

4titude®

innovations
for life sciences



11/12

BIOKÉ
sharing knowledge

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New Product Highlights

LATEST INNOVATIONS

This is a selection of our new products, which are a result of our on-going research and development programme.



FrameStrip™, the two-component PCR strips that combine the advantages of thin-walled tubes and a rigid frame, see page 28



FrameStar® Break-A-Way, the flexibility of tube strips, in a plate, see page 26



2D Barcode Scanner to read the new 2D barcoded FrameStrips™, see page 29

Ergo Stands fully adjustable microplate and PCR plate stands for maximum comfort during pipetting, see page 33





Vision Plate™ 24 High quality optical base 24well plate, see page 41



Adhesive Seal Roller
To assist with the application of adhesive seals onto PCR plates and microplates, see page 34.

Gas Permeable Adhesive Seal

Whilst this seal is gas permeable, it is moisture impermeable, see page 44.



Semi-Skirted One-Piece PCR Plate

To complement our skirted and non-skirted one-piece PCR plates, see page 31.

Vision Plate™ 384, Now available with solid base in both black and white, see page 39.

Vision Plate™ 96, Now available with solid base in black, see page 40.

Vision Plate™ 700µm, Vision Plate™ with a 700µm thick optical base, available in 384, 96, and 24well. Suitable for IN Cell 3000 analysers, see page 40.

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About us



Welcome to the new 4titude® 2011/2012 catalogue. We are delighted to introduce many new products, which are a result of our on-going and dedicated research and development programme.

This includes both in-house research and work performed with industrial and academic partners.

about us



Over the last year, we have invested in our manufacturing facilities, adding cleanroom and laboratory areas, as well as setting up state-of-the-art laser welding technology.

We continue to build upon our strengths of quality, innovation and competitiveness and we are committed to meet the highest customer expectations at all times. Our commitment to science and new technologies will enable us to offer you the best products and service now and in the future.

4titude® is ISO certified and the associated management and monitoring processes guarantee that the quality systems are in place to meet the high technical requirements of the customers in our industry.



Manufacturing

Precision Tool Design

4titude®'s skilled engineers have extensive knowledge and experience in the design and manufacture of tools for injection moulding of thin walled and other laboratory consumables to tight tolerances. The latest technology is used for tool making, resulting in precision components of outstanding quality.

Our injection moulding tools undergo regular inspection and maintenance schedules to ensure all parts can be moulded consistently and to the highest standards.



Clean Room Injection Moulding

All our consumables are produced in cleanroom injection moulding facilities to ensure the products remain free from particle contaminations such as bacterial and eukaryotic cells, dust or pyrogens.

Virgin, Medical Grade Polymers

4titude® uses medical grade and fully biocompatible polymer granulates in all our processes. As an additional measure of bio-safety, we only work with virgin materials and avoid the use of mould release agents or other additives which may have a detrimental effect on product purity.



ISO Certified Manufacturing

4titude®'s manufacturing standards comply with DIN EN ISO 9001.

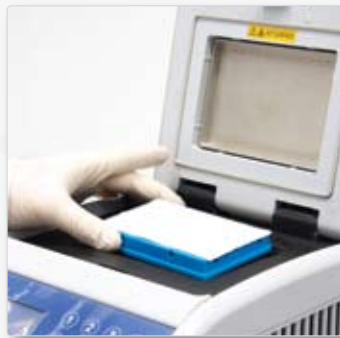


4titude® plastic consumables undergo a wide range of QC inspections during and after the production process. We perform visual, physical and biological tests to ensure both the absence of contaminants as well as the integrity of the products at all times.

Tests include:

PCR Performance Test

PCR plate samples undergo thermal cycling for leak testing under extreme temperature conditions. At the same time the plates are tested for sealing performance using heat seals, adhesive seals and cap strips.



Biological Testing

We perform functional QC testing using quantitative PCR (qPCR) to ensure that all products are free from nucleases (DNases & RNases) as well as human genomic DNA. LAL-Assays are used to test raw materials and finished product for the presence of endotoxins.

100% Inspection

Using a proprietary electrical discharge detection method we test every plate for its well integrity. Due to the sensitivity of this test we can guarantee for the absence of pin holes and knit lines which could otherwise lead to loss of valuable samples during DNA amplification (PCR plates only).



Visual Inspection

All plate types are visually inspected for moulding defects, impurities and for batch to batch consistency. Using state-of-the-art measuring equipment we verify that all parts have been produced to our own published tolerances or to industry standard specifications where appropriate (e.g. according to SBS standards).

FrameStar® two-component technology reduces evaporation from PCR plates, improving results and allowing for volume reductions to save money.

FrameStar® PCR plates maximise thermal stability at high temperatures which prevents sample loss by minimising thermal expansion during PCR. The two-component design combines the advantages of thin wall polypropylene tubes for optimum PCR results and a rigid polycarbonate skirt and deck for highest thermal stability and rigidity. In contrast to standard one-piece PCR plates, evaporation from corner positions and outer rows of wells is minimal which allows for downscaling of reagent volumes and therefore saves costs.

Benefits

- Improved PCR results
- Warp free
- SBS footprint pre- and post-PCR
- Decrease in sample evaporation from corner wells
- Improved seal integrity
- Recommended for low volume PCR
- Thin wall design for fast PCR
- Reliable use with stackers and liquid handling robots
- Guaranteed well integrity
- Free from bacterial and human genomic DNA, RNases and DNases
- Clean-room produced
- Barcoding and colour options

- Two-component technology reduces thermal expansion and sample evaporation.
- Reduction of evaporation leads to improved consistency of PCR results.
- Well spacing and position post-PCR remain accurate so liquid handling devices can reliably add or remove the smallest quantities from the plate.
- Ideal for robotics, as plate distortion is eliminated post-PCR.
- FrameStar® is ideal for assay miniaturisation due to rigid skirt eliminating warping, giving better sealing properties.
- Cost saving due to downscaling of reaction volumes.
- Lack of warpage reduces variation of fluorescent signals in optical assays, such as qPCR.

FrameStar PCR plates are covered by one or more of the following U.S. patents or their foreign counterparts, owned by Eppendorf AG: US Patent Nos. 7,347,977 and 6,340,589

"FrameStar® plates led to significantly better results and reduced evaporation compared to standard PCR plates."

Dr. Andreas Dahl, MPI f.
Molekulare Genetik,
Berlin, Germany



Thermal expansion of Polypropylene (PP) plates leads to evaporation from outer wells.

PP is the optimum material for PCR tubes. It provides the most efficient heat transfer, as well as an inert surface with low binding capabilities for nucleic acids, proteins and other molecules. However, the material is not thermally stable in a plate format and expands and contracts during each PCR cycle (Figure 1). Such thermal expansion will weaken the plate seal and leads to sample evaporation mainly from corner wells and outer rows.

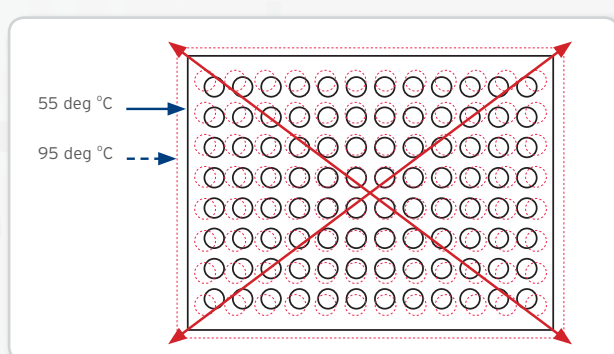


Figure 1: Standard plates with polypropylene frame expand by up to 2mm during thermal cycling which leads to movement of wells away from the plate centre. This movement is most significant in corner positions and outer rows of the plate. Sealing sheets do not expand at this rate so that the movement of wells will weaken the seal and lead to evaporation especially in corner positions and outer rows.

Thermal cycler Blocks do not prevent thermal expansion of PCR plates.

PCR blocks do not support PCR plates from the sides and the high temperatures from the thermal block and heated lid accelerate expansion of the plates (Figure 2).

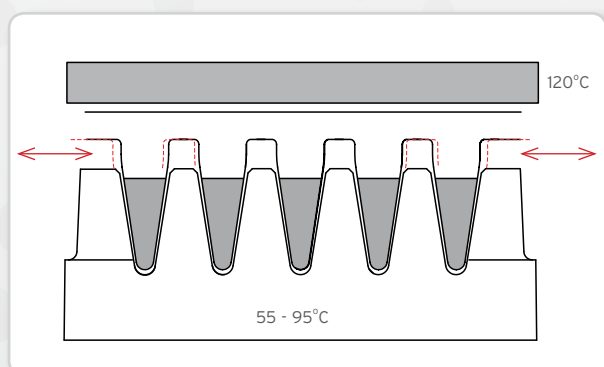


Figure 2: Side-on view of a PCR plate in a thermal cycler. The sealed plate is sandwiched between the cycler block and the heated lid but it is only partly fixed in position at the bottom of tubes, allowing the plate to expand horizontally.

FrameStar® 2-component technology reduces thermal expansion and sample evaporation

The polycarbonate frame of FrameStar® plates is more heat resistant than standard PP plates which reduces thermal expansion to a minimum. For this reason the seal integrity remains intact even at elevated temperatures during PCR.

To illustrate this advantage of our two-component technology we have compared evaporation from one piece PP plates and FrameStar® PCR plates: Each well of a non-skirted 96well plate (single piece, PP) and a Framestar® non-skirted design (code 4ti-0710) was filled with 10µl H₂O. The plates were sealed with a qPCR adhesive (code 4ti-0560) and the weight of plates was measured before and after performing PCR (30 cycles x 15" 95°C; 15" 55°C).

Table 1 shows that the average volume loss from one piece PP plates was 2.3µl per well which is equal to 23% of the total reaction volume. In contrast the volume loss from FrameStar plates was only 0.49µl per well using adhesive sealing.

Plate Type	Starting weight	Weight post PCR	Weight loss	Volume loss total/per well
Framestar 4ti-0710	26.678g	26.631g	0.047g	47µl/0.49µl
One piece	17.807g	17.586g	0.221g	221µl/2.3µl

Table 1: Weight and volume loss from 96well PCR plates. Results shown are averages from 5 plates of each plate type. One piece PP plates showed more than 4 times higher volume loss than FrameStar® plates.



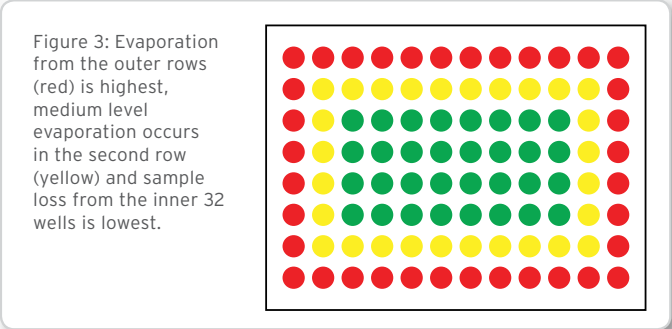
FrameStar® PCR plates minimise sample loss across the plate

Evaporation from one piece PP plates is highest in the outer wells

Since thermal expansion and movement of wells in one piece PP plates is enhanced around the edges of the plates (see Figure 1) evaporation is the highest from the two outer rows of wells. Figure 3 illustrates the levels of sample evaporation from different areas of PP plates. Only the inner 32 wells of a one piece 96well plate show low levels of evaporation but sample loss is high from the two outer rows which contain more than 65% of the wells.

FrameStar® 2-component plates improve consistency of PCR results

We have compared the degree of evaporation from different areas of one piece PP and FrameStar® PCR plates. First, the 64 outer wells (two outer rows) of both plate types were filled with 10µl H₂O, plates were then sealed with a qPCR adhesive



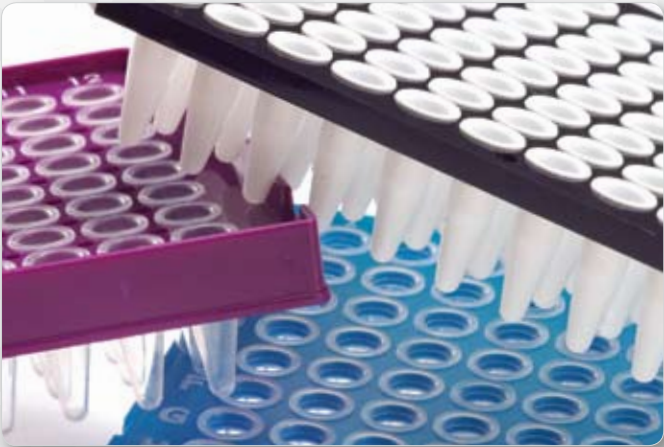
(code 4ti-0560) and their total weight determined before and after PCR. The experiment was repeated with a set of plates of which the inner 32 wells (green area in Figure 3) were filled. Table 2 shows that evaporation from outer wells of standard PP plates was significant and 65% higher than from inner wells. In contrast, FrameStar plates showed low levels of sample loss across the plate.

Weight and Volume loss

Plate Type	Starting weight (g)	Weight post PCR (g)	Weight loss (g)	Volume loss total/per well
Framestar 4ti-0710 outer 64 wells	26.230	26.193	0.037	37µl/0.57µl
One piece, outer 64 wells	17.299	17.118	0.181	181µl/2.8µl
Framestar 4ti-0710 inner 32 wells	25.841	25.824	0.017	17µl/0.53µl
One piece, inner 32 wells	17.132	17.078	0.054	54µl/1.69µl

Table 2: Weight and volume loss from different sections of 96well PCR plates. Results shown are averages from 5 plates of each plate type. Volume loss from the outer wells of one piece PP plates was 5-times higher than from FrameStar® plates.

The above results show that reaction volumes remain consistent across the 96wells (or 384wells, data not shown) in FrameStar® plates. In contrast, the reaction volumes in standard plates will differ increasingly between wells during PCR. Buffer concentrations in outer rows will increase dramatically and result in reduced enzyme activity. In extreme cases samples will fully evaporate.

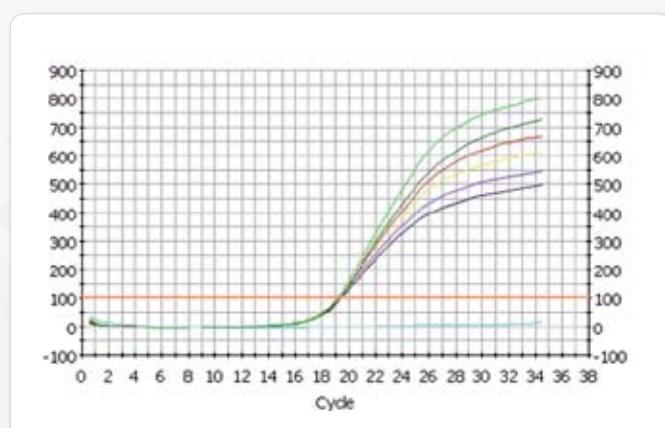


FrameStar® 2-component technology allows for reduction of assay volumes and cost

Due to the much improved seal integrity, reaction volumes can often be reduced when using FrameStar® plates. Such downscaling of experiments can be successfully implemented without any loss of assay sensitivity or consistency (Figure 4) and reagent savings can be considerable.

“Reducing the SyBr Green consumption by 40% means considerable cost savings to us.”

Carolyn Deiner, PhD



	Threshold	Identifier
Cycle	Ct	
C4	19.4	ubi 15-5µl templ
C5	19.3	ubi 15-5µl templ
C6	19.1	ubi 15-5µl templ
C7	19.4	ubi 25-5µl templ
C8	19.2	ubi 25-5µl templ
C9	19.4	ubi 25-5µl templ
E6	N/A	neg ubi- 5µl

Figure 4: Comparable Ct Values and mean deviations were obtained with 15µl and 25µl SyBr Green assays in heat sealed FrameStar® plates.

Plate Distortion Post-PCR

	X-axis	Y-axis	Warpage
FrameStar® 96, skirted	0.02mm	0.02mm	0.03mm
One Piece 96well PP Plate	1.18mm	1.69mm	1.8mm
FrameStar® 384	0.02mm	0.02mm	0.03mm
One Piece 384well PP Plate	1.22mm	1.82mm	2.2mm

Distortion tests have been performed with different PCR profiles using a variety of sealing materials. The results shown were obtained using the following protocol with 5µl reaction volumes, plates sealed with adhesive sheets (4titude® code 4ti-0500), in a Thermo Px2 Cycler: 1min 94°C, 30x(30sec 94°C, 30sec 55°C, 30sec 72°C), 5min 72°C, holding step at 4°C. Averages from measurements of 10 plate samples are shown. X- and Y- axis measurements were taken in the middle sections of the plate skirt. Warpage was measured as a maximum deviation from a flat plane.

“For our low volume real-time PCR assays the optimal combination we found were the 4titude® two component “FrameStar®” 384well PCR plates in combination with heat sealing.”

Dr. Andreas Dahl, MPI f. Molekulare Genetik, Berlin, Germany

Improved Sealing

In addition FrameStar® technology provides a much-improved level of seal integrity: During PCR, with heat seals or adhesive seals, the excessive thermal expansion/contraction of standard one-piece polypropylene plates, can have a damaging effect on seal quality. This is especially evident around the edge of the plate where these forces are at their maximum resulting in significant sample evaporation from the outer wells. In contrast, the higher thermal stability of FrameStar® plates results in a reliable seal in all areas of the plate during PCR and in cold storage down to -80°C.



