-hydraulic; 0.035 to 30 Hz; CTOD to −70 °C).

Six constant-load creep frames running to 1,100 °C and 100,000 hours qualify hot-section alloys without an overseas queue

NABL ISO/IEC 17025:2017



Six constant-load creep frames · 50 kN each · duration to 100,000 hours · ambient to 1,100 °C

Creep rate, time to rupture, elongation and reduction of area to ASTM E139 and ISO 204; time-for-rupture notch tension to ASTM E292. Temperature standards calibrated against NIST-traceable platinum resistance thermometers. Reported with measurement uncertainty per JCGM 100 (GUM).

Who sends creep work

- Turbine-disc and blade suppliers qualifying nickel superalloys
- Combustor-liner and exhaust-duct fabricators
- Heat treaters proving a solution-and-age cycle on 718 and Waspaloy
- Design offices needing Larson-Miller data for life assessment
- Power and nuclear operators (the same frames serve 300, 500 and 800 °C protocols)

TER ENGINEERING | TER ADVANCED

Source: NABL scope rows ASTM E139 (creep and stress rupture), ASTM E292 (notch rupture), ISO 204; Profile v8.5 §4.2 (six frames at 50 kN, to 1,100 °C, 100,000-hour duration; thermocouple calibration NIST-traceable).

Optical emission, ICP, XRF and combustion analysers verify melt chemistry on titanium, nickel, aluminium and steel under 405 accredited scope rows

NABL ISO/IEC 17025:2017

ICP spectrometer, Navi Mumbai chemistry laboratory

Material	Accredited method	Elements reported
Titanium and titanium alloys	ASTM E2994 (OES), in-house OES method	Al, V, Fe, Mo, Sn, Zr, Cr, Ni, Si, Mn, N
Nickel and nickel alloys	ASTM E3047 (ICP-OES), E354, E1019, AAS	Cr, Nb, Mo, Ti, Al, Co, Fe, C, S, trace elements
Aluminium and aluminium alloys	ASTM E1251 (OES), ICP, AAS	Cu, Mg, Zn, Si, Fe, Mn, Cr, Ti, Li (ICP)
Carbon, alloy and stainless steels	ASTM E415, E1086, E350, E353, IS 8811	C, S, P, Cr, Ni, Mo, V, Nb, B, N
Ferrous and non-ferrous, screening	ASTM E1476 (XRF)	Positive material identification and grade sort
Combustion analysis	ASTM E1019	Carbon and sulphur by infrared absorption

Chemical analysis is the next planned addition to the NADCAP AC7101 scope, so composition and mechanical results will travel under one aerospace accreditation.

TR» ENGINEERING | TR» ADVANCED

Source: NABL scope annexure, discipline Chemical: Metals and Alloys, 405 rows (ASTM E415, E1086, E1251, E2994, E3047, E354, E353, E1019, E1476, E1999, E536; in-house ICP and AAS methods); Profile v8.5 §4.4.

Aerospace SCC, exfoliation, intergranular and hydrogen-embrittlement tests qualify airframe alloys and plated fasteners against their field failure modes

NABL ISO/IEC 17025:2017

Environmental exposure bench, Navi Mumbai

Aluminium airframe alloys

- Alternate-immersion SCC: ASTM G47, G44
- Exfoliation (EXCO): ASTM G34
- Nitric acid mass loss (NAMLT): ASTM G67

Stainless and nickel alloys

- IGC ASTM A262 Practices A, B, C, E, F
- ASTM G28 A and B; ASTM A763; ASTM A923
- Pitting and crevice ASTM G48 A to F

Steel and plating

- Hydrogen embrittlement ASTM F519
- HE susceptibility ASTM B577, IS 6243
- Slow strain rate ASTM G129, ISO 7539-7

Atmospheric exposure

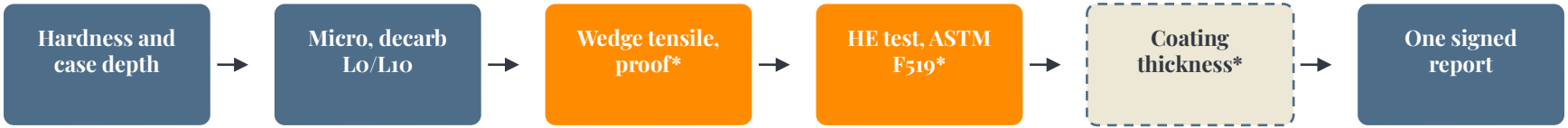
- Neutral salt spray ASTM B117, ISO 9227
- Acetic and CASS: ASTM B368, IS 6910
- Chloride SCC ASTM G36; bent-beam G39

