

## Typical materials that can be degassed:

- RTV Silicone Rubber
- Araldite
- Polyester Resin
- Pastosals
- Casting Plaster
- Polysulphide Rubber
- Polyurethane Resin
- Adhesive Mixes
- Epoxy Resins
- Investment Plaster

## Vacuum Degassing Overview:

When any of the above listed materials are mixed with the required additives, accelerators, filler etc., air bubbles can become trapped within the mixture. If not removed before the material cures the air bubbles can cause defects such as nodules, cavities and hollows in the finishes cast. With electrical and electronic encapsulation, these air bubbles can cause electrical breakdown. On intricate castings additional work will be required to correct the defects caused by the air bubbles.

All Epoxy Resins, Araldites, Silicone Rubbers as well as any other mixed materials to be degassed will expand during the degassing process. It is essential that a container of sufficient volume is used. It is not uncommon for materials to expand two to six times their initial volume while degassing. As the bubbles burst at the surface the expansion decreases. This process can take several minutes depending on the viscosity of the material, the speed of the vacuum pump and the volume of the vacuum chamber.

Consider the viscosity and the pot life of the materials. Materials with a very high viscosity may be very difficult to degas and will take a lot longer. If the pot life is short, then speed could be essential.

If you are unsure of the properties of your materials, then a few simple tests will help:

- Mix a small sample and without degassing see how long it remains fluid. That is essentially the pot life.
- Put a small sample in a container in the vacuum chamber and while closely observing through the lid see when the surface of the material starts to bubble. Use the vacuum isolation valve to stop pumping as soon as the first bubbles appear. Make a note of the pressure shown on the pressure gauge. Some materials will start to degas at quite high pressures – in excess of 50 mbar. Some materials will also seem to outgas for a very long time. This could be due to the pressure being too low and some of the volatiles in the material being evaporated off. The vacuum should only be held for a short period once bubbles are seen at the surface of the mixture, otherwise the chemical structure will be altered and curing time, so care should be taken with such materials to degas at a pressure which removes the air but does not start to evaporate the material or constituent parts of that material.

Once you are satisfied and confident the materials you are using are not going to cause problems then proceed.

Remove the vacuum chamber lid. Ensure that both the vent and vacuum isolation valves are closed and switch on the vacuum pump to warm up. A warm pump is more efficient and handles condensable vapours better.

Measure out the required amount of material together with any hardeners or fillers into a clean bucket of adequate size to allow for expansion. Mix well, either by hand or with an electric mixer.

Place the bucket in the vacuum chamber and replace the lid. Gently open the vacuum isolation valve. Some light hand pressure on the lid may be required to establish a good seal – you will see on the gauge when the pressure starts to fall indicating a seal has been made.

### Technical Overview

Observe the surface of the material. Once bubbles start to come to the surface and break, close the vacuum isolation valve. If the bubbles subside after a short time open the valve again. Repeat that process so that you progressively pump the chamber down.

If there is a rapid rise in the level of the degassing material close the vacuum isolation valve and allow a little air back into the chamber with the vent valve. That will 'collapse' the degassing material and will break a lot of the surface air bubbles. Continue pumping down and by balancing both the vacuum isolation and vent valves it will be possible to degas quite volatile mixes.

Once you are satisfied the material has been degassed close the vacuum isolation valve, open the vent valve and remove the chamber lid. You are now ready to use your degassed material.

This degassed mixture is then poured into the mould taking care to minimise any trapped air. When the mould has been filled it can be placed into the vacuum chamber and evacuated as before. This time there should be minimum air bubbles breaking the surface which were trapped in undercuts or from the surface of the mould. Please again beware of boiling off the volatile components of the mixture, only a few seconds should be required at full vacuum.

