



# TEMPERATURE APPLIED SCIENCES LTD

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## OPERATING INSTRUCTIONS

### Series 3 Environmental Test Chamber



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## 1. FOREWORD

### *ABOUT TEMPERATURE APPLIED SCIENCES LTD*

Dear Customer

With over 40 years' experience behind us, here at Temperature Applied Sciences Ltd we certainly know a thing or two about temperature & humidity generation and control.

Our latest **SERIES 3** Environmental Test Chambers represent the 'Best of British' in manufacturing technology and design:-

***The highest quality metalwork and finishing.***

***Generously sized compressors to give smooth, reliable operation.***

***The latest technology in control systems and measuring techniques.***

We design and manufacture a large product range covering most environmental simulation applications.

Innovation is always a priority - we're constantly developing and testing our products to improve performance, reliability and ease of use.

If you can't find what you need in our standard ranges - don't worry. We produce nearly as many 'special' solutions as standard machines. You could say 'specials are one of our *specialities*'!

Of course, we hope you make the decision to purchase our equipment when you will be assured of our best attentions at all times. We take pride in our products and want you to be proud to own them.

***Technical Design Team***

## 2. INTRODUCTION

Thank you for selecting this Temperature Applied Sciences' product. Please take the time to thoroughly read this manual before operating the machine. Although fitted with numerous safety features, incorrect operation can drastically shorten the life of the major components.

The machine comprises of a stainless steel inner chamber, fully seam welded and is enclosed in a mild steel outer shell. Between the two is a layer of mineral fibre and foam insulation.

A fully-hermetic air cooled refrigeration system is used to lower the temperature of the inner chamber where the refrigerant being passed through a finned evaporator coil located at the rear of the chamber behind an air baffle system. The refrigeration plant is located in the lower compartment of the chamber and exhausts warm air to the BACK of the machine.

Heating of the chamber is affected by inconel sheathed heater elements located behind the baffle system.

Humidification is generated by injecting air into a hot water bath and subsequently into the chamber working area.

De-humidification is achieved by the use of a 'dew point' coil with anti icing features.

Temperature sensing is via PRT100 thermometers and Humidity sensing is via a solid state sensor.

### 3. SPECIFICATIONS

Series 3 MTCL range (mid temperature)

| MODEL                    |                          |        | MTCL600         |   |
|--------------------------|--------------------------|--------|-----------------|---|
| Volume                   | Litres                   |        | 252             |   |
| Chamber Dimensions (mm)  | Width (W)                | Approx | 600             |   |
|                          | Depth (D)                |        | 700             |   |
|                          | Height (H)               |        | 600             |   |
| External Dimensions (mm) | Width (W)                | Approx | 900             |   |
|                          | Depth (D)                |        | 1120            |   |
|                          | Height (H)               |        | 1730            |   |
| Temperature range °C     | Maximum                  | ←      | +180            | → |
|                          | Minimum                  | ←      | -40             | → |
| Rate of change °C/min    | Heating Average          |        | 4.0             |   |
| (max temp to +25°)       | Cooling Average          |        | 9.0             |   |
| Stability                | In time                  | K      | +/-0.3 to 1.0   |   |
|                          | In Time                  | %RH    | +/- 3.0         |   |
| Power Supply             | Volts                    |        | 380/ 415        |   |
|                          | Amps                     |        | 16A 3 phase N+E |   |
| Type                     | Free Standing on Castors |        |                 |   |
| Weight                   | kg                       | Approx | 350             |   |

All performance figures quoted in +23°C ambient. We reserve the right to alter specifications without notice.

**NB The mechanical over-temperature control has been set to: +185°C**

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May contain Fluorinated Greenhouse Gases covered by the Kyoto Protocol

|               |           |     |          |           |
|---------------|-----------|-----|----------|-----------|
| Serial Number | 28900317  |     |          | MTCL600   |
| Refrigerant   | R507      | R23 | Mfr Date | Mar 2017  |
| GWP           | 3985      | --  | Volts V  | 380-415   |
| MOP/PS psig   | 240 / 375 | --  | Cyc Hz   | 50        |
| Charge kg     | 2.1       | --  | Phase    | 3 + N & E |
| psig @23°C    | --        | --  | Amps A   | 16        |
| Pentane ml    | --        | --  | FLA      | 14        |

## 4. OPERATING INSTRUCTIONS

### 4.1 STARTING THE MACHINE

This is the basic procedure for operating the chamber, followed by a detailed description of each function:-

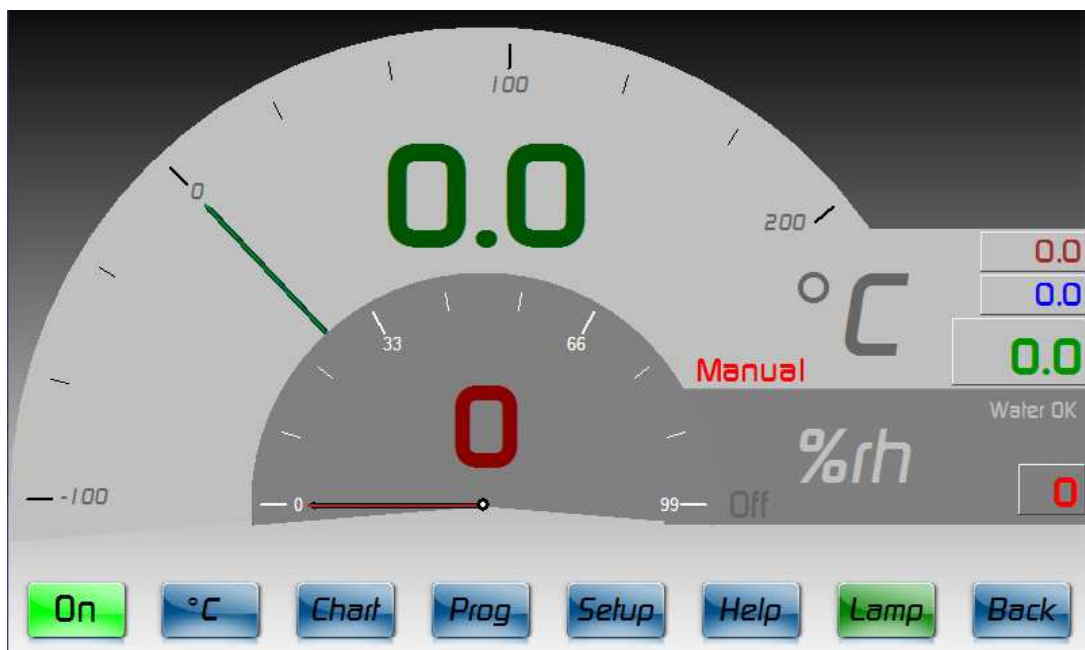
Ensure the mains supply is plugged in and the supply is ON.

Refer to the front of the machine and turn the isolator to the ON position.

The HMI panel will power up and display the TAS logo followed by the Main Screen.

To switch **on** the chamber, press the green flashing 'Start?' button – which will change to 'On' – see below.

Switch **off** the chamber using the same button.



The large figures show the current, **actual** Temperature and Humidity (if fitted) values inside the chamber. Often referred to as the *Process Variable(s)*

The smaller figures and the required conditions, or *Set Points*, which can be adjusted by tapping the screen.

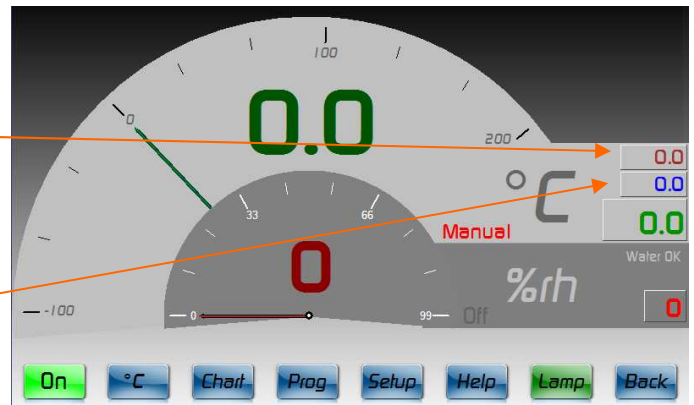
The adjustment range is limited by the specification of the chamber.

*NB The chamber must be in 'Manual' mode. If the chamber is running a Profile, the figures will be greyed out and adjustment will not be possible.*

Next, set the **Upper Temperature Limit** by tapping in the RED box

*Set this to 5 °C above the highest Temperature you will be working at*

Set the **Lower Temperature Limit** in the same way



Load the test item into the chamber and SECURE.

During the course of the test, ensure that items do not get sucked into the chamber where they can damage the refrigeration system.

During operation if the temperature exceeds the limits set above, low water is detected or there is a fault with the cooling or electrical systems, the machine will shut down and display the **System Status** panel:



**Temp High / Low** – check the limits settings are correct

**Water Empty** – ensure there is sufficient de-min water in the chamber (refer to level/filler pipe), **even if not using the humidity function!**

**Cool or Elec** – check the mains electrical supply – swap the phases on a 3 phase machine

Re-start the chamber by pressing and **holding** the **Clear?** button.

## 4.2 HUMIDITY SYSTEM – OPTION

### 4.21 INTRODUCTION

The humidity system requires a supply of clean, de-ionised water for correct operation. As standard, an on-board supply tank of approx. 25 litres (depending on chamber model) is fitted.

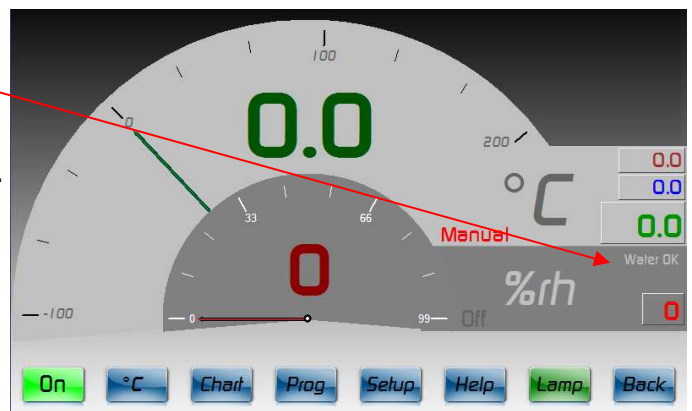
Filling and top-up is provided by the sight-tube on the front of the machine, using a funnel.

Draining the tank is via the same tube, unclip it and swing to the side.

As an option, a mains water fill system incorporating a de-ioniser cartridge can be fitted, as described later in this manual.

Water OK = Sufficient water in Chamber.

Water Low = Pre- Warning of low water  
Approx 5 mins before it will register a fault.



### 4.22 IMPORTANT NOTES

Do NOT under any circumstances use tap water or any other liquids in the chamber. Serious damage will result.

Even if humidity operation is not required, the chamber must have water available, either in the supply tank or via the mains water connection.

Regular service of the chamber is necessary; to ensure the humidity system is clean and un-contaminated.

## 4.3 HMI PANEL

### 4.31 INTRODUCTION

The control system comprises of a number of 'pages'.

Access to each page is controlled via a series of 'buttons' located on the lower edge of the screen.

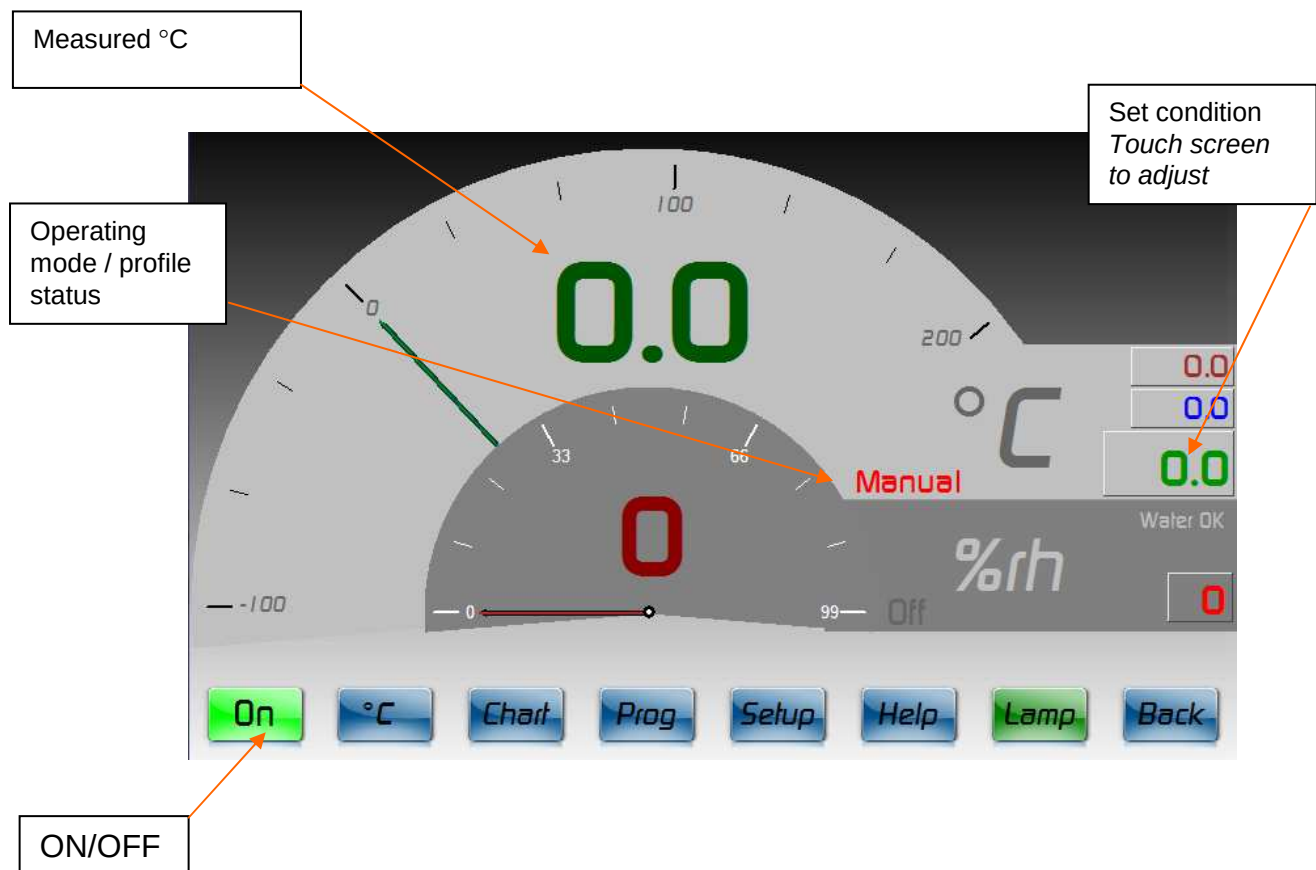


*Depending on the options requested at the time of order placement, some features might not be accessible.*

### 4.32 The °C Screen

Basic operation of chamber is controlled here.