Sealing Options

4titude® offers a wide range of sealing options for FrameStar® plates:

- A variety of optical, pierceable and peelable heat sealing options for manual and automated use (sheets and rolls respectively).
- Adhesive films and foils including materials for qPCR and other fluorescence based applications.
- Domed or flat, optical cap strips for all 96well plates.

Detailed information on all sealing options can be found on pages 32 and 42-54.



4titude® offers a range of adhesive and heat sealing films and foils. The plate left has been sealed with Q-Stick™ Adhesive for qPCR, code 4ti-0565



4titude® also offers domed cap strips and optically clear flat cap strips. The plate left has been sealed with domed cap strips, code 4ti-0752

Two FrameStar® application notes are available:
Miniaturization of a qPCR assay with reduced reagent volumes to achieve cost savings in gene expression analyses in rumen epithelium.

Consumable effects on low volume TaqMan® assays for quantitative PCR on Roche LightCycler® 480.

They can be downloaded from the Technical section of our website: www.4ti.co.uk



Barcoding

All skirted and semi-skirted FrameStar® plates are available barcoded for identification and traceability. Please see page 35 for more details.

Fluorescence Based Analysis

For experiments involving fluorescence detection, e.g. qPCR, we have developed plates which are especially low in autofluorescence. For this type of experiment we recommend to use our plates with white wells to maximize signal intensity due to the reflective properties of the pigment.

Reduced Risk of Cross Contamination



Raised rims around each tube aid the prevention of cross contamination between samples.

Improved Grid Reference

For easier sample identification we now supply all microplate designs with a printed alphanumeric grid reference.

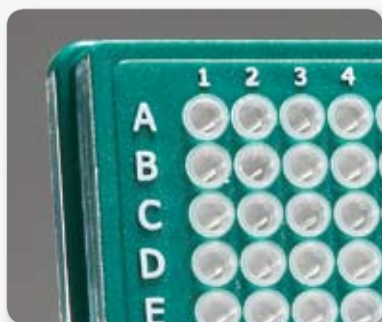


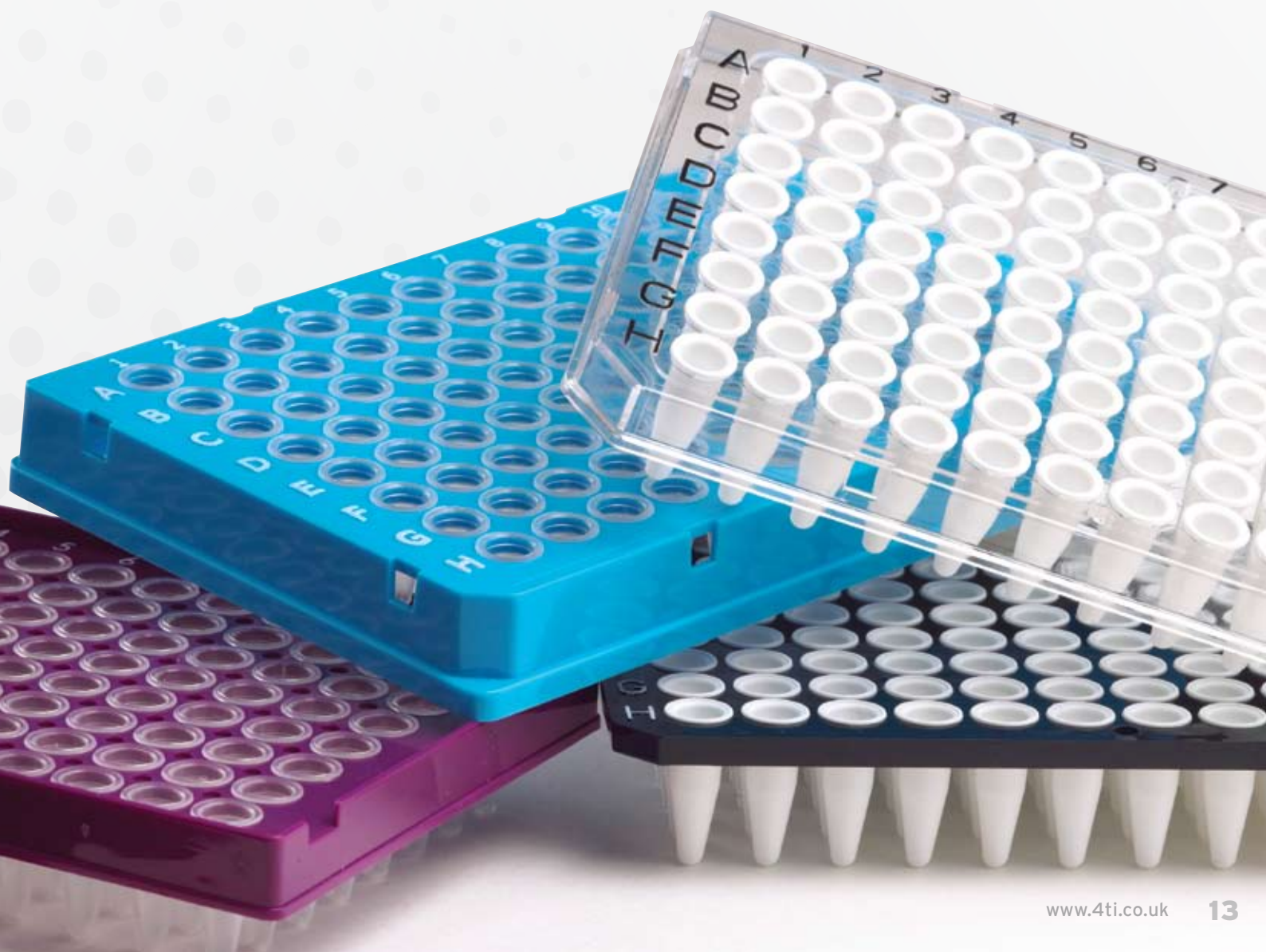
Plate Compatibility

FrameStar® plates are compatible with most PCR cyclers, real-time detection systems and sequencers. See pages 24-25.

FrameStar® plates have been validated on most automation platforms. Please contact 4titude® for further details.

Colour Options

FrameStar® plates are available with purple, blue, red, green, clear and black frames, all with clear tubes. In addition we offer plates with white tubes optimised for fluorescence assays. Plates with black tubes are also available. Please see the following pages for more details. If the plate you require is not available, please enquire.



FrameStar® 384

Ideal for robotic use



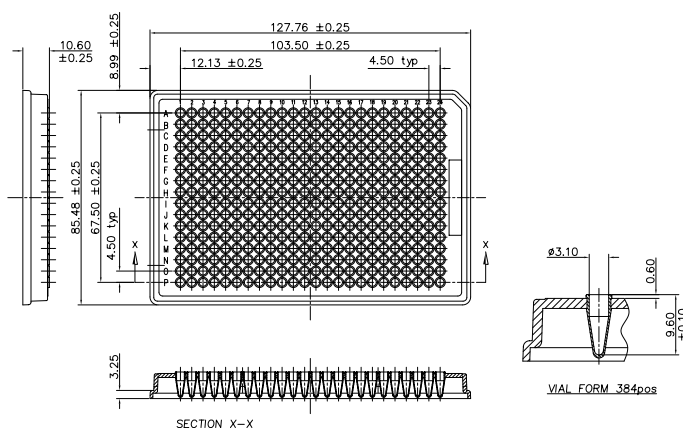
Features

- Recommended for low volume PCR
- Polycarbonate frame for mechanical stability of the plate
- Polypropylene thin-walled tubes for optimum PCR results
- Improved seal integrity due to thermal stability of frame
- Ideal for use with robotic systems
- Compatible with majority of 384 block PCR, qPCR and sequencing instruments
- 6 colour options
- Available with black plate and white wells for fluorescent based analysis
- Available barcoded

Description

Designed for high-throughput PCR. FrameStar® 384 is compatible with the majority of 384 block PCR, qPCR and sequencing instruments. The rigid two-component design eliminates warping and distortion during PCR making it ideal for use with robotic systems.

Plate Dimensions



Also see

- FrameStar® full features list (page 8)
- Plate compatibility table (page 24-25)
- Heat sealing (page 48-54)
- 4s² heat sealer (page 46-47)
- Adhesive sealing (page 42-45)
- Barcoding (page 35)

+ 2-COMPONENT DESIGN

+ LOW VOLUME PCR

+ IDEAL FOR HEAT SEALING

+ ALPHANUMERIC GRID-REFERENCE

+ SBS FOOTPRINT

+ CERTIFIED FREE FROM RNASE, DNASE, BACTERIAL & HUMAN GENOMIC DNA

+ CLEANROOM PRODUCED

+ AUTOCLAVABLE

Code	Description	Plates/Case
4ti-0384	FrameStar® 384well PCR plate, clear wells, purple frame	50
4ti-0384/B	FrameStar® 384well PCR plate, clear wells, blue frame	50
4ti-0384/C	FrameStar® 384well PCR plate, clear wells, clear frame	50
4ti-0384/G	FrameStar® 384well PCR plate, clear wells, green frame	50
4ti-0384/R	FrameStar® 384well PCR plate, clear wells, red frame	50
4ti-0384/X	FrameStar® 384well PCR plate, clear wells, black frame	50
4ti-0385	FrameStar® 384well PCR plate, white wells, black frame	50
4ti-0386	FrameStar® 384well PCR plate, black wells, black frame	50

Barcode ordering codes

Please add to ordering code
/SBC for Standard Single Barcoding or
/DBC for Standard Double Barcoding.
(See page 35 for more details)

NEW

FrameStar® 480/384 for Roche LightCycler® 480



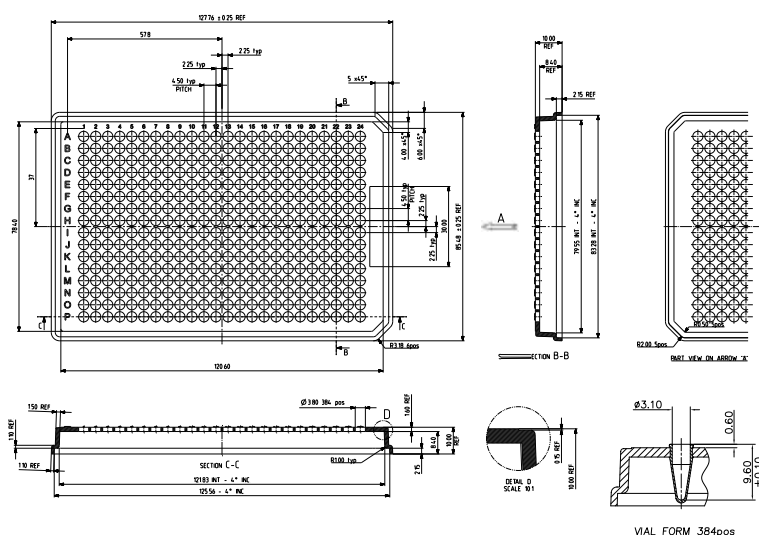
Features

- Compatible with the Roche LightCycler® 480
- Recommended for low volume PCR
- Polycarbonate frame for mechanical stability of the plate
- Polypropylene thin-walled tubes for optimum PCR results
- Improved seal integrity due to thermal stability of frame
- Ideal for use with robotic systems
- Available barcoded

Description

The dimensions of this plate are designed to optimise assay conditions on the Roche LightCycler® 480, 384well for reaction volumes of 5-20µl. The rigid two-component design eliminates warping and distortion during PCR making it ideal for use with robotic systems.

Plate Dimensions



Also see

- FrameStar® full features list (page 8)
- Plate compatibility table (page 24-25)
- Heat sealing (page 48-54)
- 4s² heat sealer (page 46-47)
- Adhesive sealing (page 42-45)
- Barcoding (page 35)

- + 2-COMPONENT DESIGN
- + LOW VOLUME PCR
- + IDEAL FOR HEAT SEALING
- + ALPHANUMERIC GRID-REFERENCE
- + SBS FOOTPRINT
- + CERTIFIED FREE FROM RNASE, DNASE, BACTERIAL & HUMAN GENOMIC DNA
- + CLEANROOM PRODUCED
- + AUTOCLAVABLE

Code	Description	Plates/Case
4ti-0380/C	FrameStar® 480, 384well PCR plate, clear wells, clear frame	50
4ti-0381	FrameStar® 480, 384well PCR plate, white wells, clear frame	50
4ti-0382	=4ti-0381 + 50 qPCR adhesive seals (4ti-0560)	50
4ti-0383	=4ti-0380/C + 50 qPCR adhesive seals (4ti-0560)	50

Barcode ordering codes

Please add to ordering code
/SBC for Standard Single Barcoding or
/DBC for Standard Double Barcoding.
(See page 35 for more details)

FrameStar® 96 Skirted

Recommended for robotics and low volume PCR



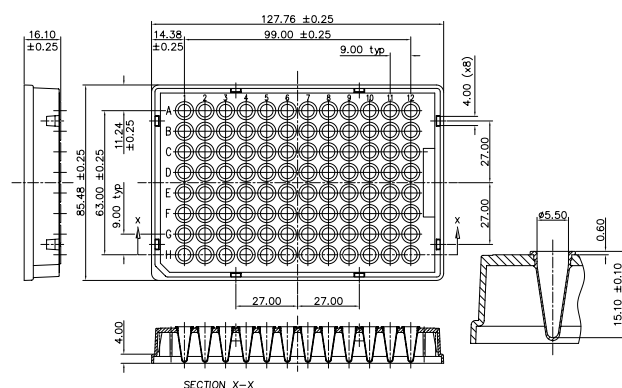
Features

- Recommended for low volume PCR
- Polycarbonate frame for mechanical stability of the plate
- Polypropylene thin-walled tubes for optimum PCR results
- Improved seal integrity due to thermal stability of frame
- Recommended for use with robotic systems
- 6 colour options
- Available with black plate and white wells for fluorescent based analysis
- Available barcoded

Description

Low profile plates have shorter wells than standard profile plates, decreasing the “dead space” between the heated lid of the thermal cycler and the sample. This eliminates condensation on the side wall of the tube, preventing reduction in PCR volume and increasing the efficiency of the reaction. Low profile products are especially recommended for use with reaction volumes below 20µl. The rigid two-component design eliminates warping and distortion during PCR making it ideal for use with robotic systems.

Plate Dimensions



Also see

- FrameStar® full features list (page 8)
- Plate compatibility table (page 24-25)
- Heat sealing (page 48-54)
- 4s² heat sealer (page 46-47)
- Adhesive sealing (page 42-45)
- Barcoding (page 35)

- + LOW PROFILE
- + 2-COMPONENT DESIGN
- + LOW VOLUME PCR
- + IDEAL FOR HEAT SEALING
- + ALPHANUMERIC GRID-REFERENCE
- + SBS FOOTPRINT
- + CERTIFIED FREE FROM RNASE, DNASE, BACTERIAL & HUMAN GENOMIC DNA
- + CLEANROOM PRODUCED
- + AUTOCLAVABLE

Code	Description	Plates/Case
4ti-0960	FrameStar® 96, skirted PCR plate, clear wells, purple frame	50
4ti-0960/B	FrameStar® 96, skirted PCR plate, clear wells, blue frame	50
4ti-0960/C	FrameStar® 96, skirted PCR plate, clear wells, clear frame	50
4ti-0960/G	FrameStar® 96, skirted PCR plate, clear wells, green frame	50
4ti-0960/R	FrameStar® 96, skirted PCR plate, clear wells, red frame	50
4ti-0960/X	FrameStar® 96, skirted PCR plate, clear wells, black frame	50
4ti-0961	FrameStar® 96, skirted PCR plate, white wells, black frame	50

Barcode ordering codes

Please add to ordering code
/SBC for Standard Single Barcoding or
/DBC for Standard Double Barcoding.
(See page 35 for more details)

FrameStar® 480/96 for Roche LightCycler® 480



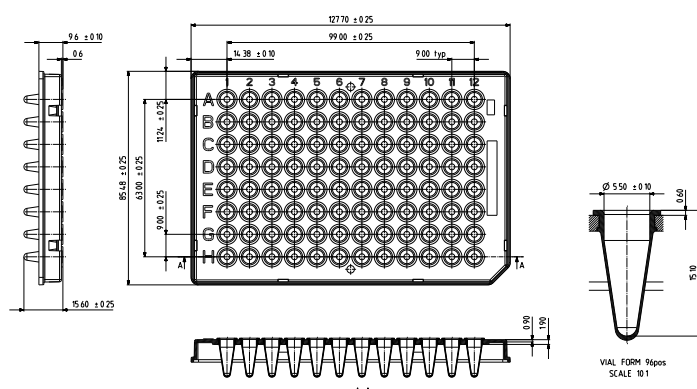
Features

- Compatible with the Roche LightCycler® 480
- Recommended for low volume PCR
- Polycarbonate frame for mechanical stability of the plate
- Polypropylene thin-walled tubes for optimum PCR results
- Improved seal integrity due to thermal stability of frame
- Ideal for use with robotic systems
- Available barcoded

Description

The FrameStar® 480/96 plates are semi-skirted and the dimensions are designed to achieve optimised assay conditions on the Roche LightCycler® 480, 96well for reaction volumes of 10-100µl. The rigid two-component design eliminates warping and distortion during PCR making it ideal for use with robotic systems. The semi-skirt allows for labelling or barcoding.

