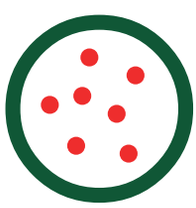
Labconsult

PLANT SCIENCE, PLANT BREEDING AND HORTICULTURE

SUPPORTING YOUR

RESEARCH AND PRODUCTION



PLANT TISSUE CULTURE
AND MICROPROPAGATION

PLANT BIOLOGY
RESEARCH

HORTICULTURE

PHYTOPATHOLOGY AND
SEED LABORATORIES

Labconsult is an independent distributor that supports leading laboratories in the selection and supply of scientific accessories and instrumentation. It is our mission to provide every lab with scientific expertise and innovative solutions.

Over 25 years of experience

With over 25 years of experience and extensive market knowledge, we have built up an impressive portfolio of products, services and solutions to cover the needs of laboratory and production facilities.

Providing highly innovative Lab Equipment and Services

At Labconsult we only offer Products & Services we believe in, all carefully selected to meet your needs. We are dedicated to develop and maintain long term relationships. This dedication allows us to continuously add real value to both our customers and suppliers. A great cooperation for everyone's success.

ISO9001 certified

Being ISO 9001 certified, we embrace the concept of quality through continual improvement. We aim to enhance customer satisfaction and consistently provide products that meet customer and regulatory requirements.

Flexible, reliable and around-the-clock

Based in Brussels and Ghent, we are able to service the whole Benelux on a flexible, reliable and round-the-clock way. A fast and professional attitude is our commitment to you.

Dedicated Team

We have assembled a dedicated team by combining experienced individuals with young and innovative thinking minds. Both the technical know-how of our Application Engineers as well as the scientific knowledge of our Product Specialists make them indispensable in our team.

Labconsult

Plant Science, Plant Breeding and Horticulture Portfolio

Labconsult offers a comprehensive portfolio of products for Plant Science, Plant Breeding and Horticulture: reagents, labware, consumables, instrumentation and LED lighting.

This brochure gives you a global overview of available product groups, a list of most suppliers we represent and the most popular products highlighted.
Our website www.labconsult.be shows our complete product portfolio, detailed product information, pricing and much more. You can search your product by description, article number or CAS number.

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PLANT MEDIA & BIOCHEMICALS

Media

Duchefa Biochemie

Choosing the proper medium formulation for your tissue culture work is one part of the work. Getting it from the right source is so important. Whether you are looking for a standard formulation or your own customized recipe, Duchefa is the preferred partner of hundreds of labs all over the world.

We offer **more than 40 published tissue culture media** (micro- and macro elements, with or without vitamins) in different volume sizes to prepare medium **from 1 liter to 100 liters**.

Using ready-made mineral mixtures, the creation of variations in the concentration of the different components is difficult. While addition of extra minerals is feasible, decreasing the concentration of others is impossible. In practice this may prove to be a disadvantage. In order to counterbalance this drawback, Duchefa Biochemie B.V. has created micro and macro mixtures. The medium is divided into micro and macro components and ammonium or potassium nitrate, so the concentration of media components can be varied as needed:

- MICRO-MACRO GAMBORG'S B5 MEDIUM
- MICRO-MACRO MURASHIGE & SKOOG MEDIUM
- MICRO-MACRO NITSCH MEDIUM

Custom manufacturing

Custom manufacturing is our greatest strength. With a focus on the unique needs of our customers, we are able to offer a custom manufacturing program that allows us to meet your demands

- quick turnaround times
- flexible packaging options
- customized delivery schedules
- limited minimum orders

Agars, Gelrite® and other Gelling Agents

Duchefa Biochemie

Agar is a natural product obtained from various types of seaweeds. All qualities have been extensively analyzed for the remaining mineral grade, limpidity, gel strength, ash content and humidity.

For quantities of 25 kg or more, we can make a batch reservation.
After testing a sample, we deliver the reservation.

Plant Agar is applied in plant cell and tissue culture as a general purpose agar that combines a good quality with a favorable price. Plant Agar can be used in a minimal concentration of 5.5 g/l to obtain a solid gel.

Micro Agar is a purified agar with a high gel strength and excellent properties for use in plant cell and tissue culture as well as microbiological work.

Gelrite® is a naturally derived gelling polymer that can be used in a variety of applications as a solidification agent instead of agar. Produced by microbial fermentation, Gelrite is a highly purified natural anionic polysaccharide without the variations commonly associated with agar. Gelrite forms rigid, brittle, agar like gels at approximately half the use level of agar in presence of soluble salts like Mg^{2+} and Ca^{2+}.
Gels prepared with Gelrite are remarkably clear in comparison to those based on regular agar. As opposed to standard agar, Gelrite contains no contaminating matters (e.g., phenolic compounds) that are toxic to certain sensitive organisms.

Plant growth hormones, antibiotics, enzymes & other biochemicals

Duchefa Biochemie

Plant hormones

	Effects in tissue culture	*Molulators of metabolism, action or transport*
Auxins	• Formation of meristems of adventitious roots • Induction of somatic embryos (in particular 2,4-D) • Cell division • Callus formation and growth • Inhibition of outgrowth of axillary buds • Inhibition of root growth	• 2,3,4-Triiodobenzoic acid (TIBA) and 1-N-naphthylphthalamic acid (NPA) inhibit polarauxin transport • p-Chlorophenoxyisobutyric acid (PCIB) inhibits auxin action as a genuine anti-auxin by binding to the auxin receptor • Phenolic compounds (e.g. ferulic acid or phloroglucinol) inhibit auxin oxidation • Riboflavin strongly promotes photooxidation of IBA and IAA
Cytokinins	• Adventitious shoot formation • Inhibition of adventitious root formation • Cell division • Callus formation and growth • Stimulation of outgrowth of axillary buds • Inhibition of shoot elongation • Inhibition of leaf senescence	• Compounds have been reported that inhibit cytokinin synthesis (lovastatin), degradation and action. The various effects are, however, not yet well studied or ambiguous.
Gibberellins	• Shoot elongatuion • Release from dormancy in seeds, somatic embryos, apical buds and bulbs • Inhibition of adventitious root formation • Synthesis-inhibitors promote root formation • Synthesis-inhibitors promote tuber, corm and bulb • Synthesis-inhibitors inhibit shoot elongation • Synthesis-inhibitors facilitate acclimatization	• There are various gibberellin synthesis inhibitors, among others paclobutrazole, ancymidol and flurprimidol
Ethylene	• Senescence of leaves • Ripening of fruits • Promotion or inhibition of adventitious regeneration (depending on the time of application or on the genotype?)	• 1-Aminocyclopropane-1-carboxylic acid (ACC) is a precursor of ethylene and is metabolized by plant tissues to ethylene • Aminoethoxyvinylglycine (AVG) inhibits ethylene synthesis. Co^{2+}, α-aminooxy-acetic acid and α-aminoisobutyric acid also inhibit ethylene synthesis but at a lower efficiency. • Silver ions inhibit ethylene action. Silver is applied as silverthiosulphate (STD) or $AgNO_3$. • $KMnO_4$, coated on porous grains effectively oxidizes ethylene.
Abscisic acid	• Maturation of somatic embryos • Facilitation of acclimatization • Bulb and tuber formation • Promotion of the development of dormancy	• Fluridone inhibits ABA synthesis. As it acts by inhibiting an early step in cartenoid synthesis, plants bleach. However, fluridone does not seem to be toxic. Paclobutrazol also inhibits ABA synthesis.