This includes switching ON or OFF and entering the Set Points (required) climatic conditions, when in **Manual** mode.



### 4.33 The Chart Screen

Provides on screen recording of the Set and Measured climatic conditions

The maximum internal storage capacity is approx. 24hrs.

This button enables the Data Display Panel – move the vertical white line to view actual recorded values.

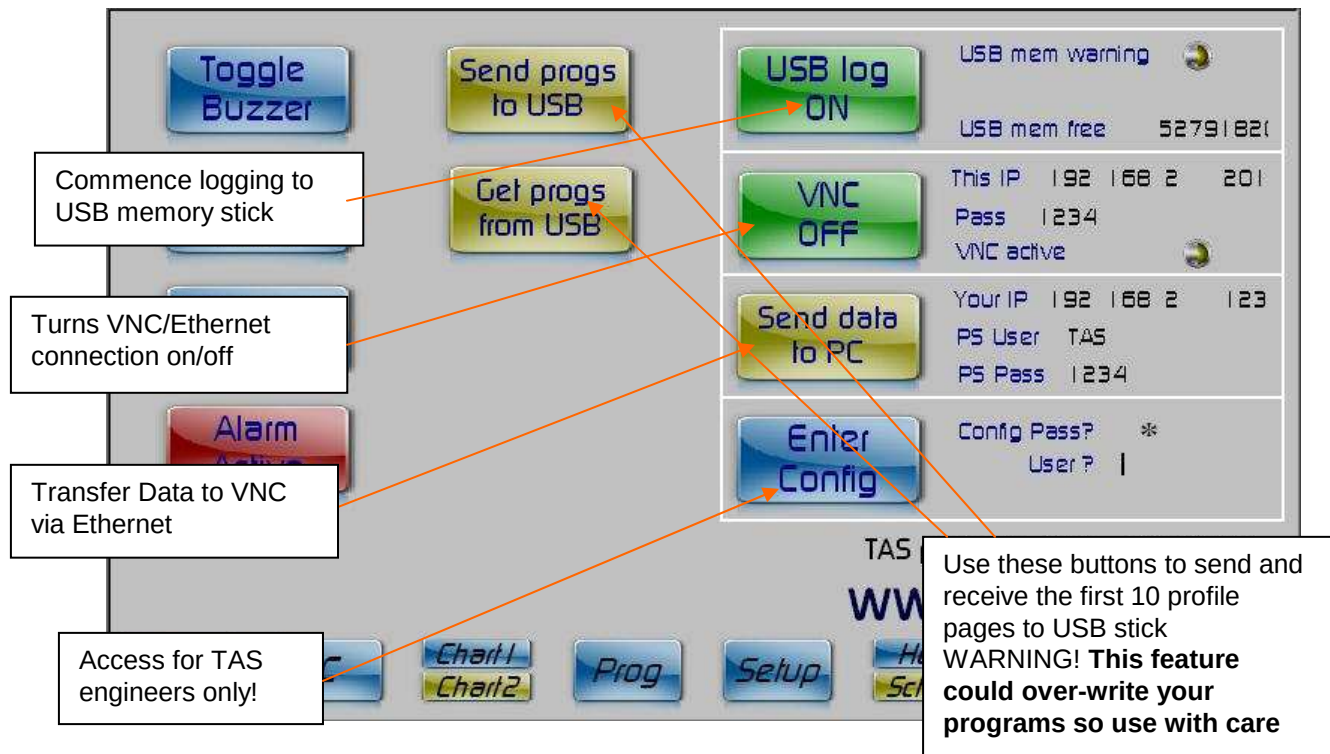
Use this slider to adjust the X axis (time span)



Use this slider to scroll through the data

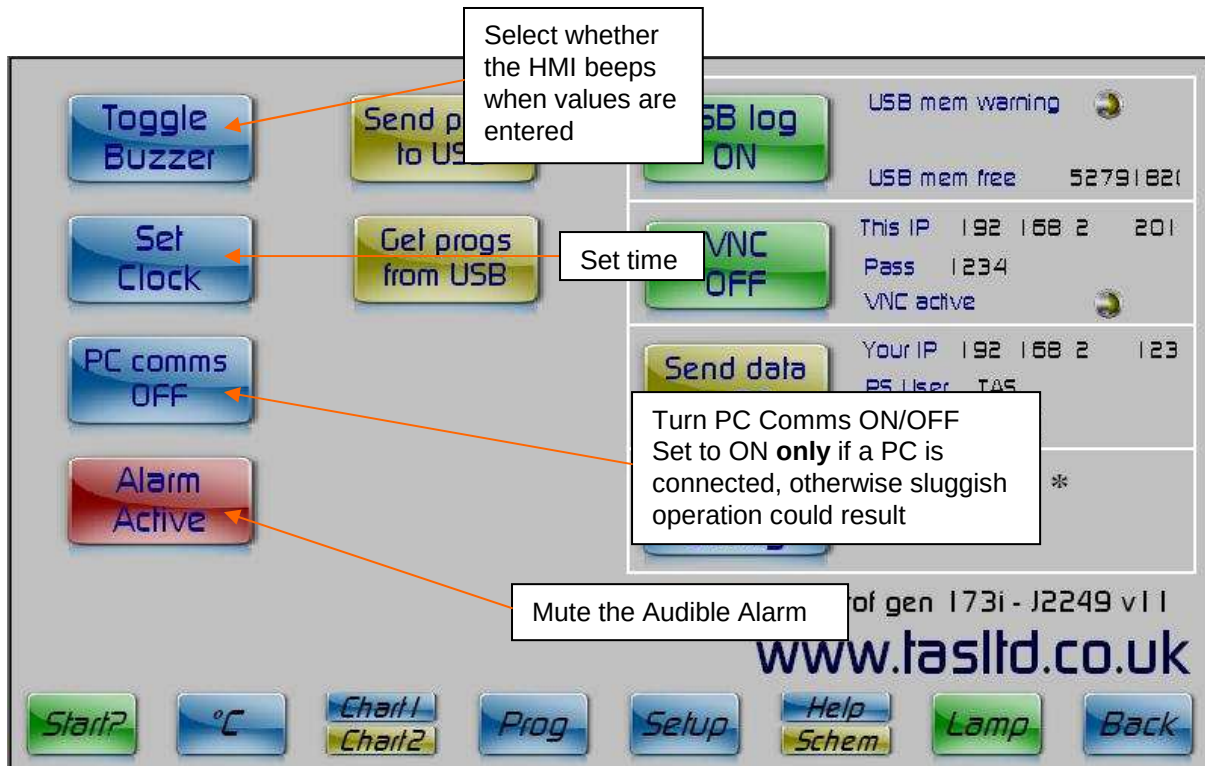
The Y axis is adjustable here

#### 4.34 The Setup Screen



##### TIP

By using the **Send/Get Progs to USB** feature it is possible to build up a suite of test programs. Simply insert the USB disk into your PC and copy over all of the files 'em0.emi' through 'em9.emi' and vice versa



#### 4.37 The Prog Screen – Profile Operation

Profile Operation or Programming is a feature that provides automatic cycling between various temperatures (and other values), over a set period of time.

For example, you may want the chamber to gradually increase the temperature from +20 to +100°C over a period of 2 hours, hold the temperature for an hour and then return to +20°C in 1 hour. *NB The actual speed of change depends on the capabilities of the chamber – if you set the machine to ramp quicker than it is capable of, no damage will be caused.*

The above example is expressed as:-

| Seg | °C  | Mins |
|-----|-----|------|
| 0   | 20  | 0    |
| 1   | 100 | 120  |
| 2   | 100 | 60   |
| 3   | 20  | 60   |
| 4   | 23  | -1   |

Segment 0 ensures the chamber starts the ramp from +20. Otherwise it will start from the current temperature inside the chamber.

Segment 4 has a time value of '–1'. This indicates the End of the profile and if required, the system will return to segment 0 and start over again.

If a repeat is not required the chamber will remain at +23 until intervention by the operator.

Each profile consists of 9 segments (0 to 8), however for large complex tests, it is possible to link profiles by setting a value of '–2' in the last segment.

When a '–1' is eventually encountered, the system will jump back to the profile that was first used.

The number of cycles or repeats can be set from 0 to 999, where 999 actually means continuous operation.

At the end of the cycles the chamber will be set to the values in the last segment, the one containing the '–1' time value.

Alternatively the chamber can be set to automatically switch off once all segments and cycles have been run. Set the End Type to Switch Off

Finally, each profile can have Hold Back enabled by setting this to a value other than 0 (holdback off), should the Actual Temperature deviate from the Set Temperature by more than the permitted amount, the profile will temporarily HOLD.

Hold Back is useful for ensuring the chamber ALWAYS reaches the set temperatures, even if a very quick ramp rate has been set.

NB Hold back only works on the Temperature control, not Humidity (if fitted). Beware of setting a very small Hold Back value as this could cause unacceptable profile duration.

### **Important Notes**

*When liking programs, ensure that each segment has a time value of at least 1 minute, otherwise unpredictable results could occur.*

*When you first RUN a program the system will check all pages to ensure that a '-1' is found indicating the end of the program. If it is not found a message will be displayed and the program will not RUN.*

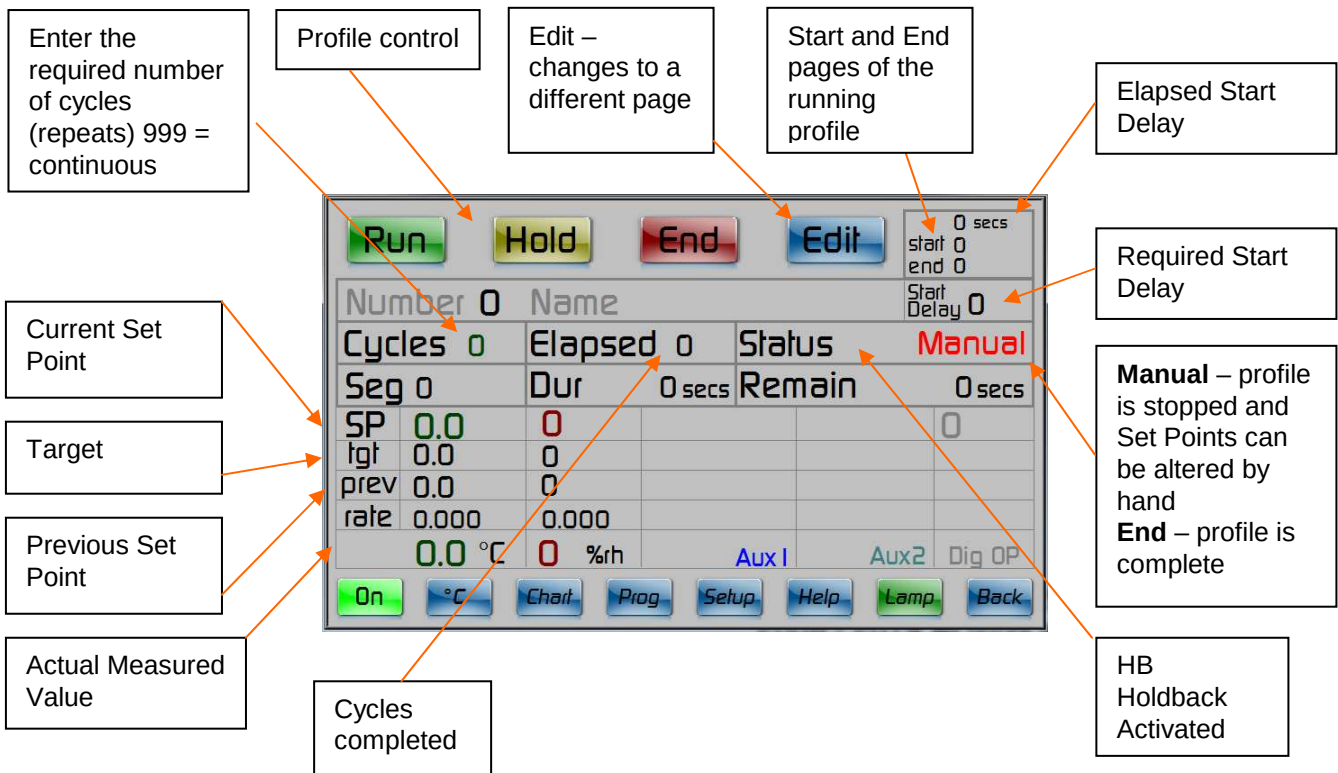
*At the same time the system will note the start page and the end page, these being shown adjacent to the RUN, HOLD, EDIT buttons.*

