



**MFC**International

by RESPIREX

ENGINEERED INFLATABLE PRODUCT SOLUTIONS

# 12 Bar Powermat Lifting Bags

Instructions for Use



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# 1. Identification

## 1.1. TYPE OF PRODUCT

Powermat type -  
KS2, KS5, KS8, KS16, KS18, KS23,  
KS30, KS43, KS49, KS68, KS81, & KS97.

Max. lifting capacity

Max. height inflated

Volume

Working pressure 12 bar (174 PSI)

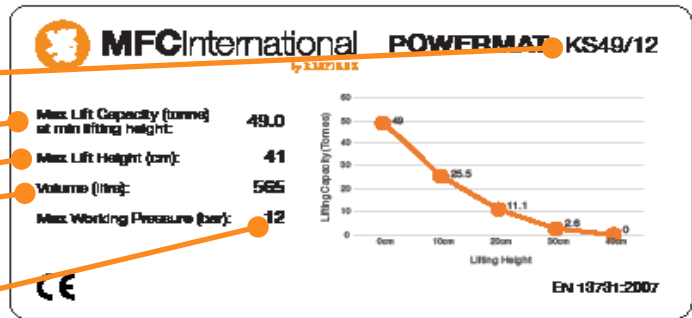


Fig 1.1 Example Powermat label

## 1.2 MANUFACTURER

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This user instruction manual provides guidance on safety, operation, maintenance and parts support for the KS range of Powermat lifting cushions.

# 2. Product Description

## 2.1. BASIC FUNCTIONS AND APPLICATION AREAS

The Powermat is a heavy-duty, high-pressure lifting cushion designed primarily for lifting vehicles and objects in emergency situations. Deflated, the Powermat has a very slim profile making it suitable for use in restricted or awkward spaces and compact to store. 12 bar Powermats are available in 12 standard sizes with maximum lifting capacities from 2000kg (2 tonne) up to 97200kg (97.2 tonne).

The Powermat inflates rapidly offering an instant lift. The most convenient source of air supply for inflation is from self-contained breathing apparatus cylinders or scuba bottles, alternatively a compressor, factory airline supply or a truck air brake system can be used. Filters should be used where there is a possibility of contaminated air supply.

Due to its rapid response capability the Powermat is an exceptionally versatile piece of equipment that can be used in USAR situations, industry, mining, railway construction/maintenance and military applications.

Powermats are constructed from compression-moulded neoprene that is reinforced with exceptionally tough high tensile Polyaramid cord (DuPont™ Kevlar®) that provides strength and rigidity, yet are light enough to be carried by just one person\*. The outer, hot-vulcanised, neoprene cover features a non-slip matrix pattern on both surfaces to increase friction and holding capability.

If required, Powermats can also have a controlled deflation facility and can be supplied with an optional bleed valve, please contact MFC International Ltd for further information.

Powermat high pressure lifting bags have been independently tested and comply with the requirements of EN 13731:2007 'Lifting bag systems for fire and rescue service use - Safety and performance requirements'.

\*KS2 through to KS43 can be carried by one person. KS49 through to KS97 should be carried by two persons.

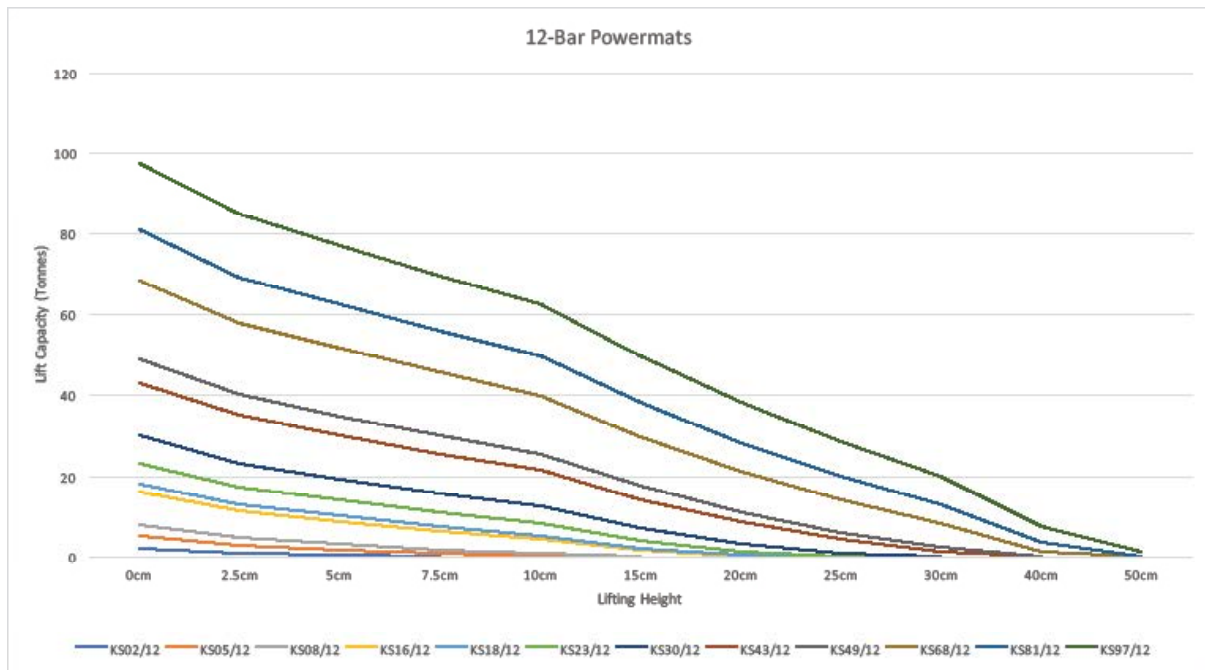


Fig.2.1

## 2.2. BASIC DATA

Technical Data	KS2	KS5	KS8	KS16	KS18	KS23	KS30	KS43	KS49	KS68	KS81	KS97
Product Code	KS02/12	KS05/12	KS08/12	KS16/12	KS18/12	KS23/12	KS30/12	KS43/12	KS49/12	KS68/12	KS81/12	KS97/12
Length (cm)	15	22.5	27	38	40.8	46	52	62	65.8	77.5	84	92
Width (cm)	15	22.5	27	38	40.8	46	52	62	65.8	77.5	84	92
Inflated Height (cm)	8	13	16	23	25	28	32	38	41	48	52	57
Deflated Height (cm)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Maximum Lift (tonne)	2	5	7.5	15.6	18.1	23.2	30	43.2	48.8	68.4	80.7	97.2
Air capacity at 12 bar (litres)	4	18	34	100	128	180	268	449	565	906	1151	1518
Weight (kg)	0.5	1.3	1.8	3.6	4.1	5.1	8	12	13.5	14.5	20	23
Max. Pressure (bar)	12	12	12	12	12	12	12	12	12	12	12	12

## 2.3. ENVIRONMENTAL CONDITIONS AND RESTRICTIONS OF USE

Powermats are suitable for use within a temperature range of -30°C to +100°C. Between -20°C to -30°C their use is limited to 1 hour, between +90°C to +100°C their use is limited to 30 minutes.

Never use where contact temperatures between the Powermat and load to be lifted are in excess of +100°C.

Powermats are **NOT** intended for use in potentially explosive atmospheres. For further information please contact MFC International Ltd.

## 2.4. SAFETY AND PERSONAL PROTECTIVE EQUIPMENT

Always wear personal protective equipment (PPE) when working with lifting mats. Fire fighters and rescue team members should wear appropriate PPE specified for their work role. Other users should wear a safety helmet, goggles, gloves and protective footwear.

## 3. Definitions

**Powermats** change the shape and size of their bearing surface when inflated.

**Bearing surface** is the surface of the Powermat in contact with the load or the object to be lifted

**Controller** is a device that supplies, empties and monitors the filling procedure with the air.

**Working pressure** is the pressure in the Powermat during operation

**Permissible pressure** is the maximum inflation pressure in the Powermat during operation, specified by the manufacturer.

**Inflation connector** is the connector on the Powermat where outlet hoses are connected

**Pressure regulator** or pressure reducer reduces the pressure of air supply to the specified pressure value

**Safety valve** protects the entire system and releases excess pressure to unload the system

**Lifting capacity\*** is the maximum weight that can be lifted by the Powermat at a specified pressure

**Connection hoses** connect the controller and Powermats

**Inlet hose** is a hose between the air source and controller

**Outlet Hose** is a hose between the controller and Powermat

**Contact surface** is the surface of the Powermat that makes contact with the load at a definite point of time during the inflation procedure

\*Max lifting capacity

## 4. Preparation Of Product For Use

### 4.1. TRANSPORTATION AND STORAGE

#### 4.1.1 TRANSPORT

During transportation, Powermats should be placed flat (horizontally) or upright (vertically); bending the Powermat should be avoided.

Powermats that are stored in a truck compartment that is subjected to constant bumping and vibration will eventually become damaged. It is strongly recommended that Powermats are stored in their own cushioned cartons. It is further recommended that all components are strapped down, braced or secured within the compartment during transport.

#### 4.1.2 STORAGE

Powermats are packed in cardboard boxes; sensitive parts of the mat are additionally protected.

Whether Powermats are stored in a stationary, mobile or movable facility the following conditions apply:

Always store in a clean, dry and dust free environment away from direct sources of light, particularly direct sunlight or intense artificial light with high ultra violet content.

Avoid equipment capable of generating ozone e.g. high voltage electrical equipment.

Powermats should be stored in a temperature range between +5°C to +25°C.

It is recommended that Powermats are stored flat (horizontally). When the Powermat is stored horizontally, the inflation connector should be facing forwards in a clearly visible position to prevent damage occurring when moving.

If the Powermat is stored vertically (upright) it is recommended fixing it to a surface (e.g. a wall) to protect against bending. The inflation connector should face upwards and be covered by the protective cap.

It is recommended that Powermats are stored in their original packaging to minimise various environmental influences on the product during storage. Alternatively, optional PVC storage pouches can be used, please contact MFC International Ltd for further information.

## 4.2. SAFETY PRECAUTIONS BEFORE USE

Always read the instructions carefully and understand safety procedures before use!

Rescue teams should participate in a training course held in conformity with internal training rules. Other users should attend a training course organised by MFC International Ltd or an authorised training service provider.

Never exceed the working pressure of 12 bar.

Under no circumstances should a Powermat be inflated to working pressure whilst not under load.

Ensure Powermats are protected from hot vehicle exhausts. Exhausts should be covered with a folded fire and heat resistant blanket.

Keep clear of loads which are unsupported by chocks during lifting operations.

Operators should be positioned away from the direction of anticipated thrust particularly when making space with partially-inserted Powermats.

Never work under a load without safety supports.

Do not use an outlet hose for retrieving or repositioning a Powermat.

Ensure all gauges are reading zero before disconnecting hose.

## 4.3. REMOVAL OF PACKAGING

In order to avoid damaging Powermats do not use sharp objects such as knives, screwdrivers or similar for the removal of packaging.

## 4.4. DISPOSAL OF PACKAGING

Packaging is made of recyclable cardboard; it should be deposited in waste bins for recycled paper or cardboard packaging.

## 4.6. INSTRUCTIONS AND PERIODIC TESTS REPORTS

Instructions and periodic test reports are enclosed with every Powermat and retained on file at MFC International Ltd for the shelf life of the lifting mat, i.e. 15 years.

**Instructions and periodic test reports should be retained throughout the service life of the mat.**

# 5. Instructions for Operations

## 5.1. RECOMMENDATIONS FOR SAFE AND EFFICIENT WORK

Failure to follow the instructions can put safety of users and third persons at risk and result in significant injury. Carefully read the instructions for operation before using the lifting mat!

**WARNING! NEVER REACH UNDER A LOAD WHICH IS NOT PROTECTED BY MECHANICAL SAFETY SUPPORTS**

- Never exceed the maximum working pressure (marked on the Powermat).
- Never place more than two Powermats on top of each other.
- Never exceed a pressure of 1 bar if no load is placed on the Powermat.
- Inflate the Powermat until a required or maximum height, or maximum working pressure is reached.



- Improper use of Powermats should be avoided. MFC International Ltd assumes no responsibility for damage resulting from improper use of the product.
- Always use the specified PPE when working with the Powermat.

#### 5.1.1. CARRYING THE POWERMAT

Carry the Powermat in an upright position and make sure the inflation connector always faces upwards to prevent damage in case of a fall. When carrying several Powermats together they should be placed horizontally and carried by two persons.

Larger and heavier Powermats, i.e. KS33, KS46, KS54 and KS67 should always be carried by two persons.

