

This is where it starts... Journey to enhanced growing.

We don't sell greenhouses or cultivation rooms, but we enable the enhanced success of our partners, cultivators and growers. When a company's offerings are so diverse, it can be hard to gather all the information we need in a set of forms like these—so let's use this to get a great start. We encourage a descriptive email telling us details of your project as well as any drawings, photos, links, etc. you can provide us to get started.

Thanks for having us help!

—Team BioTherm

GENERAL INFORMATION

Company: _____
 Name: _____
 Phone: _____
 Email: _____
 Instagram handle: _____

Address: _____

Project name and Location: _____

BIOThERM'S 3 DESIGN SYSTEMS

We offer designs for three main system types:

HEATING

Choose a BioTherm heating system.

Fill out this section.

HYDRO SCIENCES

- TOOB Dissolved Oxygen Infusion
- Irrigation Tempering
- Subirrigation Floor Systems

Fill out this section.

OPTIMIZED AIR

- Air Conditioning
- Dehumidification
- CO2 Enrichment

Fill out this section.

COMPLETE ENHANCEMENT PACKAGE

Fill out all sections.

CROP INFORMATION

Is this for Greenhouse OR Indoor Cultivation?

Crops Grown: _____

Cultivation Method:

- Containers (pots, bags, flats)
- Nutrient Film Technique
- Media beds
- Deep Water Culture

Growing surface:

Benches:

- Stationary
- Mobile Trays
- Rolling
- Gutters
- Troughs

Bench surface:

- Expanded metal
- Wire mesh
- Ebb & Flow trays
- Other _____
- Wood

– OR – Floor:

- Concrete
- Gravel/Sand
- Rafts in ponds

Current Control System:

Argus Wadsworth Priva Hortimax Other _____

Air Movement

Circulation fans: HAF VAF Other _____

UTILITIES

Natural gas Liquid propane Other (biomass, waste heat, etc). Describe: _____

Electrical service: Voltage: _____ Amperage _____ Phase _____

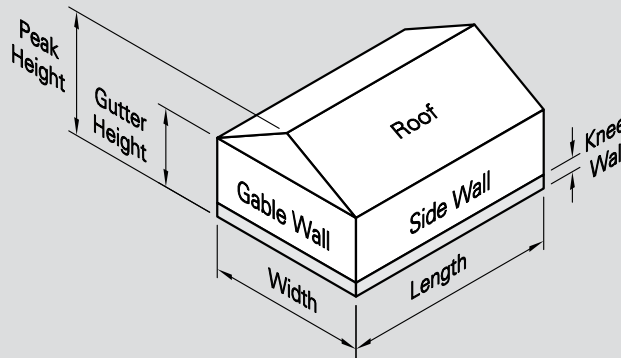
STRUCTURE INFORMATION

Using the lists and diagrams below, indicate dimensions and glazings/coverings for your project.

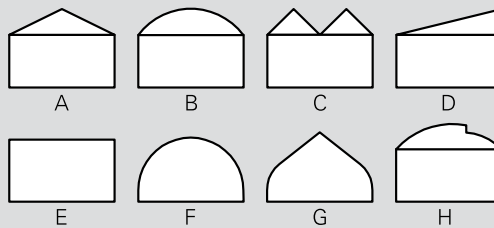
Your Project:

<input type="checkbox"/> New <input type="checkbox"/> Existing				
House	1	2	3	4
Number of ranges:				
Bays per range:				
Gutter height (ft):				
Knee wall height (ft):				
Bay width (ft):				
Bay length (ft):				
Peak height (ft):				
Structure type*:				
Glazing/Covering (from list)				
Side wall:				
Gable wall:				
Roof:				
Kneewall:				

Greenhouse Elements:



***Structure Types:**



Glazing/Covering List:

1. Polyethylene Film, Single
2. Polyethylene Film, Double
3. Acrylic Film, Double
4. Polycarbonate Sheet, 16mm
5. Polycarbonate Sheet, 8mm
6. Polycarbonate Sheet, 6mm
7. Polycarbonate Sheet, Triple Wall
8. Polycarbonate Sheet, Corrugated
9. Fiberglass
10. Glass, Sealed
11. Glass, Lap
12. Concrete, 4"
13. Concrete, 8"
14. Concrete, Block
15. Wood
16. Metal
17. Insulated (R-Value)
18. Other: _____

Shade Curtains:

Please describe any exterior, thermal, or light deprivation curtain systems to be used:

Exterior shade curtain (%): _____ Interior shade curtain (%): _____

Make and Model of Shade Curtain _____

Greenhouse Manufacturer: _____

SITE SKETCH CHECKLIST

On the following page, please provide a sketch of your facility so we know where to place your equipment and can accurately determine material quantities. For complex sites please provide additional sketches. If indoor cultivation, please provide planset and specs of the building you intend to grow in. Please provide photos to help us understand your needs.

