

UNITOR OIL BAG®**CONTENT**

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1. UNITOR OIL BAG® - Introduction

1.1 The concept

The Unitor Oil Bag (UOB) is a compact, collapsible, towable, temporary storage container designed as a rapid response measure in case of potential oil spills or for use during oil recovery operations.

The UOBs flexibility coupled with its light weight allows for ease of handling, operation, storage and transportation.

The UOB is available in different versions:

- ◆ Portable version
- ◆ Fixed version
- ◆ Helicopter version

Each of the above configurations will be described in more detail in section 1.2.

The UOBs are made of coated fabric.

The coated fabric is a composite material consisting of a fabric, woven from polyester yarn, coated on both sides with a base-coat (tie-coat) to ensure good adhesion to the fabric and then coated on both sides with a top coat.

The fabric gives the mechanical strength to the UOB whilst the coating gives the required properties regarding resistance to oil, sea water, sun, etc. The main purpose of the coating is thus to protect the fabric from the environment.

As with all materials, polymeric shows some degradation over time. This degradation is depending on temperature, humidity, sun exposure, mechanical stresses, influence of chemicals, etc.

To ensure the performance of the UOBs over years, the fabric construction that has been chosen is very strong one, i.e. tightly woven from a high tenacity yarn.

Even if some degradation will take place, the initial mechanical properties like tensile strength, tear strength and perforation strength are on such a level that the UOBs will survive normal operating conditions after years of storage.

It is, however, important to handle the UOBs with great care to avoid scratches and tears, to clean and dry it thoroughly after use, to store it as described and to repair it according to the instructions.

The UOBs are designed for fast and easy operation with a minimum of tasks from

the stored conditions and until it is fully operational.

The UOBs is flexible to handle during operation and is prepared for easy towage and mooring.

The operating draught for UOBs are small thus allowing operation in relatively shallow water in conjunction with shallow water skimmers which inherently have limited storage capacity.

1.2 Standard UOB configurations

All the standard UOB configurations described in this section are based on the same design. The main differences between the UOB configurations are basically the deployment and operational characteristics.

a. Portable version

The portable versions are as standard stowed in a transportation container which can either be crane or truck lifted to the sea front or a vessel.

By opening the top of the storage container or folding down the front, the UOB may be lifted or pulled directly out of the container and into the sea. Care must be taken not to pull the UOB over any sharp objects that may cause damage to the fabric. By connecting the filling hose, the UOB is ready for operation.

b. Fixed version

The fixed version UOB is preinstalled on a vessel, a fixed offshore structure or at a site onshore.

It is fitted with a special launching system driven by pneumatical winches and the filling hose is connected to the fixed piping system on e.g. the vessel.

The launching may take place immediately when required and it will be ready for filling as soon as the bag is in the water.

As for all the UOBs it may be disconnected and towed and a new UOB may be connected to the filling hose if required.

c. Helicopter version

One of the main features with the UOB is its high degree of flexibility and low weight. To utilize these features to the fullest and to have rapid response measure

at some distance away from the area of stowage of the UOBs, Unitor has developed a helicopter frame unit.

The helicopter version consists of a launching ramp which holds the bag, required hoses, towing lines, release mechanism and lifting gear.

The unit is lifted by helicopter to the intended area of operation, then the bag is launched into the sea by remote operation from the helicopter. The launching ramp with hoses is then put down on e.g. a vessels deck and the hose connected to the vessels piping system after which the UOB is ready to be filled.

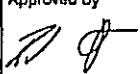
As for all UOBs it may be disconnected and towed and a new UOB may be connected to the filling hose if required.

d. Decanting

The deployment methods may be either one of the methods described in a, b or c above.

By inserting a special hose, which extends to the bottom of the UOB, through the front section, water that may collect in the bottom of the bag during a skimming operation may be pumped out.

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OIL BAG	SYSTEM ARRANGEMENT PORTABLE VERSION			92-00-021	

SYSTEM DESCRIPTION

The UNITOR OIL BAG® (UOB) is a flexible container specially designed for use in oil spill emergency situations.

The system is prepared for oil skimming operations. It is delivered with a hose specially designed for this purpose. The UOB can also be used as a transfer container

The OIL BAG is designed to be crane or truck lifted to the water front.

SYSTEM LAYOUT

The system is built up by means of standard components, individually documented.

The system consists of the following main components:

The BAG is made of a coated fabric PROTEX, specially developed for this purpose. In the aft end are two BRIDLE LINES connected for manoeuvring and mooring purpose.

The FRONT is made of mild steel and connects the bag to the TOWING ARRANGEMENT. The FRONT contains the piping, etc. required to do filling and discharging of the BAG.

The TOWING ARRANGEMENT is attached to the FRONT, and consists of a elastic towing line, two fibre weak links and a buoy. One weak link is secured in the BUOY as a spare.

The BRIDLE LINES consists of the similar components as the TOWING ARRANGEMENT, but the dimensions are different.

For decanting of water during a skimming operation a DECANTING HOSE INTERNAL SECTION may be delivered as an option.

The STORAGE CONTAINER for the OIL BAG is made of steel.

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SYSTEM OPERATION

The UOB may be launched directly from its STORAGE CONTAINER and into the water.

Filling of the BAG shall only be done when the BAG is floating in the water. The BAG will unfold by itself in the water during filling. See separate filling instruction.

The BAG can either be towed to a place for discharging or moored in calm water for later towage.

EMERGENCY OPERATION

In case a weak link on the towing arrangement breaks during towage, an additional weak link is secured in the buoy.

A REPAIR KIT can be provided as an option to conduct field repairs on tears or punctures of the fabric up to 300 mm in length.

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OIL BAG	GUIDE TO THE FLUID RESISTANCE OF PROTEX 092			92-00-995	

a) The rating shown apply generally to various grades of coatings. However, there may be small differences between grades, particularly where the fluid has moderate to severe effects. The ratings should be used only as a guide, subject to verification by testing under actual use conditions.

b) Rating Key:

- A - Fluid has little or no effect
- B - Fluid has minor to moderate effect
- C - Fluid has severe effect
- T - No data - likely to have minor effect
- X - No data - likely to have severe effect

Ratings are at 24°C unless otherwise specified.
Concentrations of aqueous solutions are saturated, except where noted.

This fluid resistance table is only for information and does not under any circumstances allow filling of any of the cargoes into the UOB unless they can be classified as crude or light bunker oil (and oil/water mixture).