TÜV ENGINEERING | TÜV ADVANCED

Source: NABL scope rows ASTM G47, G44, G34, G67, A262 (A, B, C, E, F), G28 (A, B), A763, A923, G48, G36, G39, G129, B117, B368, ISO 9227, F519, B577; Profile v8.5 §4.7.

Fastener qualification combines NADCAP hardness with NABL wedge-tensile, proof-load and hydrogen-embrittlement testing in one report

NADCAP AC7101 + NABL ISO/IEC 17025



NADCAP-accredited steps

- Core and surface hardness: Brinell, Rockwell, Vickers (M1 to M3)
- Case depth by microindentation traverse (L5)
- Decarburisation depth after heat treatment (L10)
- Grain size and microstructure (L11, L0)

NABL-accredited steps*

- Axial tensile, wedge tensile and proof load: ASTM F606, ISO 898-1, IS 1367
- Proof load on nuts: ISO 898-2, IS 1367-6
- Mechanical hydrogen embrittlement after plating: ASTM F519
- Coating thickness: ASTM B487 (microscopic), B499 (magnetic)

** Executed under NABL ISO/IEC 17025:2017, outside the NADCAP AC7101 scope.*

TR» ENGINEERING | TR» ADVANCED

Source: NABL scope rows ASTM F606 (tensile, wedge tensile, proof load), ISO 898-1 and 898-2, IS 1367 Parts 1, 3, 6, 14; ASTM F519; PRI scope codes M1 to M3, L1, L5, L10.

Penetrant, magnetic particle, ultrasonic and radiographic testing run under NABL and an AERB radiography licence; advanced ultrasonics extend sizing beyond the baseline

NABL ISO/IEC 17025:2017

Radiographic film interpretation

Liquid penetrant (PT)	Visible and fluorescent, ASTM E165, ASME V Art. 6; forgings, castings, machined parts
Magnetic particle (MT)	Yoke and prod, visible and fluorescent, ASTM E709, ASME V Art. 7
Ultrasonic (UT)	Forgings ASTM A388, plate A435/A577/A578, castings A609, bar E213, welds E164, ASME V Art. 4, 5, 23
Radiography (RT)	X-ray to 250 kV and Ir-192 gamma, ASTM E94, ASME V Art. 2 and 22; AERB licensed source storage
Advanced UT and ET†	Phased array and TOFD to ASME V Art. 4, eddy current; ASNT Level III supervision

† QMS, outside both accredited scopes. Fractography is interpretive; the underlying hardness, tensile and chemistry are accredited.

TER ENGINEERING | TER ADVANCED

Source: NABL scope discipline Non-Destructive: Metals and Alloys, 49 rows (ASTM E165, E709, E164, E213, A388, A577, A578, A609, E94; ASME V Articles 2, 4, 5, 6, 7, 22, 23); AERB Operation Licence 23-IRLOP-893925; Profile v8.5 §5.2 (PAUT, TOFD).

Four scanning electron microscopes and a 9,000-investigation archive turn an anomaly into a root cause, not an argument

ISO/IEC 17025 QMS · NON-ACCREDITED

4

SEM/EDS INSTRUMENTS

Three at Vadodara; the fourth commissions September 2026

60,000x

MAGNIFICATION

Phenom XL G2, CeB6 source

9,000+

FAILURE INVESTIGATIONS

documented, group cumulative

100,000+

MICROSTRUCTURE REPLICAS

in-situ reference database

What the bench answers

- Fractography: fatigue striations, cleavage, microvoid coalescence, intergranular SCC and hydrogen embrittlement facets
- EDS micro-analysis of inclusions, deposits and fracture-surface chemistry; XRD phase identification and residual stress (ASTM E2860)†
- Root-cause reports written for a prime's material review board, with the accredited data that supports them attached

† Performed under the ISO/IEC 17025 management system, outside both accredited scopes; the supporting hardness, tensile and chemistry are accredited.