Please sketch your site, including:

- Structure footprint and dimensions.
- Aisles and walkways (locations and sizes).
- Bed or bench dimensions.
- Control zones required.
- Boiler/Mechanical room desired.
- Indication of existing and retrofit items.
- North arrow.
- Doors.
- Utility locations..
- Water system (storage and fertigation).

SITE SKETCH

Please use checklist on previous page to guide you.

A large grid of graph paper for site sketching, consisting of 30 columns and 40 rows of small squares.

HEATING SYSTEM REQUIREMENTS

BioTherm's high-tech, efficient heating systems save fuel costs while maintaining optimal temperatures in your growing environment.

Temperature Parameters

Min. outside temp (°F): _____

Desired inside temp (°F): _____

Desired media temp (°F): _____

Air temperature current system will maintain (°F): _____

Heating

Is there an existing heating system? Boiler Unit heater

BTU capacity of existing system: _____

Zones

How many zones should we design? _____

Request for Supplemental Rootzone Heating System? Yes No

What type of heating system would you like us to design for you?

Under bench



On floor



Perimeter heating



In-bench



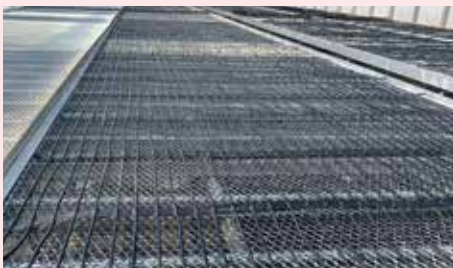
Bed heat



Integrate with irrigation



On-bench



Space heating



Boom supports



In-floor concrete



Cart-rail



In-ground gravel



Use the sketch page to guide us.

Unfamiliar with all the options BioTherm has to offer?
Learn more at www.biothermsolutions.com

HYDRO SCIENCE SYSTEM REQUIREMENTS

BioTherm Hydro Sciences has one simple focus: to enhance your irrigation system and boost plant growth using cutting-edge technologies.

What type of hydro science system would you like us to design for you?

Dissolved Oxygen Infusion

Irrigation Tempering

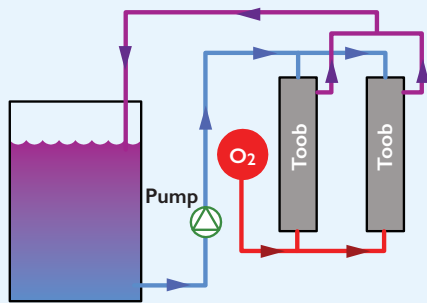
Subirrigation Floor System



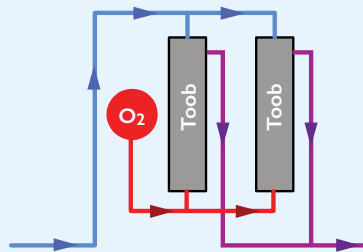
TOOB® Dissolved Oxygen System Design Conditions

TOOB infusers can be installed in different configurations to boost dissolved oxygen levels in your irrigation water.

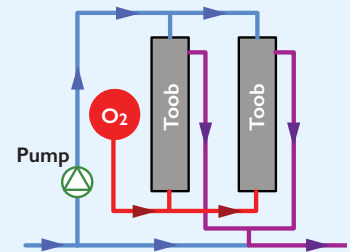
Which type of configuration would you like us to design for you?



Recirculating Tank



Inline



Sidestream

Crops to be grown _____

If irrigation is flood, pond, or bucket, are air bubblers or air stones used? Yes No

Grow medium: Soil Hydroponic Aeroponic Aquaponic Other: _____

Starting dissolved oxygen level (ppm): _____

Desired dissolved oxygen level (ppm): _____ (if unsure, we will guide you based on your type of growing)

Water flow rate (gpm): _____

Please describe how your irrigation system operates. For tank recirculation systems, we need to know specifically how many gallons are used throughout a typical growing day. _____

Please provide a simplified sketch outlining the major components (tanks, pumps, fertigation, water source, etc) and how they are connected. Use sketch area on page 3.

Irrigation Water Storage

Tank capacity (gal): _____

Tank cover: Roof Floating Open

Water stored: Clear Fertigated Recycled

Tank shape: Rectangular Circular

Tank location: Above grade Below grade

Tank dimensions (ft): Diameter _____ Length _____

Height _____ Width _____

Water depth (ft): _____

Is water recirculated? Yes No

Are tanks hydraulically connected? Yes No

If yes, which tanks are connected and what is the pipe size connecting them (inches)? _____

Fresh-water refill flow rate (gpm): _____

If refill rate is unknown, what is the pipe size? _____

Do you run out of water after maximum irrigation cycle? _____

If you are interested in using the TOOB® in applications other than clear irrigation water, please define your area of interest: _____

HYDRO SCIENCE SYSTEM REQUIREMENTS

Irrigation Tempering Design Conditions

Irrigation temperature plays a key role in plant health. Studies show that plants irrigated with water that is too cold essentially stop growing until the soil temperature stabilizes. The same is true with irrigating with water that is too hot. Our irrigation tempering systems are proven and reliable and help you deliver the optimum temperature irrigation to your crop.