Fluid not listed in the referred document should be treated as harmless to the fabric unless otherwise specified in the operation manuals for the UOBs.

FLUID	RATING ^{a, b}
A	
Acetaldehyde	C
Acetic acid, 20%	A-B
Acetic acid, 30%	T
Acetic acid, glacial	A-B
Acetic anhydride	T
Acetone	C
Aluminium chloride solution	T
Aluminium sulfate solution	T
Ammonium chloride solution	T
Ammonium sulfate solution	T
Amyl acetate	C
n-Amyl alcohol	A
ASTM Oil No. 1	A (to 100°C)
ASTM Oil No. 2	A
ASTM Oil No. 3	A (to 100°C)
ASTM Reference Fuel A	A
ASTM Reference Fuel B	B
ASTM Reference Fuel C	B-C
ASTM Reference Fuel C/ethanol or methanol, 85/15	B-C
ASTM Reference Fuel D	B
Asphalt	T

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
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FLUID	RATING ^{a, b}
B	
Barium hydroxide solution	T
Beer	T
Benzaldehyde	X
Benzene	X
Borax solution	T
Boric acid solution	T
Brake fluid, DOT No. 3	A-B
Brake fluid, DOT No. 3	B-C (to 125°C)
Bromine, anhydrous liquid	X
Butyl acetate	X
n-Butyl alcohol	A
Butyraldehyde	C
Butyric acid	T
C	
Calcium chloride solution	T
Calcium hydroxide solution	T
Calcium hypochlorite, 5-20%	T
Carbon bisulfide	X
Carbon dioxide	T
Carbon monoxide	T
Carbon tetrachloride	X
Castor oil	T
CELLOSOLVE Acetate	C
Chlorobenzene	X
Chloroform	X
Chlorosulfonic acid	X
Copper chloride solution	T
Copper sulfate solution	T
Cottonseed oil	T
Creosote oil	T
Cyclohexane	A-B
D	
DEXRON II ATF	A (to 125°C)
Dibutyl phthalate	C
Diesel fuel	B
Diethyl sebacate	X
Diocetyl phthalate	X
DOWTHERM A	T

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FLUID	RATING ^{a, b}
E Ethyl acetate Ethyl alcohol Ethyl ether Ethylene dichloride Ethylene glycol	* X A B X A
F Ferric chloride solution Formaldehyde, 40% Formic acid FREON* 113	T X T A
G Gasohol, with ethanol or methanol Gasoline, unleaded Gear oil Glycerin	B-C B A (to 100°C) T
H n-Hexane Hydrochloric acid, 20% Hydrochloric acid, 20% Hydrogen Hydrogen sulfide	A A A-B (to 82°C) T T
I Isooctane Isopropyl alcohol	T A
J JP-4 jet fuel	A
K Kerosene	A

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FLUID	RATING ^{a, b}
L Lactic acid Lard and lard oil Linseed oil Lithium grease Lubricating oils	T A (to 70°C) T A (to 100°C) A
M Magnesium chloride solution Magnesium hydroxide solution Methyl alcohol Methyl ethyl ketone Methyl isobutyl ketone Methylene chloride Milk Mineral oil	T T A C C C A A (to 70°C)
N Nitric acid, up to 30% Nitric acid, up to 30% Nitric acid, red fuming Nitrobenzene	A B (at 82°C) X X
O Olive oil	A
P Perchloroethane Perchloroethylene Potassium hydroxide, dilute solution Power steering fluid PYDRAUL 312C	B-C X T A (to 100°C) X
R Rapeseed oil	A (to 70°C)
S SAE 10W-40 oil Sea water Silicone brake fluid OFI-2023	A (to 120°C) A (to 70°C) T

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FLUID	RATING ^{a, b}
Silicone grease	A (to 100°C)
SKYDROL 500	C
Soap solution, 1%	A (to 70°C)
Sodium chloride solution, 20%	A
Sodium hydroxide, 20%	A
Soybean oil	T
Stannic chloride	T
Stannous chloride, 15%	T
Stearic acid	T
Sulfur, molten	T
Sulfur dioxide, gas	T
Sulfur dioxide, liquid	T
Sulfuric acid, up to 30%	A
Sulfuric acid, 95%	B
T	
Tannic acid, 10%	T
Tartaric acid	T
Tetrahydrofuran	X
Toluene	C
Tributyl phosphate	X
Trichlorethane	C
Trichloroethylene	C
Tricresyl phosphate	B
Triethanolamine	A
Trisodium phosphate solution	T
Tung oil	T
Turpentine	B
W	
Water	A (to 100°C)
X	
Xylene	X
Z	
Zinc chloride solution	T

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OIL BAG	OPERATING ENVIRONMENT			92-99-051	

The following specifications regarding operation and storage conditions are applicable to all UNITOR OIL BAG® (UOB) from 50 - 2000 m³.

AMBIENT TEMPERATURE

Water temperature : -5°C to +35°C
Filling medium (cargo) : 0°C to +75°C
Filling medium (cargo) during towage: max +40°C

UOBs that have been stored at low temperatures must be allowed to adjust to the seawater temperature prior to the filling operation.

The UOBs shall not be towed or be exposed to high mechanical stresses while the temperature of the oil is higher than the temperature described above. This is due to lower seam strength at elevated temperatures.

The ambient air temperature is not mentioned in the specifications above, since most of the UOB is submerged during an operation. The area exposed to air will in most case be so small that it can be neglected.

HUMIDITY

The UOB shall in all operating conditions be in water and will be more or less fully submerged.

For transportation from place of storage to area of use, the humidity as specified under storage conditions should be observed.

FLOATING MEDIUM

The design is based on difference in density for water and cargo.

Description	Density kg/m ³
Min. difference of density between water and cargo 1)	10

1) The density of the water must be higher than of the cargo.

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FILLING MEDIUM (CARGO)

The UOB is designed for crude oil and light bunker oil (and oil/water mixture), with the following main properties:

Description	Min	Max	Unit
Oil density 1)	800	1015	kg/m ³
Kinematic viscosity at operating temp. 1)	0	1000	CtS

- 1) Valid combination of density vs. viscosity is shown in Figur 1.

If air or oil vapour is trapped inside the UOB, venting has to be considered.