#### 5.1.2. WORKING ENVIRONMENT

##### TEMPERATURE OF THE OBJECT TO BE LIFTED:

Protect the Powermat with a thermal blanket, fibreboard or rubber-coated steel board if the contact surface temperature of the object to be lifted exceeds 65°C (150°F). Temperatures exceeding the permissible values can damage the Powermat. Powermats preserve their lifting capacity and material properties down to the lowest temperature permitted which is -30°C.

##### LIGHTING OF THE WORKING PLACE:

It is dangerous to work in low light conditions; ensure the work area is not poorly lit or in shadow. MFC International Ltd recommend the use of additional lighting, e.g. floodlights, even during daylight hours when visibility can be poor due to shading or cloud cover. Never use a naked flame for lighting purposes.

##### PRESENCE OF AUTHORISED PERSONNEL:

Only trained personnel should prepare and lift/lower the load. Other personnel should remain away from the area where Powermats are prepared, lifted or lowered. Appropriate measures aimed at minimizing risks that could endanger the safety of personnel and the environment, such as an outbreak of fire due to fuel leakage, should be put in place prior to carrying out lifting operations.

##### FIRE AREAS:

Powermats may be used in a fire area only after the contact temperature between the load and the ground drops below 55°C.

#### 5.2. CHOOSING A POWERMAT

The following data is required in order to choose an appropriate Powermat:

- Shape of the load
- Weight of the load to be lifted
- Required lifting height

Consider the data about the load weight and required lifting height, see Fig.2.1, in choosing an appropriate Powermat:

Example:

A load of 20 t is to be lifted to the height of 150mm using one Powermat.

Considering Fig.2.1, the lifting capacity of KS68, KS81 and KS97 Powermats meet the requirements. The lifting capacity of the KS49 Powermat is not sufficient for reaching a height of 150 mm.

Lifting heights can be increased by stacking two Powermats on top of each other; see Section 5.4.2.1. For other methods of increasing lifting height see Section 5.4.1. When stacking Powermats always ensure that the uppermost lifting cushion in the stack is of smaller dimensions than the lower, see Fig 5.21.



### 5.3. SYSTEM FOR POWERMAT INFLATION

- Powermats are to be inflated solely with air, other gases should not be used. Controllers with built-in safety valves should be used for inflation of Powermats.
- Never inflate a Powermat without a load to more than 1 bar pressure.
- Inflate the Powermat until the required or maximum lifting height or maximum working pressure is reached.

#### 5.3.1. PREPARATION OF POWERMATS FOR LIFTING PROCEDURE

Prepare the following items for lifting loads using a Powermat:

1. Air source
2. Pressure regulator (if the pressure of air source exceeds 12 bar)
3. Controller (a range of controllers is available see “5.6 OPTIONAL ACCESSORIES” on page 20.
4. Inlet hose
5. Outlet hose
6. Powermat

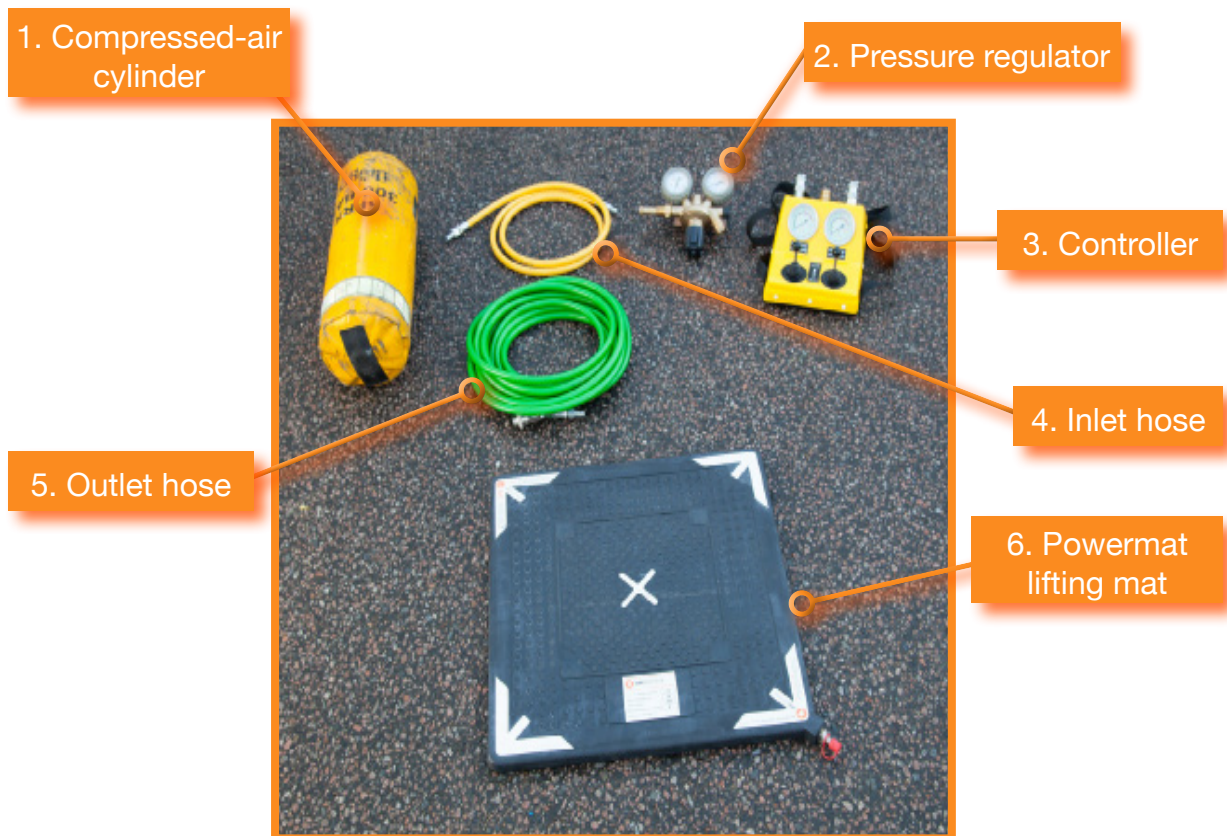


Fig 5.1

Always use the items detailed above when lifting a load using a Powermat. Use only original systems for inflation specified by MFC International Ltd. If compressed air contains oil, use oil separator.

### Step 1: Position the Powermats



Fig 5.2

Position the Powermat in a defined and previously prepared location. Follow the rules defined in sections 5.1 and 5.2. Use mechanical supports for load stabilization.

### Step 2: Connect outlet hoses to Powermat



Fig 5.3

Outlet hoses are of different colour to prevent confusion during use. If several Powermats are used, connect each one with a hose of different colour. Hoses are equipped with safety couplings having dual protection.

Connect the safety coupling of the outlet hose to the hose connector on the Powermat/s as shown by the arrow, see Fig 5.3, press firmly until it clicks into place.

### Step 3: Connect outlet hoses to controller



Fig 5.4

Connect the opposite end of the outlet hose from the Powermat to the connection coupling on the controller, see Fig 5.4. If inserted correctly, the connection coupling clicks into place.

The outlet hoses should be entirely unrolled without constrictions or kinks.

### Step 4: Prepare the air source

A compressed-air cylinder is the most frequently used air source for Powermat inflation.

If a different air source is used make sure that:

- Inlet air pressure supplied to the controller is reduced via the regulator to a maximum of 12 bar.
- The inlet hose connector for connection to the controller should be a type 26 safety coupling.

#### Step 4.1: Remove the safety plug from the compressed-air cylinder



Fig 5.5

Before removing the safety plug, check if the valve on the cylinder is shut-off; to shut-off the valve turn it clockwise.

Unscrew the safety plug and keep it in a safe place.

#### Step 4.2: Connect inlet hose to pressure regulator



Fig 5.6

Connect the inlet hose connector to the inlet air supply coupling on the pressure regulator; see the arrow in Fig 5.6. If correctly inserted, the coupling on the controller clicks into place.

#### Step 4.3: Attach the pressure regulator to the cylinder

Shut-off the relief valve on the pressure regulator by turning clockwise.

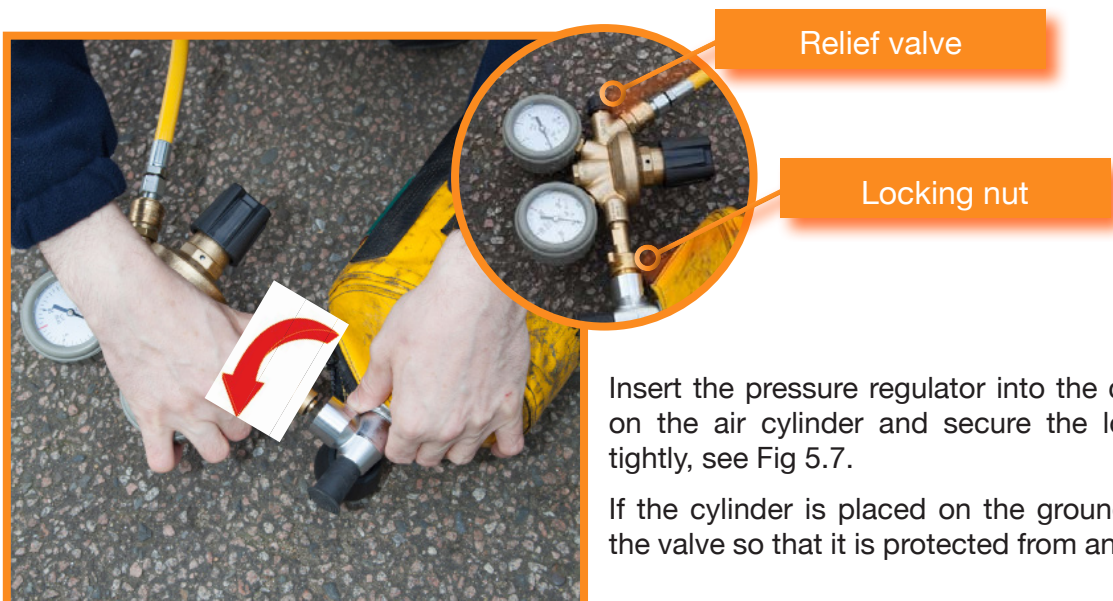


Fig 5.7

Insert the pressure regulator into the connection on the air cylinder and secure the locking nut tightly, see Fig 5.7.

If the cylinder is placed on the ground, position the valve so that it is protected from any damage.



#### Step 4.4: Set the pressure regulator to the required value



Open the valve on the cylinder.  
Unscrew it completely then turn back by half a turn.

The pressure gauge should indicate a value of 200  
or 300 bar depending on cylinder capacity.

The required working pressure is set by turning the  
adjusting valve.

Observe the set value on the outlet pressure gauge  
(12 bar) during value setting.

Fig 5.8

#### Step 5: Connect the inlet hose to the controller



Connect the inlet hose connector to the inlet air  
supply coupling on the controller; see the arrow  
in Fig 5.9. If correctly inserted, the coupling  
on the controller clicks into place. Move the coupling  
housing by 180° left or right to lock the coupling.

Fig 5.9

#### Step 6: Relieve the pressure regulator



Release the pressure into the controller by turning  
the relief valve anti-clockwise.

Fig 5.10

### 5.3.2. WORKING WITH THE CONTROLLERS

**Always monitor the pressure on the respective pressure gauge, the behaviour of the Powermats and the load during inflation.**

If the maximum pressure is exceeded the safety valve on the controller activates and relieves the pressure from the Powermat.

#### 5.3.2.1. DUAL CONTROLLER AND SINGLE CONTROLLER WITH CONTROL LEVERS



Fig 5.11

By using a dual controller, one or two Powermats can be operated simultaneously. The Powermats are handled by means of a control lever under the respective pressure gauge. When the control lever is pushed forwards, the pressure in the connected Powermat builds up. When the control lever is pulled backwards, the pressure in the Powermat reduces. When the control lever is released, it automatically returns to its neutral position. The filling and discharge valve is shut-off.

#### 5.3.3. DISCONNECTING POWERMATS

Powermats and other required components are under high-pressure, extreme caution is required when disconnecting. Disconnect the Powermats as follows:

**Step 1: Shut-off the valve on the compressed-air cylinder; see Fig 5.5.**

**Step 2: Shut-off the relief valve on the pressure regulator by turning clockwise; Fig 5.10.**

**Step 3: Completely release the pressure from the connected Powermats by pulling the levers of the controller backwards, see Fig 5.11.**

**Step 4: Completely release the air from the outlet hose and valves that are connected to the Powermats by pulling the levers of the controller backwards, then immediately empty the Powermats once again.**



Fig 5.12

**Step 5: Disconnect the inlet hose from the controller by rotating the coupling housing until the groove on the housing clicks in, see Fig 5.12. Slide the coupling housing towards the controller and disconnect the inlet hose from the controller.**

**Step 6: Dismount the pressure regulator**

Unscrew the locking nut on the pressure regulator and detach the regulator from the compressed-air cylinder, see Fig 5.7.

