



UPSC & STATE PCS CURRENT AFFAIRS · UJIYARI.COM

DAILY CURRENT AFFAIRS

ISRO Clears CE20 Cryogenic Engine for Gaganyaan

11 July 2026 ·

SCIENCE & TECH ·

GS3

CURATED & WRITTEN BY

**Bharat Choudhary**

UPSC Educator & Content Creator

[in linkedin.com/in/epicbharat](https://www.linkedin.com/in/epicbharat)

ALSO FROM THE CREATOR

BharatNotesFree UPSC notes, MCQs, PYQ analysis. **100% Free.**bharatnotes.com →

ADVERTISE

Advertise with Ujiyari

Reach thousands of UPSC aspirants daily.

[✉ epicbharat@gmail.com](mailto:epicbharat@gmail.com)



ISRO Clears CE20 Cryogenic Engine for Gaganyaan

11 July 2026 · 4 min read ·

Source: ujjyari.com — researched, fact-checked & UPSC-mapped

 Every fact web-verified against primary sources (<https://ujjyari.com/how-we-verify/>)

WHY IN NEWS

On July 6, 2026, the Indian Space Research Organisation (ISRO) completed the flight-acceptance hot test of an indigenous CE20 cryogenic (<https://ujjyari.com/vocab/cryogenic/>) engine at the ISRO Propulsion Complex (IPRC) in Mahendragiri, Tamil Nadu, clearing the engine for an upcoming Gaganyaan mission.

WHAT HAPPENED

A **flight-acceptance hot test** is the final ground qualification a rocket engine must pass before it is cleared to fly. The engine is fired on a test stand under conditions that mimic actual flight, and its performance parameters are matched against the qualified baseline. The CE20 that ISRO fired at Mahendragiri on July 6, 2026 met those parameters, and the engine has now been accepted for integration into a Gaganyaan launch vehicle.

The **CE20 powers the upper stage** of India's heavy-lift launcher. In the **LVM3** (formerly GSLV Mk III), this upper stage is designated the **C25 stage**, and the CE20 is the single engine that drives it after the lower stages have burned out and separated. For a human-spaceflight mission, every engine in the stack must be individually accepted, and the cryogenic upper stage is among the most demanding to qualify.

The CE20 at a Glance

Ujjayari Current Affairs · ujjayari.com · Free Daily Current Affairs for UPSC & State PCS

FEATURE	DETAIL
Type	Indigenous cryogenic upper-stage engine
Developed by	Liquid Propulsion Systems Centre (LPSC)
Propellants	Liquid oxygen (LOX) and liquid hydrogen (LH ₂)
Thrust	About 19 to 22 tonnes
Stage powered	C25 upper stage of LVM3
Test facility	ISRO Propulsion Complex (IPRC), Mahendragiri, Tamil Nadu

UNDERSTANDING CRYOGENIC TECHNOLOGY

A **cryogenic engine** burns propellants stored at extremely low temperatures: liquid oxygen at around minus 183 degrees Celsius and liquid hydrogen at around minus 253 degrees Celsius. This combination delivers a very high **specific impulse** (<https://ujjayari.com/vocab/specific-impulse/>), meaning more thrust per kilogram of propellant than conventional solid or liquid fuels. That efficiency is why cryogenic stages are used at the top of a rocket, where squeezing maximum velocity out of every kilogram of fuel decides how heavy a payload can be pushed into orbit.

The trade-off is complexity. Handling fluids this cold demands specialised turbopumps, insulation and ignition systems that operate reliably across a punishing temperature range. Only a handful of space agencies have mastered the technology, which is why each successful engine acceptance is a significant technical milestone.

The Road to Indigenous Mastery

India's cryogenic journey was shaped by a **technology-denial regime in the 1990s**, when access to foreign cryogenic engines and know-how was restricted. Rather than abandon the capability, ISRO chose to develop cryogenic propulsion at home. Decades of investment through the LPSC produced first the CE7.5 and then the more powerful CE20, giving India full command over the most difficult segment of launch-vehicle technology and reducing dependence on external suppliers.

LINK TO GAGANYAAN

Gaganyaan is India's first crewed orbital mission, designed to carry Indian astronauts into low-Earth orbit aboard an Indian launch vehicle and bring them safely back. Because human lives are aboard, the launcher must be **human-rated**, meaning every subsystem is tested to tighter margins and higher reliability standards than for a satellite launch. Accepting the CE20 for the mission is one step in that long qualification chain.

Separately, in early July 2026 ISRO also conducted an **Integrated Main Parachute Airdrop Test (IMAT)** as part of validating the crew module's recovery and descent systems. Taken together, these tests reflect the steady, subsystem-by-subsystem clearance that a human-spaceflight programme requires before an actual crewed launch.