### A few important things:

- **NEVER** allow degassing material to top the container you are using.
- **NEVER** allow any acetone-based solvents to be in contact with the chamber lid. The lid can be damaged or destroyed by such solvents.
- **ALWAYS** use either a disposable or a cleanable container within the chamber.
- **ALWAYS** check both the level of oil in the vacuum pump and the condition of that oil. If the oil is particularly cloudy it is time for an oil change. Degassing processes are quite hard on vacuum pumps so change the oil regularly. Oil is a lot cheaper than a pump service, or a replacement pump! When changing the oil, make sure the pump is hot before draining and NEVER use solvents of any kind as a flushing agent. If you need to flush the pump, use only clean vacuum pump oil.

### Common Causes of Bubbles in Castings:

- Air trapped in moulds.
- Volatile components in the mixture rising to the surface when under vacuum.
- Air from mixing of resins and hardeners.
- Gases generated from the curing process.
- Solvent vapours from cleaning or certain mould release agents.
- Moisture or contamination in the mixture.

### Factors That Affect the Removal of Gases:

- High viscosity.
- Heating the material can help reduce the high viscose materials, but consideration should be given to the effect on the pot life before heating any mixed materials.
- Larger, faster vacuum pumps.
- Ultimate final vacuum pump pressure.
- Stirring under vacuum.
- Volume of mixture being degassed.

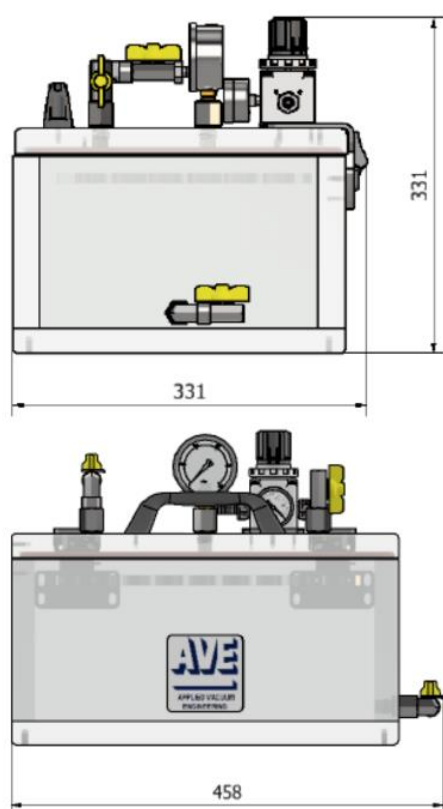
## ACB16-PT,

### Technical Data Sheet

#### System Overview

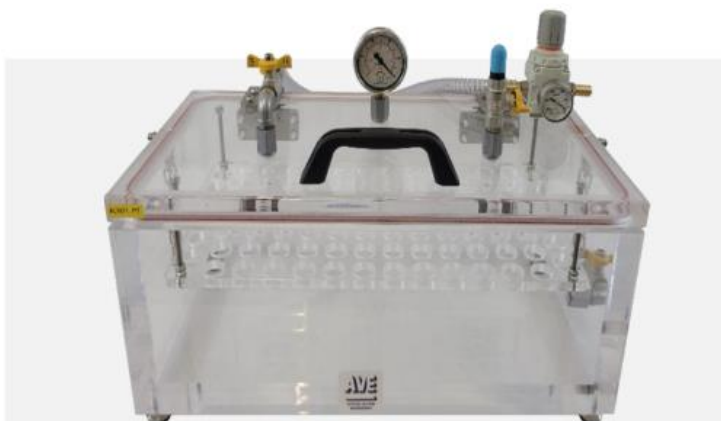
The ACB 16-PT is our 16 litre, clear cast acrylic package testing, vacuum chamber. All chambers within our PT range are designed specifically to determine leaks in flexible packaging via bubble leak submersion testing.

Our ACB chambers are compliant with ASTM D3078-02 and ISO 20484 testing standards. To ensure quality, all clear cast acrylic chambers are tested to their vacuum limit of  $5 \times 10^{-2}$  mbar.