TCR ENGINEERING | TCR ADVANCED

Source: Profile v8.5 §4.9 (three SEM/EDS at TCR Advanced Vadodara: Pemtron SS100, Jeol JCM 6000+, Phenom XL G2 to 60,000x; highest count in any Indian commercial laboratory); fourth instrument on order, delivery September 2026 (TCR management, August 2026); facts.json failure_investigations 9,000+.

04

How TCR works with an aerospace customer

Partner, not vendor: the Continuum, custom procedures, aligned timelines, the people, the clients, the roadmap

Aerospace runs qualification gates, not shutdowns, so the TCR Continuum follows the component from raw material to failure analysis

NADCAP AC7101 + NABL ISO/IEC 17025

01 Material qualification

SOURCING AND PROCUREMENT

- Tensile E8/E8M, elevated E21
- Hardness; chemistry by OES and XRF*
- Grain size E112, inclusions E45*
- Fastener testing*; vendor audits, sample picking

02 Process verification

CONSTRUCTION EQUIVALENT

- Heat-treatment verification: the AC7101 core
- Weld and braze procedure qualification*
- Case depth and decarburisation (L5, L10)
- Residual stress by XRD†; plating and HE relief F519*

03 Production surveillance

IN-SERVICE EQUIVALENT

- Batch and lot conformance testing
- Periodic requalification of processes
- SCC testing of aerospace alloys G47, G44*
- Third-party witness of acceptance tests

04 Maintenance, repair, overhaul

SHUTDOWN EQUIVALENT

- PT, MT, UT and RT on overhauled parts*
- Metallurgical evaluation of service-exposed parts
- Hardness and conductivity after repair heat treatment
- Dimensional and visual inspection

05 Failure analysis and life

THE CONTINUUM CLOSES

- SEM and EDS fractography†
- Fatigue and fracture E466, E606, E399, E1820*
- Sub-zero programmes for defence and naval aviation
- Materials research for indigenisation

Component lifecycle, raw material to life assessment

** NABL-accredited · † QMS, outside accredited scope*

TCR ENGINEERING | TCR ADVANCED

Source: tcreng.com/industries/aerospace/ Service Applications Across the TCR Continuum (five stages); Profile v8.5 §11h.5; methods checked against PRI and NABL scopes.

Custom test procedures, uncertainty budgets and contract research turn a testing supplier into an engineering partner

ISO/IEC 17025 QMS · NON-ACCREDITED

Procedures written from your specification

Send the test standard and the prime's slash sheet. TCR writes the work instruction, the acceptance criteria and the report format to match, and validates the method before the first lot.

Metrological consulting

Uncertainty budgets to JCGM 100 (GUM) and EURACHEM, decision rules stated, proficiency rounds under AC7101/14, calibration chains traceable to NPL India, NIST, PTB and NPL UK.

Contract research and simulated service

Exposure matrices, electrochemical studies, indigenisation and alloy-substitution programmes, finite element analysis where loading is in question, life assessment to API 579-1/ASME FFS-1.

Welding and source inspection

WPS, PQR and welder qualification to ASME IX, AWS D1.1, API 1104 and ISO 15614 (NABL scope*); vendor audits by ISO 9001 and API Q1 lead auditors; witness, sample picking and pre-shipment inspection.

** Executed under NABL ISO/IEC 17025:2017. Consulting, research and inspection services operate under the ISO/IEC 17025 management system outside the accredited testing scope.*

Source: Profile v8.5 §6.20 (contract research and development), §8 (QMS: JCGM 100 GUM, EURACHEM measurement uncertainty; ISO 9001 and API Q1 lead-auditor crew), §11p (Industrial Research); NABL scope rows ASME IX, AWS D1.1, API 1104, ISO 15614 weld qualification.

Five steps from NDA to signed report, with the laboratory schedule written around the customer's qualification calendar

NDA and agreement → **Test plan from spec** → **Pickup and LIMS entry** → **Testing and witness** → **Report, CoC, data**

1

Mutual NDA, enterprise agreement, IP and confidentiality terms agreed before any drawing moves.

2

Specification review, method mapping, acceptance criteria and SLA dates aligned to your programme calendar.

3

Courier pickup, tamper-evident tagging, unique job number and LIMS tracking from receipt.

4

Testing under NADCAP or NABL scope as applicable; remote or in-person witness; same-day metallurgist contact.