### **Delayed Start**

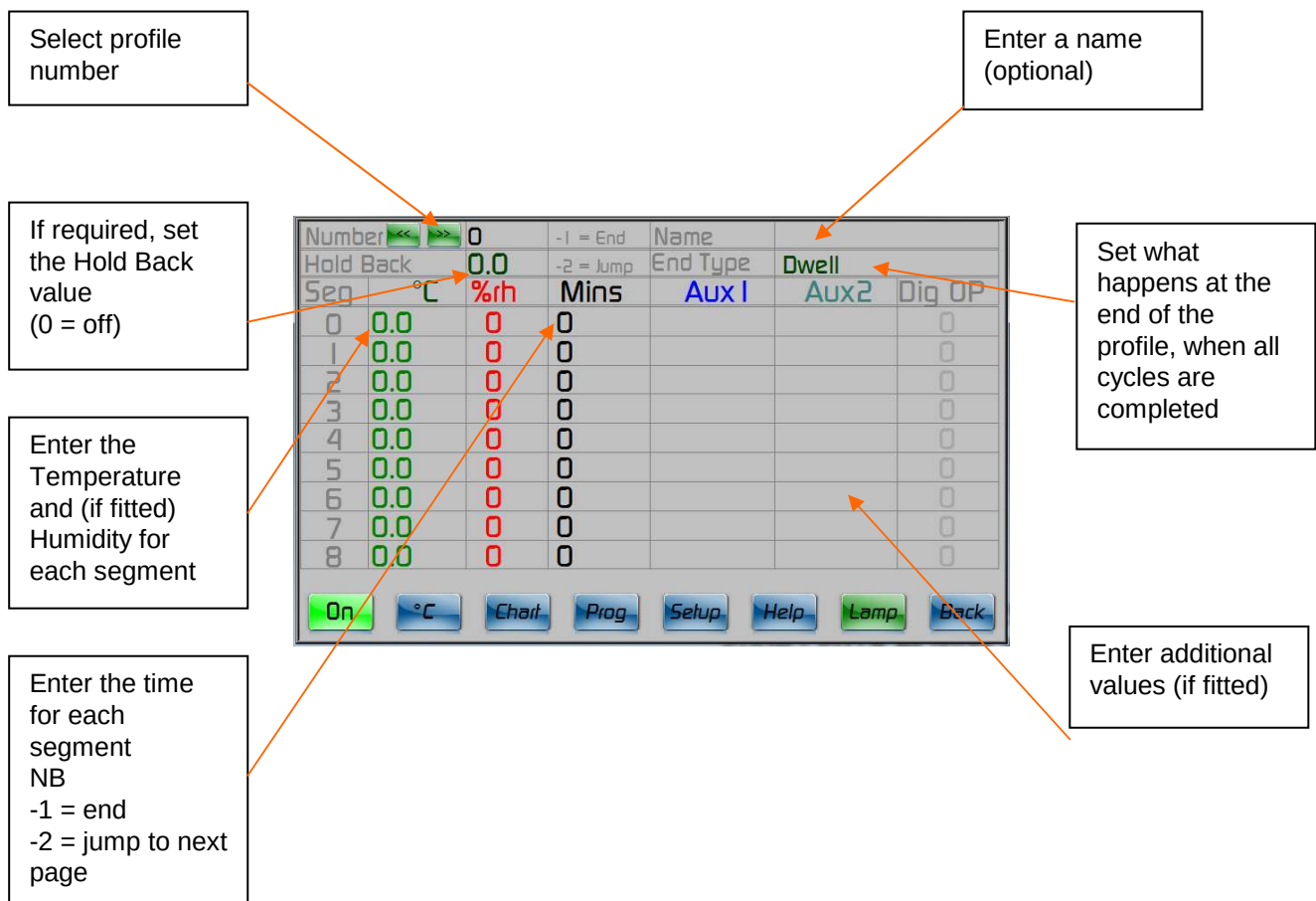
This feature is useful for 'pre-conditioning' specimens prior to carrying out a repetitive cycle. *Make sure the first segment of the first page has a time value of at least 1 minute.*

The values used for the pre-conditioning will be as per those set on the Set Point page.

Whilst the Delayed Start is active, the system will show Hold Back (HB) and the remaining seconds will count down.



Pressing the **Edit** key brings up the profile entry page:-



## 4.38 Logging data to USB memory stick (option)

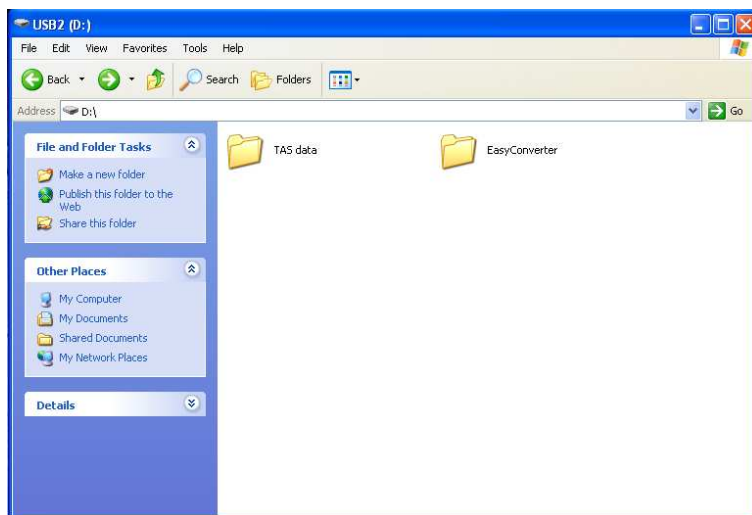
### Introduction

Fitted to the side of the chamber, or directly underneath the HMI panel (for machines with remote mounted controls) is a USB socket that will accept an industry standard USB memory stick (flash drive).

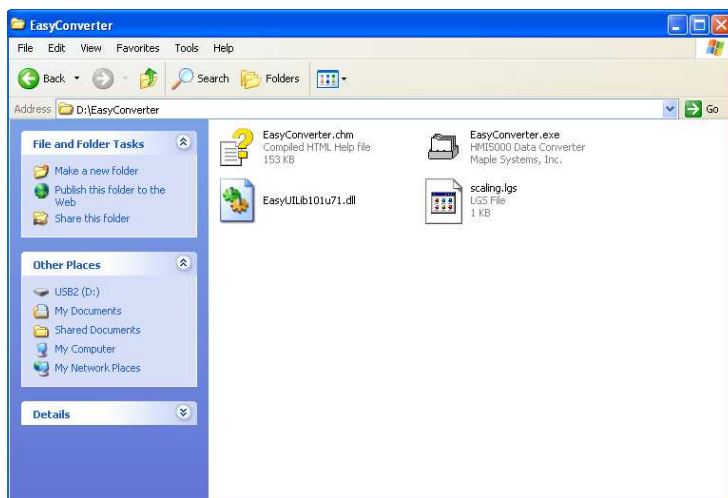
It is recommended to only use devices with a 2GB capacity. Not all devices are compatible however we recommend the use of Sandisk products.

*You will have been provided with a PC application on a CD, in a compressed (ZIP) file.*

1. Copy the application files to the USB memory device
2. Insert the USB memory device into your PC and use Explorer to view the contents.
3. Create a new folder and name it EasyConverter



4. Open this new folder and copy the contents of the ZIP file into it



**NB The application will not be installed on your PC, rather it will be run from the USB device.**

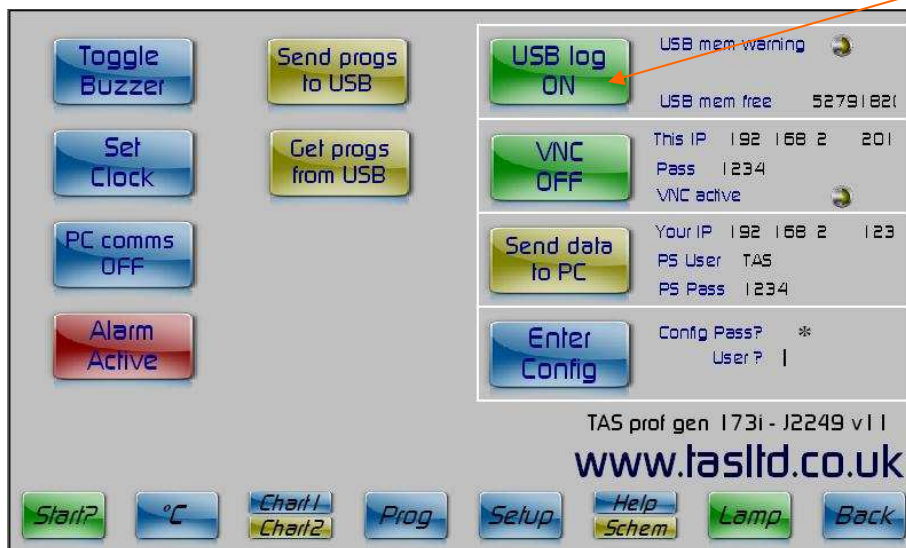
## Using the USB memory device

1. Insert the USB device into the receptacle on the TAS chamber.
2. After a few seconds a grey 'input box' will appear.

**Ignore this** – do not press any of the buttons. It will disappear in a few seconds.



Access the engineering page on the HMI and select 'USB log' to ON



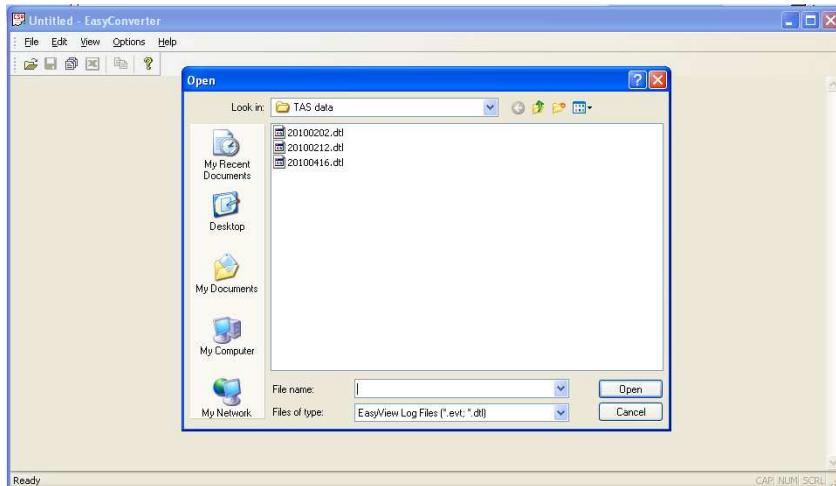
Wait for at least 30 seconds to ensure some data is recorded to the USB device.  
*This will create a 'TAS data' folder on the USB device if not already present.*

## Removing the USB memory device

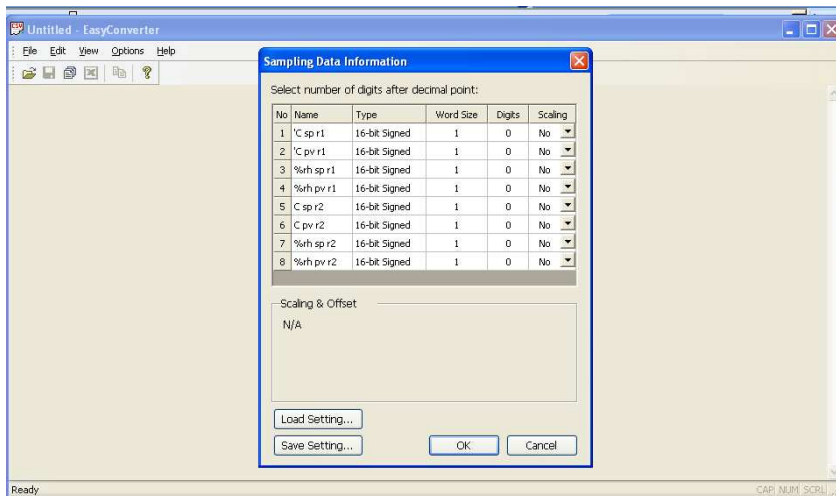
1. Turn the USB Log button OFF.
2. Remove the USB device from the chamber and insert it into the PC.  
*If the chamber HMI gives a warning that the USB device has been removed, check the 'USB log' is set to OFF.*

## Using the software

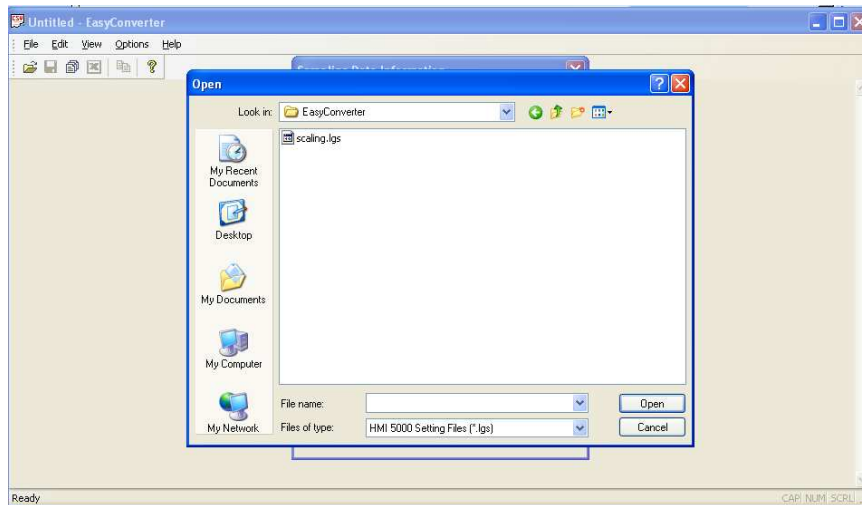
1. Using your PC, navigate to the EasyConverter folder on the USB device and run the EasyConverter.exe application.
2. If prompted, answer NO to the 'millisecond' query box.
3. Select the 'File / Open' command and navigate to the 'TAS data folder' on the USB device. *The filename itself will be the date followed by '.dtl', for example 20090421.dtl*



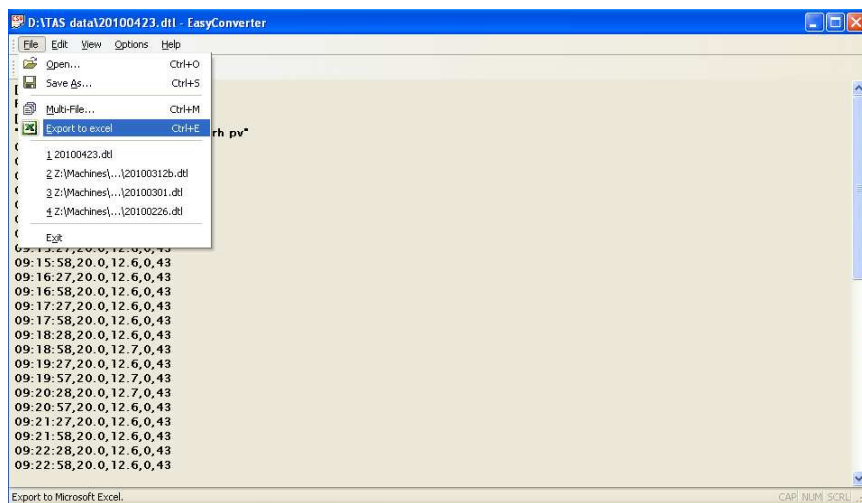
4. When prompted, for 'Sampling Data Information', click on 'Load Settings'



5. Navigate back to the 'EasyConverter' folder and select the 'scaling.lgs' file, click Open



6. Then click OK.
7. Now select 'File / Export to excel' to create a file in the '.xls' format



*NB If you do not have a suitable application installed on your PC, select 'File / Save As' instead which will enable you to save the data in 'csv' format.*

#### 4.39 Using the Ethernet port (option)

##### Introduction

Fitted to the side of the chamber, or directly underneath the HMI panel (for machines with remote mounted controls) is an Ethernet socket.