#### Our Full Package Testing Range

MODEL	INTERNAL DIMENSIONS W x D x H (MM)
ACB16-PT	360 x 260 x 170
ACB21-PT	500 x 250 x 170
ACB27-PT	300 x 300 x 300
ACB64-PT	400 x 400 x 400
ACB72-PT	450 x 400 x 400
ACB96-PT	600 x 400 x 400



#### Specifications

- Internal Dimensions: 360mm (W) x 260mm (D) x 170mm (H)
- Capacity - 16 Litres
- Weight - Approximately 17kg
- Material – Clear cast acrylic
- Sealing Face – 8mm silicone 'O' ring cord

#### Features

- Clear perforated acrylic submerge plate, suspended with stainless steel threaded studs for easy height adjustment.
- ¼" BSPP drain valve.
- 63mm glycerine filled vacuum indication gauge.
- ¼" BSPP air admittance ball valve.
- ¼" BSPP vacuum isolation valve.
- Lid mounted adjustable vacuum regulator, 240 ltr/min maximum flow.
- Over-centre latches to ensure lid seal.

#### ACB16-PT K4 Vacuum Kit

The ACB16-PT K4 vacuum kit offers a complete solution for bubble leak submersion package testing. Include within this kit is the ACB16-PT, a DVP LC.4 vacuum pump and all the necessary fittings for a plug and play set up.

#### Custom design Service

All chambers may be customised to meet specific requirements through our custom design service. Bespoke options may include personalised dimensions, additional inlet ports and electrical vacuum feedthroughs.

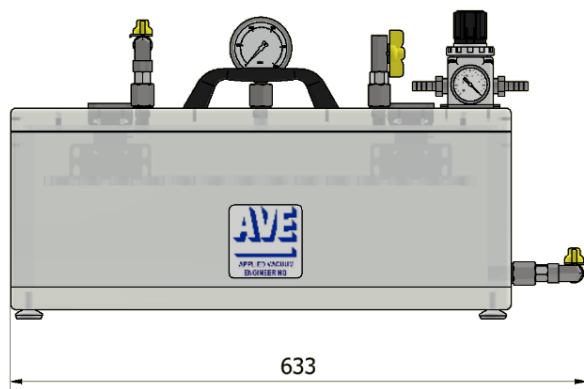
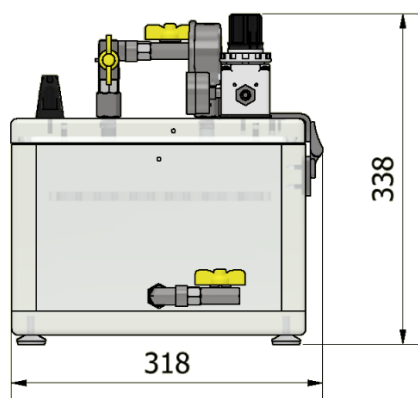
## ACB21-PT,

### Technical Data Sheet

#### System Overview

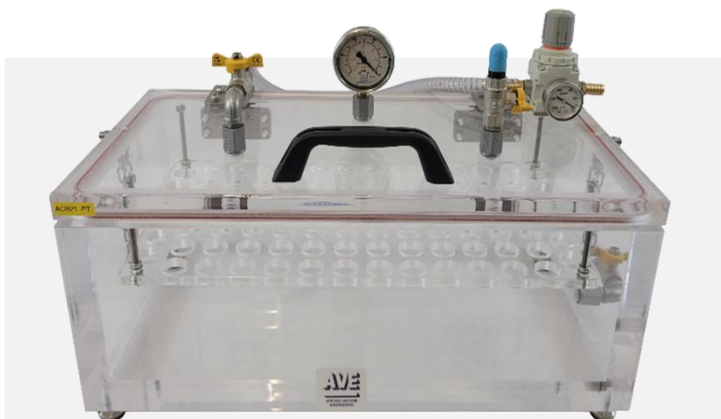
The ACB 21-PT is our 21 litre, clear cast acrylic package testing, vacuum chamber. All chambers within our PT range are designed specifically to determine leaks in flexible packaging via bubble leak submersion testing.