Plate Dimensions



Also see

- FrameStar® full features list (page 8)
- Plate compatibility table (page 24-25)
- Heat sealing (page 48-54)
- 4s² heat sealer (page 46-47)
- Adhesive sealing (page 42-45)
- Barcoding (page 35)

+ 2-COMPONENT DESIGN

+ LOW VOLUME PCR

+ IDEAL FOR HEAT SEALING

+ ALPHANUMERIC GRID-REFERENCE

+ CERTIFIED FREE FROM RNASE, DNASE, BACTERIAL & HUMAN GENOMIC DNA

+ CLEANROOM PRODUCED

+ AUTOCLAVABLE

Code	Description	Plates/Case
4ti-0950/C	FrameStar® 480, 96well semi-skirted PCR plate, clear wells, clear frame	50
4ti-0951	FrameStar® 480, 96well semi-skirted PCR plate, white wells, clear frame	50
4ti-0952	= 4ti-0951 + 50 qPCR adhesive seals (4ti-0560)	50
4ti-0953	= 4ti-0950/C + 50 qPCR adhesive seals (4ti-0560)	50

Barcode ordering codes

Please add to ordering code /SBC for Standard Single Barcoding or /DBC for Standard Double Barcoding. (See page 35 for more details)

FrameStar® FastPlate 96

Recommended for ABI Fast Block cyclers



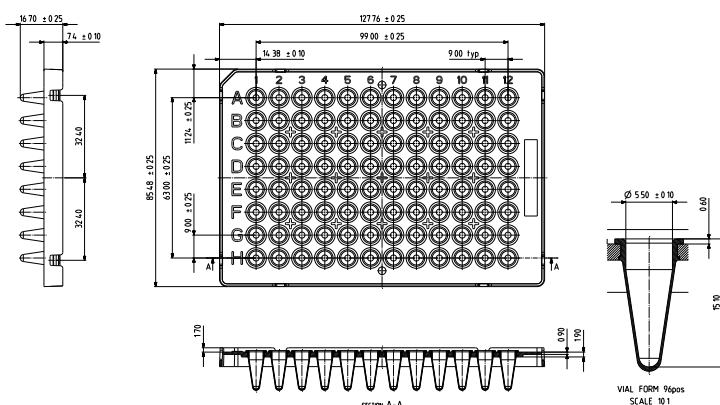
Features

- Compatible with the ABI Fast Block thermal cyclers
- Recommended for low volume PCR
- Polycarbonate frame for mechanical stability of the plate
- Polypropylene thin-walled tubes for optimum PCR results
- Improved seal integrity due to thermal stability of frame
- Ideal for use with robotic systems
- Available barcoded

Description

This semi-skirted low profile plate is recommended for ABI Fast Block thermal cyclers. Low profile plates have shorter wells than standard profile plates, decreasing the “dead space” between the heated lid of the thermal cycler and the sample. This eliminates condensation on the side wall of the tube, preventing reduction in PCR volume and increasing the efficiency of the reaction. Low profile products are especially recommended for use with reaction volumes below 20µl. The rigid two-component design eliminates warping and distortion during PCR making it ideal for use with robotic systems. The semi-skirt allows for labelling or barcoding.

Plate Dimensions



Also see

- FrameStar® full features list (page 8)
- Plate compatibility table (page 24-25)
- Heat sealing (page 48-54)
- 4s² heat sealer (page 46-47)
- Adhesive sealing (page 42-45)
- Barcoding (page 35)

+ LOW PROFILE

+ 2-COMPONENT DESIGN

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+ AUTOCLAVABLE

Code	Description	Plates/Case
4ti-0910/C	FrameStar® FastPlate, 96well semi-skirted PCR plate, clear wells, clear frame	50
4ti-0911	FrameStar® FastPlate, 96well semi-skirted PCR plate, white wells, clear frame	50

Barcode ordering codes

Please add to ordering code
/SBC for Standard Single Barcoding or
/DBC for Standard Double Barcoding.
(See page 35 for more details)

FrameStar® 96 with Upstand

Designed to fit ABI thermal cyclers and sequencers



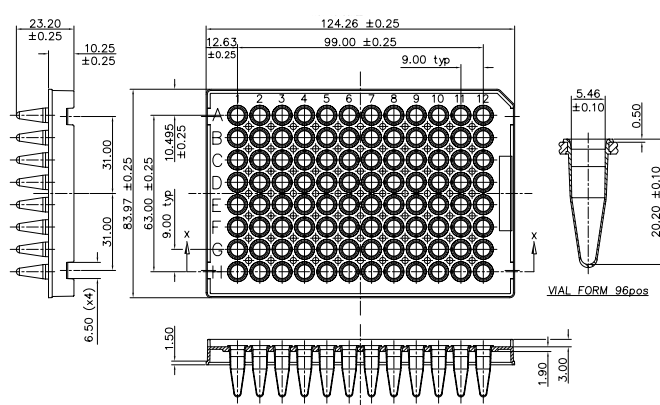
Features

- Ideal for ABI thermal cyclers & sequencers
- Recommended for low volume PCR
- Polycarbonate frame for mechanical stability of the plate
- Polypropylene thin-walled tubes for optimum PCR results
- Improved seal integrity due to thermal stability of frame
- Ideal for use with robotic systems
- 6 colour options
- Available with black plate and white wells for fluorescent based analysis
- Available barcoded

Description

This semi-skirted plate is recommended for ABI thermal cyclers and sequencers; it can be used directly with the ABI instruments with no adapters necessary. The rigid two-component design eliminates warping and distortion during PCR making it ideal for use with robotic systems. The semi-skirt allows for labelling or barcoding.

Plate Dimensions



Also see

- FrameStar® full features list (page 8)
- Plate compatibility table (page 24-25)
- Heat sealing (page 48-54)
- 4s² heat sealer (page 46-47)
- Adhesive sealing (page 42-45)
- Barcoding (page 35)

+ 2-COMPONENT DESIGN

+ LOW VOLUME PCR

+ IDEAL FOR HEAT SEALING

+ ALPHANUMERIC GRID-REFERENCE

+ CERTIFIED FREE FROM RNASE, DNASE, BACTERIAL & HUMAN GENOMIC DNA

+ CLEANROOM PRODUCED

+ AUTOCLAVABLE

Code	Description	Plates/Case
4ti-0730	FrameStar® 96well PCR plate with upstand, clear wells, purple frame	50
4ti-0730/B	FrameStar® 96well PCR plate with upstand, clear wells, blue frame	50
4ti-0730/C	FrameStar® 96well PCR plate with upstand, clear wells, clear frame	50
4ti-0730/G	FrameStar® 96well PCR plate with upstand, clear wells, green frame	50
4ti-0730/R	FrameStar® 96well PCR plate with upstand, clear wells, red frame	50
4ti-0730/X	FrameStar® 96well PCR plate with upstand, clear wells, black frame	50
4ti-0731	FrameStar® 96well PCR plate with upstand, white wells, black frame	50

Barcode ordering codes

Please add to ordering code /SBC for Standard Single Barcoding or /DBC for Standard Double Barcoding. (See page 35 for more details)

FrameStar® 96, cut corner A12

Semi-skirted microplate to fit ABI instruments



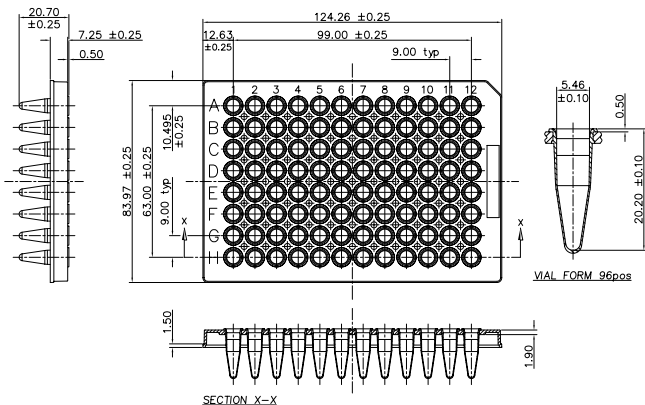
Features

- Perfect fit for ABI thermal cyclers & sequencers
- Recommended for low volume PCR
- Polycarbonate frame for mechanical stability of the plate
- Polypropylene thin-walled tubes for optimum PCR results
- Improved seal integrity due to thermal stability of frame
- Ideal for use with robotic systems
- Available barcoded

Description

Specifically designed to be directly compatible with all major thermal cyclers including all ABI instruments, this plate can be used directly in ABI 96well instruments with no adapters necessary. The rigid two-component design eliminates warping and distortion during PCR making it ideal for use with robotic systems. The semi-skirt allows for labelling or barcoding.

Plate Dimensions



Also see

- FrameStar® full features list (page 8)
- Plate compatibility table (page 24-25)
- Heat sealing (page 48-54)
- 4s² heat sealer (page 46-47)
- Adhesive sealing (page 42-45)
- Barcoding (page 35)

- + 2-COMPONENT DESIGN
- + LOW VOLUME PCR
- + IDEAL FOR HEAT SEALING
- + ALPHANUMERIC GRID-REFERENCE
- + CERTIFIED FREE FROM RNASE, DNASE, BACTERIAL & HUMAN GENOMIC DNA
- + CLEANROOM PRODUCED
- + AUTOCLAVABLE

Code	Description	Plates/Case
4ti-0770/C	FrameStar® 96well semi-skirted PCR plate, clear wells, clear frame	50
4ti-0771	FrameStar® 96well semi-skirted PCR plate, white wells, black frame	50

Barcode ordering codes

Please add to ordering code
/SBC for Standard Single Barcoding or
/DBC for Standard Double Barcoding.
(See page 35 for more details)

FrameStar® 96, cut corner H1

Universal semi-skirted plate



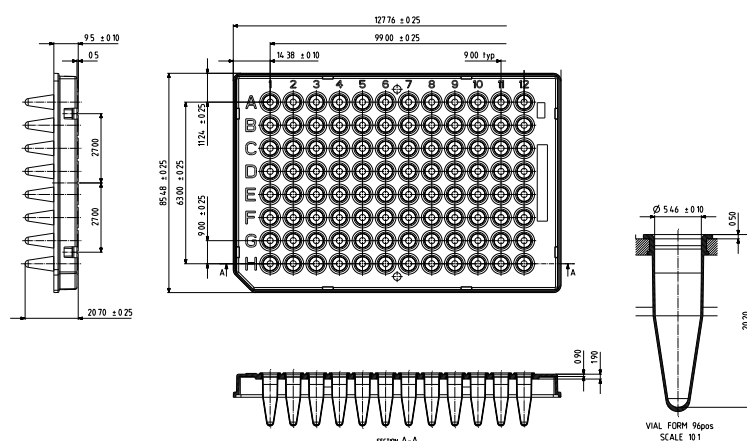
Features

- Recommended for low volume PCR
- Polycarbonate frame for mechanical stability of the plate
- Polypropylene thin-walled tubes for optimum PCR results
- Improved seal integrity due to thermal stability of frame
- Ideal for use with robotic systems
- Available barcoded

Description

This universal semi-skirted plate is designed to fit all major thermal cyclers. The rigid two-component design eliminates warping and distortion during PCR making it ideal for use with robotic systems. The semi-skirt allows for labelling or barcoding.

Plate Dimensions



Also see

- FrameStar® full features list (page 8)
- Plate compatibility table (page 24-25)
- Heat sealing (page 48-54)
- 4s² heat sealer (page 46-47)
- Adhesive sealing (page 42-45)
- Barcoding (page 35)

+ 2-COMPONENT DESIGN

+ LOW VOLUME PCR

+ IDEAL FOR HEAT SEALING

+ ALPHANUMERIC GRID-REFERENCE

+ CERTIFIED FREE FROM RNASE, DNASE, BACTERIAL & HUMAN GENOMIC DNA

+ CLEANROOM PRODUCED

+ AUTOCLAVABLE

Code	Description	Plates/Case
4ti-0900/C	FrameStar® 96well semi-skirted PCR plate, clear wells, clear frame	50
4ti-0901	FrameStar® 96well semi-skirted PCR plate, white wells, clear frame	50

Barcode ordering codes

Please add to ordering code
/SBC for Standard Single Barcoding or
/DBC for Standard Double Barcoding.
(See page 35 for more details)

FrameStar® 96 Non-Skirted

Fits most thermal cyclers



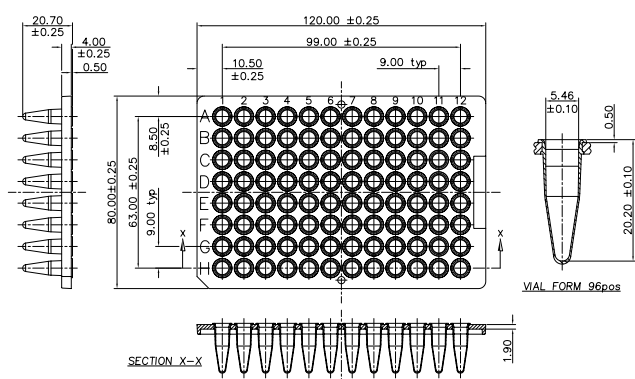
Features

- Recommended for low volume PCR
- Polycarbonate frame for mechanical stability of the plate
- Polypropylene thin-walled tubes for optimum PCR results
- Improved seal integrity due to thermal stability of frame
- 6 colour options
- Available with black plate and white wells for fluorescent based analysis

Description

This standard profile 96well PCR plate is designed to fit most major thermal cyclers. The polycarbonate frame, within the 2-component design, reduces thermal expansion during PCR, ensuring the seal integrity remains intact, even at elevated temperatures.

Plate Dimensions



Also see

- FrameStar® full features list (page 8)
- Plate compatibility table (page 24-25)
- Heat sealing (page 48-54)
- 4s² heat sealer (page 46-47)
- Adhesive sealing (page 42-45)

+ 2-COMPONENT DESIGN

+ LOW VOLUME PCR

+ IDEAL FOR HEAT SEALING

+ ALPHANUMERIC GRID-REFERENCE

+ CERTIFIED FREE FROM RNASE, DNASE, BACTERIAL & HUMAN GENOMIC DNA

+ CLEANROOM PRODUCED

+ AUTOCLAVABLE

Code	Description	Plates/Case
4ti-0710	FrameStar® 96well non-skirted PCR plate, clear wells, purple frame	50
4ti-0710/B	FrameStar® 96well non-skirted PCR plate, clear wells, blue frame	50
4ti-0710/C	FrameStar® 96well non-skirted PCR plate, clear wells, clear frame	50
4ti-0710/G	FrameStar® 96well non-skirted PCR plate, clear wells, green frame	50
4ti-0710/R	FrameStar® 96well non-skirted PCR plate, clear wells, red frame	50
4ti-0710/X	FrameStar® 96well non-skirted PCR plate, clear wells, black frame	50
4ti-0711	FrameStar® 96well non-skirted PCR plate, white wells, black frame	50

FrameStar® 96 Non-Skirted

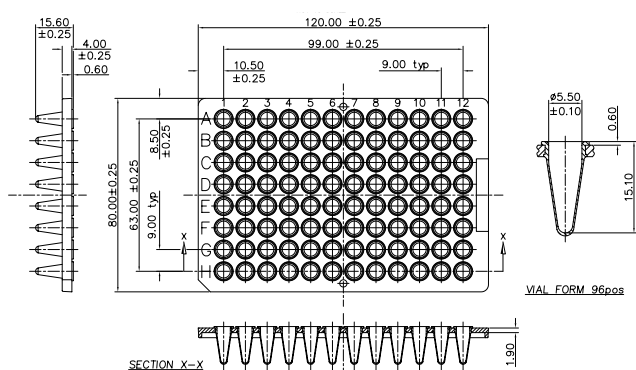
Low profile PCR plate



Description

This low profile PCR plate has shorter wells than the standard profile plate (4ti-0710), decreasing the “dead space” between the heated lid of the thermal cycler and the sample. This eliminates condensation on the side wall of the tube, preventing reduction in PCR volume and increasing the efficiency of the reaction. Low profile products are especially recommended for use with reaction volumes below 20µl. The polycarbonate frame, within the 2-component design, reduces thermal expansion during PCR, ensuring the seal integrity remains intact, even at elevated temperatures.