NB Not to be confused with the socket used to connect a remote HMI to the chamber, which will be identified with the following label:-



**Do not attach your PC to this port!**

Attach a Cat 5 or higher spec cable from the **correct port** on the chamber to your PC's Ethernet port, using a patch cord (not crossover)

The TAS HMI has an inbuilt VNC server. This allows the HMI screen and functions to be displayed on any PC, tablet, phone etc that is connected to the HMI either directly or via the Internet.

Furthermore, the HMI can send logged data direct to the attached device (PC only) for further analysis. The utility used for the data transfer is called Easy Printer and must be installed on your PC as per the below.

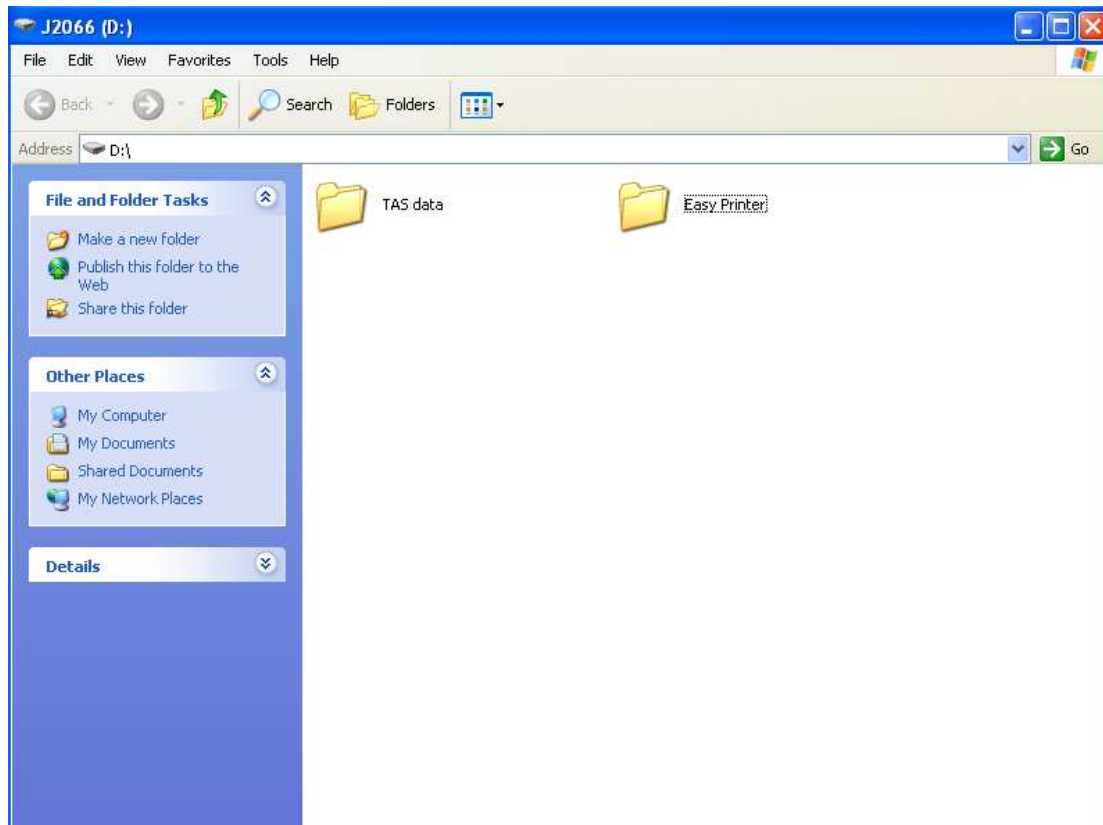
*The utility used to read the data is Easy Converter – see separate instructions for installation and operation.*

## Installation of Easy Printer onto a USB device.

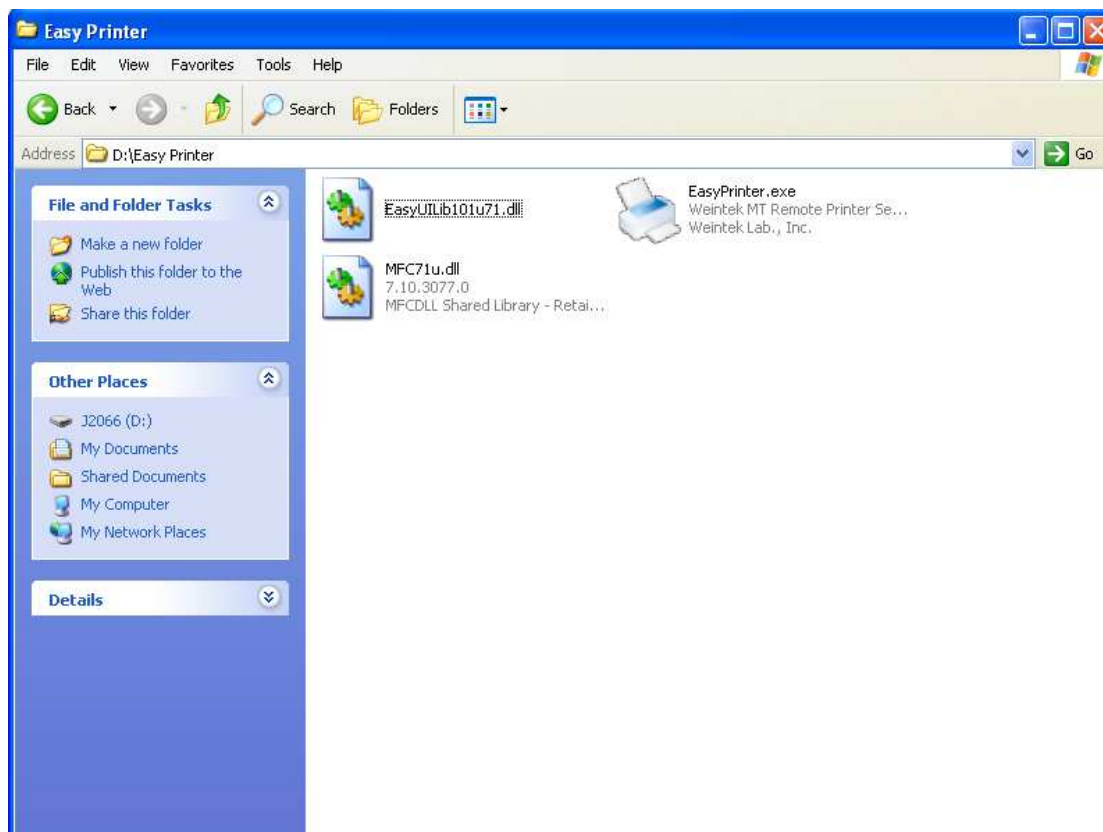
*You will have been provided with a PC application on a CD, in a compressed (ZIP) file.*

1. Using your PC, copy the application files to a USB memory device.
2. Insert the USB memory device into your PC and use Explorer to view the contents.
3. Create a new folder and name it EasyConverter

*NB the same USB device can also be used for the Easy Printer utility.*



4. Open this new folder and copy the contents of the ZIP file into it:

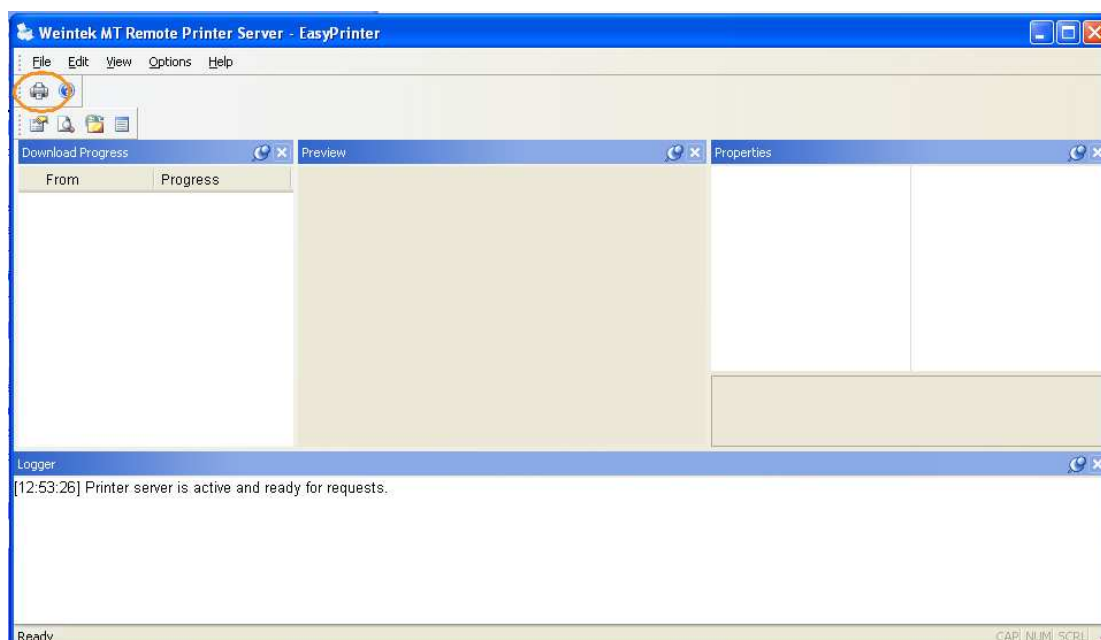


*NB The application will not be installed on your PC, rather it will be run from the USB device.*

### **Configuration of Easy Printer – first time use.**

1. Using you PC, start Easy Printer direct from your USB device.

*NB Make sure the 'printer icon' is not enabled.*



2. Click on **Options / Settings**.
3. Under the **General** tab, ensure the following information is entered:-

Port number..... 8005  
User name..... TAS (as shown on HMI engineering page)  
Password..... 1234 (as shown on HMI engineering page)

**MT8xxx Remote Printer Server Settings**

**General**

Hardcopy

Backup

**Server**

Port number of the server socket: 8005

User name: [Max. length = 12 characters] TAS

Password: [Max. length = 12 characters] 1234

**Naming Convention for HMI Folder (when writing files)**

☒ Use IP address

☐ Use HMI name (assign HMI name by LW/9032~LW/9039)

Prefix: IP\_ (Ex: IP\_192.168.1.25)

**Properties**

☒ Minimize to system tray

☒ Detailed message

OK Cancel

4. Under the **Hardcopy** tab, set the following:-

Print out to: *'leave unchecked'*  
Save to files in: *'leave unchecked'*

5. Under the **Backup** tab, set the following:-

Backup files in: *'enter the desired location on you PC, such as desktop'*  
Convert Batch File: *'leave unchecked'*

6. Click **OK**

## Operation of VNC server

1. Your PC or other device must be connected to the HMI, either direct or via a network.
2. The default IP address of the HMI 192.168.1.90, Subnet Mask is 255.255.255.0, Gateway is 192.168.2.1

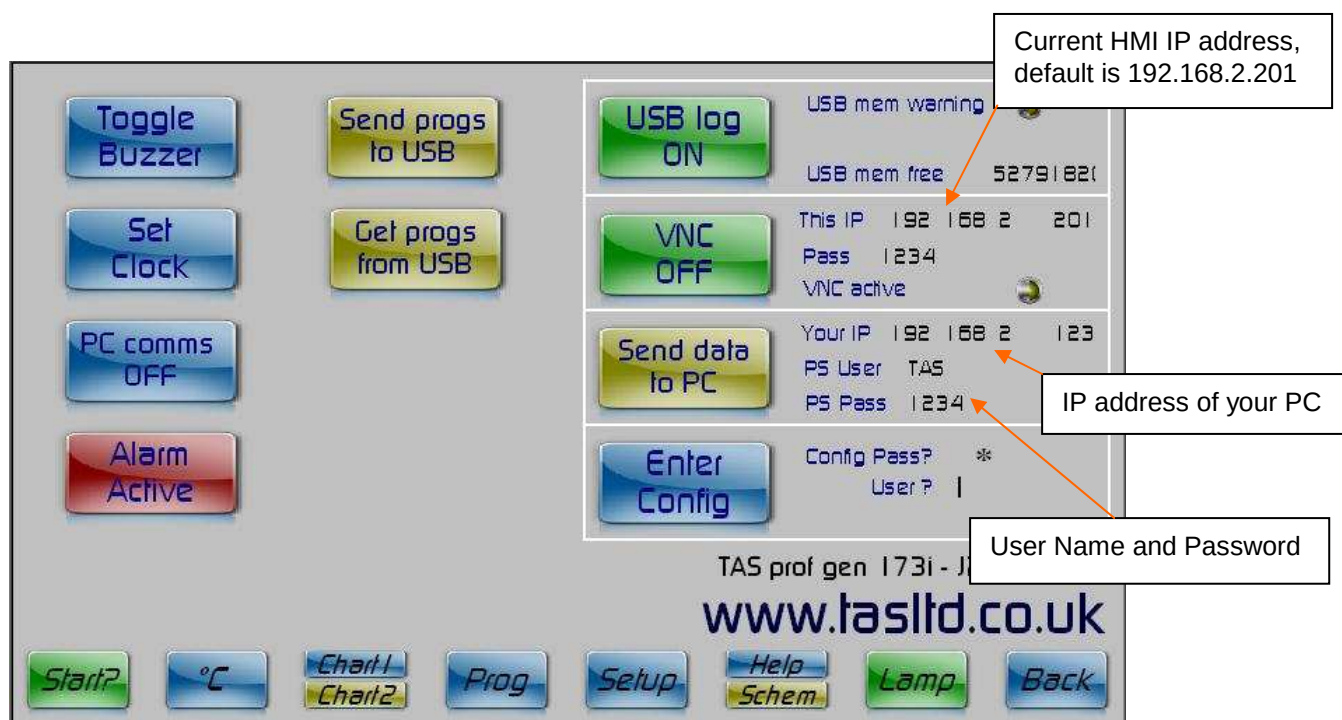
*NB Modification of the above requires access to the HMI setup page – please contact TAS for further details.*

3. Ensure your PC is on the same network as the HMI (if in doubt, contact your networking specialist).
4. On your device (PC etc) open up a new browser window and enter **192.168.1.90** into the address bar.
5. The VNC Viewer for Java© will be started.