5

Accredited report, certificate of conformance, raw data; specimens and mounts retained to your programme's retention period.

Timelines are set against your furnace-qualification, lot-acceptance and first-article dates, not a laboratory queue.

TCR ENGINEERING | TCR ADVANCED

Source: TCR Engineering engagement practice and ISO/IEC 17025:2017 clauses 7.1 (review of requests), 7.4 (handling of test items), 7.8 (reporting); NADCAP AC7101/1 job audit trail.

The people who sign the report have spent their careers at the bench, and they treat a wrong measurement as a laboratory failure, not a rounding matter

TCR Engineering laboratory team, Mahape, Navi Mumbai

Metallurgists first

Every aerospace job is run and reviewed by a metallurgist. Microstructure, fracture surfaces and case depth are read by people who enjoy reading them.

Competence on record

Operator qualification, direct observation and proficiency rounds under AC7101/1 and /14; a twenty-question competence bank behind every NADCAP method.

Independent by designation

Lab Type: Independent on both PRI certificates. TCR does not heat treat and does not make parts. The distance between maker and measurer is the product.

Continuity

53 years, one family of ownership, a bench that has outlasted three economic cycles and the transition from film radiography and wet chemistry to phased array and ICP.

Source: Profile v8.5 §1 (750+ people group-wide: 400+ Engineering, 200+ Advanced, 150+ Arabia); tcreng.com, Make in India, Test in India (laboratory culture statement); NADCAP AC7101/1 personnel competence and AC7101/14 proficiency requirements.

Seven operating countries and alliances from Hiroshima to Dammam give an aerospace supplier a local door and an Indian bench behind it

Country	Presence	What an aerospace customer gets
India	TCR Engineering, Navi Mumbai; TCR Advanced, Vadodara; TCR Eastern, Bhubaneswar	Both NADCAP AC7101 laboratories; the full NABL scope; specimen machining; source inspection across the five aerospace clusters
Japan	Chugai Technos, Hiroshima (alliance, MOU 29 April 2026)	A Japanese engine or airframe supplier sourcing Indian forgings and castings can route qualification through an Indian NADCAP bench with Japanese-language coordination; joint presence at a Japan trade show, September 2026
Saudi Arabia	TCR Arabia, Dammam (JV with GAS Arabian Services) and Jubail	Materials testing and NDT for the Kingdom's industrial and aviation-maintenance base; accredited destructive testing routed to Navi Mumbai
Qatar and Kuwait	TCR Qatar (BIEWU alliance, Doha); Kuwait served from India and KSA	Inspection, NDT and PMI crews locally; laboratory qualification through the Indian NADCAP and NABL bench
Oman and Malaysia	Served operations; Approved Group International alliance, Kuala Lumpur	South-east Asian aerospace suppliers reach the Indian bench with regional coordination and courier logistics handled end to end

NABL reports are accepted under the ILAC MRA in 90+ economies. Samples are already received from 15+ countries.

TCR ENGINEERING | TCR ADVANCED

Source: facts.json operating_countries (India, Saudi Arabia, Oman, Kuwait, Qatar, Japan, Malaysia) and alliances; Profile v8.5 §2 (Chugai Technos MOU 29 April 2026; TCR Arabia JV with GAS Arabian Services; BIEWU Qatar; AGI Malaysia); samples received from 15+ countries.

The client base runs from ISRO and DRDO to private forge and precision suppliers, anchored by the Chandrayaan-3 casing work

ISRO and space	ISRO · VSSC · LPSC · SHAR · SAC
DRDO and atomic energy	DRDO · DMRL · DMSRDE · R&DE · NMRL · NPCIL · BARC · Heavy Water Projects
Defence PSUs	HAL (Bangalore, Nashik, Koraput, Lucknow) · BEL · BEML · BDL · MIDHANI · Bharat Forge · Tata Advanced Systems · Mahindra Aerostructures · Dynamatic Technologies · Walchandnagar Industries
EPC, OEM and shipyards	Larsen and Toubro Defence · Reliance Aerostructure · Mazagon Dock · Garden Reach · Goa Shipyard · Cochin Shipyard · Hindustan Shipyard
Private aerospace suppliers	SQuAD Forging · Bharat Forge Aerospace · Anand Group · Sansera Engineering · Arjas Steel · MTAR Technologies · Sri Venkateswara Aerospace · Gemsons Precision · Shalco Industries · Bhukhanvala Industries · SE Forge · Bharat Aerospace Metals
Empanelment	CQAE · CEMILAC framework reach where applicable