Our ACB chambers are compliant with ASTM D3078-02 and ISO 20484 testing standards. To ensure quality, all clear cast acrylic chambers are tested to their vacuum limit of  $5 \times 10^{-2}$  mbar.



#### Our Full Package Testing Range

MODEL	INTERNAL DIMENSIONS W x D x H (MM)
ACB16-PT	360 x 260 x 170
ACB21-PT	500 x 250 x 170
ACB27-PT	300 x 300 x 300
ACB64-PT	400 x 400 x 400
ACB72-PT	450 x 400 x 400
ACB96-PT	600 x 400 x 400



#### Specifications

- Internal Dimensions: 500mm (W) x 250mm (D) x 170mm (H)
- Capacity - 21 Litres
- Weight - Approximately 22kg
- Material – Clear cast acrylic
- Sealing Face – 8mm silicone 'O' ring cord

#### Features

- Clear perforated acrylic submerge plate, suspended with stainless steel threaded studs for easy height adjustment.
- ¼" BSPP drain valve.
- 63mm glycerine filled vacuum indication gauge.
- ¼" BSPP air admittance ball valve.
- ¼" BSPP vacuum isolation valve.
- Lid mounted adjustable vacuum regulator, 240 ltr/min maximum flow.
- Over-centre latches to ensure lid seal.

#### ACB21-PT K8 Vacuum Kit

The ACB21-PT K8 vacuum kit offers a complete solution for bubble leak submersion package testing. Include within this kit is the ACB21-PT, a DVP LC.8 vacuum pump and all the necessary fittings for a plug and play set up.

#### Custom design Service

All chambers may be customised to meet specific requirements through our custom design service. Bespoke options may include personalised dimensions, additional inlet ports and electrical vacuum feedthroughs.

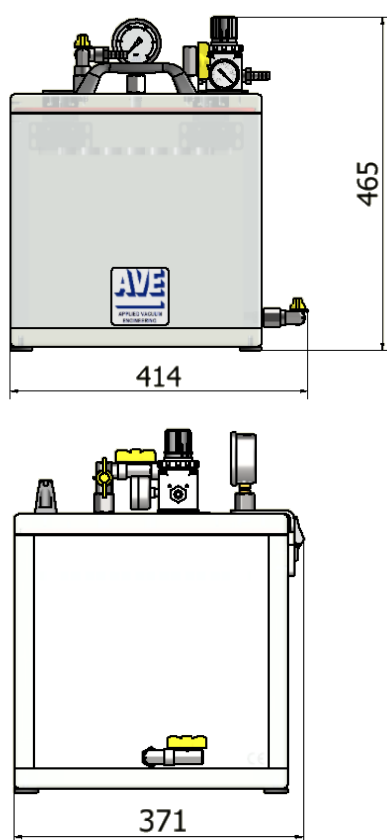
## ACB27-PT,

### Technical Data Sheet

#### System Overview

The ACB 27-PT is our 27 litre, clear cast acrylic package testing, vacuum chamber. All chambers within our PT range are designed specifically to determine leaks in flexible packaging via bubble leak submersion testing.

Our ACB chambers are compliant with ASTM D3078-02 and ISO 20484 testing standards. To ensure quality, all clear cast acrylic chambers are tested to their vacuum limit of  $5 \times 10^{-2}$  mbar.