Plate Dimensions



Features

- Recommended for low volume PCR
- Polycarbonate frame for mechanical stability of the plate
- Polypropylene thin-walled tubes for optimum PCR results
- Improved seal integrity due to thermal stability of frame
- Ideal for use with robotic systems

Also see

- FrameStar® full features list (page 8)
- Plate compatibility table (page 24-25)
- Heat sealing (page 48-54)
- 4s² heat sealer (page 46-47)
- Adhesive sealing (page 42-45)

- + LOW PROFILE
- + 2-COMPONENT DESIGN
- + LOW VOLUME PCR
- + IDEAL FOR HEAT SEALING
- + ALPHANUMERIC GRID-REFERENCE
- + CERTIFIED FREE FROM RNASE, DNASE, BACTERIAL & HUMAN GENOMIC DNA
- + CLEANROOM PRODUCED
- + AUTOCLAVABLE



Image to show the difference between low profile (left) and standard profile (right) FrameStar® PCR plates

Code	Description	Plates/Case
4ti-0720	FrameStar® 96well non-skirted, low profile PCR plate, clear wells, purple frame	50
4ti-0720/B	FrameStar® 96well non-skirted, low profile PCR plate, clear wells, blue frame	50
4ti-0720/C	FrameStar® 96well non-skirted, low profile PCR plate, clear wells, clear frame	50
4ti-0720/G	FrameStar® 96well non-skirted, low profile PCR plate, clear wells, green frame	50
4ti-0720/R	FrameStar® 96well non-skirted, low profile PCR plate, clear wells, red frame	50
4ti-0720/X	FrameStar® 96well non-skirted, low profile PCR plate, clear wells, black frame	50
4ti-0721	FrameStar® 96well non-skirted, low profile plate, white wells, black frame	50

qPCR Cyclers

Sequencers

[illegible]

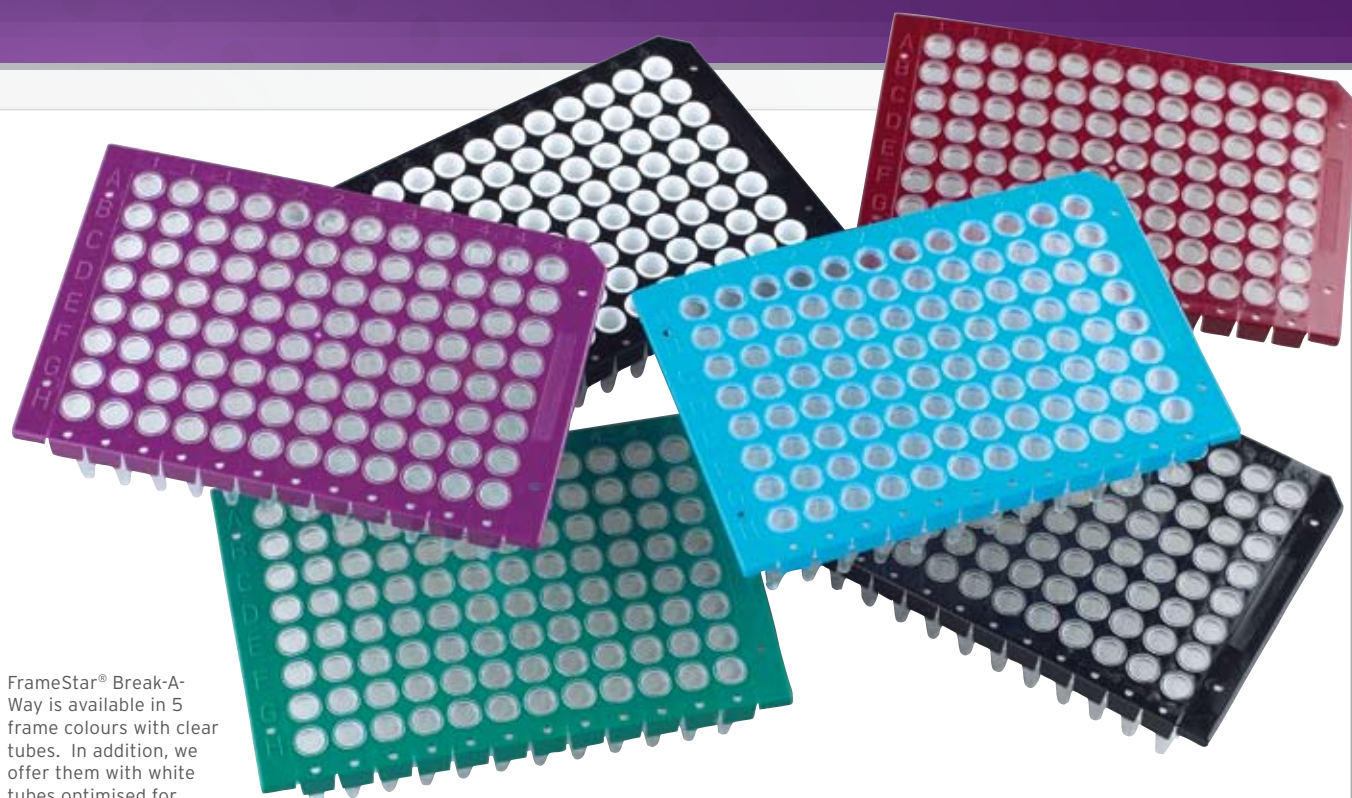
4titude's® FrameStar® Break-A-Way offers you all the flexibility of tube strips, in a plate. FrameStar® Break-A-Way is a 96well PCR plate that can easily be divided into smaller plate sections, ensuring no tubes are wasted.

- 96well rigid PCR plate that can be divided into smaller plate sections
- Provides complete flexibility
- Cost-effective
- Rigid 2-component design - thermostable frame prevents distortion of tube strip
- Fits the majority of thermal cyclers
- 5 frame colour options with clear wells
- White well strip option for qPCR and other optical assays
- End tabs for easy handling and labelling
- Eliminates tube strip breakage
- 2D barcodes available - the 14 x 14 array offers 3.6×10^{15} unique alpha numeric code
- 2D readers available - easy sample management



FrameStar® Break-A-Way can easily be snapped into smaller plate sections





FrameStar® Break-A-Way is available in 5 frame colours with clear tubes. In addition, we offer them with white tubes optimised for fluorescence assays.

FrameStar® Break-A-Way uses the two-component design we use for FrameStar® and FrameStrip™ which combines the advantages of thin-walled polypropylene tubes for optimum PCR results and a rigid frame portion for easy and reliable handling.

When used as a plate, the benefits of FrameStar® are realised - evaporation from corner positions and outer rows of wells is minimal, which allows for downscaling of reagent volumes. When used in strips, the benefits of FrameStrip™ are seen, where the rigid two-component design ensures the strip remains straight and stable.

For colour coding of experiments, we offer FrameStar® Break-A-Way in 5 colours, all with clear tubes and for optical assays, such as qPCR, we supply strips with white wells in black frames. FrameStar® Break-A-Way is compatible with the majority of thermal cyclers.



FrameStar® PCR plates are covered by one or more of the following U.S. patents or their foreign counterparts, owned by Eppendorf AG: US Patent Nos. 7,347,977 and 6,340,589

Code	Description	FrameStar® Break-A-Ways/Case
4ti-1000/P	FrameStar® Break-A-Way 96wells, clear tubes, purple frame	50 plates
4ti-1000/B	FrameStar® Break-A-Way 96wells, clear tubes, blue frame	50 plates
4ti-1000/C	FrameStar® Break-A-Way 96wells, clear tubes, clear frame	50 plates
4ti-1000/G	FrameStar® Break-A-Way 96wells, clear tubes, green frame	50 plates
4ti-1000/R	FrameStar® Break-A-Way 96wells, clear tubes, red frame	50 plates
4ti-1000/X	FrameStar® Break-A-Way 96wells, clear tubes, black frame	50 plates
4ti-1001	FrameStar® Break-A-Way 96wells, white wells, black frame	50 plates

Patents pending

STRIPS OF 8 PCR TUBES

NEW

4titude's® new FrameStripTM PCR tubes are a two-component design, combining the advantages of thin-walled tubes for optimum PCR results and a rigid frame portion for easy and reliable handling.

For the tubes we use polypropylene which provides the most efficient heat transfer, as well as an inert surface with low binding capabilities for nucleic acids, proteins and other molecules. By moulding the frame portion in a more rigid polymer the mechanical stability of the strip has been greatly improved compared with traditional single piece products.



Benefits

- Rigid two-component design - thermostable frame prevents distortion of tube strip
- Thin walled polypropylene tubes ensure optimum thermal transfer
- End tabs for easy handling and labelling
- FrameStripsTM fit all thermal cyclers
- 5 frame colour options with clear wells
- White well strip option for qPCR and other optical assays
- 2D barcodes available - the 14 x 14 array offers 3.6×10^{15} unique alpha numeric codes
- 2D readers available - easy sample management
- Available with flat, optically clear and domed cap strips
- Eliminates tube strip breakage

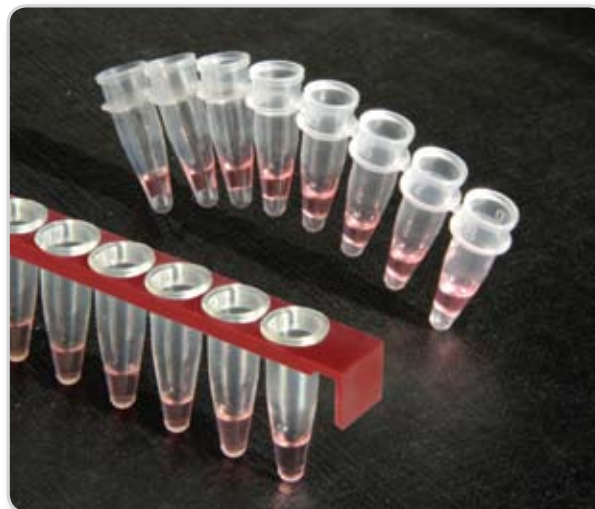
Colour Options

For colour coding of experiments we offer the strips in 5 frame colours, all with clear tubes and for optical assays such as qPCR we supply strips with white wells in black frames. FrameStrips™ are available with either domed cap strips or with flat, optically clear caps and are compatible with the majority of thermal cyclers. End tabs allow for easy handling and labelling of the strips.

2D Barcoding and Reader

The products are also available with an off-the-shelf 2D barcode offering an endless supply of unique code combinations. 4titude®'s 2D reader together with the user-friendly software allows for reliable and convenient sample management. Fast and accurate reading is guaranteed via the built in error correction with data redundancy.

Please contact 4titude® Ltd. or its authorised distributors to request samples of FrameStrips™ or to request a demo of the 2D reader system.



In contrast to standard tube strips the FrameStrips™ will remain straight and stable even at elevated temperatures and when filled with liquid.



To save or read the 2D label simply hold the tube strips against the 2D reader



FrameStrips™ are available in 5 frame colours and with domed and optically clear cap strips.



FrameStrips™ are available with 2D barcodes.

Code	Description	FrameStrips™/Case
4ti-0785/P	FrameStrip™ strips of 8 clear tubes with domed caps, purple frame	120 strips of 8 tubes & domed caps
4ti-0785/B	FrameStrip™ strips of 8 clear tubes with domed caps, blue frame	120 strips of 8 tubes & domed caps
4ti-0785/G	FrameStrip™ strips of 8 clear tubes with domed caps, green frame	120 strips of 8 tubes & domed caps
4ti-0785/R	FrameStrip™ strips of 8 clear tubes with domed caps, red frame	120 strips of 8 tubes & domed caps
4ti-0785/X	FrameStrip™ strips of 8 clear tubes with domed caps, black frame	120 strips of 8 tubes & domed caps
4ti-0786/P	FrameStrip™ strips of 8 clear tubes with flat optical caps, purple frame	120 strips of 8 tubes & flat optical caps
4ti-0786/B	FrameStrip™ strips of 8 clear tubes with flat optical caps, blue frame	120 strips of 8 tubes & flat optical caps
4ti-0786/G	FrameStrip™ strips of 8 clear tubes with flat optical caps, green frame	120 strips of 8 tubes & flat optical caps
4ti-0786/R	FrameStrip™ strips of 8 clear tubes with flat optical caps, red frame	120 strips of 8 tubes & flat optical caps
4ti-0786/X	FrameStrip™ strips of 8 clear tubes with flat optical caps, black frame	120 strips of 8 tubes & flat optical caps
4ti-0786/XW	FrameStrip™ strips of 8 white tubes with flat optical caps, black frame	120 strips of 8 tubes & flat optical caps
4ti-0785/X/2D	FrameStrip™ strips of 8 clear tubes with domed caps, black frame	120 strips of 8 tubes & domed caps with 2D barcode
4ti-0786/X/2D	FrameStrip™ strips of 8 clear tubes with flat optical caps, black frame	120 strips of 8 tubes & flat optical caps with 2D barcode
4ti-0787	FrameStrip™ 2D barcode reader plus software	1

General PCR Consumables

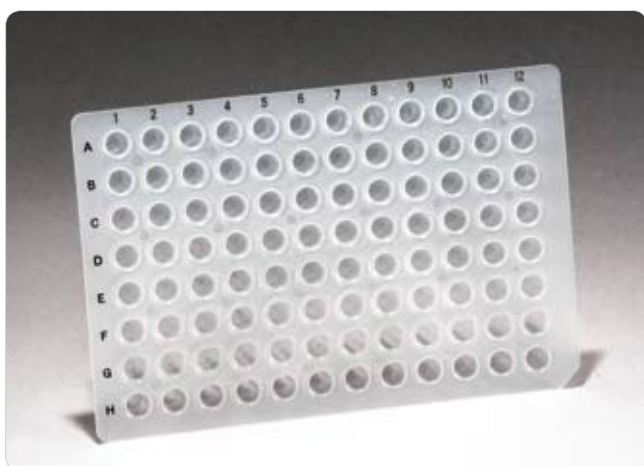
THIN WALL DESIGN

4titude® offers a range of PCR consumables for low to medium throughput applications. Our tubes, tube strips and plates are moulded from virgin polypropylene under clean-room conditions and comply to the same stringent QC requirements as our FrameStar® range. Please see pages 42-45 for sealing options.

Benefits

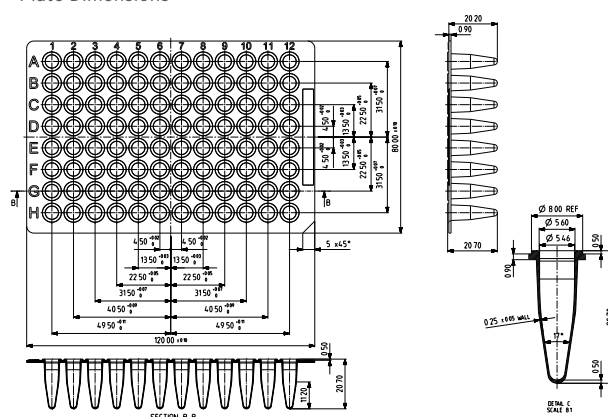
- Clean-room produced
- Thin-wall design
- Free of human DNA, RNases and DNases
- Leak tested
- Autoclavable

96well PCR Plate, non-skirted



- Universal fit for most 0.2ml thermal cyclers and sequencers
- Standard tube height with 0.3ml working volume
- Black grid reference for easy sample identification
- Cut corner for plate orientation
- Can be cut into sections

Plate Dimensions



- Clear wells for improved sample visibility
- Raised well rims to avoid cross contamination and to facilitate heat sealing
- Compatible with our domed and flat cap strips
- Heat sealing and adhesive sealing options available

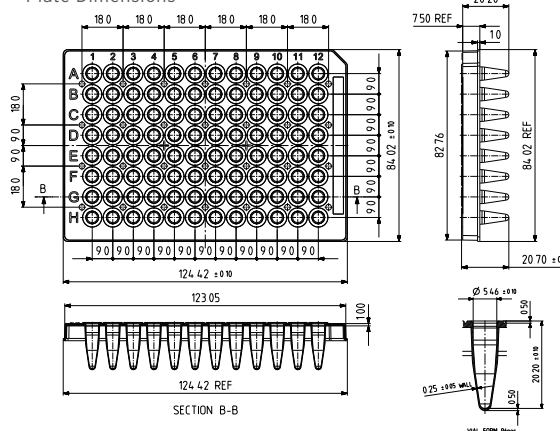
Code	Description	Quantity
4ti-0750	96well PCR plate, non-skirted	50 plates
NEW 4ti-0750/W	96well PCR plate, non skirted, white	50 plates
4ti-0751	Strips of 8 flat optical caps	300 strips
4ti-0752	Strips of 8 domed caps	300 strips

96well PCR Plate, semi-skirted



- 0.3ml maximum well volume (when used with adhesive and heat seals)
- Black grid reference for easy sample identification
- Cut-off corner for plate orientation
- Compatible with many major thermal cyclers

Plate Dimensions



- Clear wells for improved sample visibility
- Heat sealing and adhesive sealing options available
- Compatible with our domed and flat cap strips
- Suitable for barcoding

Code	Description	Quantity
4ti-0760	96well PCR plate, semi skirted	50 plates
4ti-0761	96well PCR plate, white, semi skirted	50 plates
4ti-0751	Strips of 8 flat optical caps	300 strips
4ti-0752	Strips of 8 domed caps	300 strips

Barcode ordering codes

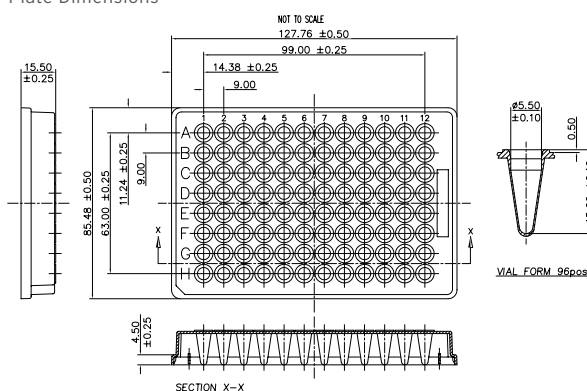
Please add to ordering code
/SBC for Standard Single Barcoding or
/DBC for Standard Double Barcoding.
(See page 35 for more details)