VISCOSITY
CtS

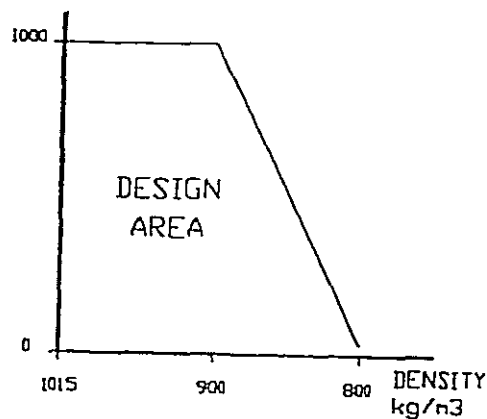


Figure 1.

SEA CONDITIONS

Waves

The following design wave conditions is used:

Description	Value	Unit
Significant wave height H_s	5	m
Spectral peak period 1) T_p	8,6 - 15	sec
Max wave height H_{max}	9 - 10	m

- 1) Range covered by design analysis to cover the most critical conditions.

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Conditions used in the design load calculations

Description	Cond.1	Cond.2	Cond.3	Cond.4	Unit
Sign. wave height 1) Hs	5	5	0	*)	m
Oil density	800	900	800	800	kg/m ³
Oil viscosity	15	1000	15	15	CtS
Towing tension	-	-	Weak link	Max.t. force	-
Towing line property	Max. stiff.	Max. stiff.	-	-	-
Towing Speed	2	2	-	*)	knots 2)
Heading	0	0	0	30	degree

- 1) $M_{s,max.} = 5$ m.
If a lower wave height is more critical with respect to dynamic tension, this value is used.
- 2) Relative to water.
- *) Conditions which gives the highest towing force (static and dynamic) for conditions defined.

The above conditions are assumed to cover a realistic set of worst case conditions.

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TOWING

Towing is only allowed connecting the tug's towing line to the UOB's towing arrangement, consisting of weak link and elastic line, to the towing attachment in the front section.

Description	Value	Unit
Empty UOB, max towing Speed, calm water	12	knots 3)
Loaded UOB, max towing Speed, calm water	8	knots 3)
Loaded UOB, max towing Speed, moderate sea state 1)	6	knots 3)
Loaded UOB, max towing Speed, worst case cond. 2)	2	knots 3)
Towing arrangement, max. line stiffness, front SK5	3	kN/m
Towing arrangement, max. line stiffness, front SK50 or OB50	10	kN/m
Change in dir. of pull to main dir. of UOB, max.	45	degree

- 1) Significant wave height $H_s < 1m$.
- 2) Corresponding to station keeping.
- 3) Relative to water.

The values listed in the above table are maximum values, and must not be confused with recommended speeds. The towing speed should at all times be kept as low as possible.

Wind

The direct effect of wind forces on the container is small and can therefore be neglected. Wind effect on the towing vessel and other equipment has to be considered.

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SALT SPRAY AND WATER

The UOBs are designed to withstand exposure to rain, salt spray, continuous submergence in seawater for one year, however, these criteria are regarded as design criteria for the fabric strength only.

Continuous storage must only take place in strict accordance with the section Storage Environment below. Operation in waters which is likely to freeze must under no circumstances take place.

SUN EXPOSURE

The UOB may be exposed continuously to one year of tropical sunlight, however, this criteria is regarded as design criteria for the fabric strength only.

Continuous storage must only take place in strict accordance with the section below.

When the UOB is stored in places with direct sunlight, due consideration must be paid to the storage temperatures as specified below.

DESIGN LIFE

Description	Value	Unit
Design life	10	year
Training: 1)	max. times per year	1 off
	max. duration each deployment	2 week
	max. accumulated time totally	20 week
Oil spill operation:	max. oil cargo storing period 2)	60 day
	max. accumulated time totally	1 year

1) Training is defined as UOB launched in sea water, filled with fresh water and towed periodically, under calm water conditions.

2) When the UOB is filled, it should be towed to calm water as soon as possible. Long time storage with oil must only take place in calm water.

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STORAGE ENVIRONMENT

The optimal conditions for storing coated fabrics will be at relative humidity of approx. 65%, roomtemperature approx. 20°C and kept in a dark space, e.g. Unitor Storage Container. However, the UOB is designed for the following maximum storage environment:

Temperature

Continuous temperature : -30°C to +60°C
Peak temp., short period: +75°C

Humidity

Relative humidity: 10% to 100%

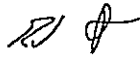
Miscellaneous

The UOB must be stored in environments free from chemicals or petrochemical solvents. Exposure to chemicals or petrochemical solvents may have detrimental effect on the fabric.

Storage after use

After use the UOB must have been cleaned and dried according to specifications prior to be put into storage.

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OIL BAG	PORTABLE VERSION			92-00-021	

GENERAL

This OPERATION INSTRUCTION gives the necessary information for safe operation of the UNITOR OIL BAG®(UOB).

Towing is described separately in the TOWING INSTRUCTION.

OPERATING ENVIRONMENT

The UOB should not be launched unless the operational conditions is in accordance with the OPERATING ENVIRONMENT document.

LAUNCHING

For launching of the UOB, the STORAGE CONTAINER should be brought to the sea front by truck or crane.

Then lift the UOB out of the STORAGE CONTAINER and into the water by the preinstalled lifting arrangement. Release the UOB by pulling the release rope connected to the quick release hook.

The UOB can alternatively be launched by dragging it into the water. Open the front of the STORAGE CONTAINER, and fold out the protective fabric. Drag the UOB into the water by the towing arrangement, over the protective fabric.

UOBs stored at low temperatures should be dropped into the sea from as low height as possible, to avoid damage to the UOB.

WARNING: Be careful not to drag the bag over any sharp objects or edges, this can cause severe damage to the fabric.

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HOSE

The following hoses are needed for a proper operation of the UOB:

For the discharging operation a noncollapsible hose is needed, for filling purpose a collapsible hose can be used. The hose must be provided with suitable quick couplings for the front, and for the filling/discharging equipment.

To be able to discharge water from the UOB during a skimming operation, the 2" decanting hose has to be used.

WARNING: Special care should be taken not to expose the hoses for any towing or pulling forces during the filling/discharging procedure. Any attempt to do so, can cause damages to the hose and fittings.

FILLING

Filling of the UOB should only take place when the bag is free floating on a sufficient depth. See draught specifications for the depth needed for the actual bag size.