ANALYSIS AND WAY FORWARD

The CE20 acceptance underlines a broader point about **strategic autonomy** (<https://ujiyari.com/terms/strategic-autonomy/>): mastery of cryogenic propulsion is not only a scientific achievement but a hedge against future technology denial. As India moves toward crewed spaceflight, a planned space station and deep-space ambitions, an indigenous, human-rated cryogenic engine is foundational infrastructure. The way forward lies in raising production reliability, shortening the test-to-flight cycle, and progressively human-rating the entire LVM3 stack so that Gaganyaan can transition from ground qualification to an actual crewed flight with confidence.

UPSC RELEVANCE

GS Paper 3: Science and technology developments and their applications; **indigenisation** (<https://ujiyari.com/vocab/indigenisation/>) of technology; achievements of Indians in science and technology; space technology.

Prelims pointers:

- The CE20 is an indigenous cryogenic upper-stage engine developed by the Liquid Propulsion Systems Centre (LPSC).
- It uses liquid oxygen (LOX) and liquid hydrogen (LH₂) as propellants and delivers about 19 to 22 tonnes of thrust.
- The CE20 powers the C25 upper stage of the LVM3 (formerly GSLV Mk III), India's heavy-lift launcher.
- The flight-acceptance hot test was conducted at the ISRO Propulsion Complex (IPRC), Mahendragiri, Tamil Nadu.
- Gaganyaan is India's first crewed orbital mission and requires a human-rated launch vehicle.

Mains question: "Mastery of cryogenic propulsion is as much a matter of strategic autonomy as of scientific capability. In the light of ISRO's Gaganyaan programme, examine India's journey in human-rating its launch vehicles and the significance of indigenous cryogenic technology." (15 marks, 250 words)

FACTS CORNER

Ujjayari Current Affairs - ujjayari.com · Free Daily Current Affairs for UPSC & State PCS

★ FACTS CORNER, KNOWLEDGE PEDIA

CE20: indigenous cryogenic upper-stage engine, developed by LPSC.

Propellants: liquid oxygen (LOX) and liquid hydrogen (LH₂).

Thrust: about 19 to 22 tonnes; powers the C25 stage of LVM3.

Test site: ISRO Propulsion Complex (IPRC), Mahendragiri, Tamil Nadu.

LVM3: formerly GSLV Mk III, India's heavy-lift launcher.

Gaganyaan: India's first crewed orbital mission; needs a human-rated launcher.

Context: India built cryogenic capability indigenously after the 1990s technology-denial regime.

Sources: *ISRO* (<https://www.isro.gov.in/>), *Liquid Propulsion Systems Centre*, *Press Information Bureau (PIB)*

Source: ISRO Clears CE20 Cryogenic Engine for Gaganyaan — Ujjayari.com | Free UPSC & State PCS Current Affairs

RELATED EDITORIALS

THE HINDU

[Instruments of Independence: Why Indian Science Must Build Its Own Tools](#)

9 Jul

DOWN TO EARTH

[Ranking the Next Pandemic: A Virus Catalogue and India's Preparedness](#)

8 Jul

BUSINESS STANDARD

[Looking Beyond Generics: Why AMR Is Rewriting India's Pharma Challenge](#)

7 Jul

INDIAN EXPRESS

[From Packaging to Fabrication: India's Semiconductor Ascent](#)

7 Jul

RELATED KEY TERMS

Ujjayi Current Affairs · ujjayi.com · Free Daily Current Affairs for UPSC & State PCS

KEY TERM

[3D Glass Solutions](#)

US semiconductor packaging firm founded 2010, originating...

KEY TERM

[3I-ATLAS Comet](#)

The third confirmed interstellar object to enter our solar system,...

KEY TERM

[Active Case Finding \(TB\)](#)

A proactive public health strategy where health workers systematically...

KEY TERM

[Advanced Technology Vessel \(ATV\) Programme](#)

India's classified, decades-long programme to indigenously design and...

Ujiyari Current Affairs · ujiyari.com · ~~Free Daily~~ Current Affairs for UPSC & State PCS

CURATED & WRITTEN BY

Bharat Choudhary

UPSC Educator & Content Creator

[in linkedin.com/in/epicbharat](https://www.linkedin.com/in/epicbharat)[Read Full Article on Ujiyari →](#)<https://ujiyari.com/daily/2026/07/11/isro-ce20-cryogenic-engine-gaganyaan-2026/>

ALSO FROM THE CREATOR

BharatNotes

Free UPSC study platform — subject-wise notes across all 4 GS papers, Prelims MCQs, Mains answer frameworks, PYQ analysis & progress tracking. **100% Free • No Login Required.**

[Start Preparing → bharatnotes.com](#)

📌 OPPORTUNITY

Advertise with Ujiyari

Reach **thousands of serious UPSC & State PCS aspirants** daily through our PDFs, website, and social channels.

Ideal for: Coaching institutes • EdTech platforms • Book publishers • Exam prep apps

[✉ epicbharat@gmail.com](mailto:epicbharat@gmail.com)

Write to us for rates & media kit

Free UPSC & State PCS Current Affairs · [ujiyari.com](#) · [bharatnotes.com](#)