Antibiotics & Antifungal agents

Duchefa Biochemie is a supplier of a wide range of antibiotics and antifungal agents.
Applications of these compounds are:

- Suppression of bacterial, fungal and mold growth in cell- and tissue cultures.
- Selective agents (in combination with resistance marker genes).

Antibiotics and antimycotics can be produced by various species of micro-organisms or by chemical synthesis. Most of our antibiotics and antifungal agents have been tested for use in cell cultures and have no cytotoxic effects. Some have been specially tested for use in plant cell and tissue cultures.

If you have any questions regarding the use of antibiotics, please don't hesitate to contact us. With internal pharmaceutical, biochemical and microbiological knowledge available, we will be able to give you an answer in most cases.

Inhibitors of Bacterial Cell Wall Synthesis

- Penicillins
- Ampicillin
- Amoxycillin
- Carbenicillin
- Penicillin G
- Ticarcillin

Cephalosporins

- Cefalexin
- Cefotaxim

Others

- Bactiracin
- Cycloserin
- Vancomycin

Bacteriostatic Inhibitors of Protein Synthesis

- Chloramphenicol
- Chlortetracycline
- Clindamycin
- Doxycyclin
- Erythromycin
- Lincomycin
- Oxytetracyclin
- Spectinomycin
- Tetracyclin

Antimetabolites

- Methotrexate
- Metronidazole
- Miconazole
- Trimethoprim
- Sulphametoxazole

Bactericide Inhibitors of Protein Synthesis: Aminoglycosides

- Gentamycin
- Kanamycin
- Paromycin
- Tobramycin
- Hygromycin B
- Neomycin
- Streptomycin
- G-418

Antifungal Agents

- Amphotericin B
- Miconazole
- Nystatin
- Cycloheximide

Inhibitors of Nucleic Acid Metabolism

- Amsacrine
- Rifampicin
- Nalidixic acid
- Doxorubicin
- Mitomycin C

Nucleic Acid Analogues

- 5-Fluorouracil
- 6-Mercaptopurine

Plant Cell TECHNOLOGY

Plant Preservative Mixture™ (PPM™)

Available sizes : 100ml - 250ml - 500ml - 1000ml

What is Plant Preservative Mixture™ (PPM™) ?

Plant Preservative Mixture™ is a broad-spectrum biocide/preservative for plant tissue culture. PPM™ is the ultimate solution to the never-ending struggle against microbial airborne, waterborne, and endogenous contamination.

About Plant Preservative Mixture™

PPM™ is a heat stable preservative/biocide which can be used to effectively prevent or reduce microbial contamination in plant tissue culture.

At optimum doses (consult User Instructions), PPM™ is an extremely effective preservative/biocide, yet does not impair in vitro seed germination, callus proliferation and callus regeneration.

PPM™ prevents growth of both bacteria and fungal spores. The patented formulation is heat-stable making it suitable for autoclaving together with culture media. PPM™ can be, and should be used as a standard ingredient in plant tissue culture media, and is also substantially less expensive than commonly used antibiotics.

While PPM™ was principally designed to inhibit airborne, waterborne, and contamination introduced from human contact, it can also -- in many cases -- be used to reduce endogenous contamination. Despite rigorous implementation of sterile techniques, the contamination of plant cell and plant tissue cultures remain a persistent problem that can result in significant losses.

Duchefa Biochemie

Enzymes

CELLULASE R-10: Routinely used for the isolation of protoplasts due to its ability to degrade cell walls. Cellulase "Onozuka R-10" is often used in combination with Macerozyme R-10

CELLULASE Onozuka RS contains a very high activity of decomposing natural celluloses. This type of cellulase can be used to obtain protoplasts in a very short time and dissolves cell walls of a wider range of plants.

MACEROZYME R-10: Macerating Enzyme from Rhizopus sp. Macerozyme is well suited for the isolation of plant cells and is often used in combination with cellulase.

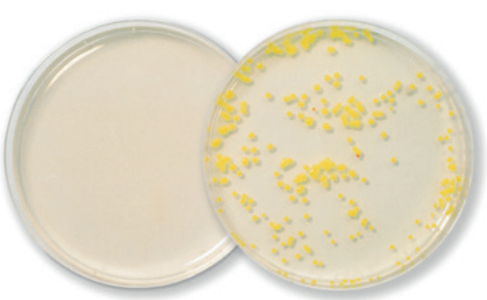
Chemicals

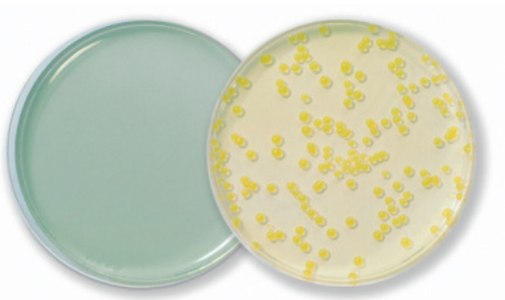
We offer a very broad range of Biochemicals, Vitamins, Buffers & other Reagents for Plant Biology research and Tissue Culture. Visit our webshop or contact us with your specific inquiry.

Phytopathology media

Duchefa Biochemie

Duchefa produces an extensive range of phytopathology media and media used in seed health testing. Since production takes place in their own laboratories, Duchefa is also able to manufacture custom made media according to laboratory specifications. Obviously, strict confidentiality is guaranteed.





- Bacteria Screening Medium 523
- CKTM Medium
- Czapek Dox Agar, CDA
- Czapek Dox Broth, CDB
- D2ANX Medium
- KB Medium (King's B Medium)
- KBBC Medium
- KBZ Medium
- Leifert and Waites Sterility test Medium
- Luria Broth Agar, Miller
- Luria Broth Base, Miller
- Malt Agar (MA)
- mCS20ABN Medium
- mD5A Medium
- mFS Medium
- mKM Medium
- MSP Medium
- MT Medium
- mTBM medium
- mTMB Medium
- mXCP1 Medium
- MXV medium
- PSM medium
- PTSA Medium
- SCM Medium
- SNAC medium
- YDC medium

PLANT GROWTH & TISSUE CULTURE TOOLS

Growth containers & tools

The full-gas microbox

Tissue culture vessels with the revolutionary breathing system for carefree micropropagation!
Polypropylene Transparent containers and hermetically closing covers with filter.

The Microbox is a clear polypropylene box, equipped with a hermetically closing polypropylene cover. **The cover** is made of crystal-clear plastic and provided with a filter battery. **Each filter battery** consists of a double row of filter wicks, i.e. micro-channels filled with hydrophobic filtering material.