96well PCR Plate, skirted, low profile



- Low profile design, 0.2ml maximum working volume (when used with sealing sheets)
- Cut-off corner for plate orientation
- Black grid reference for easy sample identification
- Stackable
- Clear wells for improved sample visibility

Plate Dimensions



- Raised well rims to avoid cross contamination and to facilitate heat sealing
- Compatible with our domed and flat cap strips
- Heat sealing and adhesive sealing options available
- Suitable for barcoding

Code	Description	Quantity
4ti-0740	96well PCR plate, skirted	50 plates
4ti-0741	96well PCR plate, white, skirted	50 plates
4ti-0751	Strips of 8 flat optical caps	300 strips
4ti-0752	Strips of 8 domed caps	300 strips

Barcode ordering codes

Please add to ordering code
/SBC for Standard Single Barcoding or
/DBC for Standard Double Barcoding.
(See page 35 for more details)

NEW

General PCR Consumables

Strips of 8 PCR Tubes



- Suitable for all standard 0.2ml block thermal cyclers
- 0.25ml maximum recommended capacity
- Individually numbered tubes
- Can be cut into sections
- Available with domed and flat, optical caps

Code	Description	Quantity
4ti-0781	Strips of 8 PCR tubes	125 strips
4ti-0780	Strips of 8 PCR tubes and domed caps	125 strips
4ti-0784	Strips of 8 PCR tubes and flat optical caps	125 strips

Individual 0.2ml PCR Tubes



- Flat and domed cap designs
- Suitable for all standard 0.2ml block thermal cyclers
- Snap-shut cap
- 0.25ml maximum recommended capacity

Code	Description	Quantity
4ti-0790	0.2ml single tube, flat cap	1000
4ti-0795	0.2ml single tube, domed cap	1000

Strips of 8 Flat Optical Caps



- Compatible with our tube strips (use code 4ti-0783) and 96well PCR plates (use code 4ti-0751)
- Optically clear for fluorescence detection (e.g. qPCR)
- Easy to apply
- Large end tabs for easy removal
- Labelled for orientation

Code	Description	Quantity
4ti-0783	Strips of 8 flat optical caps for use with our tube strips	125 strips
4ti-0751	Strips of 8 flat optical caps for use with our PCR plates	300 strips

Strips of 8 Domed Caps



- Compatible with our tube strips (use code 4ti-0782) and 96well PCR plates (use code 4ti-0752)
- Easy to apply
- Large end tabs for easy removal
- Labelled for orientation

Code	Description	Quantity
4ti-0782	Strips of 8 domed caps for use with our tube strips	125 strips
4ti-0752	Strips of 8 domed caps for use with our PCR plates	300 strips

Ergo Stands

The height and angle of the Ergo Stand can be adjusted for maximum comfort during pipetting sequences. This reduces the stress and strain on the upper body and can help to prevent repetitive strain disorders (RSI) and work related upper-body limb disorders (WRULD).

The stand includes eight spaces for 1.5ml or 2.0ml microcentrifuge tubes. This is especially useful for when pipetting master mixes into PCR plates.

For colour coding or identification of your work, we offer the Ergo Stands in 4 colours: red, green, blue or yellow.



Fully adjustable height and angle for maximum pipetting comfort.

Code	Description	Stands/Case
4ti-0393/B	Ergo Plate Stand, Blue	1
4ti-0393/R	Ergo Plate Stand, Red	1
4ti-0393/G	Ergo Plate Stand, Green	1
4ti-0393/Y	Ergo Plate Stand, Yellow	1



Less stress and strain on the upper body.



Ergo stands have eight positions for 1.5ml or 2.0ml microcentrifuge tubes.

Accessories

1.2ml 96well Low Profile Deep-Well Plate



- 1.2ml working volume
- Half the height of standard deep-well plates
- SBS footprint
- Wide diameter wells
- Cross-contamination eliminated by chimney-style wells
- Clear plastic aides visibility of samples
- Alphanumeric coding
- Ideal for use with robotic platforms
- Suitable for barcoding
- Stackable
- Autoclavable

NEW

Code	Description	Quantity
4ti-0120	1.2ml, 96well Low profile deep-well plate	50 plates
4ti-0135	96well Cap mat	100 mats

Barcode ordering codes

Please add to ordering code
/SBC for Standard Single Barcoding or
/DBC for Standard Double Barcoding.
(See page 35 for more details)

White Marker Pen



- Ideal for labelling Vision Plates™, FrameStar® plates and FrameStrips™
- Cannot be removed using aqueous or organic solvents
- Perfect solution for labelling coloured or black plates

NEW

Code	Description	Quantity
4ti-0394	White marker pen	1 pen

Roller for Adhesive Seals



- Ideal for use with 4titude® adhesive seals
- Complete and secure application of adhesive seals
- Durable plastic construction

NEW

Also see

- Adhesive sealing (page 42-45)

Code	Description	Pack Size/Dimensions
4ti-0502	Roller for adhesive seals	1 roller

FOR IDENTIFICATION AND TRACEABILITY

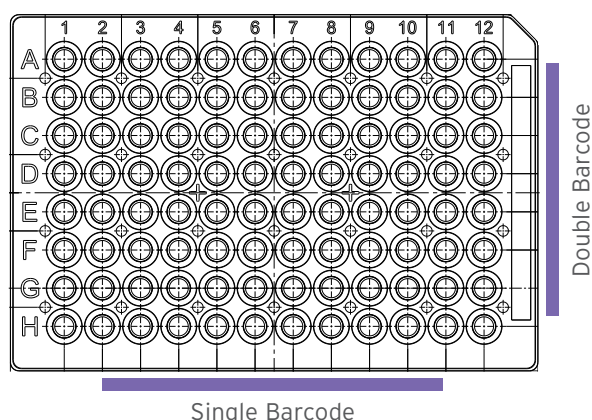
All skirted and semi-skirted plates are available with linear barcodes for identification and traceability. The labels are highly scratch resistant and can withstand cold storage (-80°C) and solvents, such as DMSO. Either single or double barcodes are available off-the-shelf and a variety of customisations are possible.

NEW

Standard Barcoded Plates

Our standard barcoded plates are available off-the-shelf, single or doubled barcoded for all our fully-skirted and semi-skirted plates. The barcodes are printed in Code 128 which is compatible with most barcode readers. In addition, human readable format is printed to the right of the label, ensuring samples can always be identified. The single barcode is positioned on the south side of the plate and the double barcode is additionally positioned on the east side of the plate. To order either version, add /SBC or /DBC or your ordering code, respectively.

Position of Standard Barcode Labels

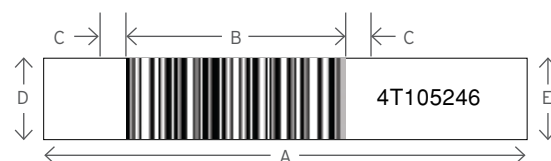


Custom Barcoded Plates

Should you require other barcoded options not offered from our standard barcoding option, our custom service can apply them in your preferred configuration or format, with any sequence. We can apply a variety of barcode formats to any side of any fully-skirted or semi-skirted plate. Custom barcode orders should be submitted with a completed custom barcode order form. This can be downloaded from www.4ti.co.uk/technical/barcode.php

Label Specification

	Dimension	Min.	Max.
A	Label length	-	46 mm
B	Code Length	-	25 mm
C	Quiet zone	3 mm	-
D	Label width	5 mm	6 mm
E	Code width	5 mm	6 mm



Vision Plate

FOR CELL BASED HIGH CONTENT SCREENING

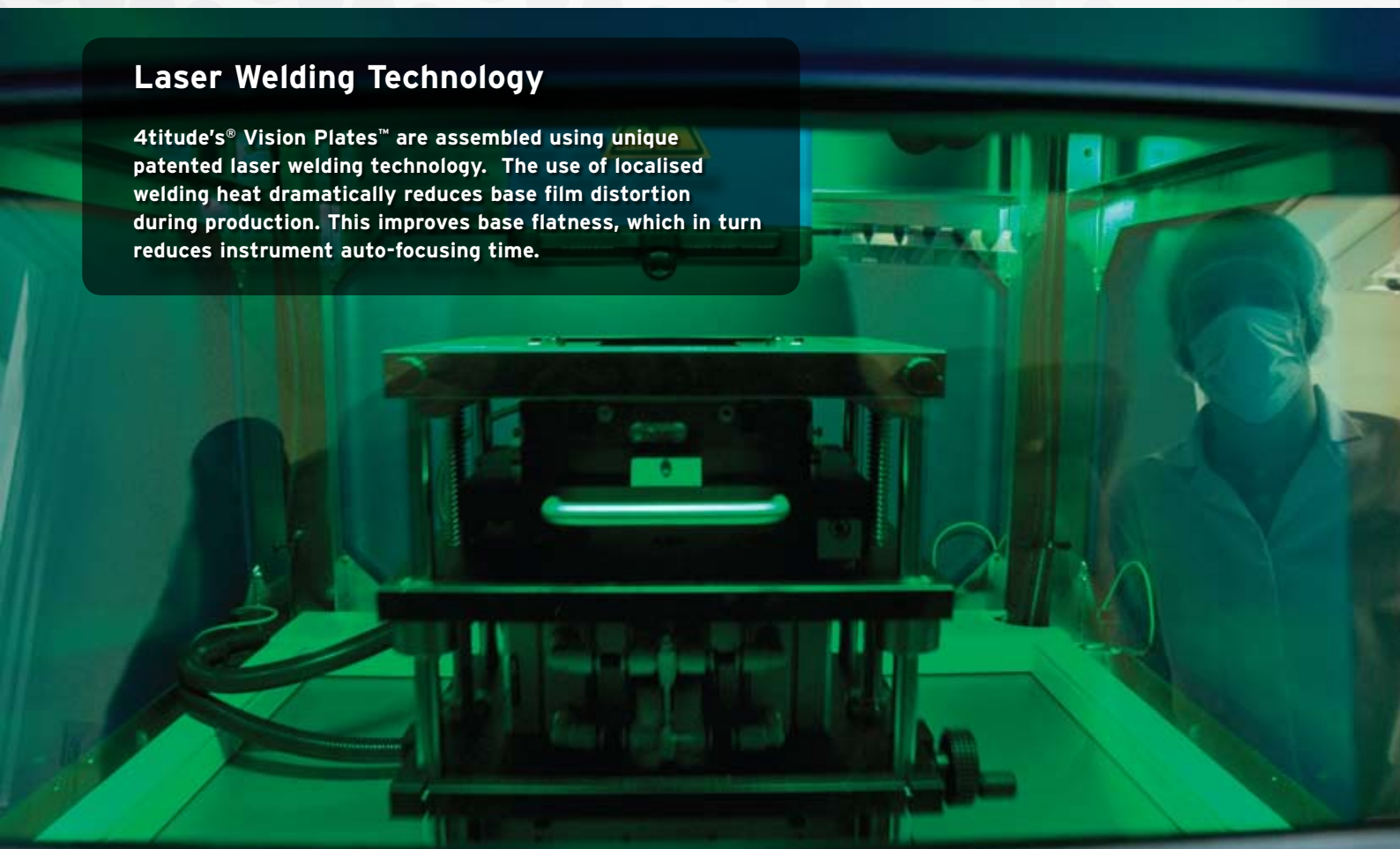
The Vision Plate™ has been designed for high content screening (HCS) assays in drug development and related areas. It is also suitable for homogeneous assays employing fluorescence intensity, FRET and TR-FRET where measurements are bottom-read. This high quality optical base plate assures the necessary accuracy and consistency for automated high throughput systems, generating optimum signal to noise ratios. Using state-of-the-art manufacturing technology 4titude® have developed a product which offers several key advantages to the end user.

Benefits

- 150µm and 700µm polystyrene base options
- Optimum signal-to-noise ratios
- Reduced autofluorescence
- Good cell adherence
- Also suitable for homogeneous assays
- Cyto-toxic free
- Leak free
- SBS format
- Barcoding options available
- Wicking and bubble formation eliminated

Laser Welding Technology

4titude's® Vision Plates™ are assembled using unique patented laser welding technology. The use of localised welding heat dramatically reduces base film distortion during production. This improves base flatness, which in turn reduces instrument auto-focusing time.



Cell Based Screening

Optical Quality of the Polymer Film



The clear base component of our Vision Plate™ demonstrates superior properties in terms of optical clarity (low absorbance and high transmission), low background fluorescence and consistency of material thickness.

The latest extrusion technology is used for manufacturing an ultraclear base of 150µm in thickness to provide optimum results with confocal microscopy and laser based detection systems.

Variation across the plate is minimised so that the time needed for complex screening applications can be reduced dramatically. In addition, cell plate types are available with a 700µm moulded base. This feature further improves the plate flatness and is critical for certain confocal readers, such as the IN Cell 3000.



Autofluorescence Intensity

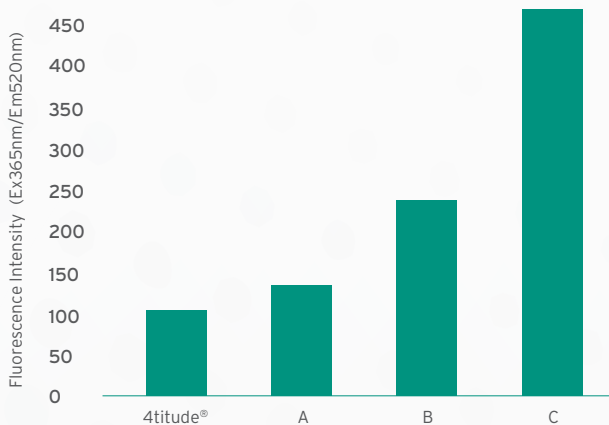


Figure 1: Graph to show the intensity of autofluorescence of 4titude®'s Vision Plate™ compared to leading brand competitors A, B & C

Reduction of Autofluorescence

4titude®'s Vision Plates™ are assembled using unique patented laser welding technology which reduces autofluorescence and does not inhibit cell growth. Other competitors assemble clear base microplates by gluing a clear film to the frame or heat-welding the components together. Both techniques can cause problems with cell growth and the subsequent microscopic or fluorometric analysis.

Heat welding of the two plate components under high pressure results in autofluorescence at the well edges called "halo effect". Gluing uses organic solvents within the adhesives, which can also cause autofluorescence. These solvents can also have cytotoxic effects, which may lead to inhibition of cell growth or even cell death. Additionally, incomplete glue lines or weld lines often result in well-to-well leakage.



Figure 2: Vision Plate™ 384 showing ripple-free bonding of frame and base



Figure 3: Competitor's plate showing areas with no adhesive

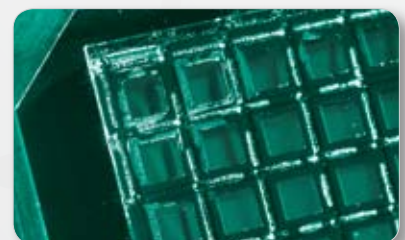


Figure 4: Competitor's plate showing adhesive ingressing into plate wells.

Vision Plate

Improved Cell Adhesion

Polymers such as polystyrene are very hydrophobic and need to be surface treated to increase wettability and to allow for cell adhesion. To introduce the necessary charges to the plastic surface screening plates are commonly undergoing corona treatment or similar low cost modifications. The drawbacks of such treatments are that they are partly reversible and that the density of the charges varies across the surface area, resulting in uneven cell growth and a short shelf life of the products.

4titude® uses a unique low pressure plasma process for treating the plastic surface which produces a more consistent and stable surface. The treatment has been especially designed to improve cell adhesion under difficult conditions (e.g. reduced serum conditions). It is also useful for growing cells with low adhesion properties such as transfected cells overexpressing proteins.

4titude® offers coatings with Collagen 1 and Poly D-Lysin, see ordering information on pages 39-41.