**Step 7: Attach the safety plug on the compressed-air cylinder, see Fig 5.5.**



Fig 5.13

**Step 8: Disconnect the outlet hoses from the controller by pushing the hose connector towards the controller. Slide the coupling housing backwards towards the controller. Release the hose from the coupling.**

When outlet hoses are disconnected, the pressure automatically releases from the hoses.

**Step 9: Remove the Powermats from the work area and keep them in an easy accessible place.**

**WARNING! Never remove Powermats by pulling on the outlet hoses.**



Fig 5.14

**Step 10: Disconnect outlet hoses from the Powermat by pushing the hose coupling towards the Powermat. Slide the hose coupling sleeve collar backwards away from the Powermat and release the hose; the plug of the Powermat automatically jumps out of the coupling.**



## 5.4. LIFTING PROCEDURE

Before starting work, check the location where the Powermat is to be positioned.

Remove any sharp objects such as glass fragments or other foreign particles to avoid damaging the Powermat. Never lift with a Powermat that is in contact with any sharp metal edges, nails, screws or similar that may puncture, abrade or otherwise damage the Powermat.

If a Powermat is to be used where a danger of slipping exists due to:

- oil spillages
- chemicals that could affect the properties of rubber
- ice or snow

spread some sand or other granulated material between the Powermat and the surface to increase friction or use a fibreboard as protection.

If the Powermat is used on non-consolidated or soft terrain place a firm support, e.g. a fibreboard, under the Powermat to assure stability during lifting and prevent possible slipping of the load or the Powermat itself.

**WARNING!** A mechanical safety support **MUST** be used in all lifting operations. Never work under a load that is only supported by means of an inflated Powermat.

Position the bag in a prepared location or on a built support, see Fig 5.15.

**WARNING!** Certain parts of the load may not be fixed to the main load to be lifted. Any loose parts should be secured or removed. Under no circumstances should loose parts be supported by an inflated Powermat in order to lift the main load.

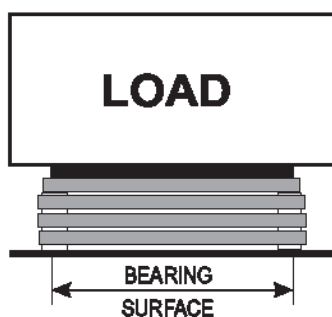


Fig 5.15

Fig 5.15: Mechanical safety support and bearing surface

A mechanical safety support should be firm enough to withstand the load. It should be placed on a solid surface to minimise the possibility of slipping.

As Powermats are inflated both their contact surface and lifting capacity decrease. For the lifting capacity at a particular lifting height refer to Fig.2.1.

Lifting capacity (tonne) is highest at the beginning of the lifting procedure when the lifting height is at its lowest (Fig 5.15). As the Powermat is inflated it gradually takes its spherical shape (Fig 5.16) and the bearing surface and thus the lifting capacity reduce correspondingly.



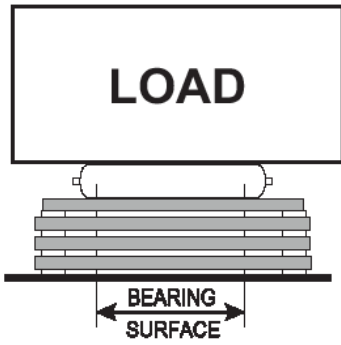


Fig 5.16

Fig 5.16: Bearing surface reduces while the lifting height increases

When the lifting height is at its maximum, the contact surface and lifting capacity of the Powermat is at its minimum (Fig 5.17).

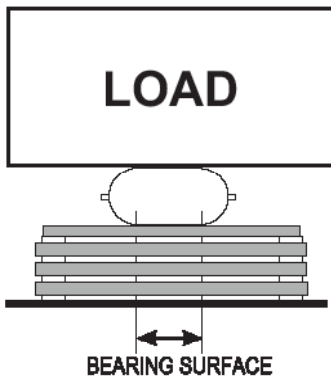


Fig 5.17

Fig 5.17: Minimum bearing surface at the maximum lifting height

#### 5.4.1. LIFTING WITH A SINGLE POWERMAT

If only one Powermat is available and the gap between the ground and the object to be lifted exceeds 70mm, build a firm and sufficiently high support to a point that just allows enough space to insert an uninflated Powermat.

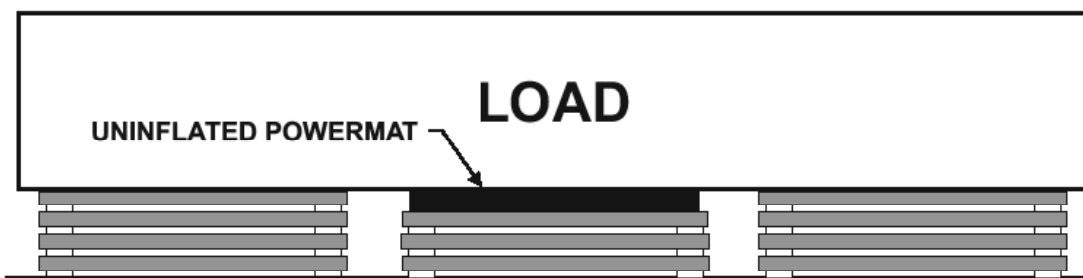


Fig 5.18

Build a safety support on each side of the load to a point where it is impossible to insert another level, see Fig 5.18. Follow this process to minimize the height from which the load may drop in the event of an abrupt air loss from the Powermat.

Position the Powermat on the middle of the support so that its inflation connector is facing forwards. Make sure that the white cross on the Powermat's upper surface makes contact with the underside of the load. If the Powermat is not positioned centrally beneath the load the bearing surface may be reduced, this can cause the load to slip away during inflation and may lead to a sudden and uncontrolled ejection of the Powermat.

Slowly inflate the Powermat to reach the required height and simultaneously add lateral safety supports, see Fig 5.19.

The uppermost support must be sufficiently solid to prevent shifting or collapse during inflation as the Powermat takes up its characteristic ovoid shape.

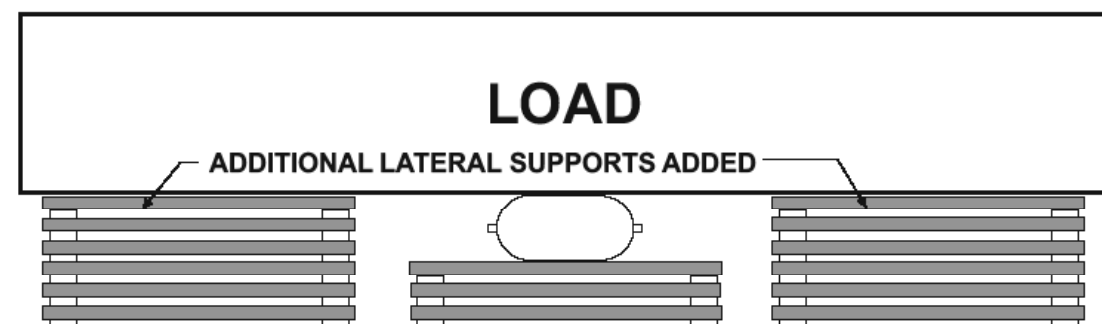


Fig 5.19

**Do not inflate the Powermat whilst adding lateral safety supports.**

Once the final lift height has been reached, carefully deflate the Powermat to allow the load to rest fully on the lateral safety supports. If a working space is required under the point of lifting, remove the Powermat and the support(s) beneath it.

**When working under a load it should be stabilised and the Powermat completely deflated.**

#### 5.4.2. LIFTING WITH SEVERAL POWERMATS, INCREASING THE LIFTING CAPACITY

Lifting capacity can be increased by positioning two Powermats side by side and simultaneously inflating, see Fig 5.20. The new capacity is double that of a single Powermat.

Example:

The capacity of combined lifting bags KS18 and KS23 side by side and simultaneously inflated amounts to 41.3 t, i.e. capable of lifting a load of 41.3 t.

Fig 5.20: Two Powermats placed side by side to increase the lifting capacity.

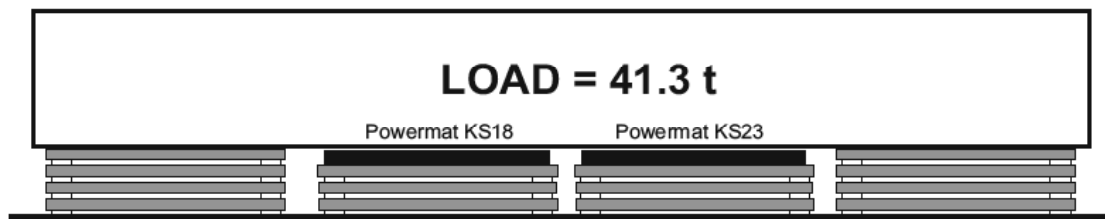


Fig 5.20

Lifting height can be increased by stacking one Powermat on top of the other, see Fig 5.21. and sections 5.4.2.1 and 5.4.2.2. The total lifting height of such a combination equals the sum of lifting heights.

**Lifting capacity does not increase by stacking two Powermats one on top of the other; only lifting height increases. The load capacity of the combination equals the capacity of the smallest Powermat within the stack.**

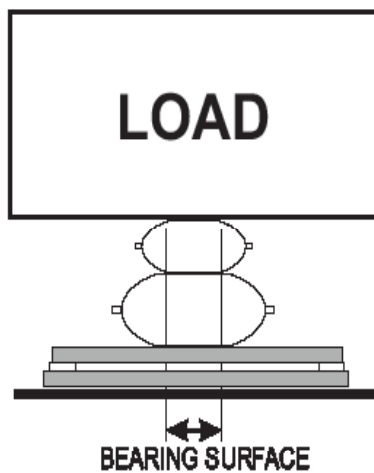


Fig 5.21

Fig 5.21: Combined Powermats to increase lifting height

**WARNING:** If the required lifting height cannot be determined, choose the largest Powermat available that can be placed under the load.

Example:

A combination of Powermats KS15 (23 cm) and KS18 (25 cm) stacked one upon the other enables a total lift height of 48 cm.

### 5.4.2.1 LIFTING USING TWO POWERMATS

**A MAXIMUM of TWO Powermats may be combined to increase lifting height.**

When combining Powermats to increase lifting height, position the smaller Powermat centrally on top of the larger and make sure that all connectors are facing forwards.

Set up the safety support and base for the Powermat and follow the procedure for working with a single Powermat, see section 5.4.1.

Firstly inflate the lower, larger Powermat until the upper, smaller Powermat comes into contact with the load. Then fully inflate the upper Powermat and if required, the lower Powermat until the required lifting height is reached.

Empty the Powermats in reverse order.

### 5.4.3. LIFTING LOADS OF UNUSUAL SHAPE

#### 5.4.3.1. LIFTING OF PIPES AND PROFILES

A problem arises when the load does not rest over the entire lifting surface of the Powermat. Moreover, the Powermat may become damaged if it bends or is overloaded with angular, jagged or sharp-edged loads.

Insert fibreboard or similar between the Powermat and the load to allow the lifting force to evenly distribute over the entire lifting surface, see Fig 5.22.

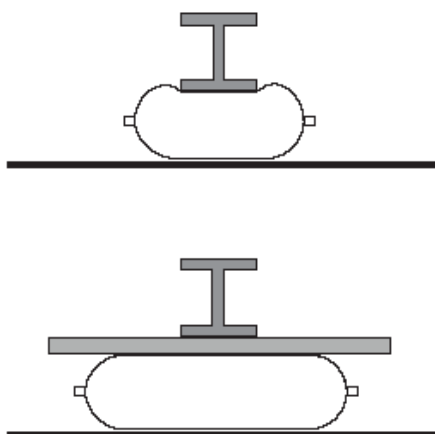


Fig 5.22: Supporting the Powermat with a fibreboard when lifting profiles or pipes

Fig 5.22

### 5.4.3.2. LIFTING OF CYLINDRICAL OBJECTS

Larger cylindrical objects such as tanks cannot be lifted using a single Powermat. If the load is not firmly fastened it will roll away as soon as the bag begins to inflate and take on its typical ovoid form.