Kv value for:	*round Microboxes*	*oval Microboxes*
White filter (L)	9,87 GR / day	7,44 GR / day
Yellow filter (XL)	13,09 GR / day	9,84 GR / day
Red filter (XXL)	15,58 GR / day	10,83 GR / day
Green filter (XXL+)*	81,35 GR / day	62,87 GR / day

* XXL+ leaves very much air through the filter, which could possibly cause dehydration

Sterile paper cutting pads

30 pieces per bag., size 13x20 cm

Duchefa Biochemie

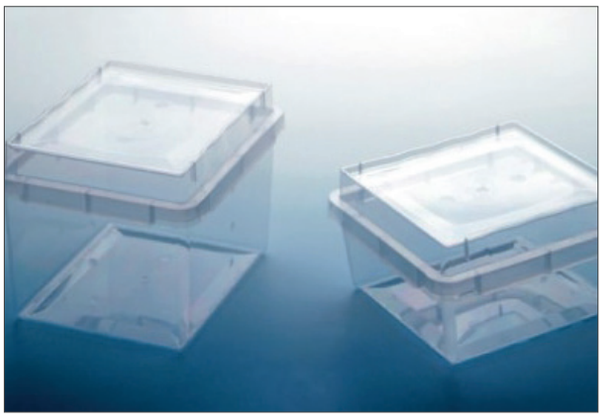
Culture tubes “DE WIT”

Polycarbonate, Gamma Radiated Heigth 130 mm, diameter middle 27 mm, diameter bottom 10 mm.

Culture Tubes “De Wit” are specifically designed for in Vitro Tissue Culture. The conical shape of the tubes provides enough space to grow while using a limited quantity of medium.

Steri Vent Containers

The newly developed Steri Vent Container is the successor of the successful Vitro Vent container. The completely new design contains many functional and ergonomic improvements. The Steri Vent is made of highly purified and totally transparent polypropylene, which results in a firm and crystal clear plant tissue culture container. Steri Vent containers are sterilized during the production process and do not need gamma irradiation, which causes discoloration of the polypropylene and detrimental chemical reactions.

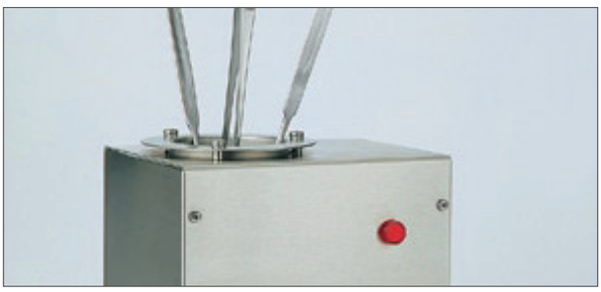


Tools

- Forceps 23 cm length stainless steel
- Forceps 30 cm length stainless steel
- Scalpel handle ergonomic, 24 an 18 cm, stainless steel
- Scalpel blased from stainless steel or carbon Steel n° 10 till n°25
- Stainless steel rest for holding sterile forceps and scalpel-handles

Glass bead sterilizers

Our glass bead sterilizers have a round tube containing glass beads that heats up to approximately 300°C, providing an environment that is able to sterilize utensils such as forceps and scalpel blades and holders. The temperature can be adjusted to the desired temperature via the analogue regulator on the outside.



Leukopor ventilating sealing tape

Available sizes:

- 1.25 cm x 9.2 m
- 2.50 cm x 9.2 m

Plant Cell TECHNOLOGY

Biocoupler™

Introducing the BioCoupler™ Temporary Immersion Bioreactor

This innovative and first-of-its-kind device is the answer to the problems and drawbacks of traditional temporary immersion bioreactor systems (TIBs). The BioCoupler™ Glass Set meets all the basic requirements and accomplishes all the needed tasks for a fraction of the cost of the traditional TIB systems, takes up little shelf space in the grow room, and is very easy to use and handle.

Every part can be autoclaved at the 121°C, or, they can be chemical or gas sterilized if needed. The liquid is usually filled to about 2/3 capacity of the lower jar and the propagules are in the upper jar. Additionally, the use of PPM will help prevent contamination, benefiting your cultures.

THE NEW AND IMPROVED BIOCOUPLER™

Biocoupler™ is the simplest Temporary Immersion Bioreactor (TIB). It couples two mason jars (or any mason glass jars) with an integrated filter to facilitate a smooth medium flow. The unique multiple narrow slots design prevents the passage of small propagules (<3mm), reduces air-lock and provides adequate mixing & aeration.

The system contains a microporous vent filter that allows pressure equalization to atmospheric pressure, whilst helping prevent contamination. The Biocoupler™ saves time & space compared to other currently available TIB systems.

BioCoupler™ is used for temporary immersion and has been successfully tested for a wide range of plants, including orchids, hemp, aquatics, succulents, ferns, and carnivorous plants. Hundreds of devices can be used to produce thousands or hundreds of thousands of plants on a yearly basis making the Biocoupler™ relevant for small- and large-scale plant businesses.

Plant growth chambers

CONVIRON®

Conviron is the world leading supplier of controlled environments for plant science and other research applications. Conviron's controlled environments provide precise, uniform, and repeatable control of numerous environmental parameters.