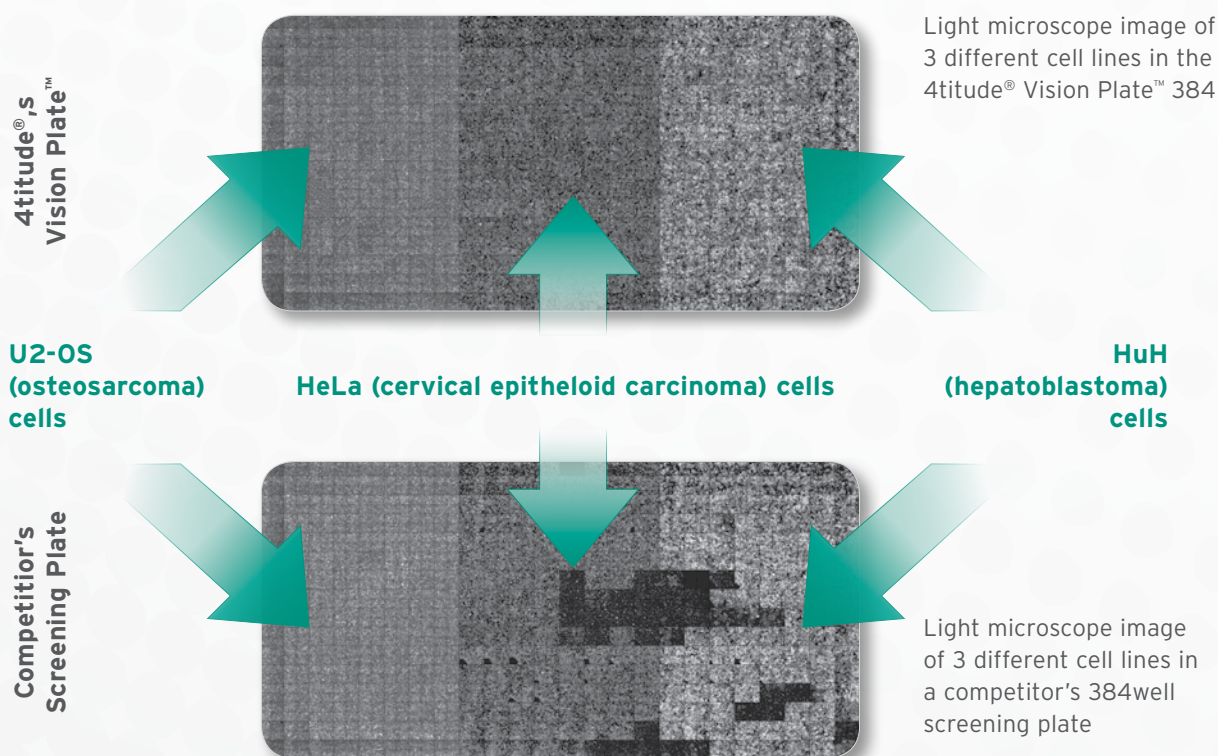
Collagen 1

Collagen 1 is a protein of the extracellular matrix (ECM), an intercellular substance which, *in vivo*, influences adhesion, migration and proliferation among other processes. Collagen 1 is one of the most important ECM proteins for in-vitro cell cultures. Difficult to cultivate cells adhere to Collagen 1 and display positive growth. Collagen 1 can also influence differentiation and morphology.

Poly-D-Lysin

Poly-D-Lysin is a synthetic molecule that improves the adhesion of different cell types to polystyrene surfaces. It can improve cultivation efficiency of individual cell lines especially when serum-free or serum-reduced medium is used, or when experiments such as transfections are performed.

Figures 5: Comparison showing the cell adherence of the 4titude® Vision Plate™ (top) versus a competitor's (bottom)



2000 cells were seeded in each well and incubated for 48 hours to achieve 90% confluency. They were then fixed in PFA and stained with Hoechst nuclear stain, followed by 5 wash steps in a PW384. U2-OS cells stayed adherent in both plates, but the more sensitive HeLa and HuH cells only stayed adherent in all areas of the 4titude® Vision Plate™.

Cell Based Screening

Vision Plate™ 384

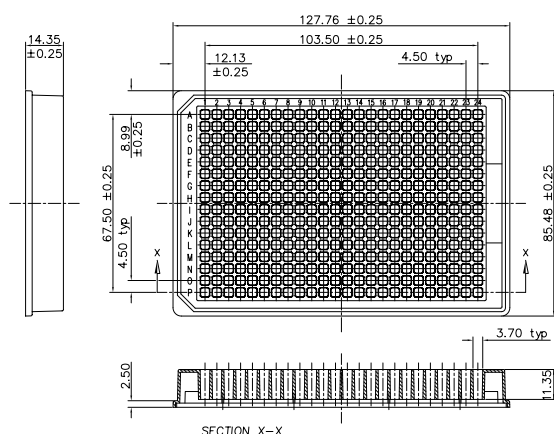
For cell based high content screening



Description

The Vision Plate™ assures the necessary accuracy and consistency for automated high throughput systems, generating optimum signal to noise ratios. Vision Plates™ are assembled using unique patented laser welding technology which reduces autofluorescence and does not inhibit cell growth. Available with 150µm polystyrene base or 700µm which is suitable for use with IN Cell 3000 analysers. 4titude®'s black heat seal is the perfect peelable seal, ideal for fluorescent and other light sensitive assays.

Plate Dimensions



Features

- Optimum signal-to-noise ratios
- Good cell adherence
- Designed for high content screening
- Ideal for homogeneous assays
- 150µm or 700µm polystyrene base
- Available barcoded

Also see

- Vision Plates™ full features list (page 36)
- Black heat seal (pages 52)
- 4s² heat sealer (pages 46 -47)
- Adhesive sealing (pages 42-45)
- Gas permeable moisture barrier seal (page 44)
- Barcoding (page 35)

- + SBS FOOTPRINT
- + TC TREATED OPTION
- + POLY D-LYSIN TREATED OPTION
- + COLLAGEN 1 TREATED OPTION
- + SOLID BASE AVAILABLE
- + IDEAL FOR HEAT SEALING
- + ALPHANUMERIC GRID REFERENCE
- + CLEANROOM PRODUCED
- + CERTIFIED FREE FROM RNASE, DNASE, BACTERIAL & HUMAN GENOMIC DNA

Code	Description	Plates/Case
4ti-0201*	Vision Plate™ 384, black, sterile, TC treated	24 plates with lids
4ti-0202*	Vision Plate™ 384, black, sterile, TC treated	30 plates
4ti-0203*	Vision Plate™ 384, black, sterile	30 plates
4ti-0204*	Vision Plate™ 384, black, non-sterile, untreated	30 plates
4ti-0205	Vision Plate™ 384, Collagen 1 treated, sterile	24 plates with lids
4ti-0206	Vision Plate™ 384, Poly D-Lysin treated, sterile	24 plates with lids
4ti-0264	Vision Plate™ 384, solid base plate, black, non-sterile	100
4ti-0274	Vision Plate™ 384, solid base plate, white, non sterile	100
4ti-0280	Vision Plate™ lid, low profile, without condensation rings, non-sterile	100

700µm ordering code

*Please add /700 to order 700µm base

Vision Plate

Vision Plate™ 96

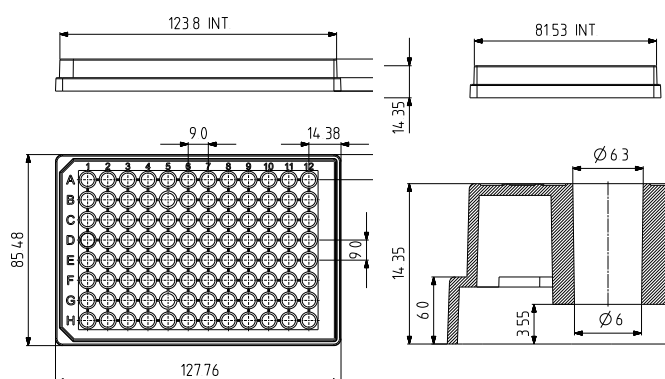
Improved cell adherence



Description

The Vision Plate™ assures the necessary accuracy and consistency for automated high throughput systems, generating optimum signal to noise ratios. Vision Plates™ are assembled using unique patented laser welding technology which reduces autofluorescence and does not inhibit cell growth. Available with 150µm polystyrene base or 700µm which is suitable for use with IN Cell 3000 analysers. 4titude®'s black heat seal is the perfect peelable seal, ideal for fluorescent and other light sensitive assays.

Plate Dimensions (150µm base)



Features

- Optimum signal-to-noise ratios
- Good cell adherence
- Designed for high content screening
- Ideal for homogeneous assays
- 150µm or 700µm polystyrene base
- Available barcoded

Also see

- Vision Plates™ full features list (page 36)
- Black heat seal (pages 52)
- 4s² heat sealer (pages 46 -47)
- Adhesive sealing (pages 42-45)
- Gas permeable moisture barrier seal (page 44)
- Barcoding (page 35)

- + SBS FOOTPRINT
- + TC TREATED OPTION
- + POLY D-LYSIN TREATED OPTION
- + COLLAGEN 1 TREATED OPTION
- + SOLID BASE AVAILABLE
- + IDEAL FOR HEAT SEALING
- + ALPHANUMERIC GRID REFERENCE
- + CLEANROOM PRODUCED
- + CERTIFIED FREE FROM RNASE, DNASE, BACTERIAL & HUMAN GENOMIC DNA

Code	Description	Plates/Case
4ti-0221*	Vision Plate™ 96, black, sterile, TC treated	24 plates with lids
4ti-0222*	Vision Plate™ 96, black, sterile, TC treated	30 plates
4ti-0223*	Vision Plate™ 96, black, sterile	30 plates
4ti-0224*	Vision Plate™ 96, black, non-sterile, untreated	30 plates
4ti-0225	Vision Plate™ 96, Collagen 1 treated, sterile	24 plates with lids
4ti-0226	Vision Plate™ 96, Poly D-Lysin treated, sterile	24 plates with lids
4ti-0263	Vision Plate™ 96, solid base plate, black, non-sterile	100
4ti-0282	Vision Plate™ lid, low profile, 96 condensation rings, non-sterile	100

700µm ordering code

*Please add /700 to order 700µm base

Cell Based Screening

Vision Plate™ 24

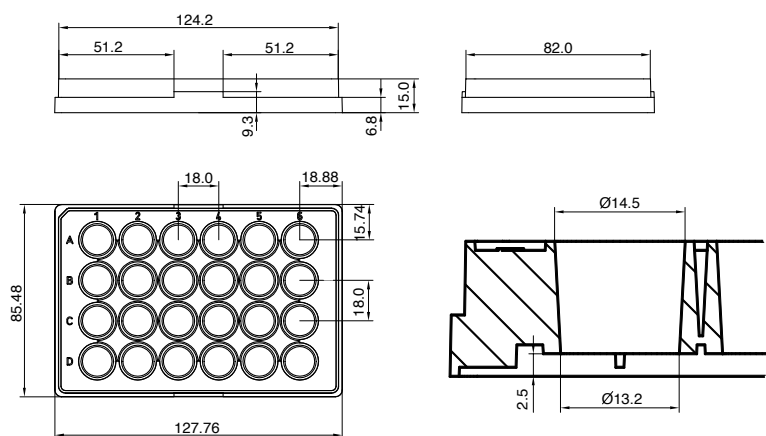
Optimum signal to noise ratios



Description

The Vision Plate™ assures the necessary accuracy and consistency for automated high throughput systems, generating optimum signal to noise ratios. Vision Plates™ are assembled using unique patented laser welding technology which reduces autofluorescence and does not inhibit cell growth. Available with 150µm polystyrene base or 700µm which is suitable for use with IN Cell 3000 analysers. 4titude®'s black heat seal is the perfect peelable seal, ideal for fluorescent and other light sensitive assays.

Plate Dimensions (150µm base)



Features

- Optimum signal-to-noise ratios
- Good cell adherence
- Designed for high content screening
- Ideal for homogeneous assays
- 150µm or 700µm polystyrene base
- Available barcoded

Also see

- Vision Plates™ full features list (page 36)
- Black heat seal (pages 52)
- 4s² heat sealer (pages 46 -47)
- Adhesive sealing (pages 42-45)
- Gas permeable moisture barrier seal (page 44)
- Barcoding (page 35)

- + SBS FOOTPRINT
- + TC TREATED OPTION
- + POLY D-LYSIN TREATED OPTION
- + COLLAGEN 1 TREATED OPTION
- + SOLID BASE AVAILABLE
- + IDEAL FOR HEAT SEALING
- + ALPHANUMERIC GRID REFERENCE
- + CLEANROOM PRODUCED
- + CERTIFIED FREE FROM RNASE, DNASE, BACTERIAL & HUMAN GENOMIC DNA

Code	Description	Plates/Case
4ti-0241*	Vision Plate™ 24, black, sterile, TC treated	24 plates with lids
4ti-0242*	Vision Plate™ 24, black, sterile, TC treated	30 plates
4ti-0243*	Vision Plate™ 24, black, sterile	30 plates
4ti-0244*	Vision Plate™ 24, black, non-sterile, untreated	30 plates
4ti-0245	Vision Plate™ 24, Collagen 1 treated, sterile	24 plates with lids
4ti-0246	Vision Plate™ 24, Poly D-Lysin treated, sterile	24 plates with lids
4ti-0284	Vision Plate™ lid, low profile, 24 condensation rings, non-sterile	100

700µm ordering code

*Please add /700 to order 700µm base

Adhesive Sealing

4titude® offers a wide range of adhesive sealing materials. All seals are certified free from nucleases and human genomic DNA contamination.



PCR Seal



- **Description**

A strong transparent adhesive seal recommended for PCR. Suitable for fluorescence applications. Non-sterile. Non-pierceable. Peelable.

- **Seal integrity range**

-20°C to 110°C

- **Application**

PCR

Code	Pack Size/Dimensions
4ti-0500	100 Sheets (135mm x 80mm)
4ti-0501	1 roll (100m x 80mm)

NEW

See also
Adhesive Seal Roller
on Page 34



Q-Stick™ for qPCR

* Not available in USA



- **Description**

Strong adhesive properties. Discrete optical windows for 96well plates. Non-sterile. Non-pierceable. Peelable.

- **Seal integrity range**

-20°C to 110°C

- **Application**

qPCR, fluorescence applications. For 96well microplates only.

Code	Pack Size/Dimensions
4ti-0565	100 sheets (135mm x 80mm)

qPCR Seal



- **Description**

Optically clear film recommended for qPCR and other fluorescence applications. Non-sterile. Non-pierceable. Peelable.

- **Seal integrity range**

-40°C to 110°C

- **Application**

qPCR (96 or 384well)

Code	Pack Size/Dimensions
4ti-0560	100 sheets (135mm x 80mm)
4ti-0561	1 roll (100m x 80mm)

NEW

PCR Foil Seal



Description

Pierceable and peelable foil seal. When pierced the irregular manner in which the foil tears prevents the formation of a vacuum. Non-sterile. Pierceable. Peelable.

Seal integrity range

-40°C to 120°C

Application

PCR and sample storage.

Code	Pack Size/Dimensions
4ti-0550	100 Sheets (135mm x 80mm)
NEW 4ti-0551	1 Roll (200m x 80mm)

Pierceable Film*

* Not available in USA



Description

This has the same adhesion properties as 4ti-0500 with cross-cut, clear windows for sample retrieval with a tip or probe. The lack of adhesive under the cross cut section reduces the risk of the tip or probe getting clogged. Non-sterile. Peelable.

Seal integrity range

-20°C to 110°C

Application

Sample application or retrieval in 96well plates (auto samplers, HPLC, DNA sequencers).

Code	Pack Size/Dimensions
4ti-0566	100 sheets (135mm x 80mm)
NEW 4ti-0567	1 Roll (100m x 80mm, 700 sheets)

See also
Adhesive Seal Roller
on Page 34



Gas Permeable Seal



Description

An adhesive microplate seal that is permeable to gases but providing a barrier to bacteria and other solid contaminants. Pierceable. Peelable.

Seal integrity range

-20°C to 80°C

Application

Eukaryotic cell culture, bacterial culture.

Code	Pack Size/Dimensions
4ti-0515	50 Sheets (135mm x 80mm)
NEW 4ti-0515/ST	50 Sheets (5 packs of 10 sheets, 135mm x 80mm), sterile
NEW 4ti-0515/R	1 Roll (100m x 80mm)

Adhesive Sealing

Gas Permeable Moisture Barrier Seal

NEW



- **Description**

This unique gas permeable adhesive seal allows uniform air and CO₂ exchange, but prevents evaporation. Sterile. Peelable.

- **Seal integrity range**

-20°C to 80°C

- **Application**

Eukaryotic cell culture, bacterial culture, long-term live cell assays

Code	Pack Size/Dimensions
4ti-0516/96	50 Sheets (5 packs of 10 sheets, 135mm x 80mm), sterile. 96 round-well only
4ti-0516/384	50 Sheets (5 packs of 10 sheets, 135mm x 80mm), sterile. 384 square-well only

Peelable Solvent Resistant Foil



- **Description**

Peelable barrier film with a very high level of solvent resistance. Non-sterile. Non-Pierceable.

- **Seal integrity range**

-20°C to 80°C

- **Application**

Sealing microplates containing solvents including DMSO.

Code	Pack Size/Dimensions
4ti-0512	100 Sheets (122mm x 80mm)

See also
Adhesive Seal Roller
on Page 34



Microplate Seal



- **Description**

A medium strength transparent adhesive seal. Non-sterile. Non-Pierceable. Peelable

- **Seal integrity range**

-20°C to 80°C





- **Application**

Sample storage (aqueous).

