CSL®

SETTING STANDARDS

ISO/IEC 17025 Accredited Testing Laboratory by NABL vide certificate no. TC-10571

FRUiTRON
Post Harvest Technologies

CALIPORT
Portable / Disposable Calibration Gas Cylinder

Ripylene™

Chemtron Science Laboratories Pvt. Ltd.

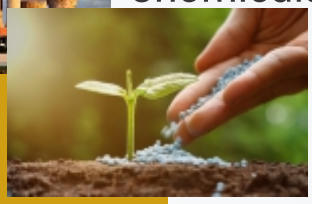
R&D & Education
institutes

Oil & Gas

Steel &
Cement

Power

Chemicals &
Fertilizers



INDUSTRIES SERVED

Marine
(Vessels)

Essential Oils &
Nutraceuticals

OEM
(GC/GAS Analysers/Detectors)

Horticulture

www.chemtronlabs.com

FRUIT RIPENING SOLUTIONS

Four Room Ripening Controller

FEATURES:

- Dedicated Mango Ripening Controller.
- One controller for 4 mango chambers.
- Programmable either for pulping of fruits or for ripening fruit for consumption.
- Suitable for both pulping polyhouses and for refrigerated ripening chambers.
- Supports chamber of any dimension.
- Weather proof stainless steel housing in SS316 Grade.
- Suitable for out-door installation.
- Comes with Temperature, RH and CO2 sensor for each chamber.

Sensor Module

TEMPERATURE CONTROL:

Temperature control in a pulping facility is achieved by cooling pad and exhaust blower setup. Some installations have misting solution with exhaust blower for temperature control. Whereas in a ripening facility that ripens mango for table consumption, a refrigeration system is present for controlling temperature. All these configurations are supported by the Mango controller.

HUMIDITY CONTROL:

Humidity control in a pulping facility is achieved by cooling pad or by misting. The water pumps are automatically started by the Mango controller based on the RH sensor.

Gas Dispensing Unit

ETHYLENE CONTROL:

Precision Ethylene injection in room which brings the chamber into desired Ethylene PPM in matter of minutes. Room leakages are taken into account by the Mango controller while dosing Ethylene.

CO2 CONTROL:

CO2 is monitored by the sensor placed inside the chamber. CO2 is controlled by the Mango controller by operating the exhaust fan in pulping units whereas in refrigerated cold rooms CO2 is controlled by operating the dampers.

Ethylene cylinders

We have a decade long experience in ripening all the major variety of mangoes like Alphonso, Totapuri, Sindhura, Banganapalli, Langra, Kesar, Neelum, Dashehari, Chausa, Imam Pasand and Pairi etc.
Our controllers are well equipped to deal with the above mentioned varieties.

COMMERCIAL RIPENING SYSTEMS

Commercial ripening systems and processes assure uniform ripening, lesser weight loss, and premium marketable quality that fetches good price. It monitors and Controls temperature, Relative Humidity (RH), Carbon Dioxide and Ethylene which constitutes all parameters in a ripening process. These systems are for ripening of climacteric fruits such as Banana, Mango, Papaya, Sapota, Tomato and Avocadoes. These systems can also de-green Lime, Lemon, Orange, Sweet lime, Kinnow and Chili.

Centralized Ripening Panel 2.0

- Central panel supports up to 10 rooms.
- Completely automated that controls parameters based on sensor feedback.
- Monitor parameters such as Temperature, RH, CO2 and Ethylene.
- Control Temperature, RH, CO2 and Ethylene.
- Sampling based Ethylene detection.
- PLC, HMI and SCADA based system.
- Data log on customer's computer.
- On board battery backup for uninterrupted monitoring.
- 3 Phase input which enables to run on any one phase
- Trends and performance graphs on HMI
- Complete diagnostics to ensure proper functioning.
- Remote monitoring and support.