GEN1000
REACH-IN
MULTI-APPLICATION CHAMBER

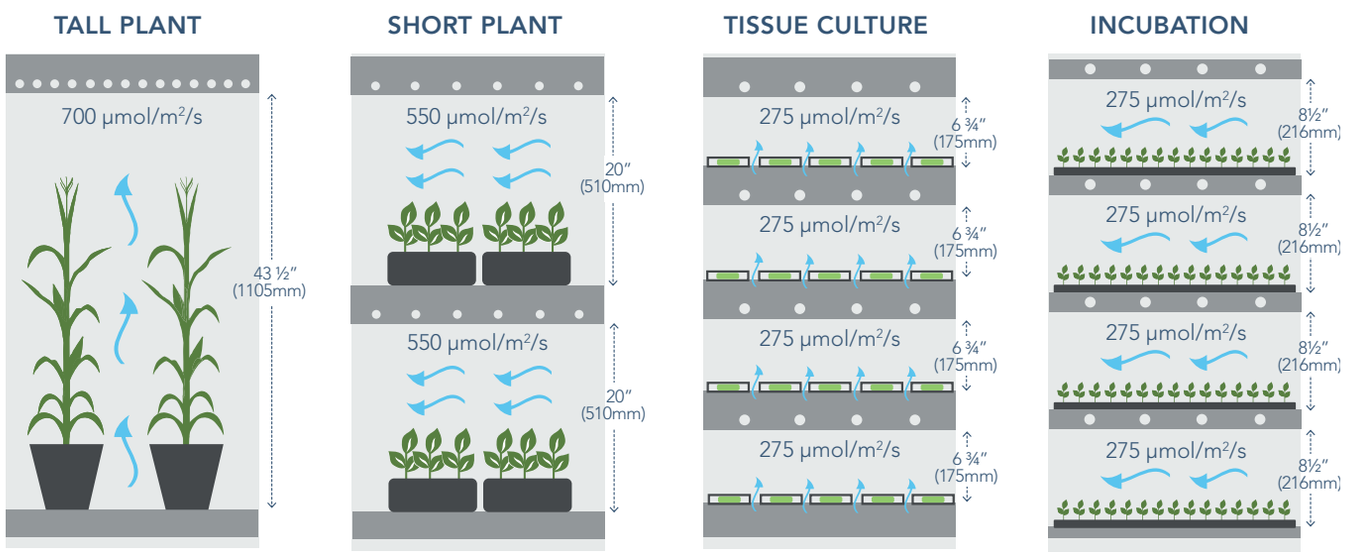
BASE CHAMBER DATA

The GEN1000 chamber is designed to fit through a standard commercial doorway and ship in one piece requiring minimal assembly and easy installation in any research lab. With foamed-in-place CFC-free insulation, painted galvanized steel exterior and galvannealed interior, the GEN1000 is highly durable, resistant to corrosion, and easy to clean, operate and maintain.

TEMPERATURE °C	INTERIOR VOLUME	EXT DIMENSIONS W x D x H	WEIGHT	ELECTRICAL SERVICE	SAFETY CERTIFICATIONS
4-40 Lights Off	27.6ft^3	41 x 32 ½ x 77 (in)	700 Lbs	120-1Ø-60Hz-2 wire	cTUVus (NRTL)
10-45 Lights On	781L	1040 x 825 x 1960 (mm)	320 Kg	230-1Ø-50Hz-2 wire	CE-mark, TÜV
Control: ±0.5					

ONE CHAMBER. FOUR APPLICATIONS.

The GEN1000 can be fitted with one of four kits. Additional kits are available allowing researchers to convert the chamber to adapt to a variety of research programs that require different light intensity, airflow direction, growth height and growth space.



Growth Area
6.31ft² (0.58m²)

Growth Area
11.3 ft² (1.05m²)

Growth Area
22.6 ft² (2.1m²)

Growth Area
22.6 ft² (2.1m²)

EXTEND YOUR CAPABILITIES WITH THESE OPTIONS

- Connect seamlessly to an Argus controls system with CMPLink
- UPS surge protection on power supply
- Observation window to ease viewing
- Phenolic-coated refrigeration coil for entomology applications
- Dehumidification
- Additional lit tier for the SH kit
- Condensate pump and drip pan
- Low temperature (2°C) operation
- Water-cooled condensing unit
- Ultrasonic humidification to 90%RH lights off
- Additive CO_2 and control

GEN2000
REACH-IN

MULTI-APPLICATION CHAMBER

BASE CHAMBER DATA

The GEN2000 chamber ships in one piece requiring minimal assembly and easy installation in most research labs. With foamed-in-place CFC-free insulation, painted galvanized steel exterior and galvannealed interior, the GEN2000 is highly durable, resistant to corrosion, and easy to clean, operate and maintain.

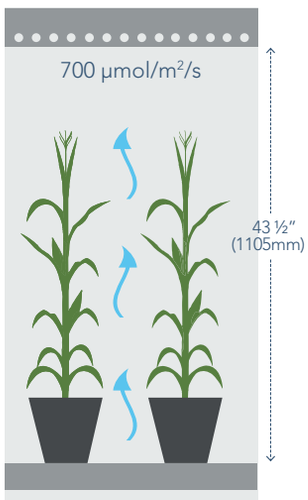
TEMPERATURE °C	INTERIOR VOLUME	EXT DIMENSIONS W x D x H	WEIGHT	ELECTRICAL SERVICE	SAFETY CERTIFICATIONS
4-40 Lights Off	59.3ft³	84 x 32 ½ x 77 (in)	1400 Lbs	120/208-3Ø-60Hz-4 wire	cTUVus (NRTL)
10-45 Lights On	1679L	2135 x 825 x 1955 (mm)	636 Kg	230/400-3Ø-50Hz-4 wire	CE-mark, TÜV
Control: ±0.5					

ONE CHAMBER. FOUR APPLICATIONS.

The entire growth area of the GEN2000 can be fitted with one of four unique kits. Additional kits are available allowing researchers to convert the chamber to adapt to a variety of research programs that require different light intensity, airflow direction, growth height and growth space:

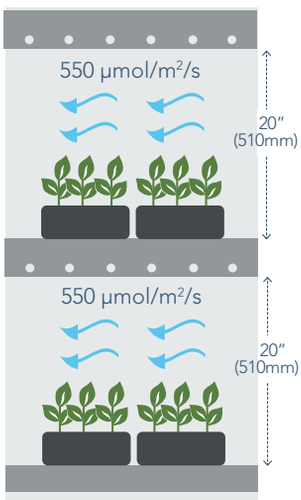
TALL PLANT

Growth Area
11.3 f² (1.05 m²)



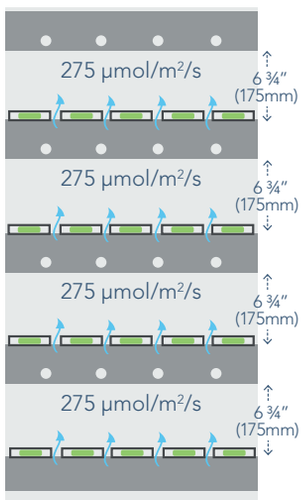
SHORT PLANT

Growth Area
22.6 f² (2.1 m²)



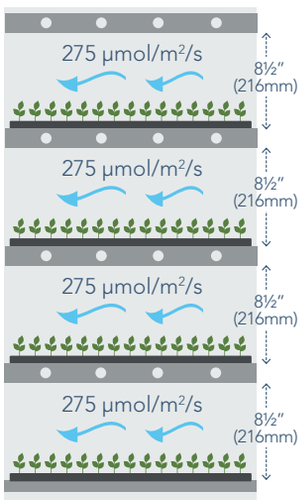
TISSUE CULTURE

Growth Area
45.2 f² (4.2 m²)



INCUBATION

Growth Area
45.2 f² (4.2 m²)



EXTEND YOUR CAPABILITIES WITH THESE OPTIONS

- Connect seamlessly to an Argus controls system with CMPLink
- UPS surge protection on power supply
- Observation window to ease viewing
- Phenolic-coated refrigeration coil for entomology applications
- Dehumidification
- Additional lit tier for the SH kit
- Condensate pump and drip pan
- Low temperature (2°C) operation
- Water-cooled condensing unit
- Ultrasonic humidification to 90%RH lights off
- Additive CO_2 and control

GEN REACH-IN CHAMBERS

PRODUCT OVERVIEW

With its unique ability to adapt to different research applications, the GEN series offers an economical and flexible solution for plant science. The base chamber can be fitted with one of four specially configured kits each with airflow, lighting and shelving designed to suit specific plants and applications.

TALL PLANT (TA) KIT:

Upward airflow, maximum growth height and light intensity for taller plants such as cereal crops, horticultural plants and silviculture.