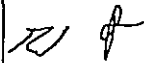
The absolute maximum allowable filling rates are 200 m³/hour for UOBs with 4 inch filling connection and 400 m³/hour for UOBs with 6 inch filling connection.

This filling rate will be limited by the maximum allowable working pressure of the connected fittings and hoses. Maximum allowable pressure for camlocks and hoses are specified elsewhere in this manual.

A UOB floating folded together, should be allowed to unfold somewhat before the filling procedure begins.

The filling rates should not exceed 100 m³/hour for the first 10 minutes, permitting the UOB to unfold.

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After 10 minutes the UOB (in most environmental conditions) will have reached such a degree of complete unfolding that the filling rate slowly can be increased to its maximum. Under no circumstances must the filling rate be increased above 100 m³/hour, before the bag is fully unfolded.

When the filling mark for the actual density of cargo is reached, the filling should be slowly reduced and stopped.

Attempts to overfill the bag may cause the bag to rupture. The above filling rates should be considered as maximum. The judgement of an experienced operator will conduct a safe filling operation without looking strictly to the time and filling rates, both when loading and discharging. The behaviour of the bag is as equally important for a safe filling operation as the filling rates.

The UOB will perform best when filled with low viscous oil, with density close to the maximum allowable (specified in the document OPERATING ENVIRONMENT). To ease the filling process of high viscus oils, 0,5 to 1 litre of Unitor Flow Improver can be added. This will reduce the viscosity of the oil significantly, and the oil will flow more easily.

WARNING: Attempts to overfill the BAG may cause damage to the BAG

WARNING: Attempts to fill the BAG when the oil temperature is too high, may cause damage to the BAG.

WARNING: Attempts to tow the UOB when the oil temperature is above +40°C may cause damage to the bag.

VENTING

During a normal filling operation the amount of air getting into the bag is negligible, and no venting is required.

In the event that air accidentally should be pumped into the UOB. Lift the front carefully out of the water, and open one of the hose couplings to allow the air to escape.

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System	Subject			Ref.	
OIL BAG	PORTABLE VERSION			92-00-021	

SKIMMING

Before the skimming operation can take place, the INTERNAL part of the decanting hose has to be inserted into the bag. This must be done through the 3" adapter in the steel front, marked DECANTING. Lock the mid coupling on the hose to the front adapter to prevent leakage. Do not try to insert the hose before the bag is fully unfolded. To ease the operation, lift the front partly out of the water.

The suction end of the INTERNAL part will sink to the bottom of the bag, and make it possible to pump out excessive water.

The EXTERNAL section of the decanting hose must then be connected in between the outlet of the INTERNAL part, and the pump, before the skimming operation can begin.

FILLING STOP AND TOWING PREPARATION.

When the UOB is filled, lift the steel front partly out of the water and disconnect the filling and skimming hoses. Caution should be taken to prevent oil spillage. Be careful to tighten the male endcaps on the couplings after disconnecting the hoses.

The loose hose ends should be secured to the vessel or to a buoy to prevent them from sinking.

The DECANTING HOSE, INTERNAL SECTION will normally not be removed during a towing operation.

The UOB is now ready to be towed away or moored for later transportation.

TOWING

Towing of the UOB should be in accordance with the TOWING INSTRUCTION.

DISCHARGING

Discharging of the UOB shall be done through the loading/discharging connection in the front section.

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OIL BAG	PORTABLE VERSION			92-00-021	

If the contents of the UOB is a high viscous oil, 0.5 to 1 litre of Unitor Flow Improver can be added. This will reduce the viscosity of the oil significantly, and simplify the discharging process.

It should be noted that adding the Unitor Flow Improver after the UOB has been loaded, often will give a nonhomogeneous mix, and thereby give a reduced effect of the Unitor Flow Improver.

Care should be taken at the end of a discharging operation, not to create an underpressure in the UOB, as this may cause the fabric to be sucked into the discharging pipe. Hence, when the UOB is nearly empty, the discharging rate should be reduced. The UOB should be stretched by pulling forward and aft to avoid the front to collapse.

It may be difficult to empty the UOB completely for the last remaining 5% of oil. It is therefor important to note the following:

There exist two ways to empty the UOB completely for oil, and the procedure are described briefly below.

1. Fill water into the bag, leave the UOB for a while to give the water and oil time to separate. Then pump the remaining oil out.
or
2. Start lifting the aft end of the UOB out of the water. Be careful not to lift faster than the oil can escape through the front. Continue to lift until the bag is empty.

The UOB will now be ready to be towed and refilled.

Note the restrictions on storage time for oil filled bag in the chapter Operating Environment.

END OF OPERATION

At the end of an operation, use the MAINTENANCE INSTRUCTION for cleaning, maintenance and packing of the UOB.

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OIL BAG	PORTABLE VERSION			92-00-021	

EMERGENCY OPERATIONS

In the supplied REPAIR KIT, equipment and instructions for field repairs and smaller damages on the fabric can be found.

OPERATING LOG

After each operational event, the UOB Operating Log has to be filled in accurately. One Operating Log shall be kept for each UOB. A copy of a Operation Log Sheet is enclosed. Information of how and what to fill in, follows below:

Deployment no

Each deployment of the UOB shall be given a deployment number. Start at 01 at increase with one for each subsequent deployment.

Launched

Date and time of when the bag actually was launched into water first time for this deployment.

Out of water

Date and time when the UOB was lifted out of the water after this deployment.

Cleaned and dried

Fill in date and time of completion of the cleaning and drying process.

Operated in

Tick off appropriate box for type of water the UOB has operated in: SW=Salt Water, FW=Fresh Water, or oil.

Type of cargo

Tick off appropriate box for type of cargo filled into the UOB: FW=Fresh Water, or Oil

Fill in as accurately as possible the type of oil actually filled into the UOB.

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OIL BAG	PORTABLE VERSION			92-00-021	

Hours of operation

Calculate actual hours in operation with either Fresh Water or Oil.

Calculate total accumulated hours of operation with both Fresh Water and Oil after this deployment.

NOTE: AFTER EACH DEPLOYMENT, CHECK ACTUAL ACCUMULATED HOURS AGAINST THE MAXIMUM ALLOWABLE SERVICE LIFE SPECIFIED IN THE DOCUMENT OPERATING ENVIRONMENT.