#### Our Full Package Testing Range

MODEL	INTERNAL DIMENSIONS W x D x H (MM)
ACB16-PT	360 x 260 x 170
ACB21-PT	500 x 250 x 170
ACB27-PT	300 x 300 x 300
ACB64-PT	400 x 400 x 400
ACB72-PT	450 x 400 x 400
ACB96-PT	600 x 400 x 400



#### Specifications

- Internal Dimensions: 300mm (W) x 300mm (D) x 300mm (H)
- Capacity - 27 Litres
- Weight - Approximately 23kg
- Material – Clear cast acrylic
- Sealing Face – 8mm silicone 'O' ring cord

#### Features

- Clear perforated acrylic submerge plate, suspended with stainless steel threaded studs for easy height adjustment.
- ¼" BSPP drain valve.
- 63mm glycerine filled vacuum indication gauge.
- ¼" BSPP air admittance ball valve.
- ¼" BSPP vacuum isolation valve.
- Lid mounted adjustable vacuum regulator, 240 ltr/min maximum flow.
- Over-centre latches to ensure lid seal.

#### ACB27-PT K8 Vacuum Kit

The ACB27-PT K8 vacuum kit offers a complete solution for bubble leak submersion package testing. Include within this kit is the ACB27-PT, a DVP LC.8 vacuum pump and all the necessary fittings for a plug and play set up.

#### Custom design Service

All chambers may be customised to meet specific requirements through our custom design service. Bespoke options may include personalised dimensions, additional inlet ports and electrical vacuum feedthroughs.

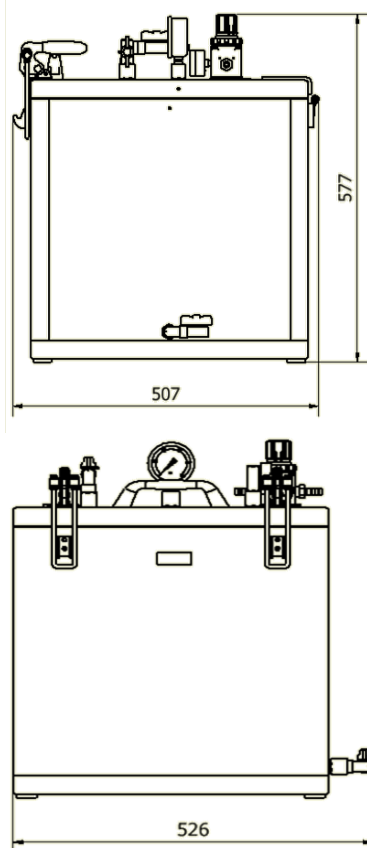
## ACB64-PT,

### Technical Data Sheet

#### System Overview

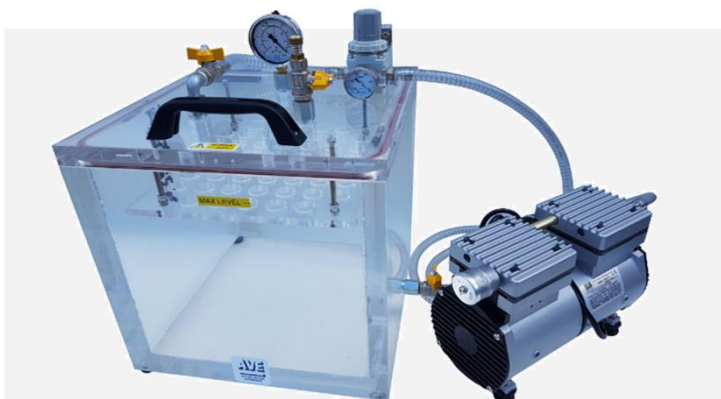
The ACB 64-PT is our 64 litre, clear cast acrylic package testing, vacuum chamber. All chambers within our PT range are designed specifically to determine leaks in flexible packaging via bubble leak submersion testing.

Our ACB chambers are compliant with ASTM D3078-02 and ISO 20484 testing standards. To ensure quality, all clear cast acrylic chambers are tested to their vacuum limit of  $5 \times 10^{-2}$  mbar.