*NB You must have Java© installed on your device.*

6. Enter the server name, which will be the IP address of the HMI = **192.168.1.90**
7. Click on OK.
8. Enter the password = **1234** and press Enter

You can now operate the TAS chamber as if you were standing directly in front of the machine.



Please 'Power Cycle' the chamber if any of the above are changed.

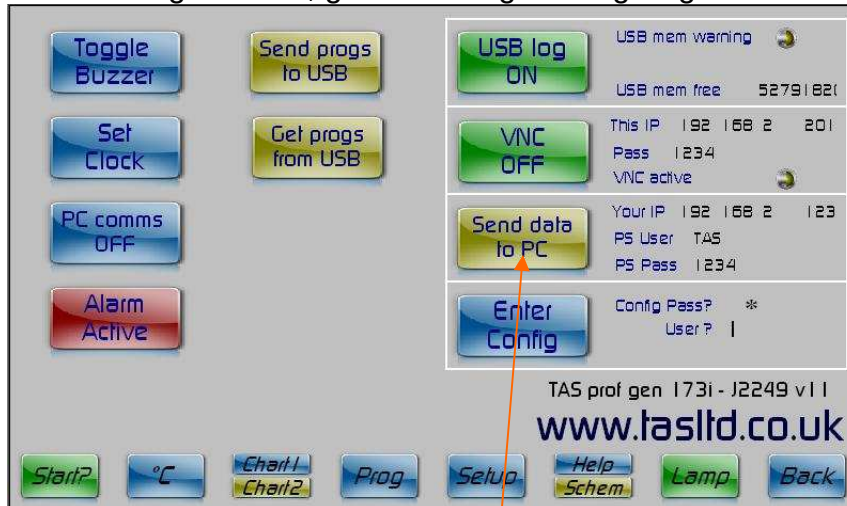
## Operation of Easy Printer

### To send data from the HMI to the PC

1. Ensure that the EasyPrinter utility is installed on your USB device.
2. Using your PC, run the EasyPrinter utility from the USB device.
3. Click on File / Enable Output – the 'printer' icon will be enabled

You will note in the lower window the following 'Printer server is active and ready for requests'.

4. Using the HMI, go to the Engineering Page.



5. Press the Send data to PC

Note the IP address under the 'Send Data to PC' button should be the same as the PC that is running the EasyPrinter Utility. This can be changed, but you must power cycle the HMI for it to take effect.

**Important Note:** You *MUST* have a USB memory stick attached to the HMI (chamber), as it is the data recorded on here that will be transferred to your PC.

6. Refer to the EasyPrinter and you will note a dialogue that indicates that the information has been received.
7. This data is in the same format as that on the USB stick, therefore use the Easy Converter application to convert the data as required.

*NB* If the IP address of the PC is ever changed, then this must be updates on the HMI – refer to the Engineering Page and note the current IP address under the 'Send data to PC' button. If you change the IP address, you will need to restart the HMI before it takes effect.

You will also note the name of the HMI and the password, both of these are used by the EasyPrinter application if ever you need to re-enter the settings. The port will always be 8005.

## 4.5 *LOADING THE TEST ITEMS*

### 4.51 SECURING TO THE SHELF

During normal operation, the chamber produces a very high velocity air flow within the test compartment.

IT IS VERY IMPORTANT THAT THE TEST ITEMS ARE SECURELY FIXED TO THE SHELF BEFORE STARTING THE TEST.

IF NOT, IT IS POSSIBLE FOR THE ITEM TO BE THROWN TOWARDS THE VIEWING WINDOW.

IN ADDITION, DAMAGE TO THE EVAPORATOR COOLING COIL AT THE REAR OF CHAMBER IS POSSIBLE.

## **5. IMPORTANT SAFETY INFORMATION**

THIS MACHINE IS CAPABLE OF TEMPERATURES THAT ARE LETHAL TO HUMAN LIFE!

ON NO ACCOUNT WHATSOEVER ENTER THE MACHINE WITHOUT PERSONAL PROTECTIVE EQUIPMENT DESIGNED FOR PROTECTION OVER THE ENTIRE TEMPERATURE RANGE.

DO NOT SHUT ANY PERSON INSIDE THE MACHINE AT ANY TIME!

WITH THE DOOR SHUT THE CHAMBER IS HERMETICALLY SEALED AND OXYGEN STARVATION COULD RESULT.

THE DOOR CATCHES HAVE BEEN DESIGNED SO THAT IT IS IMPOSSIBLE TO SHUT ONES SELF INSIDE THE MACHINE.



## 6. THEORY OF OPERATION:

### 6.1 REFRIGERATION CIRCUIT

High temperature refrigerant gas leaves the compressor through the DISCHARGE PIPE at high pressure and flows into the CONDENSER which is similar in appearance to a car radiator. A fans draw air over the fins which cools the refrigerant to below its vapourisation point at its current high pressure, causing the refrigerant to condense into a liquid. As it does, 'latent heat of condensation' is given up to the air flowing over the fins.

The high pressure liquid now passes into the LIQUID RECEIVER. From the LIQUID RECEIVER SERVICE VALVE the refrigerant flows into a DRIER where it is filtered and any moisture is removed. The SIGHT GLASS gives a visual aid to diagnosing problems with the system before the refrigerant enters the COOL SOLENOID VALVE and the THERMOSTATIC EXPANSION VALVE. This consists of a jet assembly whose orifice size is thermostatically controlled by the temperature of the refrigerant leaving the evaporator. This lowers the pressure of the refrigerant causing it to vaporise and absorb heat energy in the form of 'latent heat of vaporisation' from the EVAPORATOR and thus the Chamber air.

The cold refrigerant now in a gaseous form passes from the EVAPORATOR through the LIQUID INJECTION HEAT EXCHANGERS and into the SUCTION SERVICE VALVE where the refrigerant gas is re-compressed ready to repeat the cycle.

The flow of refrigerant is controlled by solenoid valves either to the TEV's or straight back into the compressor which allows the motor to keep running whilst not actually performing any refrigerating duty. This technique is known as HOT GAS BY-PASS or UNLOAD.

### 6.2 DIGITAL OUTPUTS (OPTION)

Please refer to the connector on the rear of the chamber

| Dig OP 1 |               | Dig OP 2 |               |
|----------|---------------|----------|---------------|
| Common   | Normally Open | Common   | Normally Open |
| 1        | 2             | 3        | 4             |

Programmable Digital Outputs – Volt Free

Max 264Vac, 2A

Min 12V, 100ma

### 6.3 MAINS WATER SUPPLY (OPTION)

If the chamber is fitted with an AUTO-FILL system for the humidity water supply tank, locate the connection tap at the rear.

Connect the supplied hose to a suitable DE-IONISED WATER SUPPLY, switch on and check for leaks.

Machines intended for connection to potable mains water supplies should be fitted with a suitable de-ionising filter cartridge, located on the side.

**The supplied rubber filter washer must be fitted**

**DO NOT USE NORMAL MAINS WATER IF A FILTER CARTRIDGE IS NOT PRESENT AS CONTAMINATION WILL OCCUR!**

## 6.4 *ELECTRICAL SCHEMATIC*

NB. Due to the complexity of operation, this item is available on WRITTEN REQUEST only.

## 7. INSTALLATION

### 7.1 CHAMBER LOCATION SITE

- i. The machine **MUST** be located on firm, dry, level ground. Adjust the chamber position and lock using the adjusting nuts on the castors.
- ii. Ingress of water **MUST** be prevented.
- iii. At least 500mm clearance **MUST** be allowed **ALL AROUND** the machine. During operation, the machine will output a **LARGE** amount of heat energy which must be dissipated into the surrounding air.
- iv. Adequate ventilation **MUST** be provided to ensure that the **AMBIENT** temperature does not exceed that stated on the **SPECIFICATIONS**.

### 7.2 ELECTRICAL

- i. The supply **MUST** be at least the rating stated in the **SPECIFICATIONS**, preferably higher, particularly when operating on lower voltages.
- ii. The preferred type of installation is **PERMANENT**, not with a plug & socket.
- iii. In addition, the use of RCD devices can cause nuisance tripping with machines utilising resistance heater elements.
- iv. If an RCD is not used, pay particular attention to **EARTH BONDING** and **CHECK REGULARLY**.

### 7.3 MAINS WATER SUPPLY HUMIDITY CHAMBERS(OPTION)

- i. If the chamber is fitted with an **AUTO-FILL** system for the humidity water supply tank, locate the connection tap at the rear.
- ii. Connect the supplied hose to a suitable **DE-IONISED WATER SUPPLY**, **ensure the supplied filter gauze is fitted**, switch on and check for leaks.
- iii. Machines intended for connection to potable mains water supplies should be fitted with a suitable de-ionising filter cartridge, located on the side.

**DO NOT USE NORMAL MAINS WATER IF A FILTER CARTRIDGE IS NOT PRESENT AS CONTAMINATION WILL OCCUR!**

**Do not connect WITHOUT fitting the filter gauze washer!**

#### *7.4 MAINS WATER DRAIN (OPTION)*

- i. Locate the 22mm copper drain pipe adjacent to the mains water fill connection at the back of the machine and connect to a free flowing waste water drain.

#### *7.5 DRAIN PUMP (OPTION)*

- i. Connect the drain hoses that lead to the Sump Pump to the drain pipes on the rear of the chamber.
- ii. Secure the pump to a solid surface using the mounting brackets.
- iii. Run the supplied 3/8" hose pipe to a waste water drain, ensuring there are no kinks, and secure with hose clips at both ends.
- iv. Pour approx 2 litres of water into the pump, for testing purposes.
- v. Connect to a permanent 230v power supply – **failure of this supply or inadvertent switching off could result in a water leak!**
- vi. Ensure the pump empties and there are no leaks from the small drain pipe.

#### *7.6 SHAKER INTERFACE (OPTION)*

- i. Locate the Access Port in the base of the chamber and remove the internal and external securing rings.
- ii. Remove the Silicone Rubber sheets and ensure that the Shaker Extension piece is removed from the shaker armature.
- iii. Cut these so that they are a snug fit around the Shaker Extension piece.
- iv. Re-fit the exterior sheet and securing ring, **without** the Shaker Extension piece.
- v. Position the chamber over the shaker, adjusting the chamber machine mounts as necessary to provide sufficient clearance.
- vi. Insert the Shaker Extension piece into the chamber and through the exterior silicone sheet. Fit to the shaker armature as per the shaker manufacturer's instructions.
- vii. Pack the area around the Shaker Extension piece with mineral fibre, such as Rockwool. The material should be fairly loose so as minimise transference of vibration from the shaker to the chamber.
- viii. Refit the internal silicone rubber sheet and the securing ring.
- ix. Operate the shaker through its normal range to ensure that there is no inference with the chamber.

## 8. OTHER FEATURES (OPTION)

### 8.1 8 CHANNEL THERMOCOUPLE LOGGER

#### Introduction

The chamber is fitted with an optional 8 channel thermocouple logger.  
This has been factory configured to:- **K type thermocouples**

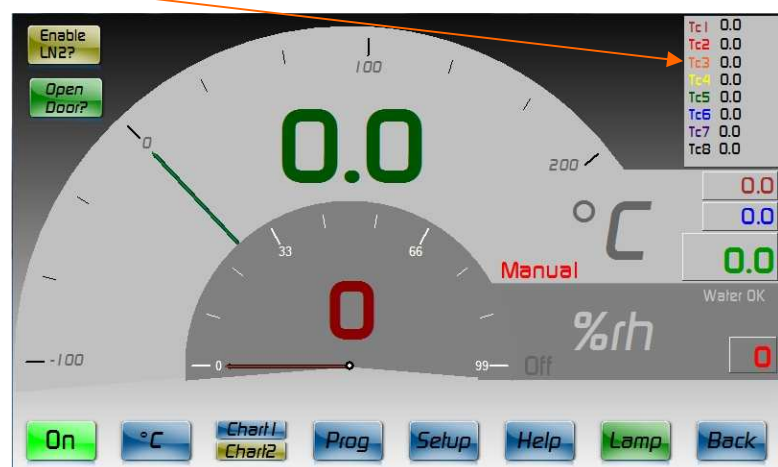
NB Due to the nature of thermocouples, the device is not intended to replace the calibrated chamber instruments, and is for indication only.

#### Operation

1. Refer to the panel on the side of the chamber:-



2. Attach your thermocouples and feed them into the chamber through the access ports.
3. The main HMI screen will show the current measured values on each channel:-



## 9. RECOMMENDED MAINTENANCE

### 9.1 REFRIGERATION SYSTEM

- i. The most common problem with any air-cooled refrigeration system is dirt on the condenser fins. Remove front lower panel and use a soft brush to remove any dirt and build up. **BE CAREFUL NOT TO DAMAGE THE CONDENSOR FINS!**
- ii. In association with the condensers are two fan motors with 'sealed for life' bearings. Periodically check for excessive play and repair/replace as necessary.
- iii. Refrigerant leaks are often distinguished by a dark area of oil at the point of the problem. **Specialist repair and re-charging is required.**

### 9.2 CHAMBER FAN MOTORS & IMPELLERS

- i. Periodically (every 3 months) check for excessive play and noise.
- ii. To replace a motor undo mounting nuts and withdraw backwards just enough to access the socket screws securing the extension shaft to the motor.
- iii. Ensure that the free shaft **does not get pushed through the shaft tube** otherwise the internal baffles will have to be removed for retrieval.
- iv. The balancing of the IMPELLERS is critical as the motors operate at very high speeds, up-to 1250 rpm.
- v. Correct positioning of the impellers on the shafts is necessary to avoid interference with the air baffles. To make adjustments, remove the top baffle and using a hexagon headed key adjust the impeller up or down to find the mid point on the shaft.

### 9.3 HEATER ELEMENTS TERMINALS

- i. A common problem with resistance type heater elements is excessive heat build up at the electrical terminations. This causes oxidation of the terminal which leads to increased current and therefore increased heat.
- ii. Eventually, the terminals fail causing an open circuit.
- iii. Replace the faulty terminal using a CRIMP TYPE CONNECTOR of THE EXACT SAME size as the terminal.

**NOTE: High NICKEL content terminals offer increased life**

## **9.4 CHAMBER LAMP**

With the chamber switched off, prise out the lamp holder complete with lamp and detach the electrical lead. Select a complete new assembly (available from TAS), re-attach the lead and re-insert into the holder.

