

L J CORE (Centre of Renewable Energy)

is organising a competition for

“Oxygen on Wheels”

**Can You Build an Easy to Use
OXYGEN CONCENTRATOR?**



The Purpose of this Challenge

India is currently witnessing massive outbreak of coronavirus and healthcare systems seem to be in turmoil. Despite all efforts being put in by the government and the frontline warriors, the onus is now on individuals to contribute in any possible manner which will eventually strengthen our stance against this pandemic.

One of the major concerns nowadays is the scarcity of OXYGEN CONCENTRATORS. People are spending large amounts of their energy and earnings to acquire oxygen cylinders and save their families. The situation has worsened to such an extent that we are relying heavily on help from other nations for the supply of oxygen as well as portable oxygen concentrators.

So this competition throws an open challenge for everyone to develop a PORTABLE OXYGEN CONCENTRATOR and grab this opportunity to contribute for saving human life during this pandemic.

What is an Oxygen Concentrator?

An oxygen concentrator draws air from the atmosphere and pushes it through a series of filters and separation membranes in order to produce pure oxygen in the range of 93-96%. The membrane is a sieve that adsorbs nitrogen and allows pure oxygen to pass through, thereby ensuring that the oxygen produced is up to the desired standard.

What are the specifications of an Oxygen Generator available in the market?

Parameter	Value	Parameter	Value
Oxygen Concentration	93-96%	Oxygen Percentage Indicator	Low oxygen 82% Very low oxygen 70%
Oxygen flow rate	1-5LPM	Weight of the machine	14-19 KG
Average Power Consumption	350 Watt	Input power	230V/50 Hz
Sound level	45 dB	Outlet pressure	5.5 psi

Expectations from the Oxygen Concentrator to be built by Participants

- The concentrator should be compact enough and not exceed the standard dimensions of machines available in market under the 5LPM category.
- It should be **portable** enough such that carrying it becomes simple.
- The concentrator **should not be bulky** than the ones available in the market for the same category.
- The device should produce oxygen which is 93-96% pure.
- The concentrator must function well for a variable output of 1-5 LPM with 93-96% concentration.
- Any material used for the adsorption of nitrogen from the air should be highly efficient with minimum cost.
- This device being in the category of life-saving equipment; should make permissible noise which is according to the standards. **(less than 45 dB)**
- The device should have an inbuilt oxygen percentage indicator
- The machine should be able to measure the oxygen concentration levels of individuals and should indicate when it moves beyond the threshold limit.
- There should be an alert if the oxygen concentration drops below 80%
- The compressor should be compact enough such that it can be encompassed inside the machine.
- The compressor should be oil-free.
- The compressor must perform efficiently 24X7 with minimum heat generation.
- Output pressure, temperature, flow rate, oxygen concentration of the output, flow rate of the machine are the parameters that should be visible on a display
- The system should generate an alarm in circumstances when the filters must be cleaned.
- The entire setup must have minimum operational and recurring maintenance cost.
- The solution must be cost-effective compared to the market price of existing products.
- **Any additional features/parts/methods can be implemented such that the basic functionality criteria mentioned above are met.**
- **The team has the liberty to apply any alternative parts/methods compared to the ones used in existing machine available in market, keeping in mind that it performs the desired above-mentioned functionalities.**

For any query, you may send an email to re_coe@ljkku.edu.in OR

You may telephonically contact Mr. Bhushan Mehta at 9033096486 between 10:30 am to 6 pm.

Timeline for this competition

Phase 1: Registration of Team details and Submission of Proposed Technical Design: **12th May, 2021**

Link for free Registration & Submission: <http://bit.ly/ljuoxycon>

Phase 2: Submission of Final working Prototype should be done **within 5 days** after the declaration of phase 1 results. Late submissions will not be accepted.

Some important notes

- 1) The team members can be inter-disciplinary, limited to a maximum of 5 members per team.
- 2) Only the teams whose design has been approved by a panel of experts will be allowed to participate in Phase 2.
- 3) All the necessary funding required for developing prototype of the oxygen concentrator will be provided by the college to the teams shortlisted in Phase 1.
- 4) Teams might be required to work on-campus at L J University premises.
- 5) Teams must follow Covid guidelines while working on the development of prototype.
- 6) This competition event is promoted by LJ CORE, L J University and supported by NewGen IEDC, DST GoI and SSIP, DoE, GoG.
- 7) All IPR with respect to the submitted prototype designs will be reserved by LJ University for free as well as commercial usage as per the State Policy.

Prize Bounty

- 1) Prize will be awarded to teams which develop successful prototype satisfying desired output criteria as follows:

First Prize: 5000

Second Prize: 3000

Third Prize: 2000



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NewGen IEDC
DEPARTMENT OF
SCIENCE & TECHNOLOGY

GOVERNMENT OF INDIA



**STUDENT START UP
AND INNOVATION
POLICY**

**DEPARTMENT OF EDUCATION
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