For this reason, two Powermats are used for lifting of cylindrical objects, placed one at each side of the object, see Fig 5.23. Make sure that Powermats are inflated evenly and simultaneously.

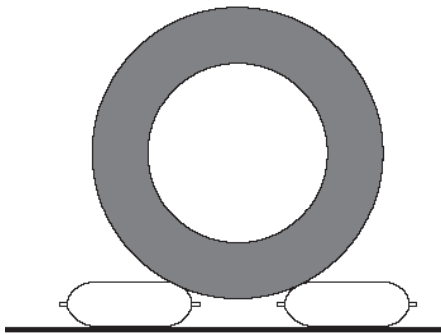


Fig 5.23: Lifting large cylindrical loads

Fig 5.23

### 5.4.3.3. USING A POWERMAT TO SEPARATE OR MOVE AN OBJECT

Powermats can be used for separating and moving objects horizontally. Position one face of the Powermat against a bar, a pillar or another firm and rigid object; position the opposite face against the object to be moved.

Thin-walled objects, e.g. sheet metal panelling, may bend or rupture due to the Powermat's pressure. To prevent damage occurring, insert a thick fibreboard or similar between the Powermat and the object to be moved, this will distribute the moving force over a greater surface area, see Fig 5.24.

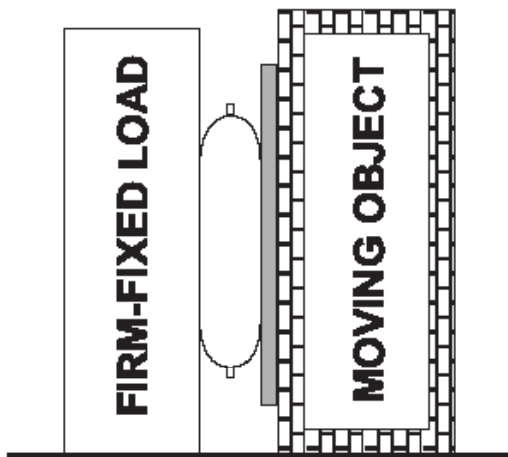


Fig 5.24: Moving or separating objects

Fig 5.24

#### 5.4.3.4. FURTHER EXAMPLE APPLICATIONS FOR POWERMATS

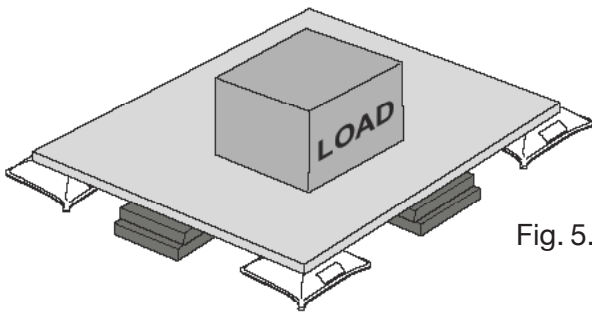


Fig. 5.25: Increasing lifting area using multiple Powermats

Fig. 5.25

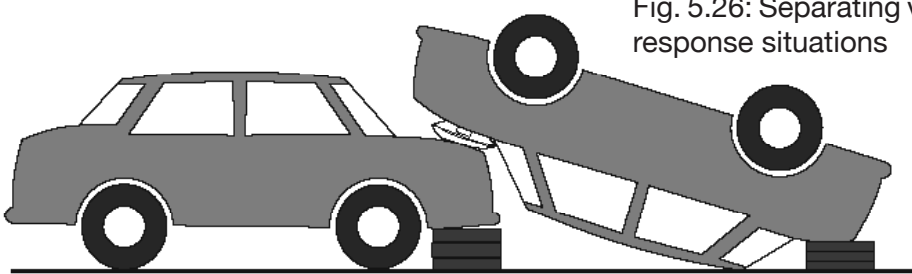


Fig. 5.26: Separating vehicles during emergency response situations

Fig. 5.26



Fig. 5.27 Vehicle wheel or tyre replacement

## 5.5. UNEXPECTED SITUATIONS

If the Powermat, hoses or any other components of the lifting system suffer damage which may compromise safety at work, immediately interrupt work and replace the damaged component. Never use Powermats and hoses that exhibit cracks, bulges, unusual deformations or similar.

If the lifting of a load using a Powermat is considered to be a hazard, either to the persons to be rescued or the rescue team, immediately stop the lifting process. Consult rescue operations professionals on the use of an alternative lifting method (crane, towing, etc.).

**A very loud bang is heard if the Powermat bursts.**

Unexpected Situation	Consequence	Procedure
Abrupt pressure drop in the Powermat. The Powermat and the load sink in an uncontrolled manner.	The load sinks down to the support. A very loud bang is heard when the Powermat bursts.	If a failure is identified on one or more of the components, replace those components; otherwise replace all components.
The pressure gauge indicates the working pressure is reached but the Powermat fails to lift.	The load cannot be lifted.	Double check whether a suitable Powermat was chosen.
Even though the valve for inflating the Powermat is activated, the working pressure on the pressure gauge is not reached.	The load cannot be lifted.	Check the Powermat inflation system. Examine individual components and if a failure is identified on one or more of the components, replace the component; otherwise replace all system components.
Uncontrolled slipping of the load or Powermat.	The load is unbalanced.	Very carefully lower the load to ground level or to the support by deflating the Powermat. Check and, if necessary, re-arrange the basic positioning of the Powermat and/or support.
Exceeding the working pressure in an uncontrolled manner.	Powermat bursts accompanied by a loud bang.	The Powermat's system is secured by means of safety valves. If working pressure is exceeded, immediately interrupt the lifting procedure and carefully lower the load to the prepared supports. Check the Powermat's inflation system. Examine individual components and if a failure is identified on one or more of the components, replace the respective component, or replace all system components.



## 5.6 OPTIONAL ACCESSORIES

Please see below for a list of optional accessories suitable for use with Powermat lifting mats. Further information is available from MFC International Ltd.

### Controllers & Regulators



**12 Bar Steel Controller**



**12 Bar Plastic Controller**



**12 Bar Hand Held Controller**



**12 Bar Aluminium Single Control Unit**



**12 Bar Aluminium Double Control Unit**



**12 Bar Aluminium Triple Control Unit**



**12 Bar Regulator**



**Scuba 300 Bar Regulator**

### Hoses



**Blue Outlet Hose (5m / 10m)**



**Red Outlet Hose (5m / 10m)**



**Green Outlet Hose (5m / 10m)**



**Yellow Inlet Hose (2m / 5m / 10m)**



**Yellow Outlet Hose (5m / 10m)**

**Couplings**



**Series 25  
Female Coupling  
1/4" BSP Female Thread**



**Series 25  
Male Coupling  
1/4" BSP Female Thread**



**Series 25  
Male Coupling  
1/4" BSP Male Thread**



**Series 26  
Female Coupling  
1/4" BSP Male Thread**

**Other Accessories**



**Safety Chocks**

Part numbers dependant on hose length and couplings selected. Contact MFC International for more information.

## 5.7. DISPOSAL OF WASTE MATERIAL

A damaged or unserviceable product or a product whose service life has expired should be withdrawn from the use.

As Powermats are designated as recyclable, waste classification according to valid local regulations applies.

# 6. Maintenance and Cleaning

## 6.1. SAFETY PRECAUTIONS

Use protective goggles, gloves and footwear when cleaning Powermats.

## 6.2. MAINTENANCE AND CLEANING AFTER USE

### 6.2.1. MAINTENANCE OF POWERMATS AFTER USE

Powermats are predominantly used in environments where contaminants are present (accident sites, manufacturing and construction sites etc.); it is therefore vitally important that thorough cleaning and inspection takes place after every use before Powermats are placed into storage.

Accumulations of dirt, oil and grease on the surface can cause Powermats to slip during use. Clean by scrubbing thoroughly with a solution of warm soapy water using a stiff bristled brush or broom and then rinse by spraying with cold water. Never use sharp objects to remove dirt from the surface. If any cleaning solution or water enters a Powermat during cleaning, allow it to dry thoroughly before repeat use.

Never use any petroleum based products, thinning agent, alcohol or aggressive cleaning agents for cleaning Powermats as these can adversely affect the product and lead to unexpected component failure.

Never use high-pressure jet washers on Powermats.

Dirt in the inflation connector can cause blockages and obstruct airflow through the outlet hoses. Check the opening in the connector; if any dirt is present it can be removed using a thin wire. Be careful to draw the dirt out of the connector rather than pushing it into the Powermat.

Do not drag or drop the Powermat on the inflation connector; this can lead to breakage of the connector and render the Powermat unserviceable. Breakage of the brass inflation connector is not covered under the warranty.

After cleaning, place the Powermat upright and wipe the connector with a clean cloth. Allow Powermats to dry naturally in the air, never dry by means of a heating device or by placing in a drier.

After cleaning and drying, examine the Powermat as follows:

- Examine all surfaces for air blisters, cuts, abrasions or bulges (ply separation) that might be hidden under debris. Pay particular attention for any evidence that fibres of the inner Polyaramid core are protruding through the surface of the Powermat. The strength of the Powermat is essentially the Polyaramid core and if this is found to be exposed the Powermat should be withdrawn from use immediately. Shallow surface cuts or abrasions will not affect the efficiency of the Powermat. If a Powermat leaks, it is NOT repairable.
- Mark any damage or defects using chalk. If there is uncertainty about the condition of a damaged Powermat, consult MFC International Ltd or an authorised service representative regarding further use of the bag.
- Examine the Powermat inflation connector for any damage that may prevent connection to outlet hoses. Damaged inflation connectors should be replaced.

### 6.2.1.1 REPLACING THE POWERMAT INFLATION CONNECTOR

The following items are required when replacing a Powermat inflation connector:

- Spare Type 25 male connector (male thread)
- 2 x 17mm spanner
- Liquid thread sealant

Using two 17mm spanners, unscrew the damaged inflation connector from the Powermat as shown in Fig 6.1. Apply a small amount of liquid thread sealant, e.g. Bondloc B542 or equivalent, to the thread of a new series 25 male connector (follow guidance from thread sealant manufacturer for precise details) and screw into Powermat. Tighten using 17mm spanners.



Fig. 6.1: Removing damaged inflation connector from Powermat

Fig 6.1



Fig 6.2: Attaching a new connector

Fig 6.2

### 6.2.2. MAINTENANCE OF HOSES AFTER USE

After each use, hoses should be cleaned using a mild solution of washing-up liquid and warm water; then rinsed with clean cold water.

Do not use high-pressure jet washers on hoses.

Check the opening in the connector and coupling. If the connector and coupling are filled with dirt, remove using a thin wire. Always pull dirt out of the connector or coupling; avoid pushing dirt into the hose.

Wipe hoses with a dry cloth.

Do not dry hoses in a drier or by means of heating devices; allow to dry naturally.

Carefully examine the cleaned and dried hoses, as follows:

- Check for any cuts or abrasions. Mark any damage or defects using chalk and consult MFC International Ltd or an authorised service regarding further use of the hose.
- Check hose series 25 male connector. If damage prevents connection to the coupling on the controller, the outlet hose should be replaced.
- Check hose series 25 female coupling; if damage prevents connection to the connector on the Powermat, the outlet hose should be replaced.

### 6.2.3. MAINTENANCE OF THE CONTROLLER AFTER USE

Controllers should be cleaned and maintained in compliance with the relevant instructions supplied.

### 6.3. PREVENTIVE MAINTENANCE

Preventive maintenance includes routine inspection of Powermats and associated equipment for lifting, performance of tests and replacement of damaged parts.

The enclosed check-up lists can offer assistance when carrying out preventive maintenance.

Always comply with the valid local regulations when carrying out preventive maintenance.

Always wear personal protective equipment (PPE) during check-ups and testing. Fire fighters and rescue team members should wear appropriate PPE specified for their work role. Other users should wear a safety helmet, goggles, gloves and protective footwear.

For further information regarding how to carry out preventative maintenance please contact MFC International Ltd.