IF THE MAXIMUM LIMITS ARE EXCEEDED, THE BAG SHOULD NOT BE USED FURTHER.

Notes

Special note from the operation, write SK if the UOB has been used for skimming operation.

Sign

Signature of the person that filled in the log.

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Type of document				Document no.	
OPERATING INSTRUCTIONS				92-00-201-7-E	
Issued by	Date of issue	Rev. no.	Rev. date	Approved by	Page
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System	Subject			Ref.	
OIL BAG	TOWING SIZE 5			92-00-201	

GENERAL

The purpose with this instruction is to describe the main points of towing the UNITOR OIL BAG® (UOB), however, this instruction does not relieve the captain of the towing vessels for any of his obligation as to ensure proper and safe handling of the bag and its content.

Towing of the UOB must only take place in strict accordance with local, national and international legislation applicable.

TOWING PREPARATION

The UOB is equipped with required special equipment needed for towing. The towing vessel must have a towing line to hook-up to the UOB's towing line.

DESCRIPTION OF THE UNITOR OIL BAG

The UOB is a flexible container specially designed for use in oil spill emergency situations. The FRONT is made of steel, and connects the UOB to the TOWING LINE. The TOWING LINE provided must be used to avoid damage to the UOB during towing.

In the aft end are two BRIDLE LINE's. The BRIDLE LINE's are designed for manoeuvring the UOB.

ENVIRONMENTAL CONDITIONS

The following environmental conditions should be observed:

There are two different wave conditions which should not be exceeded. The first wave condition is a significant wave height 1.0 m, and a peak period on 4.0 seconds, and the second wave condition is a significant wave height 5.0 m, and a peak period on 10.0 seconds.

It is assumed that the direct effect of the wind forces on the UOB will be small, and can normally be neglected.

The towing speed of the UOB should be kept as low as possible.

The bag must not be towed or operated in waters that may lead to contact between the bag and bottom, land, vessel, floating debris, ice or any other object that may cause damage to the fabric.

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OPERATING INSTRUCTIONS				92-00-201-7-E	
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System	Subject			Ref.	
OIL BAG	TOWING SIZE 5			92-00-201	

WATER DEPTHS

As the UOB is made of coated fabric, the bag must under no circumstances be towed or operated in shallow water. For more detailed information see draught specification for the actual bag size.

TOWING SPEED

Towing should commence at low speed, and then be increased gradually. The towing speed must under no circumstances exceed the maximum allowable of 4 knots. The UOB has a large inertia and the towing speed should therefore be reduced well in advance before entering a port or a destination were the bag should come into a complete stop.

TURNING RADIUS

The change in direction of pull during towing shall not at any time exceed 45 deg. to the centre line of the UNITOR OIL BAG®.

PULLING FORCE

In the TOWING LINE and the BRIDLE LINE is a WEAK LINK which is designed to brake before the design load for the UOB is reached. In the TOWING LINE is also a 70 m long elastic line with an elongation of 30%. The WEAK LINK in the TOWING LINE is designed to brake at minimum 49 kN, and the WEAK LINK in the BRIDLE LINE is designed to brake at minimum 12 kN. The pulling force must be kept as low as possible to avoid brakeage.

EMERGENCY OPERATION

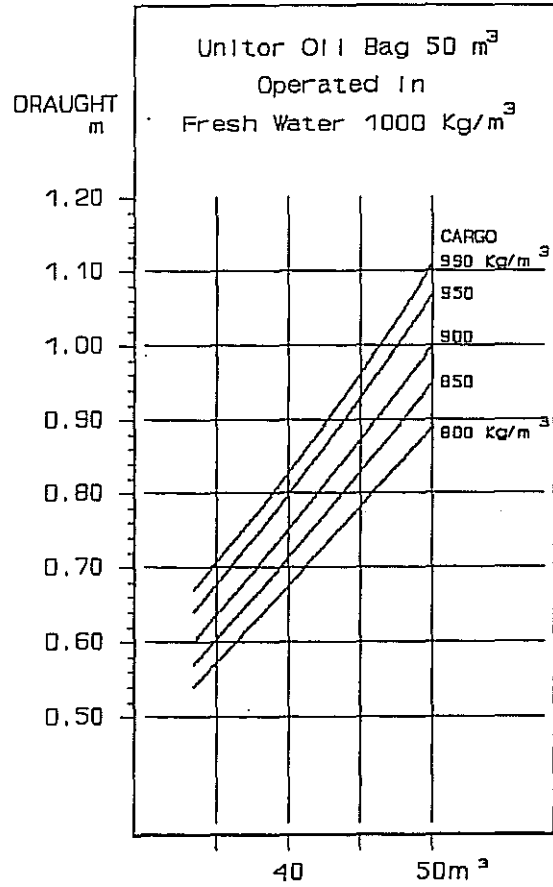
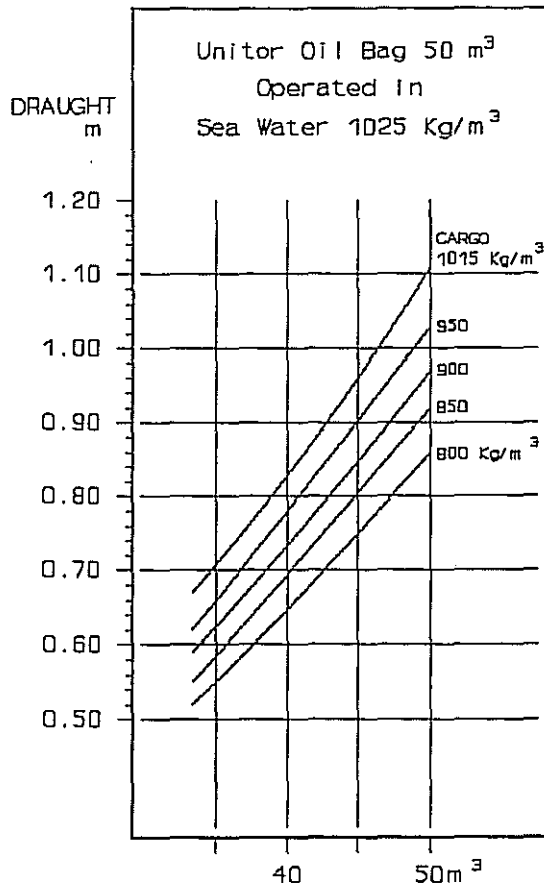
In case the WEAK LINK BREAKS, an additional weak link is fitted on the towing arrangement as a spare.