## **9.5 DRAINING HUMIDIFIER TANK**

- i. Switch off and disconnect the chamber from the electrical and water supplies.
- ii. Allow the machine to cool down, particularly if operating on high humidity levels.
- iii. Unclip the sight-glass tube and rotate to allow the water to drain into a suitable vessel.
- iv. Once empty, be sure to refit the sight-glass.
- v. Reconnect the electrical and water supplies.

## **9.6 DE-IONISER CARTRIDGE (IF FITTED)**

- i. During use, a dark coloured line will slowly move up the indicator window in the side of the cartridge.
- ii. Once the window is completely coloured, the cartridge must be replaced.
- iii. Ensure the mains water supply is switched off and the electrical supply has been isolated before commencing work.
- iv. Take care not to over-tighten the threaded connections, using PTFE sealing tape on the joints.



## 10. CALIBRATION CERTIFICATE

(OPTIONAL)

## 11. CERTIFICATE OF CONFORMITY

# EC DECLARATION OF CONFORMITY

- BUSINESS NAME AND ADDRESS OF RESPONSIBLE PERSON:-

MR. T. STEVENS

TEMPERATURE APPLIED SCIENCES LTD  
UNIT 15 MARTLETS INDUSTRIAL ESTATE  
MARTLETS WAY  
GORING BY SEA  
WORTHING  
WEST SUSSEX BN12 4HF

- FULL ADDRESS OF MANUFACTURER:-

AS ABOVE

- DESCRIPTION OF MACHINERY:-

ENVIRONMENTAL TEST CHAMBER AS PER THE SPECIFICATION GIVEN  
IN THIS DOCUMENT.

SERIAL NUMBER:- \_\_\_\_28900317\_\_

- ALL DIRECTIVES COMPLIED WITH:-

IEC 61010 (Electrical Safety)

ISO 5149 (Safety Requirements for Mechanical Refrigeration Systems)

73/23/EEC (Low Voltage Directive)

EN50081, EN50082 & 89/338/EEC (Electro- magnetic Compatibility)

## 12. COSHH DATA

### 12.1 CELOTEX INSULATION

#### Health and Safety Information Sheet HS-o8 Celotex Thermal Insulation Boards

CI/SFB | | | Rn7 | (E2g) |  
May 2006 Revision E



Identification of products and manufacturer  
**Celotex tuff-R™, Celotex T-Break™, Celotex Extra-R™, Celotex Fast-R™, Celotex Energy-Lok™, Celotex Tempchek™, Celotex Tempchek™ Deck, Celotex Energy-Ply™, Celotex PI-Rq™, Celotex double-R™ and Celotex Hydroform™.**

**Celotex Limited**, Lady Lane Industrial Estate,  
Hadleigh, Suffolk IP7 6BA.

**Composition/information on ingredients**  
Rigid polyisocyanurate or rigid polyisocyanurate-modified polyurethane foams, with aluminium foil or fibreglass reinforced composite facings. The foam may incorporate less than 5% long-strand glass fibre.

Blowing agents of zero Ozone Depletion Potential are used, **double-R** using hydrofluorocarbon, **tuff-R** using hydrocarbon.

#### Hazards Identification

**Celotex tuff-R™, Celotex T-Break™, Celotex Extra-R™, Celotex Fast-R™, Celotex Energy-Lok™, Celotex Tempchek™, Celotex Tempchek™ Deck, Celotex Energy-Ply™, Celotex PI-Rq™, Celotex double-R™ and Celotex Hydroform™** are not classified under CHIP3 regulations and are considered to be non-hazardous. However, glass fibre may cause skin irritation and dusts may cause respiratory irritation; inhalation and ingestion should be avoided. Edges of aluminium foil facings can be sharp enough to cut the skin. Product is not load bearing unless fully supported. The products should be handled and used in accordance with good occupational hygiene and safety practices.

#### First Aid Measures

**Skin** – Rinse hands under cold running water BEFORE washing with soap and water, to avoid rubbing glass fibres into the skin.

**Eyes** – If dust or particles have entered the eyes, irrigate thoroughly with emergency eyewash solution (or clean water). Seek medical advice should irritation persist.

**Inhalation/Ingestion** – If the dust causes irritation or coughing, remove the subject to fresh air, keep warm and at rest, carefully clear any excess dust from nasal passages and mouth, rinsing with clean water until clear.

In all cases, should exposure be excessive or symptoms begin to develop, seek medical attention.

#### Fire Fighting Measures

The products will burn if exposed to a fire of sufficient heat and intensity. As with all organic materials, toxic gases will be released during combustion. Do not incinerate waste. Do not inhale fumes. Fire fighters should attack the fire according to the combustible materials present, and use breathing apparatus. Cardboard and plastic packaging materials are combustible. Store away from all possible sources of ignition.

#### Accidental Release Measures

Material should be collected up and retained for disposal. Dust may be controlled with damp sand to reduce blow-away.

#### Handling Precautions & Personal Protection

Wear protective gloves to avoid cutting hands on sharp foil edges. When cutting **Celotex** product on site, use a sharp trimming knife rather than a saw to minimise dust. If skin is sensitive to fibre irritation, apply a barrier cream to exposed areas before handling the product. When sawing in an enclosed space dust extraction, eye protection and face masks must be provided.

#### Physical & Chemical Properties

**Appearance** – **Celotex** Thermal Insulation boards consist of a straw coloured fine cell foam (some products include encapsulated glass fibre) enclosed within facings.

**Odour** – virtually none. **Product density** – in the range 25 – 35 kilograms per cubic metre.

#### Stability & Reactivity

The fully reacted rigid foam core is chemically stable, but may be degraded by high temperature or the effect of solvents.

#### Toxicological Information

The fully reacted rigid foam core and blowing agent have no known toxic effects.

#### Ecological Information

The fully reacted rigid foam core and blowing agent have no known EcoToxic effects.

#### Disposal Considerations

Waste material and dust may be disposed of to landfill by a licensed contractor.

#### Transport Information

Lightweight, non-hazardous material.

#### Regulatory information

These products are NOT classified as dangerous for supply.

#### Statutory Instruments

Health and Safety at Work, etc. Act 1974; Consumer Protection Act 1987; Environment Protection Act, 1990; Control of Substances Hazardous to Health Regulations 2002; Waste Management – the Duty of Care, 1991; Personal Protective Equipment at Work Regulations, 1992.

#### Other Information

**Intended Use:** Thermal Insulation of Building Structures, as described in **Celotex** product literature.

**COSHH** – Under the COSHH Regulations 2002 it is the duty of employers to prevent or control the exposure of their employees to substances hazardous to health. Man-made mineral fibres (including glass fibres) are subject to a maximum exposure limit (MEL) as defined in HSE Guidance Note EH40.

If in doubt as to the suitability of this product for any manufacturing process or installation procedure please telephone **Celotex** for further recommendations

01473 822093.

## 12.2 ROCKWOOL INSULATION

### Material Safety Sheet in accordance with 91/155 EC

|                                                                      |                                                                                       |
|----------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>Company:</b> <b>Rockwool Limited, Pencoed, Bridgend, CF35 6NY</b> |                                                                                       |
| <b>Trade name:</b> Rockwool                                          | <b>Product name:</b> Rockwool stone wool insulation products (CAS number 287922-11-6) |
| <b>Revised on:</b> 27 February 2006                                  | <b>Replaces issues:</b> 12 July 2002, 12 August 2004, 17 November 2005                |
| <b>Authorised by:</b> N Ralph                                        |                                                                                       |

#### 1 Chemical product and company identification

- 1.1 Generic product name: Insulation material consisting of stone wool based mineral fibres [man-made vitreous (silicate) fibres].
- 1.2 Company address: ROCKWOOL Limited  
Pencoed  
Bridgend  
CF35 6NY
- 1.3 If further information is required, please telephone or fax ROCKWOOL Limited. Tel: 01656 862 621 Fax: 01656 862 302

#### 2 Composition/ information on Ingredients

Inert vitreous silicate mineral wool with a small amount of Bakelite (a synthetic thermosetting resin binder) and up to 0.3% mineral oil or up to 0.5% silicone oil or emulsion.

Table 1

|                                              | CAS-No.     | Contents | Classification | R-phrases                 |
|----------------------------------------------|-------------|----------|----------------|---------------------------|
| Man-made vitreous (silicate) fibres, Note Q. | 287922-11-6 | 90-99%   | X <sub>i</sub> | Irritating to skin (R:38) |

#### 3 Hazards identification

- 3.1 Mineral fibres: ROCKWOOL mineral fibres have been classified by EU and HSE 'CHIP' Regulations as Irritant and may cause transient mechanical skin irritation. High dust levels may irritate the throat and eyes.

#### 4 First-aid measures

- 4.1 Mineral fibres  
Skin: If irritation occurs, wash off under cold running water prior to washing with mild soap. Do not rub or scratch.  
Throat: If irritation occurs, clean throat by rinsing with cold, potable water.  
Eyes: If irritation occurs, flush eyes with potable cold water. Do not rub the eyes.  
Consult a physician if irritation persists.
- 4.2 Binder gasses  
If eye or respiratory irritation occurs, leave source of contamination and get fresh air. Consult a physician if irritation persists.

#### 5 Fire-fighting measures

- The products are non-combustible and do not pose a fire hazard. Pinking may occur at high temperatures. Some facings and packaging materials may burn.
- 5.1 Suitable extinguishing media: Water, foam, carbon dioxide or dry powder.
- 5.2 Extinguishing media that must not be used for safety reasons: None.
- 5.3 Combustion products: Carbon dioxide, carbon monoxide and trace gasses.
- 5.4 Special protective equipment for fire fighters: Observe normal fire fighting procedures.

#### 6 Accidental release measures

No special measures required.

#### 7 Handling and storage

- 7.1 Handling: Unpack material at application site to avoid unnecessary handling of product. Keep work areas clean. Dispose of scrap material and debris in suitable containers. Spray with water before sweeping or use vacuum equipment.
- 7.2 Storage: Keep material in original packaging until it is to be used. Store material to protect against damage including the weather.

|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>8</b>  | <b>Exposure controls/ personal protection</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                |
| 8.1       | <b>Respiratory protection</b><br><br><i>Fibres:</i> Workplace exposure limit (WEL) 5mg/m <sup>3</sup> , 8 hour time weighted average gravimetric measure. If the WEL is likely to be exceeded (for example when using high speed cutting tools or when working in confined spaces) disposable face masks complying with BS EN149 FFP1 or FFP2 should be used and are suitable for most applications.<br><br><i>Initial heating up:</i> When insulation wool is heated to approximately 200°C for the first time(s), release of binder components and binder decomposition products occurs. The fumes can be detected by their acrid odour and high concentrations of these gasses may irritate the eyes and respiratory system. In general, decomposition products from pyrolysis or burning of organic material can cause respiratory sensitisation. There are no recorded incidents of respiratory sensitisation from gases released from Rockwool Limited products. However, general dilution ventilation and/or local exhaust ventilation should be provided as necessary to control exposure to fumes when high temperature appliances are first put into service. |                                                                                                                                                                                                |
| 8.2       | Hand protection: Not normally required but suitable gloves can be worn.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                |
| 8.3       | Eye protection: With heavy dust development or when working with product above head height, the use of safety goggles is advised.<br>Skin protection: No special requirements: loose fitting, long-sleeved, long-legged, work clothes advised. Change clothes and wash on completing work.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                |
| <b>9</b>  | <b>Physical and chemical properties</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                |
| 9.1       | Appearance:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | solid, green-brown                                                                                                                                                                             |
| 9.2       | Odour:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | n.a.                                                                                                                                                                                           |
| 9.3       | pH (at 1000g/H <sub>2</sub> O, 25°C):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | neutral or slightly alkaline (pH7-9)                                                                                                                                                           |
| 9.4       | Boiling point:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | n.a.                                                                                                                                                                                           |
| 9.5       | Melting point:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | above 1000°C. The limiting temperature applicable for use is dependent upon specific product type and intended application and must be taken from the appropriate ROCKWOOL product data sheet. |
| 9.6       | Flash point:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | )                                                                                                                                                                                              |
| 9.7       | Flammability:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | )                                                                                                                                                                                              |
| 9.8       | Auto-flammability:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ) non combustible ISO 1182                                                                                                                                                                     |
| 9.9       | Explosive properties:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | )                                                                                                                                                                                              |
| 9.10      | Explosive properties:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | n.a.                                                                                                                                                                                           |
| 9.11      | Oxidising properties:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | n.a.                                                                                                                                                                                           |
| 9.12      | Vapour pressure:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | n.a.                                                                                                                                                                                           |
| 9.13      | Fibre density:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | n.a.                                                                                                                                                                                           |
| 9.14      | Solubility:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | generally chemically inert and insoluble in water                                                                                                                                              |
| 9.15      | Partition coefficient:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | n.a.                                                                                                                                                                                           |
| 9.16      | Other data:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | n.a.                                                                                                                                                                                           |
| <b>10</b> | <b>Stability and reactivity information</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                |
| 10.1      | Stability: Stable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                |
| 10.2      | Reactivity: Not reactive                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                |
| 10.3      | Thermal decomposition products: When insulation wool is heated to approximately 200°C for the first time(s) binder components and decomposition gases are emitted from the binder. The decomposition starts at approximately 200°C and the duration of release depends on thickness of insulation, binder content and temperature(s) applied.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                |
| <b>11</b> | <b>Toxicological Information</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                |
| 11.1      | Carcinogenic, mutagenic and reproductive toxic effects: NONE. Human epidemiological studies show no link between exposure to mineral wool fibres and lung disease or any other chronic effects. Owing to their high bio-solubility, the fibre types of ROCKWOOL stone wool insulation materials are assessed as free from suspicion of possible carcinogenic effects in accordance with EU Directive 97/69/EC (Note Q). This Directive is incorporated into UK health and safety legislation through The Chemicals (Hazard Information and Packaging for Supply) (Amendment) Regulations - known as CHIP.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                |
| 11.2      | In October 2001, the International Agency for Research on Cancer ("IARC", part of the World Health Organisation) reviewed its 1987 classification of mineral wool fibres and removed them from its list of possible carcinogens, reflecting the increase in scientific knowledge and the established safety of mineral wool for workers and building occupiers. IARC scientists gave mineral wool insulation, formerly classified as a precautionary principle as Group 2B (possibly carcinogenic to humans), a Group 3 classification (unclassified as to its carcinogenicity in humans).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                |
| 11.3      | Other observations: In the case of coarser fibres, there can be physical effects on skin, upper respiratory system (mucous membranes) and eyes that can cause temporary, self-fading effects (eg itching). No chemical effects ensue.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                |
| <b>12</b> | <b>Ecological Information</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                |
|           | Stable product with no known adverse environmental effects.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                |