#### Our Full Package Testing Range

MODEL	INTERNAL DIMENSIONS W x D x H (MM)
ACB16-PT	360 x 260 x 170
ACB21-PT	500 x 250 x 170
ACB27-PT	300 x 300 x 300
ACB64-PT	400 x 400 x 400
ACB72-PT	450 x 400 x 400
ACB96-PT	600 x 400 x 400



#### Specifications

- Internal Dimensions:  
400mm (W) x 400mm (D) x 400mm (H)
- Capacity - 64 Litres
- Weight - Approximately 48kg
- Material – Clear cast acrylic
- Sealing Face – 8mm silicone 'O' ring cord

#### Features

- Clear perforated acrylic submerge plate, suspended with stainless steel threaded studs for easy height adjustment.
- ¼" BSPP drain valve.
- 63mm glycerine filled vacuum indication gauge.
- ¼" BSPP air admittance ball valve.
- ¼" BSPP vacuum isolation valve.
- Lid mounted adjustable vacuum regulator, 240 ltr/min maximum flow.
- Over-centre latches to ensure lid seal.

#### ACB64-PT K25 Vacuum Kit

The ACB64-PT K25 vacuum kit offers a complete solution for bubble leak submersion package testing. Include within this kit is the ACB64-PT, a DVP LC.25 vacuum pump and all the necessary fittings for a plug and play set up.

#### Custom design Service

All chambers may be customised to meet specific requirements through our custom design service. Bespoke options may include personalised dimensions, additional inlet ports and electrical vacuum feedthroughs.

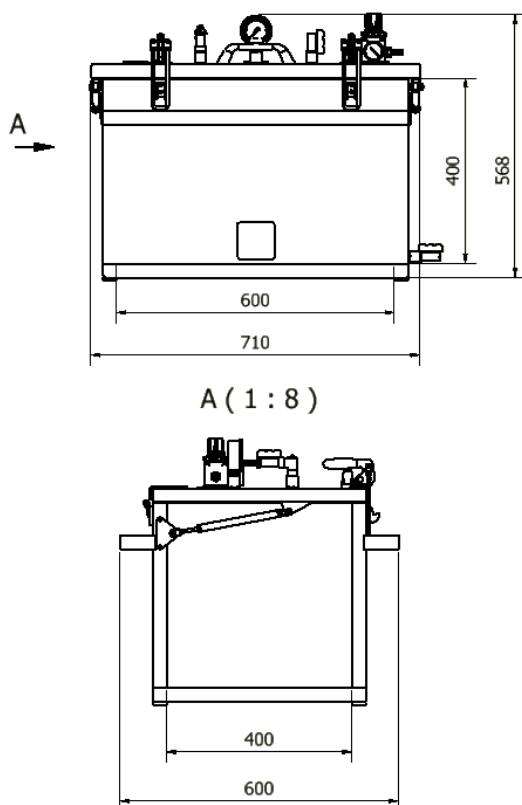
## ACB96-PT,

### Technical Data Sheet

#### System Overview

The ACB 96-PT is our 96 litre, clear cast acrylic package testing, vacuum chamber. All chambers within our PT range are designed specifically to determine leaks in flexible packaging via bubble leak submersion testing.

Our ACB chambers are compliant with ASTM D3078-02 and ISO 20484 testing standards. To ensure quality, all clear cast acrylic chambers are tested to their vacuum limit of  $5 \times 10^{-2}$  mbar.



#### Our Full Package Testing Range

MODEL	INTERNAL DIMENSIONS W x D x H (MM)
ACB16-PT	360 x 260 x 170
ACB21-PT	500 x 250 x 170
ACB27-PT	300 x 300 x 300
ACB64-PT	400 x 400 x 400
ACB72-PT	450 x 400 x 400
ACB96-PT	600 x 400 x 400



#### Specifications

- Internal Dimensions: 600mm (W) x 400mm (D) x 400mm (H)
- Capacity - 96 Litres
- Weight - Approximately 78kg
- Material – Clear cast acrylic
- Sealing Face – 8mm silicone 'O' ring cord

#### Features

- Clear perforated acrylic submerge plate, suspended with stainless steel threaded studs for easy height adjustment.
- ¼" BSP drain valve.
- 63mm glycerine filled vacuum indication gauge.
- ¼" BSP air admittance ball valve.
- ¼" BSP vacuum isolation valve.
- Lid mounted adjustable vacuum regulator, 240 ltr/min maximum flow.
- Over-centre latches to ensure lid seal.