SHORT PLANT (SH) KIT:

Horizontal airflow over multiple shelves optimizes growth area for shorter plants, like Arabidopsis. Ideal for research in propagation, genetics, physiology and other moderate light experiments.

TISSUE CULTURE (TC) KIT:

Low light and multiple tiers to maximize space and provide upward airflow that minimizes condensation in petri dishes and jars used in propagation and genetics experiments.

INCUBATION (IN) KIT:

Low light and multiple tiers for nurturing young seedlings into shorter plants.

ENTOMOLOGY:

The GEN2000 can be easily adapted for entomology research by selecting the optional phenolic coated refrigeration coil, which protects it from insect damage.

AIRFLOW

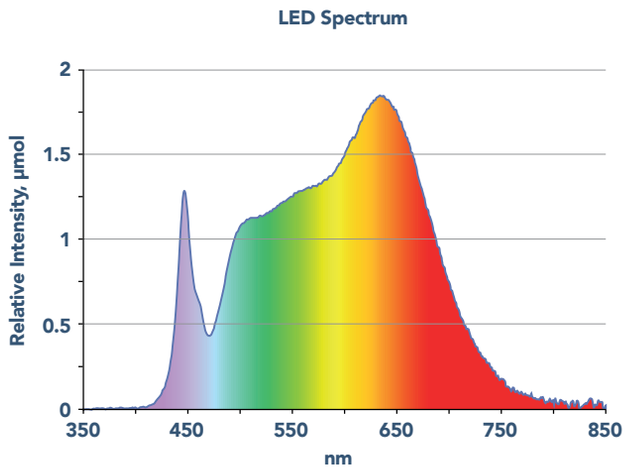
Precisely designed and manufactured air plenums are used for each of the four application kits. The TA kit utilizes a solid rear plenum and distributes air from the chamber floor for a uniform upward airflow. The SH and IN kits both use a perforated rear plenum that distributes the air horizontally across multiple shelves. The TC kit incorporates individual air-shelves that distribute air vertically to minimize condensation within petri dishes and containers.

REFRIGERATION

The air-cooled refrigeration system is optimized to ensure uniform conditions regardless of the particular kit installed. Kits do not alter the configuration of the refrigeration system and as such, kits can be interchanged by the user if additional kits are selected.

LIGHTING

The standard lighting systems for the GEN series incorporate broad spectrum 12W T5 LED fixtures configured to suit the intensity required for each application and kit. Lamp and ballast combinations have been designed to ensure uniform light distribution. As standard, lighting can be dimmed by the user through the controller. Closed loop dimming with a light meter is available as an option.



Energy saving LEDs ideal for research requiring an all-purpose broad white spectrum.

CONTROL AND MONITORING

The GEN series comes equipped with Conviron's most advanced controller – the CMP6060. In addition to powerful programming and reporting capabilities, the CMP6060 includes a full-color, high resolution touchscreen with an intuitive graphic interface. Users can create custom programs for key parameters such as temperature, lighting and humidity and receive audible, visual and email notifications of alarms. Options include connection to your local area network (LAN) and connectivity to a central PC or mobile device with Conviron Central ManagementTM. CMPLink allows seamless integration with an Argus Control system.

The CMP6060 home screen provides an easy-viewing dashboard for set points and actual conditions and quick access to other control features.

LED lighting

VALOYA

10 Years of Excellence

Since 2009 we have been committed to creating the best LED grow lights on the market enabling growers to increase their yields, quality and energy savings. With one of the largest patent portfolios of the horticulture lighting industry, we are the pioneers of high quality LED grow light solutions.

Hundreds of clients around the world rely on Valoya technology including 8 out of 10 world's largest agricultural companies. As our customers, you will receive the support and care of our photobiologists, seed to sale.

Choose a Spectrum of your needs

Solray385

Optimized sunlight for commercial horticulture and research applications.

All growth stages.

A balanced range of wavelengths from UV to FR suitable for all growth stages. Designed to boost metabolite production and result in consistent growth. Solray works as both sole source or supplemental light.

UV	B	G	R	FR
2 %	19 %	36 %	40 %	3 %

PAR	CCT	CRI	B:G	B:R	R:FR
95 %	4500	90	0.5	0.47	12.9

NS1 & NS12

Sun-like, wide spectrum for research and biotech.

All growth stages.

The spectrum that illuminates the chambers and greenhouses of some of the world's largest universities, research institutes and agricultural companies.

Table below expresses data for NS1 (upper row) /NS12 (lower row).

UV	B	G	R	FR
1 %	21 %	36 %	38 %	4 %
1 %	20 %	38 %	36 %	6 %

PAR	CCT	CRI	B:G	B:R	R:FR
95 %	4800	90	0.6	0.56	9.1
94 %	4500	90	0.5	0.57	6.1

AP67

Spectrum for vegetative and strong generative growth.

Vegetative growth, flowering, tissue culture, propagation.

Designed and proven to quickly boost plant biomass and induce flowering.

UV	B	G	R	FR
0 %	12 %	16 %	57 %	15 %

PAR	CCT	CRI	B:G	B:R	R:FR
85 %	2500	70	0.8	0.21	3.7

AP673L

Spectrum for strong vegetative growth.

Vegetative growth, tissue culture, propagation.

Designed and proven to quickly boost plant biomass and produce plants saturated with flavor and nutrients. Ideal for the cultivation of leafy greens.

UV	B	G	R	FR
0 %	10 %	19 %	63 %	8 %

PAR	CCT	CRI	B:G	B:R	R:FR
91 %	2000	60	0.6	0.16	7.9

G2

Spectrum for enhacing vernalization process, flowering and stem elongation.

Vernalization, flowering, rooting.

Designed to enhance vernalization process by reducing the time required for flowering induction. Greater plant survival, improved developement by formation of strong rootball.

UV	B	G	R	FR
0 %	9 %	2 %	66 %	23 %

PAR	CCT	CRI	B:G	B:R	R:FR
77 %	NA	NA	3.6	0.13	2.8

SolrayX

Natural looking white light for commercial horticulture.

All growth stages.

Optimized combination of wavelengths in the continuous PAR range. Ideal for consistent growth on most plant species cultivated worldwide. Solray works as both sole source and supplemental light.

UV	B	G	R	FR
0 %	19 %	37 %	42 %	2 %

PAR	CCT	CRI	B:G	B:R	R:FR
98 %	4500	95	0,5	0.46	26

S2

Supplementary light for greenhouse production.

All growth stages.

Efficient spectrum to boost biomass accumulation and yield in greenhouses. Focusing on the most effective wavelengths results in improved energy efficiency and lower operational costs. Ideal for supplementing natural sunlight or in hybrid lighting solutions.