|            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>13</b>  | <b>Disposal considerations</b><br>No special precautions.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 13.1       | Hazardous waste regulations; ROCKWOOL insulation is classified as non-hazardous waste. ROCKWOOL insulation waste is covered by the non-hazardous entry "17 06 04 insulation materials other than those mentioned in 17 06 01 and 17 06 03" in the List of Wastes/the European Waste Catalogue (EWC).                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 13.2       | Landfill regulations; ROCKWOOL insulation waste is categorized as "waste accepted at landfills for non-hazardous waste".                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>14.</b> | <b>Transport Information</b><br><br>No special precautions.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>15</b>  | <b>Regulatory Information</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 15.1       | EC Classification: The product contains Mineral Fibres [Man-made vitreous (silicate) fibres]. Danger Symbol - X <sub>n</sub> , Irritant.<br>Risk Phrases - Irritating to skin (R:38). Safety Phrases - Wear suitable protective clothing and gloves (S36/37).<br><br>ROCKWOOL mineral wool is not classified as a possible carcinogen, ref. Note Q of EU Directive 97/89/EC and HSE "CHIP" regulations.                                                                                                                                                                                                                                                                                                                      |
| 15.2       | Other Regulation: n.a.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 15.3       | Exposure Limits: Recommended workplace exposure limit (WEL) 5 mg/m <sup>3</sup> , 8 hour time weighted average gravimetric measure.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>16</b>  | <b>Further Information</b><br>Health and Safety Executive Guidance Note EH40 – Occupational Exposure Limits<br>Health and Safety Commission "The Chemicals (Hazard Information and Packaging for Supply) Regulations" - 'CHIP'<br>Hazardous Waste Regulations<br>List of Wastes/ European Waste Catalogue (EWC)<br>Environment Agency Technical Guidance WM2, "Interpretation of the definition and classification of hazardous waste"<br>Landfill Regulations<br>Eurisol Health Statement<br><br>This information reflects typical values and is not a product specification. No warranty expressed or implied is hereby made.<br><br>This materials safety data sheet does not constitute an assessment of workplace risk. |



## 1. Identification of the substance/preparation and of the company/undertaking

Product name: **Isomatic SW 32**  
 SDS #: FR-451083, UK-6140  
 Product use: Refrigerator compressor lubricant.  
 Supplier: Castrol (U.K.) Limited  
 Wakefield House  
 Pipers Way  
 Swindon  
 Wiltshire, SN3 1RE  
 United Kingdom  
 Tel.: +44 (0)1793 512712  
 Fax: +44 (0)1793 486083  
 +44 (0)2087628322

EMERGENCY TELEPHONE NUMBER

## 2. Composition/information on ingredients

Synthetic lubricant and additives.

| Chemical name                                            | CAS no. | %        | EINECS / ELINCS | Classification |
|----------------------------------------------------------|---------|----------|-----------------|----------------|
| Carboxylic acids, mixed tetraesters with pentaerythritol |         | 50 - 100 | 443-990-3       | R53            |

See section 16 for the full text of the R Phrases declared above.  
 Occupational Exposure Limits (s), if available, are listed in Section 8.

## 3. Hazards identification

This preparation is classified as dangerous according to Directive 1999/45/EC as amended and adapted.

|                           |                                                                                            |
|---------------------------|--------------------------------------------------------------------------------------------|
| Physical/chemical hazards | Not classified as dangerous.                                                               |
| Human health hazards      | Not classified as dangerous.                                                               |
| Environmental hazards     | May cause long-term adverse effects in the aquatic environment.                            |
| Effects and symptoms      |                                                                                            |
| Eyes                      | May cause mild eye irritation.                                                             |
| Skin                      | Prolonged or repeated contact can defat the skin and lead to irritation and/or dermatitis. |
| Inhalation                | Vapours and aerosols can produce mucous membrane, nose and throat irritation.              |
| Ingestion                 | Ingestion may cause gastrointestinal irritation and diarrhoea.                             |

## 4. First aid measures

|              |                                                                                                                                                                                                                                  |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Eye Contact  | In case of contact, immediately flush eyes with a copious amount of water for at least 15 minutes. Get medical attention if irritation occurs.                                                                                   |
| Skin contact | Wash skin thoroughly with soap and water or use recognised skin cleanser. Remove contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if irritation develops. |
| Inhalation   | If inhaled, remove to fresh air. Get medical attention if symptoms appear.                                                                                                                                                       |
| Ingestion    | Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately.                   |

## 5. Fire-fighting measures

|                                  |                                                                                                                                                                                                                               |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Extinguishing Media              |                                                                                                                                                                                                                               |
| Suitable                         | In case of fire, use water fog, foam, dry chemical or carbon dioxide extinguisher or spray. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain. |
| Not suitable                     | Do not use water jet.                                                                                                                                                                                                         |
| Hazardous decomposition products | These products are carbon oxides (CO, CO <sub>2</sub> ).                                                                                                                                                                      |

|                             |                           |                            |
|-----------------------------|---------------------------|----------------------------|
| Product Name Isomatic SW 32 | Product code 451083-FR 01 | Page: 1/4                  |
| Version 1.01                | Date of issue 1 June 2004 | Format United Kingdom (UK) |
|                             |                           | Language ENGLISH           |
|                             | Build 6.2.5               | ( ENGLISH )                |

## 6. Accidental releases/emergencies

|                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Personal Precautions                           | Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment (Section 8). Follow all firefighting procedures (Section 8).                                                                                                                                                                                                                                                                                                                                                                                                  |
| Environmental precautions and clean-up methods | If emergency personnel are unavailable, contain spilled material. For small spills: add absorbent (soil may be used in the absence of other suitable materials) to scoop up material and place in a sealed liquid-proof container for disposal. For large spills: keep spilled material or otherwise contain material to ensure runoff does not reach a waterway. Place spilled material in an appropriate container for disposal. Minimize contact of spilled material with soils to prevent runoff to surface waterways. See Section 13 for Waste Disposal Information. |
| Personal protection in case of a large spill   | Splash goggles, Full suit, Boots, Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.                                                                                                                                                                                                                                                                                                                                                                                                                       |

## 7. Handling and storage

|          |                                                                                                               |
|----------|---------------------------------------------------------------------------------------------------------------|
| Handling | Avoid contact of spilled material and runoff with soil and surface waterways. Wash thoroughly after handling. |
| Storage  | Keep container tightly closed. Keep container in a cool, well-ventilated area.                                |

## 8. Exposure controls/personal protection

|                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Occupational exposure limits  | This product does not have any assigned OELs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Control Measures              | Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapours below their respective occupational exposure limits.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Hygiene measures              | Wash hands after handling compounds and before eating, smoking, using lavatory, and at the end of day.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Personal protective equipment |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Respiratory system            | None required; however, use of adequate ventilation is good industrial practice.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Skin and body                 | Wear appropriate clothing to avoid prolonged skin contact.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Hands                         | Wear protective gloves if prolonged or repeated contact is likely.<br>Chemical resistant gloves. Recommended Butyl gloves.<br>The correct choice of protective gloves depends upon the chemicals being handled, the conditions of work and use, and the condition of the gloves (even the best chemically resistant glove will break down after repeated chemical exposures). Most gloves provide only a short time of protection before they must be discarded and replaced. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. Gloves should therefore be chosen in consultation with the supplier/manufacturer and with a full assessment of the working conditions. |
| Eyes                          | Safety glasses with side shields.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

## 9. Physical and chemical properties

|                |                                                                                   |
|----------------|-----------------------------------------------------------------------------------|
| Flash point    | >233 °C (Open cup) Cleveland                                                      |
| Pour Point     | -46 °C                                                                            |
| Colour         | Yellow, (Light)                                                                   |
| Odour          | Mild                                                                              |
| Physical state | Liquid                                                                            |
| Density        | <1.000 kg/m³ (<1 g/cm³) at 20 °C                                                  |
| Vapor pressure | <0.01 kPa (<0.075 mmHg) at 20 °C                                                  |
| Solubility     | Insoluble in water.                                                               |
| Viscosity      | Kinematic: 32 mm²/s (32 cSt) at 40 °C<br>Kinematic: 5.6 mm²/s (5.6 cSt) at 100 °C |

Product Name: **cematics W 32**

Product code: **451083-FR-01**

Page: **2/4**

Version: **1.01**

Date of issue: **1 June 2004**

Format: **United Kingdom (UK)**

Language: **ENGLISH**

Build: **6.2.5**

( **ENGLISH** )

Incompatibility with various substances

Hazardous polymerization Will not occur.

## 11 . Toxicological information

Chronic toxicity

Carcinogenic effects

No component of this product at levels greater than 0.1% is identified as a carcinogen by ACGIH, the International Agency for Research on Cancer (IARC) or the European Commission (EC).

## 12 . Ecological information

Persistence/degradability

Inherently biodegradable.

Mobility

Nonvolatile. Liquid. Insoluble in water.

Environmental hazards

May cause long-term adverse effects in the aquatic environment.

## 13 . Disposal considerations

Disposal Consideration / Waste information

Avoid contact of spilled material and runoff with soil and surface waterways. Consult an environmental professional to determine if local, regional or national regulations would classify spilled or contaminated materials as hazardous waste. Use only approved transporters, recyclers, treatment, storage or disposal facilities.

Hazardous waste

This product is listed as Hazardous by the EU Directive on hazardous waste. Dispose of according to all national and local applicable regulations.

## 14 . Transport information

Not classified as hazardous for transport (ADR, RID, UN, IMO, IATA/ICAO).

## 15 . Regulatory information

Label Requirements

Risk Phrases

R53- May cause long-term adverse effects in the aquatic environment.

Safety Phrases

S61- Avoid release to the environment. Refer to special instructions/Safety data sheets.

EU Regulations

Classification and labelling have been performed according to EU directives 1999/45/EC and 67/548/EEC as amended and adapted.

Other regulations

Inventories

AUSTRALIAN INVENTORY (AICS): Not determined.

CANADA INVENTORY (DSL): Not determined.

CHINA INVENTORY (IECS): Not determined.

EC INVENTORY (EINECS/ELINCS): In compliance.

JAPAN INVENTORY (ENCS): Not determined.

KOREA INVENTORY (ECL): Not determined.

PHILIPPINE INVENTORY (PICCS): Not determined.

US INVENTORY (TSCA): Not determined.

## 16 . Other information

Full text of R-phrases referred to in sections 2 and 3

R53- May cause long-term adverse effects in the aquatic environment.

History

Date of issue

01/06/2004.

Date of previous issue

19/05/2004.

Prepared by

Product stewardship

Notice to reader

Product Name Icematic SW 32

Product code 451083-FR 01

Page: 3/4

Version 1.01

Date of issue 1 June 2004

Format United Kingdom  
(UK)

Language ENGLISH

Build 6.2.5

( ENGLISH )

## 12.4 R507 REFRIGERANT



### Safety Data Sheet

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|                             |                |                  |
|-----------------------------|----------------|------------------|
| Product :                   | R507           | Page :1/5        |
| MSDS Nr : 300-25-0015BOC(U) | Version : 1.01 | Date :30/11/2001 |

---

#### 1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY

|                         |                           |
|-------------------------|---------------------------|
| Product name            | R507                      |
| Company identification  | see heading and/or footer |
| Emergency phone numbers | see heading and/or footer |

---

#### 2 COMPOSITION/INFORMATION ON INGREDIENTS

|                       |                                                                                                              |
|-----------------------|--------------------------------------------------------------------------------------------------------------|
| Substance/Preparation | Preparation                                                                                                  |
| Components/Impurities | Contains the following components: 50% w/w Trifluoroethane (R143a) (F+;R12)/50% w/w Pentafluoroethane (R125) |
| EEC Nr (from EINECS)  | Not applicable for preparations                                                                              |

---

#### 3 HAZARDS IDENTIFICATION

|                        |                                                                |
|------------------------|----------------------------------------------------------------|
| Hazards identification | Liquefied gas<br>In high concentrations may cause asphyxiation |
|------------------------|----------------------------------------------------------------|

---

#### 4 FIRST AID MEASURES

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Inhalation       | In low concentrations may cause narcotic effects. Symptoms may include dizziness, headache, nausea and loss of co-ordination.<br>In high concentrations may cause asphyxiation. Symptoms may include loss of motility/consciousness. Victim may not be aware of asphyxiation.<br>Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped. |
| Skin/eye contact | In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing.<br>Immediately flush eyes thoroughly with water for at least 15 minutes.<br>Remove contaminated clothing.<br>Obtain medical assistance.                                                                                                                                                                                                                                 |
| Ingestion        | Ingestion is not considered a potential route of exposure.                                                                                                                                                                                                                                                                                                                                                                                                       |

---

#### 5 FIRE FIGHTING MEASURES

|                               |                                                                                                                                 |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| Specific hazards              | Exposure to fire may cause containers to rupture/explode.<br>Non flammable                                                      |
| Hazardous combustion products | If involved in a fire the following toxic and/or corrosive fumes may be produced by thermal decomposition:<br>Carbonyl fluoride |

## Safety Data Sheet

Product :

R507

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Date : 30/11/2001

|                                                |                                                                             |
|------------------------------------------------|-----------------------------------------------------------------------------|
|                                                | Carbon monoxide                                                             |
|                                                | Hydrogen fluoride                                                           |
| Suitable extinguishing media                   | All known extinguishants can be used.                                       |
| Specific methods                               | If possible, stop flow of product.                                          |
|                                                | Move away from the container and cool with water from a protected position. |
| Special protective equipment for fire fighters | Use self-contained breathing apparatus and chemically protective clothing   |

### 6 ACCIDENTAL RELEASE MEASURES

|                           |                                                                                                             |
|---------------------------|-------------------------------------------------------------------------------------------------------------|
| Personal precautions      | Evacuate area.                                                                                              |
|                           | Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.          |
|                           | Ensure adequate air ventilation.                                                                            |
| Environmental precautions | Try to stop release.                                                                                        |
|                           | Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. |
| Clean up methods          | Ventilate area                                                                                              |

### 7 HANDLING AND STORAGE

|                      |                                                                                                                                                       |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Handling and storage | Suck back of water into the container must be prevented.                                                                                              |
|                      | Do not allow backfeed into the container.                                                                                                             |
|                      | Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt. |
|                      | Refer to supplier's container handling instructions                                                                                                   |
|                      | Keep container below 50 C in a well ventilated place.                                                                                                 |