**If you are unsure as to the safe performance of a test consult MFC International Ltd or an authorised representative.**

**Function tests or pressure tests should only be carried out after a visual check has verified that the bag is defect free.**

**Never use a Powermat if a visual or function test has identified damage, leakages or irregularities in operation of the equipment.**

#### 6.3.1. CHECK-UP INTERVAL

##### Powermat lifting mat

Test	Check-up interval	Performed by	Procedure
Visual test	After every use	Personnel qualified for operating Powermats	Section 6.3.1.1.
	Annually		
Function test	After every use	Personnel qualified for operating Powermats	Section 6.3.1.2.
	Annually		
Periodic test	5,7,9,11,12,13 and 14 years after manufacture	Manufacturer or a person authorised by the manufacturer	

##### Pressure Regulator

Test	Check-up interval	Performed by	Procedure
Visual test	After every use	Personnel qualified for operating Powermats	Section 6.3.1.3.
	Annually		
Function test	After every use	Personnel qualified for operating Powermats	Section 6.3.1.4.
	Annually		
Periodic test	5,7,9,11,12,13 and 14 years after manufacture	Manufacturer or a person authorised by the manufacturer	

## Hoses (Outlet and Supply)

Test	Check-up interval	Performed by	Procedure
Visual test	After every use	Personnel qualified for operating Powermats	Section 6.3.1.5.
	Annually		
Function test	After every use	Personnel qualified for operating Powermats	Section 6.3.1.6.
	Annually		
Periodic test	5,7,9,11,12,13 and 14 years after manufacture	Manufacturer or a person authorised by the manufacturer	

## Controller

Test	Check-up interval	Performed by	Procedure
Visual test	After every use	Personnel qualified for operating Powermats	Section 6.3.1.7.
	Annually		
Function test	After every use	Personnel qualified for operating Powermats	Section 6.3.1.8.
	Annually		
Function test of pressure gauges	After every use	Personnel qualified for operating Powermats	Section 6.3.1.9.
	Annually		
Function test of safety valve	After every use	Personnel qualified for operating Powermats	Section 6.3.1.10.
	Annually		
Periodic test	5,7,9,11,12,13 and 14 years after manufacture	Manufacturer or a person authorised by the manufacturer	

### 6.3.1.1. VISUAL TEST OF THE POWERMAT

**The following test should be performed outdoors only. Observe a safe distance between all personnel present, neighbouring buildings and the Powermat under test..**

Connect an unloaded Powermat as specified in section 5.3. Inflate the Powermat to 0.2 x working pressure (2.4 Bar, 35 psi). Visually check for any unusual bulges, punctures, cuts, abrasions or other mechanical damage. Using a brush, apply some soapy water over the entire surface of the Powermat, including around the inflation connector. Visually check the surface of the Powermat for any air bubbles denoting a leak(s). If air leakage is detected the Powermat is not repairable and should be withdrawn from service.

### 6.3.1.2. FUNCTION TEST OF THE POWERMAT

**The following test should be performed outdoors only. Observe a safe distance between all personnel present, neighbouring buildings and the Powermat under test..**

Connect an unloaded Powermat as specified in section 5.3. Inflate the Powermat to 0.5 x working pressure (6 Bar, 87 psi). The Powermat is functional if the pressure does not drop by more than 10% within an hour.

#### 6.3.1.3. VISUAL TEST OF PRESSURE REGULATOR

Visually check for any signs of obvious damage on:

- Threads of cylinder connection locking nut, see Fig 5.7 on page 8.
- Pressure gauges and the maximum working pressure marking
- Protective caps on pressure gauges
- Relief valve
- Hoses for splits, abrasions or other damage, e.g. damage as a consequence of contact with acids

#### 6.3.1.4. FUNCTION TEST OF PRESSURE REGULATOR

Connect the pressure regulator to a standard compressed-air cylinder. Shut off the relief valve.

Open the valve on the cylinder. The left pressure gauge on the regulator should display the cylinder contents.

Using a brush, apply some soapy water around the connection between the regulator and the cylinder and check for air bubbles denoting a leak(s).

Rotate the adjusting valve and reduce the outlet pressure until 0 bar is displayed on the right hand gauge. Rotate the adjusting valve in the opposite direction until the maximum value marked on the right hand gauge is reached (12 bar). The adjusting valve should permit setting and operate smoothly throughout the working range.

Using a brush, apply some soapy water around the connector and check sealing of the relief valve.

Connect an inlet hose between the pressure regulator and controller. Slowly open the relief valve until it is fully open. The relief valve should operate smoothly at all times. The pressure gauge on the controller should display the same value as displayed on the right hand pressure gauge of the pressure regulator. Using a brush, apply soapy water to the inlet hose between the pressure regulator and controller and check all connections for leaks.

#### 6.3.1.5. VISUAL TEST OF THE OUTLET HOSE

Visually check for damage on:

- Connection couplings (series 25)
- Hoses for splits, abrasions or other damage, e.g. damage as a consequence of contact with acids

#### 6.3.1.6. FUNCTION TEST OF THE OUTLET HOSE

Connect the controller and Powermat with an outlet hose, see section 5.3.1. Inflate the Powermat to 0.2 x working pressure (2.4 Bar, 35 psi). Using a brush, apply soapy water to all connections and the outlet hose itself, then check for air bubbles denoting a leak(s).



#### 6.3.1.7. VISUAL TEST OF THE CONTROLLER

Visually check for any signs of obvious damage on:

- Inlet connecting couplings (series 26)
- Outlet connecting couplings (series 25)
- Pressure gauges and the maximum working pressure marking
- Body of controller

#### 6.3.1.8. FUNCTION TEST OF THE CONTROLLER

Connect the inlet hose from the pressure regulator; see section 5.3.1, to check the function of the inlet coupling. Connect the controller and Powermat with an outlet hose, see section 5.3.1, then check the function of the outlet couplings. Firstly move the control levers into the lifting position and then into the lowering position. Control levers should operate smoothly. When the control lever is in the lifting position, the connected Powermat should lift.

**WARNING: Do not exceed 0.2 x working pressure in the Powermat.**

#### 6.3.1.9. FUNCTION TEST OF PRESSURE GAUGES ON THE CONTROLLER

Functionality of pressure gauges fitted to the controller is tested by means of reference pressure gauges. **This testing can only be undertaken by MFC International or an authorised representative.**

#### 6.3.1.10. FUNCTION TEST OF THE SAFETY VALVE

With an inlet hose still connected to the controller, connect the pressure regulator. See section 5.3.1.

Move the control lever into the lifting position and gradually build up pressure in the controller until the safety valve opens and the working pressure is exceeded (12 bar). The safety valve is functioning correctly if it activates within the range of 0+10% working pressure of the controller. When activated the safety valve emits a characteristic sound. Reduce the pressure in the controller and check that the safety valve re-seats before 10.8 bar, the valve should cease to emit the characteristic sound.

#### 6.3.1.11. HYDRAULIC PRESSURE TEST

Prior to delivery Powermats undergo a ten minute hydraulic pressure test at 1.5 x working pressure, i.e. 12 bar. **This testing can only be undertaken by MFC International or an authorised representative.**

### 6.4 SERVICE LIFE

A serial number is displayed next to the connector on the Powermat. The first two digits indicate the month of manufacture and the second two digits the year of manufacture.

**Powermats are manufactured from neoprene and are therefore subject to a natural ageing process. Although regular visual inspections can help assure good operational condition, Powermats should always be removed from service after 15 years as the material construction can mask signs of ageing.**

## 6.5 TROUBLESHOOTING

Fault	Reason	Remedy
Inlet pressure gauge of pressure regulator does not display sufficient pressure	Empty compressed air cylinder	Replace the cylinder
	Shut-off valve on the cylinder	Open the valve on the cylinder
Required pressure cannot be set on the outlet pressure gauge of pressure regulator	Adjusting valve blocked pressure in the cylinder	Briefly (1s) open the relief valve. Try to set the pressure repeatedly
	Adjusting valve failure	Replace the pressure regulator
	Outlet pressure gauge failure	Replace the pressure regulator
The pressure regulator hose cannot be correctly inserted in the controller's connecting coupling	Dirt on the connector or coupling	Clean the plug and coupling
	Connector or coupling are damaged	Replace the pressure regulator and/or controller
Inlet hose cannot be correctly inserted in controller's connecting coupling	Dirt on connectors or couplings	Clean the connector and coupling
	Connectors or couplings are damaged	Replace hose and/or controller
Despite activating the control lever for inflating the Powermat, the Powermat fails to inflate	Safety valve failure	Replace the controller
	Connector or coupling blocked	Tighten the protective screw on safety valve
	The pressure regulator hose and/or inlet hose are incorrectly connected	Clean the connector or coupling
	The pressure regulator hose and/or inlet hose are damaged and do not seal correctly	Check and re-connect the pressure regulator hose and/or inlet hose  Replace the pressure regulator hose and/or inlet hose
Despite activating the control lever for lowering the Powermat, the Powermat fails to deflate	Connectors or couplings are blocked	<p><b>Warning!</b>  <b>Exercise the utmost caution when carrying out the following procedure</b></p> <ol style="list-style-type: none"> <li>1. Double-check whether the load is correctly supported to assure stability when deflating Powermat</li> <li>2. Shut-off the valve on the cylinder</li> <li>3. Disconnect the outlet hose from the controller to deflate Powermat</li> <li>4. Exercising the utmost caution, disconnect the hose from the Powermat which has failed to deflate</li> <li>5. If the Powermat still fails to deflate, clean the inflation connector with a small screwdriver; keep a safety distance</li> </ol>
		Smaller foreign bodies may only be removed from the surface if they do not damage an area by more than 25mm <sup>2</sup> (1inch <sup>2</sup> ), and are not too deeply embedded. Only small fibres are permitted on the surface, larger items, e.g. stones etc. can change or affect the Powermat's contact surface. Powermats with larger items embedded should be withdrawn from service immediately.
Foreign bodies embedded into surfaces of the Powermat	Powermat used on rough terrain, e.g. gravel etc.	

<b>Fault</b>	<b>Reason</b>	<b>Remedy</b>
Bulges on Powermat lifting surfaces	Damage to internal structure of Powermat leading to voids, e.g. ply separation	Bulges on the lifting surfaces of Powermats can effect efficiency and safe operation. Internal damage is irreparable and Powermats exhibiting bulges must be withdrawn from use immediately.
Screw thread damaged on inflation inlet	Inflation connector overtightened	Powermats that have damaged screw threads on the inflation inlet must be withdrawn from use. Always follow the procedure detailed in 6.2.1.1 when changing an inflation connector.
Surface cracks/splits	Powermat accidentally cut whilst being removed from packaging or due to use on sharp objects, e.g. broken glass	Cracks/splits of no more than 0.8mm (1/32") in width and 0.8mm (1/32") in depth, and no more than 102mm (4") in length are acceptable. Powermats with cracks/splits of greater size should be withdrawn from use immediately.
Torn/Ripped Handles	Handles accidentally cut, e.g. during removal from packaging	The Powermat remains usable but should be re-tested. Contact MFC International or an authorised service representative.
Illegible labelling	Dirt, Oil etc. on labels	Powermat should be cleaned so that labelling remains visible for operators to read.
Illegible serial number	Damage caused by general wear and tear	Contact MFC International or an authorised service representative to have serial number reapplied to Powermat.
Damage to edges of Powermat	Incorrect storage	The Powermat remains usable but avoid storing vertically on sharp or rough surfaces that may cause cuts or deformities to edges.

## 7. Warranty Conditions

### 7.1. GENERAL CONDITIONS

7.1.1. These warranty conditions apply as of dd/mm/yyyy for products manufactured by MFC International Ltd. If any provision of these warranty conditions are contrary to any mandatory legal provisions in any particular jurisdiction, such provision shall apply to a maximum extent as provided for by such mandatory legal provisions.

7.1.2. Products which may be sold by MFC International Ltd but not manufactured by it are not covered by this warranty and are sold exclusively with warranties, if any, by their original manufacturer.

### 7.2 MANAGEMENT OF PRODUCTS

7.2.1 In order to claim a remedy pursuant to this warranty, the purchaser must conform to the Powermat instructions for use.

### 7.3. WARRANTY

7.3.1. MFC International Ltd warrants to the purchaser that for the period of twelve (12) months as of delivery of the products, such products shall be free from defects in material and workmanship, subject to proper usage in accordance with manufacturer's instructions. For Powermats the warranty period amounts to sixty (60) months/five (5) years.

7.3.2. This warranty shall be in lieu of any other warranties, express or implied, including, but not limited to, any warranty of merchantability or fitness for a particular purpose.

### 7.4. EXCLUSION OF WARRANTY

7.4.1. Warranty shall be excluded in cases where the products have not been used for the ordinary purposes or have been subject to abnormal conditions such as, but not limited to misuse, mishandling (such as, but not limited to, cuts, tears, vandalism, fire, wilful destruction, improper installation and/or improper maintenance, misapplication), use of unauthorized components or attachments or if adjustments or repairs have been performed by anyone other than MFC International Ltd or its authorized agents.