Code	Pack Size/Dimensions
4ti-0510	100 sheets (135mm x 80mm)
4ti-0510/R	1 Roll (110m x 80mm)

NEW

Adhesive Sealing Films & Foils Comparison Table

Adhesive Sealing Films & Foils										
Product	PCR Seal		Q-Stick™ for qPCR		qPCR Seal		PCR Foil Seal		Pierceable Film	
		PCR		qPCR, fluorescence, 96well PCR plates only		qPCR & other fluorescent applications		PCR & sample storage		Sample application or retrieval, 96well plates only
Special Properties	Good optical clarity		Discrete optical windows for 96well plates		Good optical clarity		Irregular tearing when pierced prevents formation of vacuum		Pre-cut with cross which reduces tip or probe becoming clogged	
Min Temp	-20°C		-20°C		-20°C		-40°C		-20°C	
Max Temp	110°C		110°C		110°C		120°C		110°C	
Sterile?										
Pierceable										
Peelable										
RNase/DNase free										
Measurements (mm)*	Total = 137, Adhesive = 117 (no tear strips)		Adhesive = 119 (inside tear strips)		Adhesive = 116 (inside tear strips)		Adhesive = 118 (plus 2 x 8 mm tabs)		Total = 134, Adhesive = 113 (no tear strips)	
Product Codes (100 Sheets)	4ti-0500		4ti-0565		4ti-0560		4ti-0550		4ti-0566	
							</			

All Adhesive Sealing Films & Foils have width of 80mm
* Pack of 50 sheets

A PERFECT SEAL - EVERY TIME!

The 4s² is a semi-automatic thermal sealer which is compatible with a wide range of seals and plates of differing designs and heights.

With variable temperature and time settings, sealing conditions are easily optimised to produce a 100% seal, eliminating sample loss.

Plate and seal are placed on the holder and once the draw is pushed closed, the sealing process is automatically controlled by an electric mechanism. This unique feature eliminates operator variation, giving a consistent seal every time and reducing the damage caused to microplates by over-sealing.

Features and Benefits

- Automatic sealing process for unmatched sealing consistency
- Selectable temperature and time settings for easy optimisation of sealing conditions
- Single action operation - closing the draw initiates the process
- Rapid heating element for fast start-up
- Real time temperature display
- Auto stand-by function to save energy
- Auto switch-off function for added safety
- Works with all plate types
- Full range of thermal seals available.

Technical Data

- **Weight:** 9kg
- **Dimensions:** H 310 x D275 x W 181mm
- **Voltage:** 110/230V
- **Power:** 300W
- **Sealing Temp.** 120-200°C



Code Pack Size/Dimensions

- | | |
|-----------------|---|
| 4ti-0650 | 4s ² thermal sealer incl. universal power supply, power cord, manual, standard plate adapter (4ti-0615) and seal platen (4ti-0602) |
|-----------------|---|

Sealing Accessories and Tools

- | | |
|------------------|---|
| 4ti-0615* | Adapter for deep-well and 384well plates |
| 4ti-0616 | Adapter for Roche 1536well PCR plate |
| 4ti-0602* | Weighted seal platen to hold down sealing sheets that have a tendency to curl |
| 4ti-0625 | Adapter for 96well PCR plates, includes sealing frame (4ti-0612) |
| 4ti-0612 | Sealing frame for use with 4ti-0625 adapter |

* These items are included with the 4s² thermal sealer

Plate Sealing

Real Time Display

The rapid heating element allows for a quick start up within minutes. The temperature is displayed in real time so that the heating up process can be monitored.

Energy Saving Functions

When the unit is left idle it automatically switches into stand-by mode during which the temperature of the heating element is reduced to 60°C to save energy. When the sealer is left idle for longer periods it switches off automatically for added safety. The times at which the unit switches into stand-by and switch-off modes can be adjusted to suit the user's needs.

Adapters and Sealing Aids

The 4s² employs a unique and cost saving adapter system. Deep-well plates and most other skirted plates can be sealed on the standard plate carrier (4ti-0615, supplied with the unit). For all 96well PCR plates an additional plate carrier (4ti-0625, optional extra) must be used. Both plate carriers can also be combined for easier handling of shallow well plates such as 384well PCR plates.

For better sealing of those films which have a tendency to curl we offer sealing aids. A weighted platen (4ti-0602) for use with deep-well blocks is provided with the unit and a sealing frame for use with all other plate designs is supplied when ordering the optional 4ti-0625 adapter.



Figure 1: 96well PCR plate adapter 4ti-0625 (optional)



Figure 2: Standard plate adapter 4ti-0615



Figure 3: 4ti-0615 and 4ti-0625 can be interlocked for easy handling of shallow well plates



Figure 4: Sealing frame 4ti-0612 (optional, but included when ordering 4ti-0625)



Figure 5: Weighted sealing platen 4ti-0602

Plate Formats

The following plate formats can be used.

- SBS standard polypropylene & polystyrene plates & deep-well blocks (incl. 384well PCR plates), use adapter 4ti-0615
- 96well PCR plates (incl. skirted, semi-skirted and non-skirted formats), use adapter 4ti-0625



4s² operation in 6 easy steps!



Step 01

Set time



Step 02

Set temperature



Step 03

Load plate & seal



Step 04

Push drawer in



Step 05

Plate is sealed automatically



Step 06

Remove sealed plate

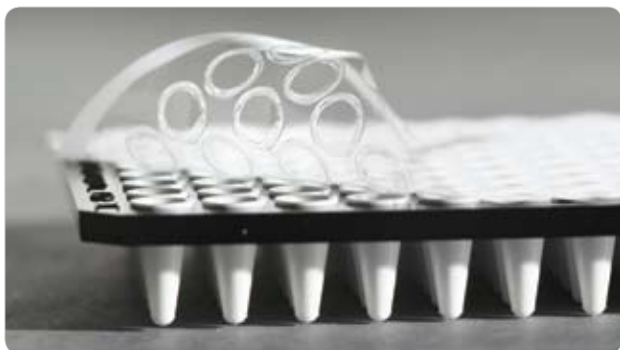
Heat Sealing



4titude® offers a wide range of heat sealing materials in roll and sheet formats. All seals are certified free from nucleases and human genomic DNA contamination and have the following benefits compared to conventional adhesive sealing:

- High degree of reliability for automated sealers
- Substantial savings compared to adhesive seals
- No adhesion of dry samples to the film - reduces the risk of contamination
- Minimises sample loss - cost savings and reduction in reaction failures

Clear Seal



Description

Clear polymer film forming a peelable seal to PP, PE, PS and COC plates. Good optical clarity. Moderate solvent resistance. Non-pierceable. Peelable.

Seal integrity range

-80°C to 80°C (110°C with pressurised PCR heated lid)

Application

qPCR, short term compound storage.



Code	Dimensions
4ti-0540	500m x 78mm Roll ¹
4ti-0540/REMP	500m x 78mm Roll ³
4ti-0540S	Trial Roll ¹
4ti-0542	350m x 115mm Roll ²
4ti-0542/REMP	500m x 115mm Roll ⁴
4ti-0542S	Trial Roll ²
4ti-0541	100 Sheets (125mm x 78mm)

NEW

NEW

Clear Weld Seal Mark II



Description

Clear polymer film forming a permanent seal to PP that can not be peeled and is difficult to pierce. Good optical clarity and solvent resistance. Non-pierceable. Non-peelable.

Seal integrity range

-80°C to 110°C

Application

PCR, especially water bath thermal cyclers, qPCR. Storage and disposal of hazardous materials. Sample inspection. Recommended for use with DMSO.



Code	Dimensions
4ti-0573	610m x 78mm Roll ¹
4ti-0573S	Trial Roll ¹
4ti-0574	500m x 115mm Roll ²
4ti-0574S	Trial Roll ²
4ti-0575	100 Sheets (125mm x 78mm)

Plate Sealing

Clear Seal 3730



- **Description**

Clear polymer. Seals to PP, PS, PE and COC. Pierceable. Good optical clarity, some solvent resistance. Not suitable for peeling. Pierceable. Non-peelable

- **Seal integrity range**

-80°C to 80°C (110°C with pressurised PCR heated lid)

- **Application**

Recommended for use with the ABI 3730 Sequencer as the thinner structure pierces more easily.



Code	Dimensions
4ti-0580	610m x 78mm Roll ¹
4ti-0580S	Trial Roll ¹
4ti-0582	500m x 115mm Roll ²
4ti-0582S	Trial Roll ²
4ti-0581	Roll of 1000 Perforated Sheets

Peel Seal



- **Description**

This popular laminate material gives a peelable heat seal to PP plates. Can be peeled directly from -80°C freezer. Good barrier to aqueous solutions. Moderate resistance to solvents at room temperature. Non-pierceable. Peelable

- **Seal integrity range**

-80°C to 110°C

- **Application**

Low temperature, compound storage, short term room temperature compound storage (less than 5 days), PCR.



Code	Dimensions
4ti-0520	600m x 78mm Roll ¹
4ti-0520S	Trial Roll ¹
4ti-0522	500m x 115mm Roll ²
4ti-0522S	Trial Roll ²
4ti-0521	100 Sheets (125mm x 78mm)

¹ Compatible with Thermo Fisher ALPS 300™ / ALPS 3000™ / KBiosystems Wasp™ / KBioscience FlexiSeal and Cube

² Compatible with Agilent (Velocity 11) PlateLoc®

³ Compatible with REMP Portrait Heat Sealer (PHS)

⁴ Compatible with REMP Landscape / Stacking Heat Sealers (LHS/SHS)

PP = Polypropylene PS = Polystyrene COC = Cyclic Olefin Copolymer
PE = Polyethylene

Heat Sealing

DMSO Resistant Peel Seal



Description

Identical sealing characteristics to Peel Seal but with a high resistance to solvents even at elevated temperatures. Excellent seal on COC plates. Non-pierceable. Peelable. Not certified free from nucleases and DNA.

Seal integrity range

-80°C to 80°C

Application

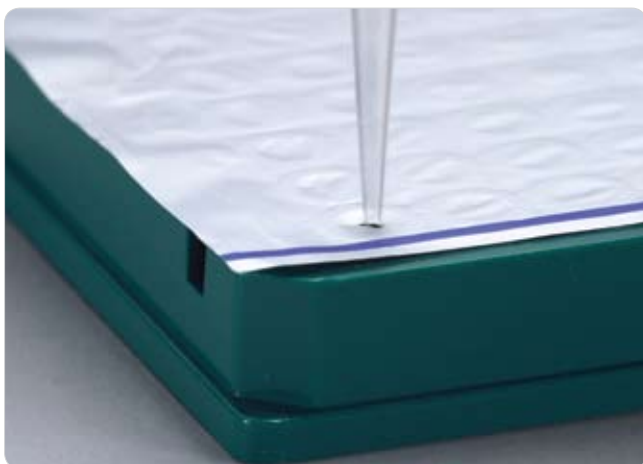
Both low temperature and room temperature compound storage with DMSO* and other organic solvents.

* 100% DMSO can be stored at room temperature for 12 months with no deterioration of the seal quality.



Code	Dimensions
4ti-0585	500m x 78mm Roll ¹
NEW 4ti-0585/REMP	500m x 78mm Roll ³
4ti-0585S	Trial Roll ¹
NEW 4ti-0586	500m x 115mm Roll ²
4ti-0586/REMP	500m x 115mm Roll ⁴
4ti-0586S	Trial Roll ²
4ti-0587	100 Sheets (125mm x 78mm) supplied on a perforated roll

Pierce Seal



Description

Foil based material. Heat seals to PP and PS plates and can be easily pierced with a tip. Very good solvent resistance including DMSO. Seals can be applied on top of each other allowing multiple access/resealing of samples. Not recommended for peeling. A colour print identifies the non-sealing surface. Pierceable. Non-peelable.

Seal integrity range

-20°C to 120°C

Application

PCR, compound storage, sample shipping.

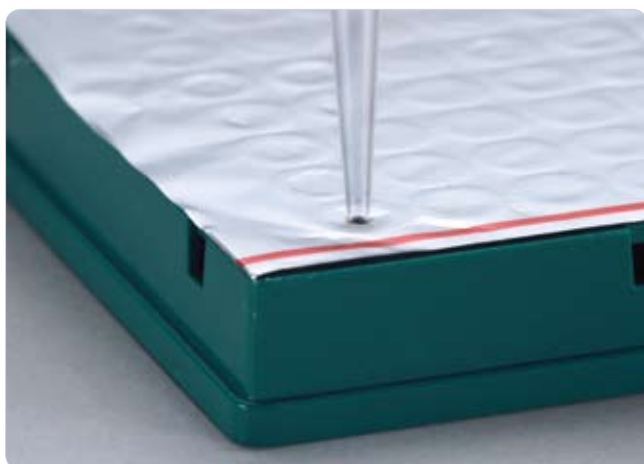


Code	Dimensions
4ti-0530	610m x 78mm Roll ¹
NEW 4ti-0530/REMP	610m x 78mm Roll ³
4ti-0530S	Trial Roll ¹
NEW 4ti-0532	500m x 115mm Roll ²
4ti-0532/REMP	500m x 115mm Roll ⁴
4ti-0532S	Trial Roll ²
4ti-0531	100 Sheets (125mm x 78mm)

Foil Seal & PS Foil Seal*

* For a stronger, but still peelable bond to PS plates

NEW



Description

Heat seal to PP and PS plates that can be pierced with a tip or peeled off by hand. Good solvent resistance including DMSO. Resealing onto existing seal is possible. A colour print identifies the non-sealing surface. Pierceable. Peelable.

Seal integrity range

-20°C to 110°C

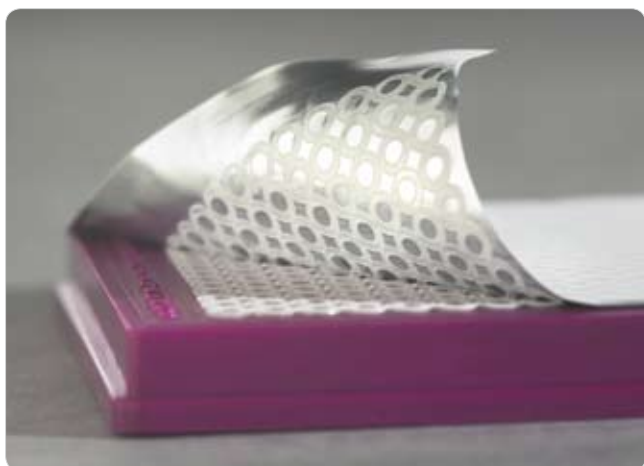
Application

Low temperature compound storage, short term room temperature compound storage, PCR.



Code	Dimensions
NEW 4ti-0535	610m x 78mm Roll ¹
4ti-0535/REMP	610m x 78mm Roll ¹
4ti-0535S	Trial Roll ¹
NEW 4ti-0537	500m x 115mm Roll ²
4ti-0537/REMP	610m x 78mm Roll ¹
4ti-0537S	Trial Roll ²
NEW 4ti-0536	100 sheets (125mm x 78mm)
4ti-0547	100 sheets PS Foil Seal (125mm x 78mm)

Thermal Bond



Description

Heavy duty laminate material that seals to PP to give a very strong peelable seal. High degree of sample protection. Good solvent resistance including DMSO. Non-pierceable. Peelable.

Seal integrity range

-200°C to 110°C

Application

Long term storage including storage and transportation at low temperature. PCR, especially water bath cyclers. Storage of organic solvents, acids and alkalines.



Code	Dimensions
4ti-0590	500m x 78mm Roll ¹
4ti-0590S	Trial Roll ¹
4ti-0591	100 sheets (125mm x 78mm)
4ti-0592	300m x 115 mm Roll ²

¹ Compatible with Thermo Fisher ALPS 300™ / ALPS 3000™ / KBiosystems Wasp™ / KBioscience FlexiSeal and Cube

² Compatible with Agilent (Velocity 11) PlateLoc®

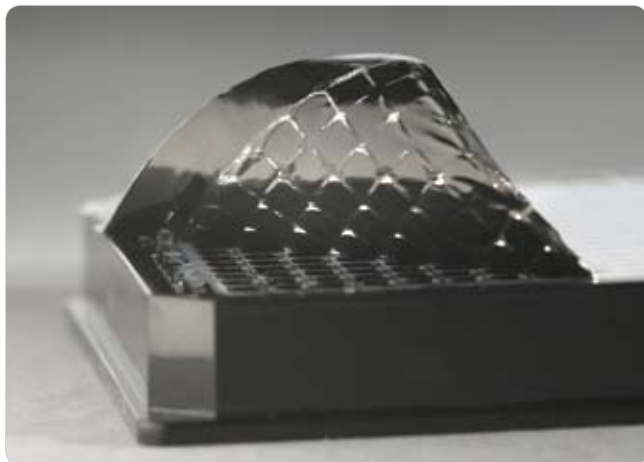
³ Compatible with REMF Portrait Heat Sealer (PHS)

⁴ Compatible with REMF Landscape / Stacking Heat Sealers (LHS/SHS)

PP = Polypropylene PS = Polystyrene COC = Cyclic Olefin Copolymer

Heat Sealing

Black Seal



- **Description**

A foil based heat seal, coated on the sealing surface with a low fluorescence black pigment. Forms a peelable seal to PS plates. Non-pierceable. Peelable. Not certified free from nucleases and DNA.

- **Seal integrity range**

-20°C to 80°C

- **Application**

Fluorescent and other light sensitive assays.



Code	Dimensions
4ti-0525	610m x 78mm Roll ¹
4ti-0526	500m x 115mm Roll ²
4ti-0527	100 sheets (125mm x 78mm)

Gas Permeable Seal



- **Description**

A woven heat seal that is permeable to gasses but providing a barrier to solid contaminants. Permeability rate >4000g/sqm/24h. Pore size up to 35 Microns. Seals to PP and PS plates. Pierceable. Peelable. Not certified free from nucleases and DNA.