UNITOR

Type of document				Document no.	
OPERATION INSTRUCTIONS				92-01-101-7-E	
Issued by	Date of Issue	Rev. no.	Rev. date	Approved by	Page
OPS	31.03.92	01	09.06.92	<i>[Signature]</i>	1 OF 1
System	Subject			Ref.	
OIL BAG	OIL BAG 50 M ³ DRAUGHT SPECIFICATION			92-01-101	

GENERAL

This OPERATING INSTRUCTION gives the draught of the UNITOR OIL BAG® (UOB) versus various volumes and densities.



UNITOR

UOB OPERATING LOG

UOB SERIAL NO. : _____
 DATE OF DELIVERY : _____
 PAGE : _____

L T	LAUNCHED DATE TIME	OUT OF WATER DATE TIME	CLEANED & DRIED DATE TIME	OPERATED IN		TYPE OF CARGO		HOURS OF OPERATION				NOTES	SIGN	
				SW	FW	FW	OIL	SPEC	EACH DEPLOYMENT		ACCUM. HOURS			
									FW CARGO	OIL CARGO	FW CARGO			OIL CARGO
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				<input type="checkbox"/>	OIL									
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				<input type="checkbox"/>	OIL									

UNITOR

Type of document				Document no.	
TECHNICAL DESCRIPTION				92-00-301-2-E	
Issued by	Date of issue	Rev. no.	Rev. date	Approved by	Page
OPS	07.08.91	02	13.05.92	<i>[Signature]</i>	1 OF 1
System	Subject			Ref.	
OIL BAG	TOWING LINE ARRANGEMENT			92-00-301	

APPLICATION

The TOWING LINE ARRANGEMENT is designed for use in the towing operation of the UOB system.

DESIGN

The TOWING LINE ARRANGEMENT is designed with an ELASTIC LINE shackled to the FRONT and shackled to a fibres WEAK LINK.

The WEAK LINK is designed to break if the towing forces exceeds the design force for the UOB.

In the shackle on the towed end the TOWING LINE ARRANGEMENT is a spare WEAK LINK and a BUOY attached.

FUNCTION

When the UOB has been launched, the TOWING LINE ARRANGEMENT may be used to keep the UOB stationed.

For towing, the tug must hook up in the WEAK LINK.

The ELASTIC LINE will work as a compensator for the dynamic towing force caused by the relative horizontal motion between the tug and the UOB.

TECHNICAL INFORMATION

Material:

Elastic line	: White nylon rope
Weak link	: Ice blue ESTalon fibre rope
Buoy	: Soft PVC
Shackle	: Galvanised steel

UNITOR

Type of document

TECHNICAL DESCRIPTION

Document no.

92-00-311-2-E

Issued by

OPS

Date of Issue

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Approved by



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System

OIL BAG

Subject

BRIDLE LINE ARRANGEMENT

Ref.

92-00-311

APPLICATION

The BRIDLE LINE ARRANGEMENT is designed for use in connection with manoeuvring of the UOB.

DESIGN

The BRIDLE LINE ARRANGEMENT is designed with an ELASTIC LINE hooked to the BRIDLE LINE CONNECTOR and shackled to a fibres WEAK LINK.

The WEAK LINK is designed to break if the towing forces exceeds the designed force for the OIL BAG.

In the shackle on the BRIDLE LINE ARRANGEMENT is a spare WEAK LINK and a BUOY attached.

FUNCTION

When the UOB has been launched, the BRIDLE LINE ARRANGEMENT line may be used to keep the OIL BAG stationed.

For manoeuvring, the tug must hook up in the WEAK LINK.


The ELASTIC LINE will give required distance between the tug and the OIL BAG. The fabric, in which the BRIDLE LINE ARRANGEMENT is connected, compensates for the dynamic forces.

TECHNICAL INFORMATION

Material:

Elastic line	:	White nylon rope
Weak link	:	Ice blue ESTalon fibre rope
Buoy	:	Soft PVC
Shackle	:	Galvanised steel

UNITOR

Type of document				Document no.	
TECHNICAL DESCRIPTION				92-01-011-2-E	
Issued by	Date of Issue	Rev. no.	Rev. date	Approved by	Page
OPS	13.05.92	01	05.02.93		1 OF 1
System	Subject			Ref.	
OIL BAG	OIL BAG			92-01-001	

APPLICATION

The UNITOR OIL BAG® (UOB) is a specially designed flexible container for use in the UOB system as the storage compartment.

DESIGN

The OIL BAG is a container made of PROTEX fabric sheets welded together in a tear-shape. The tear-shape is the optimum shape for the towed flexible container. In the tension and/or mechanical critical areas of the bag additional layers of fabrics are welded in.

The inlet/connection opening is reinforced with a rope preparing the container for the connection with the FRONT.

In the aft end of the bag, two soft eyes are added for connection of the BRIDLE LINES.

Each bag size is equipped with buoyancy elements in order to keep the bag afloat in unfilled condition.

FUNCTION

The OIL BAG is a soft, pliable, container capable of being folded when stored.


The bag can be towed and/or manoeuvred by any vessel.

In the OIL BAG system, the BAG is the storage container for the oil or the mixture of oil and water as will be the case during an oil skimming or filling operation.

TECHNICAL SPECIFICATION

See TECHNICAL DESCRIPTION for OIL BAG MATERIAL PROTEX document no. 92-01-990-2-E.

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				92-01-990-2-E	
Issued by	Date of Issue	Rev. no.	Rev. date	Approved by	Page
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System	Subject			Ref.	
OIL BAG	OIL BAG MATERIAL PROTEX 092			92-01-990	

The PROTEX fabric is specially designed and developed for use in the UNITOR OIL BAG system.

PROTEX fabric is a sandwich construction consisting of a polyester textile coated on both sides with a polymer blend. The plasticisers can not be extracted or washed out in the same degree as normal plasticised PVC-coated materials. PROTEX will thus keep its mechanical and chemical properties over time.

The OIL BAG's are welded with modern high frequency welding equipment and tests show that the seams are as strong as the material itself.

The strength of the container with regards to external factors, has been of major concern during the development process.

PROTEX:

- Has required strength for the specified loading conditions.
- Is resistant to sea water and oil.
- Has long term properties for storage.
- Does not build up static electricity when the OIL BAG is in water.
- Is field repairable for smaller tears or punctures.