How would you like your irrigation water tempered? Warm Cool Both

Flow Rate (gpm): _____ Starting temperature (°F): _____ Any additional details: _____

Usage (min/hour): _____ Desired temperature (°F): _____ Please provide a simple sketch on page 3.

What type of Subirrigation Floor System would you like us to design for you?

Flood Floor (fill and drain)

Cascade Floor (constant "skim" flow)



Please provide a dimensional sketch on page 3.

Flood Floor and Cascade Floor Design Conditions

Flood Floor systems have been a vital tool of top growers for decades. Labor and water savings are only a couple of the many advantages they offer. Cascade floors are based on the same technology, but the water "cascades" across the floor, irrigating all plants on a flat, slightly pitched floor, delivering even more precise irrigation.

I would like to Retrofit an existing structure New construction at new facility Expansion of existing facility

• Compressed Air

Provide compressed air for valves with irrigation system. Compressed air is or will be available.

• Greenhouse Site

Is freezing a possibility? Yes No

Topography: All on one grade Cut and grade Fill and grade

Depth to bedrock (m) _____ Water table (m) _____ Soil type _____

Recirculating Irrigation System Design Conditions

Floor: Length (m) _____ Width (m) _____ Quantity _____ Slope: "V" "W"

Max watering time (min): Per floor: _____ Per system: _____

Water depth required (mm): _____

Valves flush with ground? Yes No

Water Storage for Subirrigation

Number of tanks: Clear water _____ Feed _____

In Ground: Poured concrete Pre-cast concrete Covered Open

Above Ground: Steel, plastic-lined Plastic Fiberglass Other _____

Tank location: _____

Tank size: Normal Oversize

Tank refill during operation: Drain to outside Clean switch-over

Unfamiliar with all the options BioTherm has to offer?
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OPTIMIZED AIR SYSTEM REQUIREMENTS

Controlling relative humidity and air temperature is vital to managing Vapor Pressure Deficit (VPD) and controlling pathogens. CO2 Enrichment can increase photosynthetic activity by 30% and reduce supplemental lighting hours.

What type of air system would you like us to design for you?

Air Conditioning



Dehumidification



CO2 Enrichment



Usage type:

Cultivation

Storage

Drying

Lab

Walk-in cooler

Other _____

If cultivation, how do you irrigate?

Hand

Drip

Spray

Mist

Aeroponic

Hydroponic

Flood/Cascade

Cooling Design Conditions

(for hybrid or enclosed greenhouse operation)

Desired Indoor Setpoint temp (°F): _____

Lighting load per room (watts): _____

Additional heat load (describe): _____

Dehumidification Design Conditions

Target VPD: _____

Day target relative humidity (%): _____

Night target relative humidity (%): _____

Irrigation water input per bay (gal/day): _____

Irrigation drain to waste (%): _____

Dehumidification period:

Night Day Both

Shade curtain % _____

Indoor day temperature _____

Indoor night temperature _____

Light per room _____ Wattage per light _____

Cannabis Drying Design Conditions

Initial plant weight (lbs): _____

Final plant weight (lbs): _____

Drying time (days): _____

Air Handling Units

Where do we have space?

Is this going to be an under-bench or overhead polytube application with custom BioTherm AHUs in a corridor?

Under-Bench Polytube

If no corridor, are you ok with hanging AHUs at the gutter level inside the grow space?

CO2 Enrichment Design Conditions

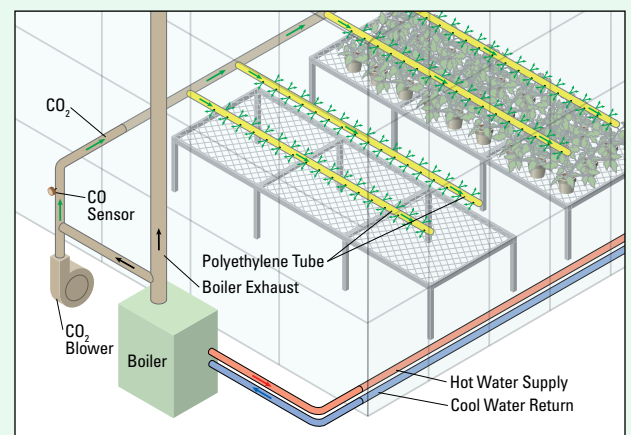
(CO2 systems use boiler exhaust to supplement the levels of CO2 in a greenhouse)

CO2 level desired (ppm): _____

Construction: Existing New New w/future expansion

Excess Heat: Store Discard (cooling tower)

Zones: Quantity _____ (Show on sketch, page 3)



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