- **Seal integrity range**

-20°C to 80°C

- **Application**

Cell culture, over night incubation, seed and insect storage.



Code	Dimensions
4ti-0596	200m x 78mm Roll ¹
4ti-0595	100 sheets (125mm x 78mm)

¹ Compatible with Thermo Fisher ALPS 300™ / ALPS 3000™ / KBiosystems Wasp™ / KBioscience FlexiSeal and Cube

² Compatible with Agilent (Velocity 11) PlateLoc®











³ Compatible with REMP Portrait Heat Sealer (PHS)

⁴ Compatible with REMP Landscape / Stacking Heat Sealers (LHS/SHS)

PP = Polypropylene PS = Polystyrene CQC = Cyclic Olefin Copolymer



Heat Sealing Films & Foils Comparison Table

Product Application	Clear Seal		Clear Weld Seal Mark II		Clear Seal 3730		Peel Seal		DMSO Resistant Peel Seal		Pierce Seal		Foil Seal & PS Foil Seal		Thermal Bond		Black Seal		Gas Permeable Heat Seal	
		qPCR, short term compound storage.		PCR (esp. water bath), qPCR. Ideal for Roche LightCycler 480. Storage & disposal of hazardous materials.		For use with ABI 3730 Sequencer.		Low temperature, compound storage, short term room temperature compound storage (<5 days), PCR.		Low temperature/room temperature compound storage with DMSO & other organic solvents. Good seal on COC plates.		PCR, compound storage, sample shipping		Low temperature compound storage, short-term room temperature compound storage, PCR.		Low temperature transportation & storage. PCR, esp. water bath cyclers. Storage of organic solvents, acids & alkalines.		Fluorescent & other light sensitive assays		Cell culture, over night incubation, seed & insect storage.
Special Properties																				
Min Temp		-80°C	-80°C		-80°C		-80°C		-80°C		-80°C		-80°C		-20°C		-20°C		-20°C	
Max Temp		80°C (or 110°C with pressurised PCR heated lid)	110°C		80°C (or 110°C with pressurised PCR heated lid)		110°C		80°C		120°C		110°C		110°C		80°C		80°C	
Sterile																				
Pierceable		•			•				•		*	•	*	•			*	•	*	•
Peelable																				
RNase/DNase free		•			•				•		•	•	•	•			•	•	•	•
Material		Laminate	Laminate	Polymer	Laminate	Laminate	Laminate	Laminate	Laminate	Laminate	Foil	Foil	Foil	Laminate			Foil	Woven material		
Seals to		PP, PE, PS, COC	PP	PP, PE, PS, COC	PP	PP	PP	PP	PP	PP, PS	PP, PS	PP, PS	PP, PS	PP			PS	PP, PS, COC		
Roll length mm (78mm width)		500	610	610	600	500	500	500	500	500	610	500	610	500			610	200		
Roll length mm (115mm width)		350	500	500	500	500	500	500	500	500	500	500	500	300			500	-		
4s ² sealing time (°C / secs) ⁵		180 / 2	175 / 2	175 / 2	175 / 2	175 / 2	175 / 2	175 / 2	175 / 2	175 / 2	160 / 2	175 / 2 (180 for reseal)	160 / 2	175 / 2			-	170 / 2		
4s ² sealing time with 384 well PP Plates (°C / secs) ⁵		175 / 2	175 / 2	170 / 2	175 / 2	175 / 2	175 / 2	175 / 2	175 / 2	175 / 2	160 / 2	170 / 2	170 / 2	170 / 2			-	170 / 2		
4s ² sealing time with Vision Plates [™] (°C / secs) ⁵		-	-	175 / 2	175 / 2	-	-	-	-	-	-	-	175 / 2	-			180 / 2	170 / 2		
Product Codes																				
Roll 78mm ¹		4ti-0540	4ti-0573	4ti-0580	4ti-0520	4ti-0585	4ti-0530	4ti-0535	4ti-0590	4ti-0525	4ti-0596									
Roll 78mm ³		4ti-0540/REMP	-	-	-	4ti-0585/REMP	4ti-0530/REMP	4ti-0535/REMP	4ti-0592	4ti-0526	-									
Roll 115mm ²		4ti-0542	4ti-0574	4ti-0582	4ti-0522	4ti-0586	4ti-0532	4ti-0537	4ti-0591	4ti-0527	-									
Roll 115mm ⁴		4ti-0542/REMP	-	-	-	4ti-0586/REMP	4ti-0532/REMP	4ti-0537/REMP	-	-	-									
Pack of 100 sheets (125mm x 78mm)		4ti-0541	4ti-0545	4ti-0581+	4ti-0521	4ti-0587 #	4ti-0531	4ti-0536	4ti-0591	4ti-0527	4ti-0595									

- ^ 100% DMSO can be stored at room temperature for 12 months with no deterioration of the seal quality
- + Roll of 1000 Perforated Sheets
- # Supplied on a perforated roll
- 1 Compatible with Thermo Fisher ALPS 300[™] / ALPS 3000[™] / KBiosystems Wasp / KBioscience FlexiSeal & REMP/Tecan Plate Sealer
- 2 Compatible with Agilent (Velocity 11) PlateLac[®]
- 3 Compatible with REMP Portrait Heat Sealer (PHS)
- 4 Compatible with REMP Landscape/Stacking Heat Sealers (LHS/SHS)
- 5 Add 1 second to the sealing time when a weighted platen is used (4ti-0602)
- PP Polypropylene
- PS Polystyrene
- COC Cyclic Olefin Copolymer
- PE Polythene

Heat Sealing Product Selection Guide

This table makes it simpler for you to select the right heat seal for your sealer:

Choose which type of seal you require across the top and follow down to the correct row for your heat sealer, listed on the left. Take a note of the product code.

	Clear Seal	Clear Weld Seal Mark II	Clear Seal 3730	Peel Seal	DMSO Resistant Peel Seal	Pierce Seal	Foil Seal	Thermal Bond	Black Seal	Gas Permeable Seal
4itude®										
4S [®]	4ti-0541	4ti-0575	4ti-0581	4ti-0521	4ti-0587	4ti-0531	4ti-0536	4ti-0591	4ti-0527	4ti-0595
Agilent										
Plateloc	4ti-0542*	4ti-0574*	4ti-0582*	4ti-0522*	4ti-0586*	4ti-0532*	4ti-0537*	4ti-0592	4ti-0526	-
KBioscience										
Cube	4ti-0540*	4ti-0573*	4ti-0580*	4ti-0520*	4ti-0585*	4ti-0530*	4ti-0535*	4ti-0590*	4ti-0525	4ti-0596
FlexiSeal	4ti-0540*	4ti-0573*	4ti-0580*	4ti-0520*	4ti-0585*	4ti-0530*	4ti-0535*	4ti-0590*	4ti-0525	4ti-0596
KBiosystems										
E-Fluor 2	4ti-0541	4ti-0575	4ti-0581	4ti-0521	4ti-0587	4ti-0531	4ti-0536	4ti-0591	4ti-0527	4ti-0595
Wasp	4ti-0540*	4ti-0573*	4ti-0580*	4ti-0520*	4ti-0585*	4ti-0530*	4ti-0535*	4ti-0590*	4ti-0525	4ti-0596
Chameleon™	4ti-0540*	4ti-0573*	4ti-0580*	4ti-0520*	4ti-0585*	4ti-0530*	4ti-0535*	4ti-0590*	4ti-0525	4ti-0596
REMP										
EasySealer	4ti-0541	4ti-0575	4ti-0581	4ti-0521	4ti-0587	4ti-0531	4ti-0536	4ti-0591	4ti-0527	4ti-0595
Portrait (PHS)	4ti-0540/REMP*	-	-	-	4ti-0585/REMP*	4ti-0530/REMP*	4ti-0535/REMP*	-	-	-
Landscape/Stacking (LHS/SHS)	4ti-0542/REMP*	-	-	-	4ti-0586/REMP*	4ti-0532/REMP*	4ti-0537/REMP*	-	-	4ti-0596
Thermo Fisher										
ALPS 300™	4ti-0540*	4ti-0573*	4ti-0580*	4ti-0520*	4ti-0585*	4ti-0530*	4ti-0535*	4ti-0590*	4ti-0525	4ti-0596
ALPS 3000™	4ti-0540*	4ti-0573*	4ti-0580*	4ti-0520*	4ti-0585*	4ti-0530*	4ti-0535*	4ti-0590*	4ti-0525	4ti-0596
ALPS™ 50	4ti-0541	4ti-0575	4ti-0581	4ti-0521	4ti-0587	4ti-0531	4ti-0536	4ti-0591	4ti-0527	4ti-0595
ALPS™ 25	4ti-0541	4ti-0575	4ti-0581	4ti-0521	4ti-0587	4ti-0531	4ti-0536	4ti-0591	4ti-0527	4ti-0595

* These rolls are available in a trial roll. Add S to the end of the product code to order.

Following years of development in high quality laboratory plastics, 4titude® is able to offer extensive knowledge and expertise in tool making and precision injection moulding. Many custom solutions for your labware requirements are available.



Tool Design, Tool Making & Injection Moulding

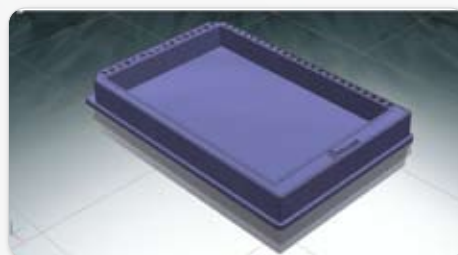
The ultimate quality of any injection moulding is dependent on not only the design of the component to be produced, but also the design, accuracy, construction and precision of the mould tool. By working with both our in-house engineers and ISO registered manufacturing partners, we can offer a complete integrated project management service to ensure there is a smooth transition from initial project idea through to finished product.



The mould tool is key in producing high quality injection moulding

Services offered include:

- **Precision tool design**
- **Rapid prototyping**
- **Use of medical grade polymers**
- **Cleanroom injection moulding**
- **Full project management**



Component designs provided by 4titude®

Working very closely with our customers, the project management process can include any, or all of the following:

- **Rapid prototyping (using the latest solid modelling techniques)**
- **3D mould tool design**
- **Mould flow analysis**
- **Polymer selection**
- **Tool production**
- **Tool trialling**
- **QC compliance**
- **Clean room assembly line production**

We understand the costs involved with new projects. We would be happy to discuss a range of funding solutions for new projects. This may involve options such as tool ownership and product exclusivity.

Please contact us to discuss your specific requirements in detail and complete confidence.

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Terms and Conditions

1 Exclusive terms of sale

- (a) 4titude® does not agree to and is not bound by any other terms or conditions, unless a duly authorised officer of 4titude® has expressly agreed to those terms and conditions in writing
- (b) These conditions shall be incorporated into the contract to the exclusion of any other terms or conditions stipulated or referred to by the customer

2 Pricing

- (a) Where prices are quoted in our catalogue they will be either in pounds sterling (£) or Euros (€) as indicated Where VAT is applicable, the prices quoted are exclusive of VAT, which will be added to UK orders at the rate prevailing at the time of invoice
- (b) All prices quoted are exclusive of delivery, which will be charged at cost
- (c) All prices are subject to change without notice
- (d) UK customers who are VAT exempt must supply a VAT exemption certificate with their order; customers who fail to comply will be charged VAT at the rate prevailing

3 Packaging and delivery

- (a) Goods may be despatched by first class mail, express courier, or air freight, the method of despatch to be at 4titude®'s discretion unless otherwise directed. The cost of transport packaging material and, where applicable, dry ice, will be charged to the customer. Where overseas airfreight despatch is necessary, communications notifying the customer of flight details will be included in the delivery charges
- (b) Delivery of the goods takes place on their passing from 4titude® to the express courier, airfreight forwarder, postal service or other method of despatch decided by 4titude® in accordance with clause 3(a) above
- (c) Late delivery of the goods does not entitle the customer to reject the goods or withhold payment in whole or in part
- (d) The Customer is responsible for payment of any import or customs duties or any other tax or fiscal imposition on the goods and for complying with all applicable laws and regulations relating to the import of the goods into the country to which they are delivered

4 Orders

All orders are subject to stock availability and acceptance of your order by 4titude®. Acceptance by 4titude® may be made either by communicating this to you or by supplying the goods that you have ordered

5 Payment

Payment is strictly net 30 days from the date of invoice and must be paid in the currency of the Invoice. An interest charge of 2% per month will be made for all invoices unpaid after this date

6 Returns

- (a) No returns can be accepted without prior approval by 4titude®
- (b) Claims for damaged goods or delivery discrepancies must be made within 24 hours of receipt of goods and if the claim is initially made orally it must be confirmed in writing within two days containing full details of the claim
- (c) 4titude® is not liable for material that becomes defective through improper storage or handling
- (d) 4titude® will not be held responsible for any loss, damage or inconvenience to the customer for goods that are lost or damaged in transit. It is the customer's responsibility to insure the goods during transit if he so wishes

7 Product liability

All products are for in vitro research or manufacturing use only and are not intended for human diagnostic or therapeutic applications

- (a) 4titude® shall have no liability to the customer for any loss or damage of any nature arising from any breach of any express or implied warranty or condition of the contract or of any negligence, breach of statutory or other duty on the part of 4titude® or arising in other way out of, or in connection with, the performance of or purported performance or failure to perform the contract, except for death or personal injury resulting from the negligence of 4titude® or as expressly stated in these conditions
- (b) If the customer establishes that any goods are defective 4titude® shall, at its option, replace with similar goods, repair any defective goods, allow the customer credit for their invoice value or, to the extent that the goods are not of 4titude® manufacture, assign to the customer so far as 4titude® are able to do so any warranties given by the manufacturer of the goods to 4titude®
- (c) Without prejudice to the generality of the foregoing, 4titude® shall not be liable for any loss, whether direct or indirect, of revenue, profit anticipated savings, wasted expenditure or indirect or consequential loss arising from the supply or non delivery of these products or the use of them by the customer or otherwise arising from this agreement or the performance of it
- (d) 4titude®'s liability for failure of goods or services performed by 4titude® is limited strictly to the value of the goods or services supplied
- (e) The goods are sold on the understanding that the user is solely responsible for determining the suitability of the goods for the proposed application.

8 Retention of title

- (a) The risk in respect of any goods supplied shall pass to the customer on 4titude® delivery of the goods to the carrier for shipment, but the title to the goods shall not pass to the customer until the customer has paid all monies due and owing whether under the appropriate invoice or otherwise. Until the title passes the customer shall hold the goods as bailee for 4titude® and shall store or mark them so that they can at all times be identified as the property of 4titude®
- (b) If the customer being a company has a petition presented for its winding up, or passes a resolution for a voluntary winding up (other than for the purpose of a bona fide amalgamation or reconstruction) or, enters into a voluntary arrangement with its creditors, or has a receiver appointed of all or any of its assets, or the customer being an individual or firm becomes bankrupt or insolvent, or enters into a voluntary arrangement with creditors then 4titude® shall be entitled to suspend any further deliveries and any

monies owing shall become due immediately regardless of any previous agreement to the contrary

9 Patent and design rights

- (a) 4titude® has not and will not knowingly or intentionally infringe the design right, patent, trademark or any other intellectual property right (any of which design right, patent, trademark or any other intellectual property right shall be referred to in this clause as "a relevant right") of any third party, but if 4titude® shall innocently infringe a relevant right then it shall have no liability for any injury, loss, damage or other expense of whatever nature, whether direct or indirect, which may be suffered by the customer as a result of any action, claim, demand or other proceedings by any third party In this clause 4titude® shall be deemed to have acted innocently unless it is shown that it had actual knowledge that the product goods or services in question were manufactured, produced or supplied in breach of a relevant right
- (b) If 4titude® shall receive or be served with any action, claim, demand or other proceedings in which it is alleged that it has infringed a relevant right in respect of products, goods or services which it has agreed to supply to the customer then 4titude® may, at its absolute discretion and without enquiry into the merits of such a claim and without notice, terminate any contract with the customer for the sale or supply of the offending products, goods or services without liability to the customer for any loss, damage or expense suffered by the customer as a result of such termination, although such termination shall be without prejudice to any antecedent breach of contract and 4titude® shall refund to the customer all monies if any, paid by the customer in advance for goods, products or services not supplied

10 Insurances

The customer warrants that it has taken out all necessary public liability and other relevant insurances in respect of any goods, products or services supplied or to be supplied by 4titude® in respect of any and all actions, claims, demands or proceedings made against 4titude®, its employees, servants or agents which relate to any products, goods or services which have been supplied to the customer

11 Governing Law

This agreement shall be governed by and construed and interpreted in accordance with English Law and the parties submit to the jurisdiction of the English Courts

12 Invalidity

If any provision of this agreement is found to be invalid, illegal or unenforceable by a court or tribunal of competent authority that provision found to be invalid, illegal or unenforceable shall be amended to such an extent as is necessary to make it valid, legal and enforceable

13 Notices

Any notice which must be given under these Conditions or for any other purpose may be either delivered personally or posted Notice given by post should be to the addresses stated on the invoice and will be deemed served if posted in the UK, then the second business day after the day of posting and if posted outside the UK, then the fifth business day after the day of posting

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