UV	B	G	R	FR
0 %	5 %	8 %	86 %	1 %

PAR	CCT	CRI	B:G	B:R	R:FR
99 %	1600	35	0.6	0.06	124

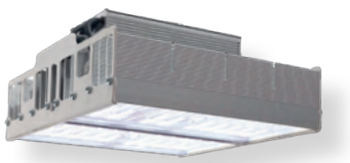
Choose a Form Factor of your needs

RF-Series

High intensity multi-tier grow room, vertical farming

- Dimmable
- IP65

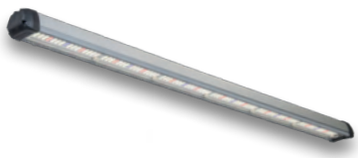
C-series



Greenhouses and HPS hybrid.

- Dimmable
- High power
- IP65

BX-Series



Rooms and chambers, vertical farming, greenhouses, and HPS hybrid.

- Dimmable
- IP67

BL-Series

Greenhouses and HPS hybrid.

- Non-dimmable
- Chainable
- IP66

L-Series

Rooms and chambers, tissue culture and vertical farming.

- Non-dimmable
- Slim, retro-fit
- IP65

C-series

Rooms and chambers, tissue culture and vertical farming.

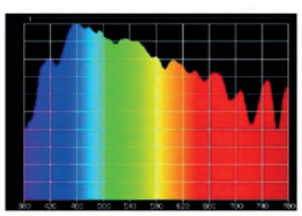
- Dimmable
- IP66

Rofianda® Light Solutions

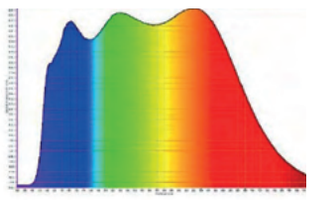
Sunlight, the most complete spectrum for crops

The mechanisms plants use to respond to light are so intricate, we do not yet comprehend the full story. Plants do not thrive with only red (600-700nm) and/or only blue (400-500nm) light. To support the full potential of plant growth, the complete range of the visible spectrum & parts of the UV and NIR are relevant. The wavelengths outside these classic red & blue peaks do have a lower PAR contribution but are needed for optimal efficiency in plant development.

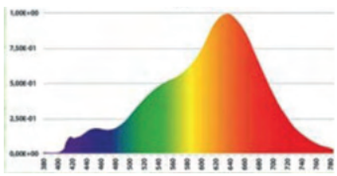
Spectral composition of sunlight



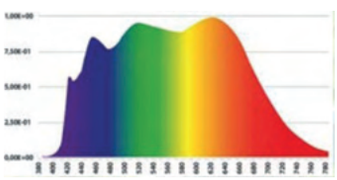
Rofianda SunLike Assimilation



2700K



5000K



The ratio of 1:2:2 (blue:green:red) in the Rofianda sunlike spectrum (380-780nm) is similar to sunlight and optimal for crop growth (seed to fruit). A 10% share of far-red (700-800nm) and about 0,5% of UV-A (380nm) is necessary to have a crop with approximately 25% bigger leaf surface and a stronger stem. This allows an easier flow of growth substances from the roots upwards. A combination of these factors results in faster and better growth with higher yields.

For vegetative growth, the 5200K spectrum with a higher share of blue light is advised. For generative growth, we advise the 2700K spectrum which has a higher share of red light.

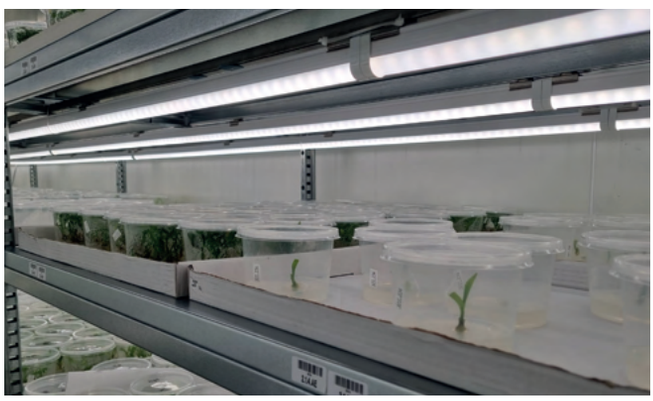
Controlling lighting levels can make a major contribution to growth & yields of crops. By using sensors & dimmable drivers, the lighting level of the Rofianda fixture can be controlled at all times.

Rofianda fixtures, generating the full spectrum by a single chip, are compatible with almost all crop growing practices ranging from Greenhouses, Tissue culture chambers, Walk-in growth chambers, DC trolleys, Vertical farming,...etc

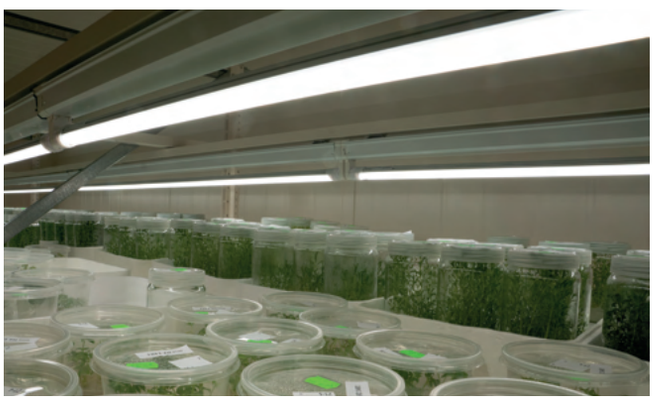
SUN-like assimilation lighting

ILM-PG

ILM-T5



LTL-S-...-FS

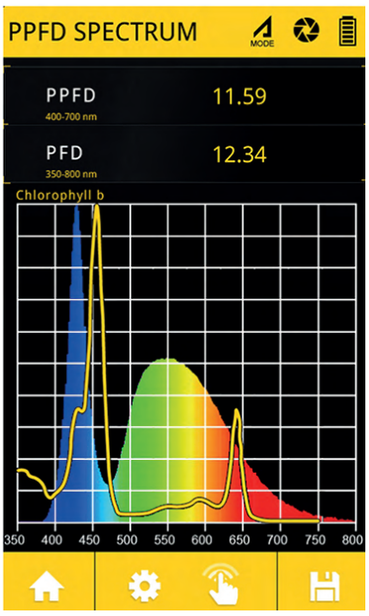


LED PANELS

UPRtek

The burgeoning indoor horticulture industry has resulted in a booming market for Grow Lights. Whether augmenting sunlight or using it as the main source of light energy, the practice and
proper usage of Grow Lights will have a significant impact on the appearance, taste and shape of a plant. And there is only one way to practically ensure the quality and quantity of light over a large indoor farming area and that is to use a light meter. But not all light meters are designed with grow lights in mind.

UPRTek spectrometers are geared specifically for grow lights with both spectral and quantitative measurements allowing growers and researchers a tool for getting their arms around the fickle nature of growing plants with artificial lights.



The **PG200N Handheld Spectral PAR Meter** works in the PAR (350 nm – 800 nm) and expresses PPFD values in µmol/m2/s and PPF in µmol/s, an ideal tool for measurements of light which stimulates plant growth and is designed to be suitable for laboratory applications. The spectrometer is enriched with a high resolution and extended spectral range.