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Type of document				Document no.	
TECHNICAL DESCRIPTION				92-01-990-2-E	
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System	Subject			Ref.	
OIL BAG	OIL BAG MATERIAL PROTEX 092			92-01-990	

TECHNICAL SPECIFICATION

Material properties are documented against recognised standards as far as applicable.


The fabric has been tested mechanically with following results:

	PROTEX 092
Weight (g/m ²):	1600
Thickness (mm):	1,30
Tensile strength DIN 53354 (N/5cm):	9000/8500
Elongation at break (%):	24/26
Leg tear DIN 53356 (N):	1500/1700
Trapezoid DIN 53363 (N):	1500/1700
Adhesion (N/5cm):	100
Perforation w/chisel NS 3548 A (N):	1800
Cold Crack BS 3424 (°C):	-36

Colour: Red RAL 3000 (may vary due to blending and production)

Continuous storage temp. (°C):	- 30 to +60
Peak temp., short periods (°C):	+ 75
Humidity range storage (%):	10 to 100
Water temperature (°C):	- 5 to +35
Cargo temperature (°C):	0 to +75
Cargo temp. during tow (°C):	max +40

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Type of document				Document no.	
TECHNICAL DESCRIPTION				92-02-002-2-E	
Issued by	Date of issue	Rev. no.	Rev. date	Approved by	Page
OPS	13.01.92	02	26.01.93		1 OF 2
System	Subject			Ref.	
OIL BAG	FRONT SK5, F6/S3 SKIMMING VERSION			92-02-002	

APPLICATION

The FRONT SK5 is specially designed for use in the UNITOR OIL BAG® (UOB) system for filling volumes up to, and including 500 m³.

The FRONT is the connection between the towing arrangement and the bag, and it contains the necessary connections for the operations.

DESIGN

The FRONT is made of steel and has sufficient buoyancy to float.

The steel front has been designed for the specific towing force applicable to the largest bag size.

The loading and discharge connection has been located to give the best possible access during operation. The various connections are clearly marked.

On top of the FRONT, is a threaded connection for signal mast.

FUNCTION


After the UOB has been launched into the water, the loading may take place through the loading/discharging connection. This connection must be used for loading as a special plate is built in to avoid damage on the UOB fabric.

WARNING: Attempts to load the bag through any other connections than the specially designed one, may cause the bag to rupture.

To discharge the oil in the bag, use the loading/discharging connection.

For skimming operation, take off the end cover on the decanting pipe connection and insert the decanting hose through the opening, connect the adapter on the FRONT to the connector on the hose.

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Type of document				Document no.	
TECHNICAL DESCRIPTION				92-02-002-2-E	
Issued by	Date of Issue	Rev. no.	Rev. date	Approved by	Page
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System	Subject			Ref.	
OIL BAG	FRONT SK5, F6/S3 SKIMMING VERSION			92-02-002	

TECHNICAL INFORMATION

Materials:

Body : Mild steel NVA
Securing clamp : Mild steel NVA
Bolts and nuts : Stainless steel AISI 316
Fittings : Brass

Surface treatment outside:

Preliminary treatment: Sand blasted SA 2.5

Application:

Product	DFT (μ)	Theoretical Coverage ($M^2/Litre$)
Barrier 2-comp. zinc epoxy	40	13.3
Jotunmastic 87 Al., epoxy	150	6
Hardtop AS, polyurethane	40	12.5

Total Dry Film Thickness 230 Microns


Surface treatment inside : Fill the front with
Tecktyl, then drain.

Connections:

Loading/discharging : 6" male adapter
Decanting : 3" male adapter
Mast connection : 1 1/2" BSP female thread

Net buoyancy : Approx. 30 kg
Weight with valves : Approx. 170 kg

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Type of document				Document no.	
TECHNICAL DESCRIPTION				92-02-990-2-E	
Issued by	Date of issue	Rev. no.	Rev. date	Approved by	Page
OPS	25.06.91	02	11.01.93		1 OF 1
System	Subject			Ref.	
OIL BAG	SURFACE TREATMENT FOR FRONTS			92-02-990	

F R O N T I N S I D E A N D O U T S I D E .

SURFACE TREATMENT (OUTSIDE)

Gritblasting to grade SA 2 1/2 according ISO 8501-1 or SIS 055900.

Remove all spent grit, dirt, scale and other debris prior to application. Wash down with clean fresh water and allow to dry.

Surface profile: 50-70 Microns.

Grit type: Good quality grit.

Application (external)

Product	DFT (μ)	Theoretical Coverage ($M^2/Litre$)
Barrier 2-comp zinc epoxy	40	13.3
Jotamastic 87 Al., epoxy	150	6
Hardtop AS, polyurethane	40	12.5

Total Dry Film Thickness 230 Microns

Colour: Signal Yellow Ral 1021

Apply all coats by high pressure spray.

Do not apply in temperatures below 10°C.

SURFACE TREATMENT (INSIDE)

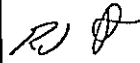
Prepare by wire brushing, remove all dirt, scale and other debris prior to application.

Fill the front with Tecktyl, then drain.

MAINTENANCE

Treatment similar to the factory treatment as and when required.

UNITOR

	Type of document				Document no.	
	TECHNICAL DESCRIPTION				92-04-041-2-E	
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OPS	09.08.91	03	12.08.92		1 OF 1	
System	Subject			Ref.		
OIL BAG	DECANTING HOSE, INTERNAL SECTION			92-04-041		

APPLICATION

The DECANTING HOSE is specially designed for discharging water from the UNITOR OIL BAG® (UOB) system during a skimming operation.

DESIGN

The decanting hose consists of two main parts, the INTERNAL and EXTERNAL section, connected to each other with 2" quick couplings. The INTERNAL section is designed to be inserted into the UOB through a 3" adapter in the steel front. The hose is equipped with a quick coupling device in the middle, which secure and tighten the hose to the front adapter. The suction end is provided with a specially designed inlet, which eases the insertion of the hose, and prevents it from causing any damage to the bag during the process.

FUNCTION

When the INTERNAL section of the decanting hose is inserted, the suction end will sink to the bottom of the UOB. Any excessive water collected in the bag can then be pumped out by connecting the EXTERNAL section of the decanting hose to a pump.