7.4.2. Warranty shall also be excluded and MFC International Ltd shall not be held liable in case of force majeure circumstances, such

as, but not limited to:

- war or threat of war, sabotage, insurrection, riots or requisition;
- all laws, restrictions, regulations, by-laws, prohibitions or any other measures by the governmental, parliamentary or local bodies;
- import and export regulations or embargo;
- strikes, lock-outs or other industrial measures or trade disputes (if including manufacturer's employees or third party);
- difficulties with supply of raw materials, work force, fuel, parts or machinery;
- power blackout, breakdown of machinery.

7.4.3. MFC International Ltd shall not be held liable for any deficiencies in products manufactured according to drawings, designs, project drafts and/or specifications provided by the purchaser.

7.4.4. Ordinary wear and tear is not covered by this warranty.

## 7.5. MAKING A WARRANTY CLAIM

7.5.1. The purchaser is obliged to take delivery of the products and perform an ordinary inspection of the product upon delivery.

7.5.2. Any claim by the purchaser with reference to the products shall be deemed waived unless submitted in writing to MFC International Ltd within the earlier of (I) eight days as of the discovery of the defect, or (II) sixty (60) months as of delivery of the product. Discovery of the defect is deemed to have occurred when a defect could have reasonably been detected by the purchaser.

7.5.3. Claim must at least contain the following data:

- part number,
- serial number,
- description of defect (including a photograph if possible) and how it occurred

Upon request, MFC International Ltd must be allowed to inspect the product.

7.5.4. To obtain performance under this warranty, any products suspected of having a manufacturing defect in materials or workmanship shall be returned freight prepaid for inspection to MFC International Ltd.

## 8. Powermat Chemical Compatibility

Use the following chemical compatibility table as a general guide only in determining the resistance to solvents, acids, salts and other chemical solutions of Powermat II lifting mats. Each substance is assigned an alpha character to denote its expected effect upon the Powermat. The specific ratings in the table are based for the most part upon published literature from various polymer suppliers, rubber manufacturers and in some cases, the considered opinion of experienced compounders. MFC International Ltd cannot guarantee their accuracy nor assume responsibility for use thereof.

Chemical effect rating:

A. - RECOMMENDED - Little or minor effect, long service may be expected with Suitable for continuous service.

B. - MINOR TO MODERATE EFFECT - still useful in many applications but properties will be affected by the exposure. Usually suitable for continuous and intermittent service.

C. - MODERATE TO SEVERE EFFECT - perhaps still useful in limited applications if exposure is limited or infrequent. Not recommended for continuous use but may give some service if it is the only option available.

U. - NOT RECOMMENDED

BLANK- NO DATA OR INSUFFICIENT EVIDENCE

The table positions which are not rated indicate insufficient information at the time of publication to determine an accurate rating.

**A**

Acetamide..... B  
 Acetic Acid 5%..... A  
 Acetic Acid 30%..... A  
 Acetic Acid, Hot High Press..... C  
 Acetic Acid, Glacial..... U  
 Acetic Anhydride..... A  
 Acetone..... C  
 Acetophenone..... U  
 Acetyl Acetone..... U  
 Acetyl Chloride..... U  
 Acetylene..... B  
 Acetylene Tetrabomide..... B  
 Acrylonitrile..... C  
 Adipic Acid..... A  
 Aero Lubriplate..... A  
 Aero Safe 2300..... U  
 Aero 2300W..... U  
 Aero Shell IAC..... B  
 Aero Shell 7A Grease..... B  
 Aero Shell 17 Grease..... B  
 Aero Shell 750..... U  
 Aerozene 50 (50% Hydrazine  
 50%UDMH)..... U  
 Air Below 148.9°C (300°F)..... A  
 Air Above 148.9°C (300°F)..... U  
 Alkazene..... U  
 Alum-N3Cr-K..... A  
 Aluminium Acetate..... B  
 Aluminium Bromide..... A  
 Aluminium Chloride..... A  
 Aluminium Fluoride..... A  
 Aluminium Nitrate..... A  
 Aluminium Phosphate..... A  
 Aluminium Salts..... A  
 Aluminium Sulfate..... A  
 Ambrex 33 Mobil..... B  
 Amines, Mixed..... B  
 Ammonia Anhydrous (Liquid) ... A  
 Ammonia Gas, Cold..... A  
 Ammonia Gas, Hot..... B  
 Ammonia & Lithium Metal  
 Solution..... U  
 Ammonium Carbonate..... A  
 Ammonium Chloride..... A  
 Ammonium Hydroxide  
 (Concentrate)..... A  
 Ammonium Nitrate..... A  
 Ammonium Nitrite..... A  
 Ammonium Persulfate Solution A  
 Ammonium Persulfate 10%..... A  
 Ammonium Phosphate..... A  
 Ammonium Phosphate,  
 Mono-Basic..... A  
 Ammonium Phosphate, Dibasic A

Ammonium Phosphate, TribasicA  
 Ammonium Salts..... A  
 Ammonium Sulfate..... A  
 Ammonium Sulfide..... A  
 Amyl Acetate..... U  
 Amyl Alcohol..... A  
 Amyl Borate..... A  
 Amyl Chloride..... U  
 Amyl Chloranaphthalene..... U  
 Amyl Naphthalene..... U  
 Anderol L-774 (diester)..... U  
 Anderol L-826 (diester)..... U  
 Anderol L-829 (diester)..... U  
 Ang-25 (Glycerol Ester)..... B  
 Ang-25 (di-ester Base) (TG749)U  
 Anhydrous Ammonia..... A  
 Anhydrous Hydrazine..... B  
 Anhydrous Hydrogen Fluoride.. U  
 Aniline..... U  
 Aniline Dyes..... B  
 Aniline Hydrchloride..... U  
 Aniline Oils..... U  
 Animal Fats..... B  
 Animal Fats (Lard Oil)..... B  
 AN-O-3 Grade M..... B  
 An-O-6..... B  
 AN-O-366..... B  
 AN-VV-O-366b Hydr Fluid..... B  
 Ansul Ether..... U  
 Aqua Regia..... U  
 Argon..... U  
 Aroclor 1248..... U  
 Aroclor 1254..... U  
 Aroclor 1260..... A  
 Aromatic Fuel 50%..... U  
 Arsenic Acid..... A  
 Arsenic Trichloride..... A  
 Askarel..... U  
 Asphalt Emulsion..... U  
 Asphalt Topping..... B  
 ASTM Oil #1..... A  
 ASTM Oil #2..... B  
 ASTM Oil #3..... B  
 ASTM Oil #4..... U  
 ASTM Reference Fuel A..... B  
 ASTM Reference Fuel B..... U  
 ASTM Reference Fuel C..... U  
 ATL-857..... U  
 Atlantic Dominion F..... B  
 Aurex 903R Mobil..... B  
 Automatic Transmission Fluid.. B  
 Automotive Brake Fluid..... B

**B**

Bardol B..... U  
 Barium Chloride..... A  
 Barium Hydroxide..... A  
 Barium Salts..... A  
 Barium Sulfate..... A  
 Barium Sulfide..... A  
 Bayol D..... B  
 Beer..... A  
 Beet Sugar Liquors..... A  
 Benzaldehyde..... U  
 Benzene..... B  
 Benzenesulfonic Acid..... A  
 Benzine..... B  
 Benzochloride..... U  
 Benzoic Acid..... A  
 Benzophenol..... U  
 Benzyl Alcohol..... B  
 Benzyl Benzoate..... U  
 Benzyl Chloride..... U  
 Black Point 77..... C  
 Black Suphate Liquors..... A  
 Blast Furnace Gas..... U  
 Bleach Solutions..... U  
 Borax..... A  
 Bordeaux Mixture..... B  
 Boric Acid..... A  
 Boron Fluids (HEF)..... U  
 Brake Fluid (Non-Petroleum).... B  
 Bray GG-130..... U  
 Brayco 719-R(WH-910)..... B  
 Brayco 885 (MIL-L-6085A)..... U  
 Brayco, 910..... B  
 Bret 710..... B  
 Brine..... A  
 Brom-113..... U  
 Brom-114..... B  
 Bromine..... U  
 Bromine Anhydrous..... U  
 Bromine Pentafluoride..... U  
 Bromine Trifluoride..... U  
 Bromine Water..... B  
 Bromobenzene..... U  
 Bromochloro Trifluoroethane ... U  
 Bunker Oil..... B  
 Butadiene..... B  
 Butane..... A  
 Butane 2, 2-Dimethyl..... B  
 Butane 2, 3-Dimethyl..... B  
 Butanol ( Butyl Alcohol )..... A  
 1-Butene, 2-Ethyl..... U  
 Butter..... B  
 Butyl Acetate..... U  
 Butyl Acetate Ricinoleate..... U  
 Butyl Acrylate..... U



Butyl Alcohol.....	A	Chrome Plating Solutions.....	U	Dibutyl Phthalate.....	U		
Butyl Amine.....	U	Chromic Acid.....	U	Dibutyl Sebacate.....	U		
Butyl Benzoate.....	U	Chromic Oxides 88 Wt %		O-Dichlorobenzene.....	U		
Butyl Butyrate.....	U	Aqueous Solution.....	U	P-Dichlorobenzene.....	U		
Butyl Carbitol.....	C	Circo Light Process Oil.....	B	Dichloro-Butane.....	U		
Butyl Cellosolve.....	U	Citric Acid.....	A	Dichloro-Isopropyl Ether.....	U		
Butyl Cellosolve Adipate.....	U	City Service Koolmotor-AP Gear		Dicyclohexylamine.....	U		
Butyl Ether.....	U	Oil 140-E.P. lube.....	B	Diesel Oil.....	B		
Butyl Oleate.....	U	City Service #65, #120, #250 ...	B	Di-Ester Lubricant MIL-L7808...	U		
Butyl Stearate.....	U	Cobalt Chloride.....	A	Di-Ester Synthetic Lubricant.....	U		
Butylene.....	C	Cobalt Chloride, 2N.....	A	Diethylamine.....	B		
Butyraldehyde.....	U	Cocoa nut Oil.....	A	Diethyl Benzene.....	U		
Butyric Acid.....	U	Cod Liver Oil.....	B	Diethyl Ether.....	U		
<b>C</b>						Diethyl Sebacate.....	U
Carbon Tetrachloride.....	U	Coffee.....	A	Diethylene Glycol.....	A		
Carbonic Acid.....	A	Coke Oven Gas.....	U	Difluorodibromomethane.....	U		
Castor Oil.....	A	Coliche Liquors.....	A	Disobutylene.....	L		
Cellosolve.....	U	Convelex 10.....	U	Disococetyl Sebacate.....	U		
Cellosolve Acetate.....	U	Coolanol (Monsanto).....	A	Disopropyl Benzene.....	U		
Cellosolve Butyl.....	U	Copper Acetate.....	B	Disopropyl Ketone.....	U		
Celloguard.....	A	Copper Chloride.....	A	Dimethyl Aniline.....	U		
Cellulube A60 (Now Fyrquel)....	U	Copper Chloride.....	A	Dimethyl Formamide.....	U		
Cellulube 90,100,150,220,300,		Copper Cyanide.....	A	Dimethyl Phthalate.....	U		
500.....	U	Copper Salts.....	A	Dinitro Toluene.....	U		
Cellutherm 2505A.....	U	Copper Sulfate.....	A	Dioetyl Phlltalate.....	U		
Cetane (Hexadecane).....	B	Copper Sulfate 10%.....	A	Dioetyl Sehaeate.....	U		
China Wood Oil (Tung Oil).....	A	Copper Sulfate 50%.....	A	Dioxane.....	U		
Chloracetic Acid.....	A	Corn Oil.....	A	Diозolane.....	U		
Chlorodane.....	C	Cottonseed Oil.....	A	Dipentene.....	U		
Chlorextol.....	B	Creosols.....	U	Diphenyl.....	U		
Chlorinated Salt Brine.....	U	Creosote.....	C	Diphenyl Oxides.....	U		
Chlorinated Solvents, Dry.....	U	Creosote, Coal Tar.....	B	Dow Chemical 50-4.....	B		
Chlorinated Solvents, Wet.....	U	Creosote, Wood Tar.....	B	Dow Chemical ET378.....	U		
Chlorine, Dry.....	C	Creosylic Acid.....	U	Dow Chemical ET588.....	B		
Chlorine, Wet.....	C	Crude Oil.....	U	Dow Corning-3.....	A		
Chlorine Dioxide.....	U	Cumene.....	U	Dow Corning-4.....	A		
Chlorine Dioxide (8% Cl as		Cutting Oil.....	B	Dow Corning-5.....	A		
NACIO2 in solution).....	U	Cyclohexane.....	U	Dow Corning-11.....	A		
Chlorine Trifluoride.....	U	Cyclohexanol.....	B	Dow Corning-33.....	A		
Chloroacetone.....	C	P-Cymene.....	U	Dow Corning-44.....	A		
Chloroacetic Acid.....	U	<b>D</b>				Dow Corning-55.....	A
Chlorobenzene.....	U	Decalin.....	U	Dow Corning-200.....	A		
Chlorobenzene, (Mono).....	U	Decane.....	U	Dow Corning-220.....	A		
Chlorobromo Methane.....	U	Delco Brake Fluid.....	B	Dow Corning 510.....	A		
Chlorobutadiene.....	U	Denatured Alcohol.....	A	Dow Corning 550.....	A		
Chlorododecane.....	U	Detergent Solutions.....	B	Dow Corning-705.....	A		
Chloroform.....	U	Developing Fluids (Photo).....	A	Dow Corning-710.....	A		
O-Chloronaphthalene.....	U	Dextron.....	B	Dow Corning-710.....	A		
1-Chloro 1-Nitro Ethane.....	U	Diacetone.....	U	Dow Corning-1208.....	A		
Chlorosulfonic Acid.....	U	Diacetone Alcohol.....	U	Dow Corning-4050.....	A		
Chlorotoluene.....	U	Diazon.....	C	Dow Corning-6620.....	A		
Chlorox.....	B	Dibenzyl Ether.....	U	Dow Corning-F60.....	A		
O-Chlorphenol.....	U	Dibenzyl Sebacate.....	U	Dow Corning-F61.....	A		
Chrome Alum.....	A	Dibromoethyl Benzene.....	U	Dow Corning-XF60.....	A		
		Dibutylamine.....	U				
		Dibutyl Ether.....	U				