#### ACB96-PT K25 Vacuum Kit

The ACB96-PT K25 vacuum kit offers a complete solution for bubble leak submersion package testing. Include within this kit is the ACB96-PT, a DVP LC.25 vacuum pump and all the necessary fittings for a plug and play set up.

#### Custom design Service

All chambers may be customised to meet specific requirements through our custom design service. Bespoke options may include personalised dimensions, additional inlet ports and electrical vacuum feedthroughs.

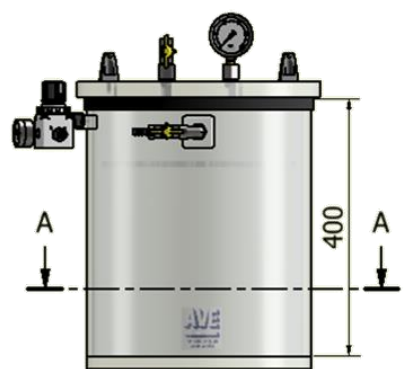
## ACC34-PT,

### Technical Data Sheet

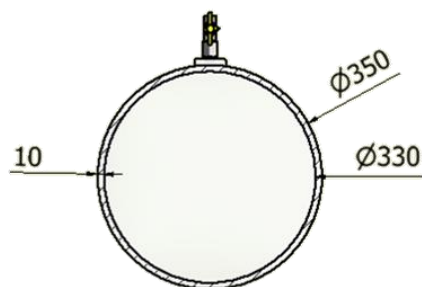
#### System Overview

The ACC34-PT is our 34 litre, clear cast acrylic, cylindrical package, testing, vacuum chamber. All chambers within our PT range are designed specifically to determine leaks in flexible packaging via bubble leak submersion testing.

Our ACB chambers are compliant with ASTM D3078-02 and ISO 20484 testing standards. To ensure quality, all clear cast acrylic chambers are tested to their vacuum limit of  $5 \times 10^{-2}$  mbar.



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#### Our Full Package Testing Range

MODEL	INTERNAL DIMENSIONS W x D x H (MM)
ACB16-PT	360 x 260 x 170
ACB21-PT	500 x 250 x 170
ACB27-PT	300 x 300 x 300
ACB64-PT	400 x 400 x 400
ACB72-PT	450 x 400 x 400
ACB96-PT	600 x 400 x 400



#### Specifications

- Internal Dimensions: 330mm Diameter x 400mm High
- Capacity - 34 Litres
- Weight - Approximately 32kg
- Material – Clear cast acrylic
- Sealing Face – Nitrile 'L' gasket

#### Features

- Clear perforated acrylic submerge plate, suspended with stainless steel threaded studs for easy height adjustment.
- ¼" BSPP drain valve.
- 63mm glycerine filled vacuum indication gauge.
- ¼" BSPP air admittance ball valve.
- ¼" BSPP vacuum isolation valve.
- Side mounted adjustable vacuum regulator, 240 ltr/min maximum flow.
- Over-centre latches to ensure lid seal.

#### ACC34-PT K8 Vacuum Kit

The ACC34-PT K8 vacuum kit offers a complete solution for bubble leak submersion package testing. Include within this kit is the ACC34-PT, a DVP LC.8 vacuum pump and all the necessary fittings for a plug and play set up.

#### Custom design Service

All chambers may be customised to meet specific requirements through our custom design service. Bespoke options may include personalised dimensions, additional inlet ports and electrical vacuum feedthroughs.