Centralized Ripening Controller 3.0

- Central controller supports up to 4 rooms.
- Completely automated that controls parameters based on sensor feedback.
- Monitor parameters such as Temperature, RH and CO2.
- Control Temperature, RH, CO2 and Ethylene.
- Potential free relay output to control Temperature and RH.

Automatic Ripening Controller 1.0

- Dedicated ripening controller for a chamber.
- Completely automated that controls parameters based on sensor feedback.
- Monitor parameters such as Temperature, RH and CO2.
- Controls Temperature, RH, CO2 and Ethylene.
- Relay output to control Temperature and RH.
- Messaging services can be provided as add on component.
- Data logging onto USB and SCADA PC,
- Trends and performance graphs on HMI
- Remote monitoring and support.

Semi-Automatic Ripening Controller 1.1

- Central controller which supports up to 4 Rooms.
- Automatic operation based on timer control.
- Controls Ethylene dosing and CO2 venting.
- Cost effective systems that provides repetitive results.

Product	Model	Chambers	Ripening Parameters										SCADA	Datalog
			Temperature		RH		CO2		Ethylene		Pulp			
			Monitor	Control	Monitor	Control	Monitor	Control	Monitor	Control	Monitor	Control		
Fruitron Ripening Controller Fully Auto System	1.0	Upto 1	✓	✓	✓	✓	✓	✓	x	✓	✓	✓	x	x
Fruitron Ripening Controller Semi System	1.1	Upto 4	x	x	x	x	x	✓	x	✓	x	x	x	x
Fruitron centralised ripening management system PLC	2.0	Upto 10	✓	✓	✓	✓	✓	✓	✓	✓	✓	x	✓	✓
Fruitron Ripening Auto System	3.0	Upto 4	✓	✓	✓	✓	✓	✓	x	✓	✓	x	x	x
Fruitron Ripening Semi Auto System	3.1	Upto 8	x	x	x	x	x	✓	x	✓	x	x	x	x

Our products are designed from a decade of learning and experience in the field of commercial ripening. We can provide solution to small scale ripeners to large scale ripeners. With our knowhow and support you can achieve the perfect ripened commodity for your target market.

RIPYLENE - FRUIT RIPENING GAS

Ripylene is derived from Ethylene which is a gas used to make Polyethylene. Ethylene is also a natural plant hormone, it accelerates ripening in climatic fruits like Banana, Mango, Papaya and Sapota etc. This is a scientific way to ripen fruits have no residue of harmful chemicals and have an appetizing look with bright yellow peel colour and green tips.

Ripylene 6

We are the proud to be the inventors of fruit ripening CANS. These CANS of Tin were filled with Ethylene that empowered and enabled smallest of retailers throughout the country with 'Ripening Technology' and practically eliminated harmful chemicals like Calcium Carbide and Ethapon used in ripening process.

Features:

- Each CAN ripens approximately 6 tons of fruit kept in 40 m3 closed volume.
- For small scale ripening capacity of ripening upto 12 Tons of fruits.
- No expiry for storage.
- Repetitive ripening results.
- Disposable after use.
- Easily available throughout the country.

Ripylene 200

We introduced this product as a substitute to 47 litres bulky cylinders. Each cartridge can ripe from 150 to 170 tons of fruit. It is easy to handle, use, transport and delivers better results as compared to 5% Ethylene and 10% Ethylene cylinders.

Features:

- 0.5 Litre pure Ethylene cartridges.
- Weighs upto 2.5 Kg.
- Easily to handle.
- Low cost transportation and empty ones can be sent by courier.
- Cheaper than 5% and 10% Ethylene cylinders.
- Can be retrofitted to ripening systems using old cylinders.

Pure Ethylene Cylinders

The product was purely launched for ripening of mangoes used in mango pulping industry. Each cylinder can ripe upto 600 tons of mangoes in polyhouse chambers.

Features:

- Available in 3 & 10 Litre pure Ethylene Cylinder
- Weighs upto18 Kg.
- Instant ethylene build up in the chamber as compared to slow working ethylene generators.
- Easily to handle.