### 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

|                                  |                                                   |
|----------------------------------|---------------------------------------------------|
| Exposure limit value for country | UK: Trifluoroethane (R143a) - LTEL: 1000ppm       |
|                                  | UK: Pentafluoroethane - LTEL: 1000ppm             |
| Personal protection              | Ensure adequate ventilation.                      |
|                                  | Do not smoke while handling product.              |
|                                  | Protect eyes, face and skin from liquid splashes. |

### 9 PHYSICAL AND CHEMICAL PROPERTIES

|                  |         |
|------------------|---------|
| Molecular weight | 98.8    |
| Boiling point    | -46.9 C |

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Product :

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|                          |                                                                                                                                                         |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| Critical temperature     | 70.8 °C                                                                                                                                                 |
| Relative density, gas    | 3.4 (air=1)                                                                                                                                             |
| Relative density, liquid | 1.07 (water=1)                                                                                                                                          |
| Vapour Pressure 20 °C    | 11.3 bar(a)                                                                                                                                             |
| Solubilitymg/l water     | No reliable data available.                                                                                                                             |
| Appearance/Colour        | Colourless gas                                                                                                                                          |
| Odour                    | Ethereal                                                                                                                                                |
| Other data               | Poor warning properties at low concentrations.<br>Gas/vapour heavier than air May accumulate in confined spaces, particularly at or below ground level. |

### 10 STABILITY AND REACTIVITY

|                          |                                                                                                                                    |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Stability and reactivity | Stable under normal conditions.<br>Thermal decomposition yields toxic products which can be corrosive in the presence of moisture. |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------|

### 11 TOXICOLOGICAL INFORMATION

|         |                                                                            |
|---------|----------------------------------------------------------------------------|
| General | Pentafluoroethane - May produce irregular heart beat and nervous symptoms. |
|---------|----------------------------------------------------------------------------|

### 12 ECOLOGICAL INFORMATION

|                       |                                                                                                                                                                                                                   |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General               | Trifluoroethane (R143a) - When discharged in large quantities may contribute to the greenhouse effect.<br>Pentafluoroethane (R125) - When discharged in large quantities may contribute to the greenhouse effect. |
| Global warming factor | 3800 (CO <sub>2</sub> =1)                                                                                                                                                                                         |

### 13 DISPOSAL CONSIDERATIONS

|         |                                                                                                                                                                                                                |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General | Avoid discharge to atmosphere.<br>Do not discharge into any place where its accumulation could be dangerous.<br>Refer to supplier's waste gas recovery programme.<br>Contact supplier if guidance is required. |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### 14 TRANSPORT INFORMATION

|                   |       |
|-------------------|-------|
| UN Nr             | 3163  |
| Class/Div         | 2.2   |
| ADR/RID Item Nr   | 2, 2A |
| ADR/RID Hazard Nr | 20    |

## Safety Data Sheet

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Date :30/11/2001

### Labelling ADR

### Other transport information

Label 2: non flammable non toxic gas

Avoid transport on vehicles where the load space is not separated from the driver's compartment.

Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency.

Before transporting product containers ensure that they are firmly secured and:

- cylinder valve is closed and not leaking
- valve outlet cap/nut or plug (where provided) is correctly fitted
- valve protection device (where provided) is correctly fitted
- there is adequate ventilation.
- compliance with applicable regulations.

## 15 REGULATORY INFORMATION

Number in Annex I of Dir 67/548

Not applicable for preparations

EC Classification

Not classified as dangerous substance

Labelling of cylinders

Symbols

Label 2: non flammable non toxic gas

## 16 OTHER INFORMATION

Ensure all national/local regulations are observed.

Asphyxiant in high concentrations.

Contact with liquid may cause cold burns/frost bite.

Keep container in well ventilated place.

Do not breathe the gas.

The hazard of asphyxiation is often overlooked and must be stressed during operator training.

Users of breathing apparatus must be trained.

## Safety Data Sheet

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Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.

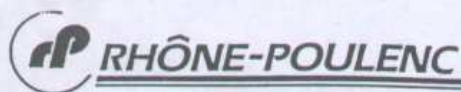
Details given in this document are believed to be correct at the time of going to press. Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.

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End of document.

Number of pages:5

## 12.5 R23 REFRIGERANT



### RHÔNE-POULENC CHEMICALS

PO BOX 46,  
ST ANDREW'S ROAD,  
AVONMOUTH,  
BRISTOL BS11 9YF

## Safety Data Sheet

Product: ISCEON 23

Page : 1/7

Date : 18 / 02 / 1997

Version : 2

Cancels and replaces version : 1

### 1 Product and company identification.

|                   |                                                                             |
|-------------------|-----------------------------------------------------------------------------|
| PRODUCT NAME:     | ISCEON 23                                                                   |
| SUPPLIER:         | Manufacturer :                                                              |
| Name:             | Rhône-Poulenc Chemicals Ltd                                                 |
| Address:          | PO Box 46<br>St Andrews Road<br>Avonmouth<br>BRISTOL<br>BS11 9YF<br>England |
| Telephone number: | (44) 0117 948 4242.                                                         |
| Telefax number:   | (44) 0117 948 4249.                                                         |

### 2 Composition / information on ingredients

>> SUBSTANCE:  
Common chemical name: TRIFLUOROMETHANE  
Synonyms: HFA23.  
HFC23.  
Fluoroform..  
CAS number: 75-46-7.

### 3 Hazards identification

#### MOST IMPORTANT HAZARDS:

|                                  |                                                                                                            |
|----------------------------------|------------------------------------------------------------------------------------------------------------|
| Adverse human health effects:    | Contains a liquefied gas. Contact of liquid may cause frostbite and injury to the cornea.                  |
| Main symptoms:                   | May have a narcotic effect at high concentrations.                                                         |
| Physical and chemical hazards:   | Heating will cause a rise in pressure with a risk of bursting.<br>On combustion, toxic gases are released. |
| Classification/Specific hazards: | According to EEC criteria, this product is not classified as a "hazardous substance".                      |

### 4 First-aid measures

|               |                                                                                                                                                                                                                                                                         |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Inhalation:   | Move the affected person away from the contaminated area and into the fresh air.<br>Make the affected person rest.<br>If breathing stops, give artificial respiration.<br>Call a doctor immediately.                                                                    |
| Skin contact: | Contact of liquid with the skin:<br>Rinse immediately with plenty of warm water.<br>Immediately remove contaminated clothing or footwear.<br>If it sticks, do not pull it off.<br>Cover the affected area with a sterile dressing.<br>Transfer to hospital immediately. |

EMERGENCY CONTACT NUMBER :(United Kingdom) : (0)117 938 1289

**RHÔNE-POULENC CHEMICALS**

PO BOX 46,  
ST ANDREW'S ROAD,  
AVONMOUTH,  
BRISTOL BS11 9YF

## Safety Data Sheet

**Product: ISCEON 23**

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Date : 18 / 02 / 1997

Version : 2

Cancels and replaces version : 1

**Eye contact:**

Contact of liquid with the eyes:  
Rinse with water whilst keeping the eyes wide open.  
Consult an eye specialist immediately.

**Ingestion:**

Not specifically applicable (gas).

**Notes to the physician:**

Avoid administering adrenaline or any other similar products.

**Fire - fighting measures**

**Extinguishing media:**

- Suitable:

All extinguishing agents can be used.

- Not suitable:

None. If there is a fire close by, use suitable extinguishing agents.

**Specific hazards:**

Pressurized container. On heating there is a risk of bursting due to internal pressure build-up.

NOT flammable. However, it may present a risk in the event of a fire.

Toxic vapours (halogen compounds) are released.

**Specific fire fighting methods:**

Stay upwind.

Evacuate the personnel away from the fumes.

Cool down the containers/equipment exposed to heat with a water spray.

**Protection of fire-fighters:**

Self-contained breathing apparatus.

**6 Accidental release measures**

**Personal precautions:**

Avoid contact with skin and eyes.

Do not breathe gas.

NO naked flames.

Do NOT smoke.

For further information refer to section 8 "Exposure-controls/personal protection".

Heavy vapours. Shut off low-level openings in the vicinity (ventilation shafts, drains...).

Prevent the product from entering cellars, basements or pits.

Stop the leak.

Ventilate spillage area.

Ventilate basements.

**Environmental precautions:**

Prevent the product from spreading into the environment.

Contain the spilled material by bunding.

**Methods for cleaning up:**

- Recovery:

Recover as much of the product as possible.

- Cleaning/Decontamination:

Allow residual product to evaporate.

- Disposal:

For disposal of contaminated materials refer to section 13: "Disposal considerations".

**7 Handling and storage**

**HANDLING**

**Technical measures:**

Ventilation.

Use in a closed system.

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**RHÔNE-POULENC CHEMICALS**

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AVONMOUTH,  
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**9 Physical and chemical properties****APPEARANCE:**

- Physical state: Compressed liquefied gas.
- Colour: colourless.
- Odour: slightly ethereal.
- pH: Not applicable

**Specific temperatures:**

- Freezing: -155°C.
- Boiling: -82.02°C.

**Flammability characteristics:**

- Flash point: Not applicable.

**Oxidizing properties:**

Non oxidizing material according to EEC criteria.

Vapour pressure: 4730 kPa, at 25°C.

Relative density (air = 1): 2.43.

Specific gravity: Liquid product:  
670 kg/m<sup>3</sup> at 25°C.**Solubility:**

- in water: Slightly soluble.  
1 g/l at 20 °C.
- in organic solvents: Soluble in:  
- common solvents.

**10 Stability and reactivity.**

Stability: Stable at ambient temperature and under normal conditions of use.

**Hazardous reactions:**

- Conditions to avoid: May decompose:  
- on contact with hot surfaces and flames.

**- Materials to avoid:**

Reacts violently with:  
- alkali metals.  
- alkaline earth metals.  
- magnesium.  
- powdered metals.

**- Hazardous decomposition products:**

On combustion or on thermal decomposition (pyrolysis) releases:  
toxic gases.  
(Fluorinated compounds).  
(Hydrofluoric acid).

**11 Toxicological information**

Acute toxicity: LC 50 inhalation (Rat) / 2h : 200000 ppm.  
(Unpublished work).

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**Acute symptoms:**

Effects following high level exposure:

Headaches.

Dizziness.

Loss of consciousness.

Possible effects, following high level exposure:

Cardiac disorders.

Possibility of cardiac arrest.

**Local effects:**

Contact with liquefied gas causes frostbite.

Contact with liquefied gas causes injury to the cornea.

**Further information:**

Not classified as hazardous according to EEC criteria.

**12 Ecological information**

Behaviour in the environment:

Mobility:

Product is volatile when in aqueous solution.

Persistence/Degradability:

No information available.

Bioaccumulation:

Not bioaccumulable.

Destination of the product:

Ultimate destination of the product : AIR.

Ecotoxicity:

- Effects on the aquatic environment:

No information available.

**13 Disposal considerations****WASTE FROM RESIDUES:**

Prohibition:

Do not allow the product to be released into the environment.

Destruction/Disposal:

Consult the manufacturer or supplier for information regarding recovery and recycling of the product.

If recovery is not possible:

Incinerate at a licensed installation.

**CONTAMINATED PACKAGING:**

Decontamination/cleaning:

De-gas.

Destruction/Disposal:

Re-usable containers:

Return to the supplier.

Disposable containers:

Dispose of at an authorised land-fill site.

**NOTE:**

The user's attention is drawn to the possible existence of local regulations regarding disposal.

**14 Transport information (\*)****INTERNATIONAL REGULATIONS :**

Land:

- Rail/road (RID/ADR):

UN number: 1984.

Class:2.

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**Sea (IMO/IMDG):**

Item number : 2°A). (\*)  
Hazard identification number: 20.  
Labelling: 2.  
Class: 2.2.  
UN Number: 1984.  
Labelling: 2 GAZ COMPRIME ININFLAMMABLE.  
Marine pollutant: NO.

**Air (ICAO-IATA):**

Class: 2.2.  
UN number: 1984.  
Labelling: 2 NON-FLAMMABLE GAS.  
Cargo aircraft : Packing instruction: 200 Quantity : 150 kg.  
Passenger aircraft: Packing instruction: 200 Quantity : 75 kg.

**OTHER REGULATIONS:**  
- United Kingdom: Rail/road

Substance identification number: 1984.  
Classification for conveyance: NON-FLAMMABLE COMPRESSED GAS.  
Emergency action code: 2RE.

**NOTE:**

The above regulatory prescriptions are those valid on the date of publication of this sheet.  
Given the possible evolution of transport regulations for hazardous materials, it would be advisable to check their validity with the Rhone-Poulenc commercial agency.

### 15 Regulatory information

**LABELLING :**
**EEC regulations:**

- R phrases:

- S phrases:

Mandatory labelling (self-classification) of hazardous substances: not applicable.

No R phrases.

S 24/25: Avoid contact with skin and eyes.

S 41: In case of fire and/or explosion do not breathe fumes.

&gt;&gt;Further regulations:

United Kingdom:

Handle in accordance with relevant British legislation e.g.

Health and Safety at Work Act 1974.

Environmental Protection Act 1990.

**NOTE:**

The regulatory information given above only indicates the principal regulations specifically applicable to the product described in the Safety Data Sheet.

The user's attention is drawn to the possible existence of additional provisions which complete these regulations.

Refer to all applicable national, international and local regulations or provisions.

### 16 Other information

**Uses:**

- Recommended uses:

Refrigerant.

Further product information:

Chemical formula:

C H F3.

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Molecular mass:

70.02 g

Registration numbers:

Registered in the TSCA inventory.

Registered in the EINECS inventory.

EINECS N°: 200-872-4.

This safety data sheet should be used in conjunction with technical sheets. It does not replace them. The information given is based on our knowledge of this product, at the time of publication. It is given in good faith.

The attention of the user is drawn to the possible risks incurred by using the product for any other purpose other than that for which it was intended.

This does not in any way excuse the user from knowing and applying all the regulations governing his activity. It is the sole responsibility of the user to take all precautions required in handling the product.

The aim of the mandatory regulations mentioned is to help the user to fulfil his obligations regarding the use of hazardous products.

This information is not exhaustive.

This does not exonerate the user from ensuring that legal obligations, other than those mentioned, relating to the use and storage of the product, do not exist. This is solely his responsibility.

End of document.

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