Dow Guard ..... A  
 Dowtherm Oil..... U  
 Dowtherm A or E..... U  
 Dowtherm 209, 50% Solution... B  
 Drinking Water..... B  
 Dry Cleaning Fluids ..... U  
 DTE Light Oil ..... B

**E**

Elco 28-EP Lubricant..... C  
 Epichlorohydrin..... U  
 Epoxy Resins..... A  
 Esam-6 Fluid ..... B  
 Esso Fuel 208..... B  
 Esso Golden Gasoline..... U  
 Esso Motor Oil..... C  
 Esso Transmission Fluid  
 (Type A)..... B  
 Esso WS3812 (MIL-L-7808A)... U  
 Esstic 42,43 ..... B  
 Ethane ..... B  
 Ethanol ..... A  
 Ethanol Amine ..... B  
 Ethers ..... U  
 Ethyl Acetate-Organic Ester .... U  
 Ethyl Acetoacetate..... U  
 Ethyl Acrylate..... U  
 Ethyl Acrylic Acid ..... B  
 Ethyl Alcohol ..... A  
 Ethyl Benzene ..... U  
 Ethyl Benzoate ..... U  
 Ethyl Bromide ..... U  
 Ethyl Cellosolve..... U  
 Ethyl Cellulose..... B  
 Ethyl Chlorocarbonate..... U  
 Ethyl Chloroformate..... U  
 Ethyl Cyclopentane..... C  
 Ethyl Ether ..... U  
 Ethyl Formate ..... B  
 Ethyl Hexanol ..... A  
 Ethyl Mercaptan..... C  
 Ethyl Oxalate ..... U  
 Ethyl Pentachlorobenzene..... U  
 Ethyl Silicate ..... A  
 Ethylene..... A  
 Ethylene Chloride ..... U  
 Ethylene Chlorohydrin ..... B  
 Ethylene Diamine ..... A  
 Ethylene Dibromide ..... U  
 Ethylene Dichloride..... U  
 Ethylene Glycol..... A  
 Ethylene Oxide ..... U  
 Ethylene Trichloride ..... U  
 Ethylmorpholene Stannous  
 Octoate (50/50 Mixture).....

**F**

F-60 Fluid (Dow Corning)..... A  
 F-61 Fluid (Dow Corning)..... A  
 Fatty Acids..... B  
 FC-43  
 Heptacosofluorotributylamine... A  
 FC75 Fluorocarbon..... A  
 Ferric Chloride..... A  
 Ferric Nitrate..... A  
 Ferric Sulfate ..... A  
 Fish Oil ..... A  
 Fluoroboric Acid..... A  
 Fluorine (Liquid)..... C  
 Fluorobenzene..... U  
 Fluorocarbon Oils ..... A  
 Fluorolube..... A  
 Fluorinated Cyclic Esters..... U  
 Fluosilicic Acid ..... A  
 Formaldehyde..... C  
 Formic Acid..... A  
 Freon, 11 ..... U  
 Freon, 12 ..... A  
 Freon, 12 and ASTM Oil #2  
 (50/50 Mixture) ..... B  
 Freon, 12 and Suniso 4G -  
 (50/50 Mixture) ..... B  
 Freon, 13 ..... A  
 Freon 13B1..... A  
 Freon, 14 ..... A  
 Freon, 21 ..... B  
 Freon, 22 ..... A  
 Freon, 22 and ASTM Oil (50/50  
 Mixture)..... B  
 Freon, 31 ..... A  
 Freon, 32 ..... A  
 Freon, 112 ..... B  
 Freon, 113 ..... A  
 Freon, 114 ..... A  
 Freon, 114B2..... A  
 Freon, 115 ..... A  
 Freon. 142b ..... A  
 Freon. 152a ..... A  
 Freon, 218 ..... A  
 Freon, C316..... A  
 Freon, C318..... A  
 Freon,502 ..... A  
 Freon, BF..... B  
 Freon, MF..... U  
 Freon, TF..... A  
 Freon, TA..... A  
 Freon, TC ..... A  
 Freon, TMC ..... B  
 Freon, T-P35..... A  
 Freon, T-WD602..... B  
 Freon, PCA..... A

Fuel Oil ..... B  
 Fuel Oil, Acidic..... B  
 Fuel Oil, #6 ..... U  
 Fumaric Acid..... B  
 Fuming Sulphuric Acid - (20/25%  
 Oleum)..... U  
 Furan (Furfuran) ..... U  
 Furfural ..... B  
 Furfuraldehyde ..... B  
 Furfaryl Alcohol..... U  
 Furyl Carbinol ..... U  
 Fryquel A60 ..... U  
 Fryquel 90, 100,150,220,300,  
 500..... U

**G**

Gallic Acid..... B  
 Gasoline ..... B  
 Gelatin ..... A  
 Girling Brake Fluid ..... B  
 Glacial Acetic Acid ..... U  
 Glauber's Salt..... A  
 Glucose ..... A  
 Glue (Depending on Type) ..... A  
 Glycerine-Glycerol..... A  
 Glycols..... A  
 Green Suphate Liquor ..... B  
 Gulfcrown Grease..... B  
 Gulf Endurance Oils ..... B  
 Gulf FR Fluids (Emulsion) ..... B  
 Gulf FRG-Fluids..... A  
 Gulf FRP-Fluids..... U  
 Gulf Harmony Oils ..... B  
 Gulf High Temperature Grease. B  
 Gulf Legion Oils ..... B  
 Gulf Paramount Oils ..... B  
 Gulf Security Oils..... B

**H**

Halothane ..... U  
 Hannifin Lube A ..... A  
 Heavy Water ..... B  
 HEF-2 (High Energy Fuel)..... U  
 Helium ..... A  
 N-Heptane ..... B  
 N-Hexaldehyde..... A  
 Hexane ..... B  
 N-Hexane-I ..... B  
 Hexyl Alcohol ..... B  
 High Viscosity Lubricant, U4..... B  
 High Viscosity Lubricant, H2..... B  
 Hilo MS #1 ..... U  
 Houghto-Safe 271 (Water and  
 Glycol Base) ..... B  
 Houghto-Safe 620  
 (Water/Glycol)..... B



MIL-C-5545A	B	MIL-F-16884	C	Mobilgas WA200, Type Automatic
MIL-H-5559A	B	MIL-F-16929	A	Trans. Fluid
MIL-F-5566	B	MIL-L-16958A	B	Mobil Oil SAE 20
MIL-G-5572	U	MIL-F-17111	B	Mobiltherm 600
MIL-F-5602	B	MIL-L-17331D	B	Mobilux
MIL-H-5606B	B	MIL-L-17353A	C	Mono Bromobenzene
MIL-J-5624G, JP-3	U	MIL-L-17672B	A	Mono Chlorobenzene
MIL-J-5624G, JP-4	U	MIL-L-18486A	A	Mono Ethanolamine
MIL-J-5624, JP-5	U	MIL-G-18709A	A	Monomethyl Aniline
MIL-L-6081C	B	MIL-H-19457B	U	Monmethyl Ether
MIL-L-6082C	B	MIL-F-19605	C	Monmethyl Hydrazine
MIL-H-6083C	B	MIL-L-19701	C	Monoitroluene & Dinitrotoluene
MIL-L-6085A	U	MIL-L-2126	B	(40/60 Mix.)
MIL-L-6086B	A	MIL-G-21568A	A	Monovinyl Acetylene
MIL-A-6091	A	MIL-H-22072	B	Mopar Brake Fluid
MIL-L-6387	A	MIL-H-22251	B	Mustard Gas
MIL-C-6529C	B	MIL-L-22396	A	
MIL-F-7024A	U	MIL-L-23699A	C	<b>N</b>
MIL-H-7083A	B	MIL-G-23827A	C	Naptha
MIL-G-7118A	C	MIL-G-25013D	B	Napthalene
MIL-G-7187	U	MIL-F-25172	C	Napthalenic Acid
MIL-G-7421A	C	MIL-L-25336B	C	Natural Gas
MIL-H-7644	B	MIL-F-25524A	C	Neatsfoot Oil
MIL-L-7645	B	MIL-G-25537A	B	Neon
MIL-G-7711A	U	MIL-F-25558B	B	Neville Acid
MIL-L-7808F	U	MIL-F-25576C	C	Nickel Acetate
MIL-L-7870A	B	MIL-H-25598	B	Nickel Chloride
MIL-C-8188C	U	MIL-F-25656B	U	Nickel Salts
MIL-A-8243B	B	MIL-L-25681C	B	Nickel Sulfate
MIL-L-8383B	A	MIL-G-25760A	C	Niter Cake
MIL-H-8446B	B	MIL-L-25968	C	Nitric Acid (1) 3 Molar
MIL-I-8660B	A	MIL-L-26087A	A	Nitric Acid (1) Concentrated
MIL-L-9000F	B	MIL-G-27343	A	Nitric Acid Dilute
MIL-T-9188B	U	MIL-P-27402	B	Nitric Acid (1) Red fuming
MIL-L-9236B	U	MIL-H-27601A	B	(RFNA)
MIL-E-9500	A	MIL-G-27617		Nitric Acid (1) Inhibited, Red
MIL-L-10295A	B	MIL-I-27686D	B	fuming (IRFNA)
MIL-L-10324A	B	MIL-L-27694A	A	Nitrobenzene
MIL-G-10924B	U	MIL-L-46000A	C	Nitrobenzine
MIL-L-11734B	C	MIL-H-46001A	A	Nitroethane
MIL-O-11773	C	MIL-L-46002	A	Nitrogen
MIL-P-12098	B	MIL-H-46004	B	Nitrogen(Tetroxide(N2O4)(1))
MIL-H-13862	B	MIL-P-46064A	B	Nitromethane
MIL-H-13866A	B	MIL-H-81019B	B	Nitropropane
MIL-H-13910B	B	MIL-S-81087	A	
MIL-H-13919A	B	MIL-H-83282	B	<b>O</b>
MIL-L-14107B	A	Milk	A	O-A-548A
MIL-L-15016	B	Mineral Oils	A	O-T-6324b
MIL-L-15017	B	Mobil 24 DTE	B	Octachloro toluene
MIL-L-15018B	A	Mobil HF	B	Octadecane
MIL-L-15019A	A	Mobil Delvac 1100, 1110, 1120,	B	N-Octane
MIL-L-15719A	B	1130	B	Octyl Alcohol
MIL-G-15793	C	Mobil Nivac 20 and 30	A	Oleic Acid
		Mobil Velocite C	B	Oleum (Fuming Sulfuric Acid)
				Oleum Spirits
				Olive Oil