FAQS ON ETHYLENE

Is Ethylene banned for ripening?

Ethylene is the only natural ripening agent accepted internationally for commercial ripening and they are approved by FDA and FSSAI.

Is Ethylene is harmful for fruits?

It is not, it a natural plant hormone. This ripening process using Ethylene is also the plant's way of ripening the fruit.

Is Ethylene absorbed by the fruit?

Ethylene only triggers the ripening process, with good amount of ethylene the fruit keeps ripening with increased rate of respiration.

How much Ethylene is needed for ripening?

Only trace levels (in PPB) are required for triggering ripening process. For commercial ripening we maintain 100 to 200 PPM concentration inside the ripening chambers which accounts for leakages in the chamber.

Is Ethylene dangerous?

LEL (Lower Explosive Level) of ethylene is 2.7% by vol. above which it becomes inflammable. Our controller and cans releases only the gas required for maintaining 100 – 200 ppm throughout the dozing time.

Are Ethylene cylinders risky?

We provide only CCOE approved cylinders designed pressure at 500 bars they are hydro leak tested at 300 bars. The gas is filled less than its 50% capacity at 130-140 bars. This makes the cylinders safe for use provided its handled by professional equipments.

Is it expensive as compared to other ways of ripening?

Ripening by Ripylene is cheaper and least labour intensive than any other way of ripening. We have solutions for small scale to large scale fruit ripeners.Our methods and process along with our support and guidance will ensure you with premium ripened fruit and flourishing business.

We are proud to be associated with the **"YELLOW REVOLUTION"** that has taken place over the decade and are constantly innovating in order to create products which change the status quo and delivering value to farmers, providing profit to retailers and passing quality to consumers.

COLD ROOM & GAS SENSORS

Smart Sensor Module for Cold Rooms

Features:

- Most comprehensive sensor module measuring all key parameters responsible for uniform ripening which are Temperature , RH, Pulp, and CO2.
- Sensor module communicates on RS 485 hence no transmission losses over long distances very typical to cold storages.
- IP-65 housing designed for harsh environment which are prevalent for ripening chambers.
- Digital communication for long distance.
- 4 analog inputs for other sensors like ethylene , oxygen , ammonia etc.
- Easily attachable IP-68 communication wire connectors

SPECIFICATIONS

GENERAL	
Supply	24 V DC, single phase, 50 Hz
Wattage	8W
Dimensions	200mm x 120 x 75mm
Weight	400gm
Communication	RS 485 RTU (2 wire config)
Inputs (4 + 8)	4 RTD and 8 Analog 4-20 mA / 0-10V DC
Operating Temperature and Humidity	0 - 60°C and 0 - 95% RH for the unexposed parts

AMBIENT TEMPERATURE SENSOR	
Operating Principle	Band Gap
Measuring Range	0-50 ° C
Accuracy	0.1°C
Response Time	5 seconds
Resolution	0.1°C
Output Signal	Digital SPI

PULP TEMPERATURE SENSOR	
Operating Principle	PT 100 4 wire configuration
Measuring Range	0-50 ° C
Accuracy	0.1°C
Response Time	5 seconds
Resolution	0.1°C
Output Signal	Resistance

RH SENSOR	
Operating Principle	Capacitive
Measuring Range	0-98 %
Accuracy	1%
Response Time	5 seconds
Resolution	1%
Output Signal	Digital SPI

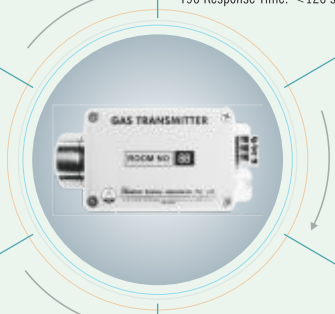
CARBONDIOXIDE SENSOR	
Operating Principle	NDIR
Measuring Range	0 - 3.2% / 0 to 32000 ppm
Accuracy	± 0.1% FS
Response Time	2 minutes by 90% diffusion sampling method model
Operating Temperature & Humidity	0 - 50°C and 0 - 95% RH Non condensed
Resolution	0.01% or 100 ppm
Output Signal	PWM Output on USART