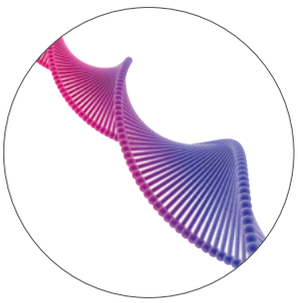
The handheld spectrometer is suitable for a wide range of applications and offers a large selection of various measurements.

- Ideal for greenhouse, growth room, growth chamber and outdoor usage
- Access results immediately on the large, bright color screen. Compare spectra in overlay mode
- Do 5 measurements with one click. Choose from over 30 parameters. Compare results side by side

-OMICS RESEARCH PRODUCTS

Sample preparation kits for RNA, DNA, and protein purification

NORGEN BIOTEK CORP.



DNA Purification Kits

Plant DNA, RNA, microRNA Isolation and Purification Kits

Superior performance for challenging plant samples

- Plant/Fungi Total RNA Purification Kit
- Plant microRNA Purification kit
- Plant RNA/DNA Purification kit
- Plant/Fungi DNA Isolation Kit
- Plant DNA Isolation Kit (Magnetic bead system)

Homogenizing Equipment

OMNI INTERNATIONAL
The Homogenizer Company™

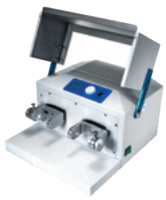
Bead Ruptor 24 Elite

Omni Bead Ruptor 24 Elite Bead Mill Homogenizing System Includes Bead Ruptor 24 motor drive and User Manual. Bead Ruptor tube carriages and disposable tubes sold separately. The Bead Ruptor 24 Elite is the most advanced and powerful bead mill homogenizer available.

It is designed for grinding, lysing, and homogenizing biological samples prior to molecular extraction. Available with a wide range of accessories the Bead Ruptor 24 Elite enables processing of samples in volumes ranging from 0.5 mL to 50 mL.

The optional Bead Ruptor 24 Cryo Cooling Unit is designed to prevent the increase of sample temperature during the homogenization process.

The Bead Ruptor 24 Elite unique tube carriage motion coupled with sample specific bead beating materials ensure that a thorough homogenate is achieved regardless of the sample type. The high lysing efficiency of the Bead Ruptor 24 Elite results in an increase in nucleic acid, protein and small molecules yields and increases the sensitivity of the downstream assay.




	Bead Ruptor 96	Bead Ruptor 24 Elite	Bead Ruptor 12	Bead Ruptor 4
Maximum Sample Capacity	576	96	16	4
Tube Capability	0.5, 1.5, 2 mL	0.5, 1.5, 2, 7, 15, 30, 50 mL	0.5, 1.5, 2, 7 mL	0.5, 1.5, 2, 7 mL
Well Plates	✓	-	-	-
Speed Control	3 - 30 Hz	0.8 - 8 ms	0.8 - 6 ms	1 - 5 ms
Run Time	5sec - 99min	1sec - 9.59min	1sec - 9.59min	1sec - 5min
Processing Range	25 µl - 50 mL	25 µl - 50 mL	25 µl - 7 mL	25 µl - 7 mL
Savable Protocols	-	✓	✓	-
Weight	42kg	29,5kg	29,5kg	7,5kg
Dimensions	W: 38cm, H: 43cm, L: 24cm	W: 38cm, H: 43cm, L: 33cm	W: 38cm, H: 43cm, L: 33cm	W: 25cm, H:22cm, L: 29cm
Touch Screen	-	✓	-	-

BR-Cryo Cooling Unit

For use with the Bead Ruptor 24 Elite

The BR-Cryo Cooling Unit is compatible with the Bead Ruptor 24 and is designed to prevent the increase of sample temperature during the homogenization process. Friction generated through the bead milling process generates heat that is imparted to the sample. In order to maintain a constant processing temperature during homogenization, the BR-Cryo passes chilled air (-100°C to -50°C) into the sample processing chamber and across the sample tubes to dissipate heat.

Product features:

- Adjustable cooling rate
- Compatible with liquid nitrogen or dry ice with ethanol
- BR-Cryo maintains sample temperatures from 4°C to ambient
- Prevent protein degradation
- Ensure RNA stability
- Prevent enzyme activation
- 1-year warranty

Pre-filled Bead Mill Tubes and Bulk Beads



Bead Media	Tube Size	Bead Size	Description	Quantity	Order #	Bead Ruptor Compatibility			DNase/Rnase Free	Microbial DNA Free
						BR4	BR12	BR 24		
Glass	2 mL	0.1 mm	Micro-Organism Lysing Mix	50	19-621	■	■	■	■	
		0.5 mm	Tough Micro-Organism Lysing Mix	50	19-622	■	■	■	■	
		0.5 mm	Tough Micro-Organism Lysing Mix	50	19-622D	■	■	■	■	■
Garnet	0.5 mL	0.15 mm	Small Volume Micro-Organism Lysing Mix	50	19-623	■	■	■	■	
	2 mL	0.7 mm	Hard & Fibrous Tissue Homogenizing Mix	50	19-624	■	■	■	■	
Carbide	0.5 mL	0.25 mm	RNA Extractions, Micro-Organism & Soil Homogenizing Mix	50	19-625	■	■	■	■	
Metal	1.5 mL	2.4 mm	Hard Tissue Grinding Mix	50	19-610	■			■	
	2 mL	2.4 mm	Hard Tissue Grinding Mix	50	19-620	■	■	■	■	
		2.4 mm	Hard Tissue Grinding Mix	50	19-620D	■	■	■	■	■
	7 mL	2.4 mm	Hard Tissue Grinding Mix	50	19-670	■	■	■		
	30 mL	2.4 mm	Hard Tissue Grinding Mix	50	19-6350			5 m/s		
			Hard Tissue Impaction Grinding Mix with 1/4" Ceramic	50	19-6350Z			5 m/s		
Ceramic	0.5 mL	1.4 mm	Small Volume Soft Tissue Homogenizing Mix	50	19-626	■	■	■	■	
	1.5 mL	1.4 mm	Soft Tissue Homogenizing Mix	50	19-617	■		5 m/s	■	
		2.8 mm	Hard Tissue Homogenizing Mix	50	19-618	■			■	
	2 mL	0.5 mm	Universal Microbial Griding Mix - Nuclease Free	50	19-631	■	■	■	■	
		0.5 mm	Universal Microbial Griding Mix -Nuclease and Microbial DNA Free	50	19-631D	■	■	■	■	■
		0.1 mm	Universal Microbial Griding Mix - Nuclease Free	50	19-632	■	■	■	■	■
		0.1 mm	Universal Microbial Griding Mix -Nuclease and Microbial DNA Free	50	19-632D	■	■	■	■	■
		1.4 mm	Soft Tissue Homogenizing Mix	50	19-627	■	■	■	■	■
		1.4 mm	Soft Tissue Homogenizing Mix	50	19-627D	■	■	■	■	■
		2.8 mm	Hard Tissue Homogenizing Mix	50	19-628	■	■	■	■	
		2.8 mm	Hard Tissue Homogenizing Mix	50	19-628D	■	■	■	■	■
	7 mL	1.4 mm	Soft Tissue Homogenizing Mix	50	19-677	■	■	■		
		2.8 mm	Hard Tissue Homogenizing Mix	50	19-678	■	■	■		
	15 mL	2.8 mm	Hard Tissue Homogenizing Mix	50	19-6158			5 m/s		
	30 mL	1.4 mm	Soft Tissue Homogenizing Mix	50	19-6357			5 m/s		
			Soft Tissue Impaction Homogenizing Mix with 1/4" Ceramic	50	19-6357Z			5 m/s		
		2.8 mm	Hard Tissue Homogenizing Mix	50	19-6358			5 m/s		
			Hard Tissue Impaction Homogenizing Mix with 1/4" Ceramic	50	19-6358Z			5 m/s		
	50 mL	2.8 mm	Hard Tissue Homogenizing Mix	50	19-6508			5 m/s		