MARQUEE PROJECTS

2023	**Rocket-motor casing hardware for Chandrayaan-3**	Through Larsen and Toubro Defence for VSSC-ISRO; no non-conformity observed
Multiple	**ISRO Project ASLV**	Materials testing with ISRO's written appreciation
Continuous	**DRDO / NMRL**	Long-term contract for naval materials testing
2013 to 2026	**NPCIL elevated-temperature tensile**	300, 500 and 800 °C protocol; approval renewed February 2026
2025 to 2026	**SQuAD Forging aerospace SCC**	ASTM G47 and G44 on 7xxx and 2xxx aluminium
Continuous	**HAL, MIDHANI, Bharat Forge, Tata Advanced Systems**	Materials testing, NDT, source inspection, special-alloy certification

TCR ENGINEERING | TCR ADVANCED

Source: tcreng.com/industries/aerospace/ Named Clients and Marquee Projects; Profile v8.5 §11h.6 and §11h.7; facts.json client_approvals (NPCIL February 2026). Names are typographic only; no logos without written clearance.

Seven planned enhancements close the remaining gaps between the aerospace page and the accredited scope

01 **Chemical analysis into the NADCAP scope**

OES, ICP and combustion C and S brought under AC7101, so composition and mechanical results travel under one aerospace accreditation.

02 **Interstitial gas analysis: LECO O, N, H**

ASTM E1409 oxygen and nitrogen, ASTM E1447 hydrogen, for titanium and superalloy melt verification and weld pickup.

03 **Fastener methods: ASTM F1624, NASM 1312, ASTM B565**

Incremental step-load hydrogen embrittlement, the NASM 1312 fastener test series, and double shear of fasteners and rivets.

04 **Film digitisation: add the ASTM E1936 aerospace practice**

Already a current service to ISO 14096 (250,000+ films scanned for IOCL and GAIL pipeline projects); extend the qualification to the ASTM E1936 practice aerospace primes cite.

05 **ISO/IEC 17020 accreditation for third-party inspection**

Source inspection, witness and vendor audits under an inspection-body accreditation in their own right.

06 **NADCAP AC7006 laboratory accreditation**

Explore the AC7006 route (the Nadcap laboratory accreditation programme aligned to ISO/IEC 17025) alongside the existing AC7101.

07 **Registration and approval by aerospace primes**

Supplier registration and approval with the primes whose specifications TCR already tests against. No prime approval is held as at August 2026.

Every line here is a gap we found ourselves by auditing our own page against our own certificates. That is the habit the accreditation exists to reward.

TCR ENGINEERING | TCR ADVANCED

Source: TCR management roadmap, August 2026; gaps identified by checking the aerospace page against the PRI scope and the NABL scope annexure. Dates are intentions, not commitments; accreditation decisions rest with PRI and NABL.

FROM ASLV TO CHANDRAYAAN-3 · TWO LABORATORIES, ONE SIGNATURE

TEST IN INDIA.

The rocket-motor casing hardware for Chandrayaan-3 cleared this bench with no non-conformity. The next Indian aircraft, engine and launch vehicle can be qualified here too.

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WHAT YOU GET

Two NADCAP AC7101 laboratories and two NABL ISO/IEC 17025 scopes. Specimen machining, mechanical, metallography, hardness, fatigue, fracture, creep, chemistry, corrosion, fasteners, NDT and electron microscopy under one group signature. Procedures written from your specification. Timelines written around your programme.

NEXT STEP

Send one coupon from your next furnace qualification or lot acceptance and audit the result line by line. Or visit: Navi Mumbai and Vadodara are open to customer audits at short notice. Government buyers can procure through GeM, seller ID ENEQ200001820172.

Transparency. Competence. Reliability.

Questions are welcome.

TCR ENGINEERING | TCR ADVANCED

Established 1973 · NABL (NABLT0726MH18640) ISO/IEC 17025:2017 · NADCAP AC7101 · BIS, IBR, BMC, CIDCO Approved | TCR Advanced: NABL (TC-6739) ISO/IEC 17025:2017 · NADCAP AC7101