Oronite 8200.....	A	Potassium Acetate.....	B	Shell Macoma 72.....	B
Oronite 8515.....	A	Potassium Chloride.....	A	Silicate Esters.....	A
Orthochloro Ethyl Benzene.....	U	Potassium Cupro Cyanide.....	A	Silicone Greases.....	A
Ortho-Dichlorobenzene.....	U	Potassium Cyanide.....	A	Silicone Oils.....	A
OS 45 Type III(OS45).....	A	Potassium Dichromate.....	A	Silver Nitrate.....	A
OS 45 Type IV(OS45-1).....	A	Potassium Hydroxide.....	A	Sinclair Opaline CS-EP Lube ...	B
OS70.....	A	Potassium Nitrate.....	A	Skelly, Solvent B, C, E.....	U
Oxalic Acid.....	B	Potassium Salts.....	A	Skydrol 500.....	U
Oxygen, Cold.....	A	Potassium Sulfate.....	A	Skydrol 7000.....	U
Oxygen, Cold 93°C - 204°C (200°F - 400°F).....	U	Potassium Sulfite.....	A	Soap Solutions.....	A
Ozone.....	C	Prestone Antifreeze.....	A	Socony Vacuum AMV AC781 (Grease).....	B
<b>P</b>					
P-S-661b.....	C	PRL-High Temp. Hydr. Oil.....	B	Socony Vacuum PD959B.....	B
P-D-680.....	C	Producer Gas.....	B	Soda Ash.....	A
Paint Thinner, Duco.....	U	Propane.....	B	Sodium Acetate.....	B
Palmitic Acid.....	B	Propane Propionitrile.....	B	Sodium Bicarbonate (Baking Soda).....	A
Para-dichlorobenzene.....	U	Propyl Acetate.....	U	Sodium Bisulfite.....	A
Par-al-Ketone.....	U	N-Propyl Acetone.....	U	Sodium Borate.....	A
Parker O Lube.....	A	Propyl Alcohol.....	A	Sodium Carbonate (Soda Ash). A	
Peanut Oil.....	B	Propyl Nitrate.....	U	Sodium Chloride.....	A
Pentane,2 Methyl.....	B	Propylene Oxide.....	U	Sodium Cyanide.....	A
Pentane,2-4 Dimethyl.....	B	Pyranol, Transformer Oil.....	B	Sodium Hydroxide.....	B
Pentane,3 Methyl.....	B	Pyranol.....	U	Sodium Hypochlorite.....	B
N-Pentane.....	A	Pydraul, 10E, 29ELT.....	U	Sodium Metaphosphate.....	B
Perchloric Acid.....	B	Pydraul, 30E, 50E, 65E, 90E....	U	Sodium Nitrate.....	B
Perchloroethylene.....	U	Pydraul, 115E.....	U	Sodium Perborate.....	B
Petroleum Oil, Crude.....	B	Pydraul, 230E, 312C, 540C.....	U	Sodium Peroxide.....	B
Petroleum Oil, Below 121.1°C (250°F).....	B	Pyridine Oil.....	U	Sodium Phosphate (Mono).....	B
Petroleum Oil, Above 121.1°C (250°F).....	U	Pyrogard, C, D.....	B	Sodium Phosphate (Dibasic)....	A
Phenol.....	U	Pyrolingneous Acid.....	U	Sodium Phosphate (Tribasic) ...	B
Phenol, 70%/30% H2O.....	U	Pyrolube.....	U	Sodium Salts.....	B
Phenol, 85%/15% H2O.....	U	Pyrrole.....	U	Sodium Silicate.....	A
Phenylbenzene.....	U	<b>R</b>			
Phenyl Ethyl Ether.....	U	Radiation.....	C	Sodium Sulfate.....	A
Phenyl Hydrazine.....	U	Rapeseed Oil.....	B	Sodium Sulfide.....	A
Phorone.....	U	Red Oil (MIL-H-5606).....	B	Sodium Sulfite.....	A
Phosphoric Acid 20%.....	B	Red Line 100 Oil.....	B	Sodium Thiosulfate.....	A
Phosphoric Acid 45%.....	B	RJ-1(MIL-F-25558).....	B	Sovasol #1, 2 and 3.....	B
Phosphoric Acid, 3 Molar.....	C	RP-1(MIL-R-25576).....	B	Sovasol #73 and 74.....	B
Phosphoric Acid, Concentrated	U	<b>S</b>			
Phosphorous Trichloride Acid ...	U	Sal Ammoniac.....	A	Soybean Oil.....	A
Pickling Solution.....	U	Salicylic Acid.....	C	Spry.....	B
Picric Acid, H2O Solution.....	B	Salt Water.....	A	SR-6 Fuel.....	U
Picric Acid, Molten.....	U	Santo Sale 300.....	U	SR-10 Fuel.....	U
Pinene.....	C	Sewage.....	B	Standard Oil Mobilube GX90-EP Lube.....	B
Pine Oil.....	U	Shell Alvania Grease #2.....	B	Stannic Chloride.....	B
Piperidine.....	U	Shell Carnea 19 and 29.....	U	Stannic Chloride 50%.....	U
Plating Solutions, Chrome.....	U	Shell Diala.....	B	Stannous Chloride.....	A
Plating Solutions, Others		Shell Iris 905.....	A	Stauffer 7700.....	U
Pneumatic Service.....	A	Shell Iris 3XF Mine Fluid (Fire Resist Hydr).....	B	Steam, Below 176.7°C (350°F) U	
Polyvinyl Acetate Amulsion.....	B	Shell Iris Tellus #27, Pet. Base. B		Steam, Above 176.7°C (350°F) U	
		Shell Iris Tellus #33.....	B	Stearic Acid.....	B
		Shell Iris UMF (5% Aromatic) ...	B	Stoddard Solvent.....	C
		Shell Lo Hydrax 27 and 20.....	B		

Styrene .....	U	Texaco Meropa #3 .....	B	Ucon Lubricant 50-HB260 .....	A
Styrene (Monomer).....	U	Texaco Regal B .....	U	Ucon Lubricant 50-HB660 .....	A
Sucrose Solutions.....	A	Texaco Uni-Temp Grease .....	B	Ucon Lubricant 50-HB5100 .....	A
Sulfite Liquors.....	B	Texamatic "A" Transmission Oil .....	B	Ucon Oil LB-385 .....	A
Sulfur .....	A	Texamatic 1581 Fluid.....	B	Ucon Oil LB400X.....	A
Sulfur Chloride.....	U	Texamatic 3401 Fluid.....	B	Ucon 50-HB-280X (Polyacrylon Glycol Deriv.) .....	A
Sulfur Dioxide, Wet.....	B	Texamatic 3525 Fluid.....	B	Univis 40 (Hydr. Fluid) .....	B
Sulfur Dioxide, Dry.....	U	Texamatic 3528 Fluid.....	B	Univolt #35 (Mineral Oil).....	B
Sulfur Dioxide, Liquefied under pressure.....	U	Texas 1500 Oil.....	B	Unsymmetrical Dimethyl Hydrazine (UDMH) .....	B
Sulfur Hexafluoride .....	A	Thiokol TP-908 .....	B	<b>V</b>	
Sulfur Liquors .....	B	Thiokol TP-95 .....	B	VV-B-680 .....	B
Sulfur Molten .....	C	Thionyl Chloride.....	U	VV-G-632.....	A
Sulfur Trioxide.....	U	Tidewater Oil-Beedol .....	B	VV-G-671c.....	A
Sulfuric Acid Dilute.....	B	Tidewater Oil-Multigear 140, EP Lube.....	B	VV-H-910.....	B
Sulfuric Acid Concentrated .....	U	Titanium Tetrachloride .....	U	VV-I-530a.....	B
Sulfuric Acid 20% Oleum .....	U	Toluene .....	U	VV-K-211d .....	C
Sulfuric Acid 3 Molar .....	C	Toluene Diisocyanate .....	U	VV-K-220a .....	B
Sulfurous Acid.....	B	Transformer Oil.....	B	VV-L-751b.....	B
Sunoco SAE 10 .....	B	Transmission Fluid Type A.....	B	VV-L-800.....	B
Sunoco #3661 .....	B	Triacetin.....	B	VV-L-820b.....	B
Sunoco All Purpose Grease .....	B	Triaryl Phosphate.....	U	VV-L-825a, Type I.....	A
SunSAFE(Fire Resist Hydr.Fluid) .....	B	Tributoxyethyl Phosphate .....	U	VV-L-825a, Type II.....	A
Super Shell Gas .....	B	Tributyl Mercaptan .....	U	VV-L-825a, Type III.....	B
Swan Finch EP Lube .....	U	Tributyl Phosphate .....	U	VV-O-526.....	A
Swan Finch Hypoid-90 .....	B	Trichloroacetic Acid .....	U	VV-P-216a .....	B
<b>T</b>		Trichloroethane.....	U	VV-P-236 .....	B
TT-N-95a .....	C	Trichloroethylene .....	U	Varnish.....	U
TT-N-97B .....	C	Tricresyl Phosphate.....	B	Vegetable Oil .....	C
TT-I-735b .....	B	Triethanol Amine.....	U	Versilube.....	A
TT-S-735, Type I.....	B	Triethyl Aluminum .....	U	Vinegar .....	B
TT-S-735, Type II.....	C	Triethyl Borane .....	U	Vinyl Chloride .....	U
TT-S-735, Type III.....	C	Trifluoroethane .....	U	<b>W</b>	
TT-S-735, Type IV .....	A	Trinitrotoluene.....	A	Wagner 21B Brake Fluid .....	B
TT-S-735, Type V .....	B	Trioctyl Phosphate .....	U	Water .....	A
TT-S-735, Type VI .....	B	Tripoly Phosphate.....	B	Wemco C.....	B
TTT-656b .....	U	Tung Oil (China Wood Oil).....	B	Whiskey and Wines.....	A
Tannic Acid .....	B	Turbine Oil .....	U	White Pine Tar .....	U
Tannic Acid 10% .....	A	Turbine Oil #15 (MIL-L-7808A) .....	U	White Oil.....	B
Tar Bituminous.....	C	Turbine Oil #35 .....	B	Wolmar Salt.....	B
Tanaric Acid .....	A	Turpentine .....	U	Wood Alcohol.....	A
Terpineol.....	U	Type I, Fuel (MIL-S-3136).....	B	Wood Oil.....	B
Tertiary Butyl Alcohol .....	B	Type II Fuel (MIL-S-3136).....	U	<b>X</b>	
Tertiary Butyl Catechol.....	B	Type III Fuel (MIL-S-3136).....	U	Xylene.....	U
Tertiary Butyl Mercaptan.....	U	<b>U</b>		Xylenes-Mixed-Aromatic Amines.....	U
Tetrabromomethane .....	U	Ucon Hydrolube J-4 .....	B	Xylol.....	U
Tetrabutyl Titanate .....	B	Ucon Lubricant LB-65.....	A	Xenon .....	A
Tetrachloroethylene .....	U	Ucon Lubricant LB-135.....	A	<b>Z</b>	
Tetraethyl Lead.....	C	Ucon Lubricant LB-285.....	A	Zeolites .....	A
Tetraethyl Lead "Blend" .....	U	Ucon Lubricant LB-300.....	A	Zinc Acetate.....	B
Tetrahydrofuran .....	U	Ucon Lubricant LB-625.....	A	Zinc Chloride .....	A
Tetralin .....	U	Ucon Lubricant LB-1145.....	A	Zinc Salts.....	A
Texaco 3450 Gear Oil.....	U	Ucon Lubricant 50-HB55 .....	A	Zinc Sulfate.....	A
Texaco Capella A and AA.....	B	Ucon Lubricant 50-HB100 .....	A		



## 9. Powermat Test Report

The report shown below details testing carried out by MFC International or an authorised representative only.



**MFC International**  
WALSLEY  
ENGINEERED INFLATABLE PRODUCT SOLUTIONS

### High Pressure Lifting Bag - Test Report

**Size:** \_\_\_\_\_ **Serial Number:** \_\_\_\_\_

		<b>OK</b>
- Hydro pressure test ( 1.5 x WP @ 10 mins)		<input type="checkbox"/>
- Air pressure test ( WP @ 10 mins)		<input type="checkbox"/>
- Leakage check	- Bag - Valve	<input type="checkbox"/> <input type="checkbox"/>
- Visual check	- No irregularities on the surface - No irregularities on the edge	<input type="checkbox"/> <input type="checkbox"/>
- Label	- Straight - Not damaged	<input type="checkbox"/> <input type="checkbox"/>
- Serial number	- Correct position - Readable	<input type="checkbox"/> <input type="checkbox"/>

**Approved:**      **Yes**                       **No**

**Test date:** \_\_\_\_\_ **Test Stamp:** \_\_\_\_\_





**MFC**International

by **RESPIREX**

ENGINEERED INFLATABLE PRODUCT SOLUTIONS

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