Note: In addition, we offer BULK PACKAGING of **Prefilled Bead Tubes, Bulk Beads and Bulk Bead Mill Tubes**. This is the most economical solution for high-throughput users. Feel free to ask us for more information!

PCR Enzymes, Master Mixes and related products

highQu qPCR master mixes are well-known for their excellent performance and ease of use with minimum optimization required. Supplied with PCR water, optimized for both common and fast cycling workflows, they convince by their early Ct values, and provide reproducible results.

qPCR

highQu qPCR mastermixes are based on the small molecular inhibitor technology Hot Start PCR allowing to achieve highest sensitivity and specificity under both standard and fast qPCR cycling conditions. They provide excellent results on both AT and GC rich templates, in multiplexing and guaranty rapid extension with early Ct values with minimum or no optimization.

ORA™ & ORA™ SEE qPCR Probe Mix

- qPCR assays based on specific probes: including TaqMan®, Molecular Beacons, Scorpions™ Probes
- Quantification of gDNA, cDNA, viral DNA, low copy number genes, gene expression analysis
- ORA™ SEE qPCR Probe Mix contains an inert blue dye for a better sample visibility and tracking
- ORA™ and ORA™ SEE qPCR Probe mixes are also available as ROX L (low ROX) and ROX H (high ROX)

ORA™ & ORA™ SEE qPCR Green Mix

- qPCR from gDNA, cDNA, viral DNA, low copy number genes
- Relative gene expression analysis, absolute quantification
- qPCR assays based on fluorescence of intercalating dye
- ORA™ SEE qPCR Green Mix contains an inert blue dye for a better sample visibility and tracking
- ORA™ and ORA™ SEE qPCR Green mixes are also available as ROX L (low ROX) and ROX H (high ROX)

ORA™ qPCR HRM Mix

High Resolution Melting analysis (HRM) is a fast and simple technique for identification of DNA sequence variations. It allows identifying single nucleotide differences by detecting minor changes in qPCR melting curves. HighQu ORA™ HRM qPCR Mix includes a proprietary intercalating saturating dye showing no inhibition for PCR. The dye has the same affinity for both AT or GC rich sequences what leads to highest accuracy in genotyping.

- Detection of sequence variations
- SNP genotyping
- Methylation analysis
- Mutation scanning

One Step RT qPCR

highQu 1Step RT qPCR mastermixes in combination with a blend of thermostable and extremely active Reverse Transcriptase & advanced RNase Inhibitor (RT Mix) allow for a single step one tube RT qPCR. To suit the broad instrument range the 1Step RT qPCR Probe Mixes are available in three versions – without ROX, with low or high ROX concentration.

1Step RT qPCR Probe Kits

- RT qPCR assays based on specific probes: including TaqMan®, Molecular Beacons, Scorpions™ Probes
- Quantification of any RNA template (mRNA, total RNA, viral RNA), low copy number genes

1Step RT qPCR Green Kits

- Relative gene expression analysis, absolute quantification of any RNA template (mRNA, total RNA, viral RNA), low copy number genes
- Intercalating dye fluorescence based qPCR on instruments calibrated with low ROX conc.

End-point PCR Enzymes & Master Mixes

	Standard		Hot Start	Robust, Long & Hot Start		High Fidelity	Direct
	ALLin™ (RED) Taq DNA polymerase	Taq DNA polymerase	ALLin™ Hot Start (HS RED) Taq Polymerase	ALLin™ RPH Polymerase	ALLin™ RPH Mastermix	ALLin™ HiFi DNA polymerase	SampleIN™ Direct PCR Kit
Fast cycling	✓		✓	✓	✓	✓	✓
GC/AT rich PCR	✓✓		✓✓	✓✓	✓	✓✓	✓
Hot Start			✓	✓	✓		✓
High Sensitivity			✓✓	✓	✓		✓
Fidelity vs TAQ	1x	1x	1x	5x	5x	50x	1x
Long PCR	Standard mix only			✓✓	✓✓	✓	
Max. amplicon	6kb	5kb	6kb	35kb	35kb	10kb	5kb
High yields	✓✓	✓	✓	✓✓	✓✓	✓	✓
Direct PCR	Colony	Colony	Colony, blood, urine	Colony, blood	Colony, blood	Colony	Mouse tail, ear, blood, tissues, swab, hair
Multiplex PCR	✓		✓✓	✓	✓		✓
Classical PCR		✓✓					
Cloning	TA	TA	TA	TA	TA	Blunt	TA
Direct loading on gel	RED mix only		RED mix only				RED mix
ALLin™ Buffer* with dNTPs	Standard mix only		Standard mix only	✓		✓	
Mastermix	RED mix only		RED mix only		✓		✓

RT PCR & Reverse Transcription

	1Step RT PCR Kit	*HighScriber™ Reverse Transcriptase Mix*	*qScriber™ cDNA Synthesis Kit*
Description	One-step RT PCR in one tube	cDNA synthesis of long transcripts at elevated temperature	Unbiased cDNA synthesis for qPCR
Enhanced cDNA synthesis	✓	✓	✓
GC rich and complex templates	✓	✓	✓
Full-length cDNA transcripts up to 15 kb		✓	
High sensitivity	✓	✓	✓
One-step RT-PCR	✓		
Two-step RT-PCR		✓	✓
Two-step RT-qPCR		✓	✓
RNA protection from RNases	✓	✓	✓

DNA Electrophoresis Stains

	StainIN™ RED Nucleic Acid Stain	*StainIN™ GREEN Nucleic Acid Stain*
Fluorescence	Red	DNA green, RNA red
Excitation max.	540nm	490nm
Emission max.	630nm	520nm and 635nm
In gel staining during agarose electrophoresis	✓	✓
Staining of PAGE during electrophoresis	✓	✓
Post-run staining	-	-
DNA detection sensitivity	0,3 - 0,6 ng	0,1 - 0,3 ng
UV detection	✓	✓
Blue light detection	-	✓
Used as loading dye	-	-
Cloning compatible	Yes, when UV exposure is minimal	Yes, under Blue light
Filters to use	Ethidium Bromide	SYBR® Green

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