Other Sensor Transmitters

B Co2 Transmitter
Measurement range: 0-5 %, 0-10%
Sensing method:NDIR
Resolution: 0.1%
Repeatability: 1% of Signal
T90 Response Time: <120 seconds

A Ammonia Transmitter
Measurement range: 0-500ppm
Sensing method: Electrochemical
Resolution: 0.1ppm
Repeatability: 1% of Signal
T90 Response Time: <140 seconds

C Ethylene Transmitter
Measurement range: 0-200 ppm
Sensing method:Electrochemical
Resolution: 1ppm
Repeatability: 1% of Signal
T90 Response Time: <180 seconds



F Oxygen Transmitter
Measurement range: 0-30%
Sensing method: Electrochemical
Resolution: 0.1%
Repeatability: 1% of Signal
T90 Response Time: <120 seconds

D H2S Transmitter
Measurement range: 0-200 / 0-1000 / 0-2000ppm
Sensing method: Electrochemical
Resolution: 1ppm
Repeatability: 1% of Signal
T90 Response Time: <180 seconds

E Methane Transmitter
Measurement range: 0-100% LEL
Sensing method: Electrochemical
Resolution: 0.1% LEL
Repeatability: 1% of Signal
T90 Response Time: <180 seconds

General Specifications:

- **Dimensions:**100 * 70 * 50 mm
- **Weight:** 200g
- **Enclosure:** IP 65
- **Calibration:** Span, Zero
- **Input voltage:** 24V DC
- **Signal Output:** 0-10 VDC / 0-5VDC / 4-20 mA
- **Output Linearity:** Linear

We also provide calibration gases, calibration services and gas handling equipments for smooth functioning of your business.

CONTROLLED ATMOSPHERE SYSTEMS

CA Management Systems:

- A compact single skid design
- Upto 12 chambers of up to 250 MT each.
- Monitoring controlling and data logging of all CA parameters
- Control valves, instruments and electronics in one panel for one point service and maintenance.
- The panel supports both single vessel and twin vessel CO2 scrubber model.
- SCADA monitor and control with remote access.

Gas Analyser:

- Independent atmosphere analysis of the cold room by sampling gas from of all CA rooms.
- Continuous monitoring for sensor failure, indoor fan failure and other refrigeration failure redundancies.
- Carbon dioxide and Ethylene monitoring, control and alarms for long storage of the commodity.
- Self-Calibrating and auto tuning sensors

N2 Generator:

- Nitrogen production using Membrane technology imported from Japan , Netherlands and the USA
- No mechanical moving parts and noise free* nitrogen production.
- Nitrogen generated is oil free, dust free and moisture free which keeps your commodity clean.
- Variable Nitrogen output from 90% to 99.5% achievable dynamically.
- Models from 5 m3/hr up to 60 m3/hr.
- Smart control enables quicker pulldown and saves time cost and energy.

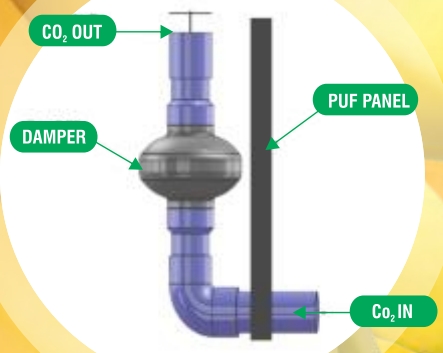
CO2 Scrubber:

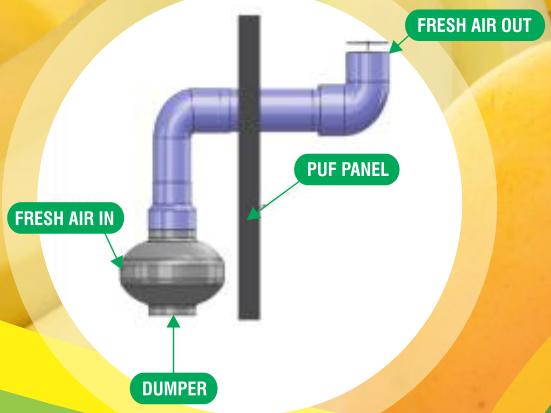
- Co2 scrubbing by cyclic adsorption and De-adsorption of CO2 over activated carbon.
- Premium grade made in India Activated carbon ensures long life without physical disintegration
- CO2 scrubbing capacity from 50 Kg CO2 per day to 250 Kg CO2 per day on a single skid.
- Controls using SS316 pneumatic valves which are sturdy with 10000 cycle operational life.
- Scrub and Purge cycle based on sensor feedback enabling precise CO2 control.

Safety Valve

Manometer

Breather Bag





Fruitron CO_2 Control System

(For Cold / Ripening Storages)

Automatic Specialized system for CO_2 ventilation & Fresh Air Intake

For first time in **INDIA** we are launching "Automatic CO_2 Controlling System"

After being leaders in post harvest technologies solutions for over a decade CSL brings yet another innovative product for Ethylene Spray can users who have been done manual ripening of tropical fruit frm many years.

FEATURES:-

- Available in two model **100 CB & 150 CB** as per room capacity i.e. For **5 to 15 MT 100 CB** & more than **15 MT 150 CB.**
- It ventilates the CO_2 gas & intake the fresh air in fruit chamber. (Make sure room should be Airtight.)
- Specialized circular PVC connections & fittings hence no leakage in room.
- Easy to operate, no actuators or Mechanical moving part.
- No recurring cost, easy to maintain & install.

ADVANTAGE:-

- Cheaper & easy technology
- No need of controller system.
- Appropriate air circulation & Uniform ripening with maintaining fruit shine & reducing looseness in fruit.
- Low electricity consumption.
- Automatic process, so less manpower engagement.

CSL®

Working Procedure of Automatic CO_2 controlling system

- After ethylene gas dosing process get complete, system will start for ventilation process i.e. CO_2 venting, which has automatically performed by set of Dampers itself for next 72 to 96 hr.
- In this there is 2 set of Dampers we attach to the chamber i.e. One for CO_2 ventilation which is down side/corner of chamber (because CO_2 is heavier than Air & it always remains downside of room) & another one is for Fresh air intake which is upper side /corner of chamber (because Fresh Air is lighter in weight it remains upper side of room)
- After 24 hours of ethylene gas dosing, CO_2 percent in cold room start rising. Please switch on Dampers connection & it will start their operation by setting time based logic i.e. CO_2 ventilation & Fresh Air Intake.
- This process will start form 2 nd day of ripening followed up to 5 th day of taking out fruit from Chamber.

Effect on Banana with Damper on 5th Day

Effect on Banana without Damper on 5th Day

RESEARCH CHAMBER & MUSHROOM SOLUTIONS

Post-Harvest Research Chamber

The chamber comes in
500 Litres, 1000 Litres,
1500 Litres & 27,000 Litres.

Sustainable solutions for research organizations in the field of post-harvest technologies such as institutes, kVkS, UASs and local agricultural bodies.

Applications

- Conducting research on ripening.
- Conducting research on Controlled Atmosphere Storage.
- To study the effect of waxing and other chemicals & gases.
- To validate shelf life of fruit and vegetable.
- To standardize and monitor the output quality of their fruits.

Features:

- It comes with ports to introduce gases inside the chamber.
- Glass doors for visual inspection of commodity from outside.
- Adjustable trays as per users convenience.
- Controls Temperature and RH.
- Ultrasonic mist for humidity control.
- Data logging onto USB and SCADA on customers PC.
- Trends and graphs on HMI.
- User programmable set points for each parameter.
- Customizable as per client's request.

Sensing and Control Parameters

Sr.No	Sensor	Range	Status	Quantity
1	Ethylene	10-50000PPB or 0.01-50.0 PPM	Online	1
2	CO2	0.0-5.0 %	Online	1
3	Oxygen	0.0-25.0%	Online	1
4	Temperature	0.0-50.0 ºC	Online	1
5	RH	0 - 100 %	Online	1
6	Temperature PULP	0.0-50.0 ºC	Portable	1
7	Ethylene	0-500 PPM	Portable	1

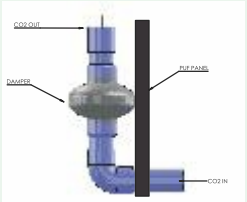
Mushroom Solutions

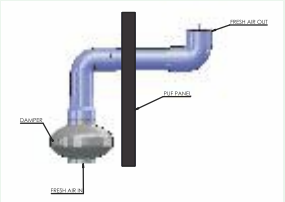
Controller

An automatic controller which precisely monitors and controls Temperature, RH and CO2 for optimal growth of mushroom indoors.

The control panel features are as follows:

- Monitor and control Temperature, RH and CO2.
- Temperature, RH, CO2 sensors are placed inside each room.
- Temperature monitoring of compost / substrate (upto 4 zones in each room).
- 4 potential free relay output per room.
- 4.3" Colour Touch HMI.
- PLC control.
- Datalogging onto USB and SCADA on customer's PC.
  rends and graphs available on HMI.





CO2 exhaust system

Specialized dampers are needed in Mushroom chambers to exhaust CO2.

Features:

- Available in 100 and 150 CFM.
- It removes the CO2 build up but does not allow light to enter the room.
- Circular PVC connections and fittings hence no leakages in the room.
- Weight based operations, no actuators or mechanical moving part.
- No recurring cost, easy to maintain.

BIO GAS SOLUTIONS

Solutions We Have

- Online Analyzers
- Benchtop Analyzers
- Portable / Handheld Analyzers
- Gas Chromatograph
- Gas Sampling Bottles
- Calibration Gas Standards
- Analytical Services

Application of Our Solutions

- Bio Gas analysis.
- Digester gas research
- Engine Feed gas analyzer.
- Sampling systems and sample collection devices.
- Research.
- Production line monitoring.
- Calibrating existing analyzers.
- Collect samples for analysis at distant location.

Online Biogas Analyzer 2.0 :

This analyzer is typically used for analysis of continuous gas stream or production.

Features:

- Upto 4 gases CH4, CO2, H2S, O2
- Upto 4 streams.
- Internal gas sampling conditioning.
- H2S scrubbing to prevent sensor corrosion
- Dilution system for measurement of H2S up to 2 % Vol/Vol.
- Data logging in SCADA via MODBUS®
- Signal retransmission by 4-20mA signals.
- Auto calibration and manual calibration.

Portable Biogas Analyser 1.0

The analyzers are used for validating the process and for research and laboratories purposes.

Features:

- Analysis of upto 4 gases.
- Data logging onto USB.
- Battery backup.
- Manual calibration.
- Data logging in SCADA via MODBUS®.
- Signal retransmission by 4-20mA signals.

Handheld Gas Analyser 601

These analyzers are used for site survey and applications were the measurement of gases is not so critical and are best suited for on field surveys and diagnostics.

Features:

- Single as well as multi gas analyzers.
- Economical.
- Battery life for 8 hours.
- Manual calibration.

Gas Chromatograph:

The GAS chromatograph widely used for research level applications were the measurement accuracy is better than 0.1 %.

Features:

- Accuracy within 0.1%.
- TCD detector for H2S, CO2 and CH4.
- Online as well as offline solutions.
- Analysis time less than 5 minutes.

HUBS & DISTRIBUTORS

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