TECHNICAL INFORMATION

Material:

Hose : Reinforced rubber hose.
Fittings: Brass
Jointing: Shrinkable tubing.

UNITOR

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OPS		25.06.91	02	11.01.93	<i>[Signature]</i>	1 OF 1
System		Subject			Ref.	
OIL BAG		SURFACE TREATMENT FOR BRIDLE LINES CONNECTIONS			92-06-990	

SURFACE TREATMENT

Gritblasting to grade SA 2 1/2 according ISO 8501-1 or SIS 055900.

Remove all spent grit, dirt, scale and other debris prior to application. Wash down with clean fresh water and allow to dry.

Surface profile: 50-70 Microns.

Grit type: Good quality grit.

Application (external)

Product	DFT (μ)	Theoretical Coverage (M ² /Litre)
Barrier 2-comp zincepoxy	40	13.3
Jotamastic 87 Al., epoxy	150	6
Hardtop AS, polyurethane	40	12.5

Total Dry Film Thickness 230 Microns

Colour: Signal Yellow Ral 1021

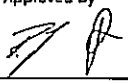
Apply all coats by high pressure spray.

Do not apply in temperatures below 10°C.

MAINTENANCE

Treatment similar to the factory treatment as and when required.

UNITOR

Type of document		Document no.			
TECHNICAL DESCRIPTION		92-09-990-2-E			
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OPS	25.06.91	02	12.01.93		1 OF 1
System	Subject			Ref.	
OIL BAG	SURFACE TREATMENT FOR STORAGE CONTAINERS			92-09-990	

SURFACE TREATMENT

Gritblasting to grade SA 2 1/2 according ISO 8501-1 or SIS 055900.

Remove all spent grit, dirt, scale and other debris prior to application. Wash down with clean fresh water and allow to dry.

Surface profile: 50-70 Microns.

Grit type: Good quality grit.

Application (external)

Product	DFT (μ)	Theoretical Coverage ($M^2/Litre$)
Barrier 2-comp zincepoxy	40	13.3
Jotamastic 87 Al., epoxy	150	6
Hardtop AS, polyurethane	40	12.5

Total Dry Film Thickness 230 Microns

Colour: White Ral 9010

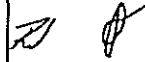
Apply all coats by high pressure spray.

Do not apply in temperatures below 10°C.

MAINTENANCE

Treatment similar to the factory treatment as and when required.

UNITOR

Type of document		INSTALLATION PROCEDURES			Document no.	
					92-00-021-3-E	
Issued by	Date of issue	Rev. no.	Rev. date	Approved by	Page	
OPS	06.08.91	01	12.08.92		1 OF 1	
System	Subject			Ref.		
OIL BAG	PORTABLE VERSION			92-00-021		

SYSTEM ARRANGEMENT

The UNITOR OIL BAG® (UOB) is packed in a steel container together with the required equipment for operation.

The container is designed for crane and truck-handling, and can be stacked in two heights. The UOB is prepared for direct launching from the storage container.

STORAGE INDOORS

If the container is stored indoors, it should be placed convenient for quick access by truck or crane in case of emergency.

STORAGE OUTDOORS

Outdoor storage must give free access to the container for truck or crane handling in an emergency situation.

Attention should be paid to the environmental conditions.

INSTALLATION ONBOARD

It is important that the container with the UOB is placed convenient for quick access and launching. The container must be lashed to the ship-deck, using the prepared holes in the structure. The containers should under no circumstances be stacked on top of each other during a voyage or transportation.

GENERAL STORING INFORMATION

The container should not be exposed to any mechanical damage.

The container is not designed for any heavy stacking loads or other external loads.

The maximum temperature exposed to the container surface should not exceed 40°C over time, or 60°C for shorter periods.

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OIL BAG	PORTABLE VERSION			92-00-021	

GENERAL

One of the main objects while designing the UNITOR OIL BAG[®] (UOB) has been to keep the requirement for maintenance as low as possible.

However, some regular maintenance will always be required, and below we have specified what would normally be required at certain intervals.

MAINTENANCE AND SERVICE BY UNITOR

UNITOR offers throughout its world wide service network various service and maintenance services.

Please feel free to contact nearest UNITOR office to get assistance.

SPARE PARTS

Additional spare parts to your system can be ordered through your nearest UNITOR office.

MAINTENANCE RECORDS

All maintenance performed should be recorded on the enclosed maintenance record.

An accurate filled in maintenance record will assist you in better control of the system and will enable easier tracing of potential problem areas.

HOW TO FILL IN THE FORM

1. Date

Give date of completion of the maintenance.

2. Item inspected

Short description of item inspected.

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3. Spares used

List spares and consumables replaced during the maintenance.

4. Status

Status of the system component after the maintenance.
Is it in operable condition or not?

5. Remarks

Any notes that may highlight special problems, what has been found etc.

6. Signature

The signature of the person responsible for the maintenance.

ANNUAL INSPECTION

The storage container

Check the STORAGE CONTAINER for mechanical damage and repair or replace the container if required.

Containers found corroded or traces of corrosion shall be dealt with as required. Surface treatment according to separate procedure.

The bag

An unused bag do not normally need to be checked, however, if there are any possibility to that the bag has been exposed to any damage, the bag should be inspected and repaired as required.

BAG's that have been used and repacked, must be taken out off the storage container, wrapped up on the ground, filled with air and inspected annually. See cleaning procedure. If the BAG has damages or weaknesses, the BAG has to be repaired or replaced if required.

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The BAG shall be packed according to separate procedure.

WARNING: The ground where the bag shall be unpacked must be relatively smooth and free from any sharp objects. Cover the ground with tarpaulins before the bag is unpacked. Personnel entering the bag must wear shoes free from sharp objects or edges. Failure to comply with the above may damage the bag. Regarding personal protection equipment, see cleaning procedure.

The FRONT

FRONTS found corroded or traces of corrosion should be surface treated according to separate procedure.

Each drain plug should be checked for movement and tightness.

Use silicon grease from the spare part kit to lubricate bolts and nuts if required.

Gaskets in end cover's shall be visually inspected and replaced if necessary.

Check bolts and nuts on securing clamps, grease with silicon grease and tighten nuts and bolts if required.

Towing equipment

The BUOY should be filled with air, if not, it must be pumped up. Damaged BUOYS has to be replaced.

BRIDLE LINE CONNECTION found corroded shall be surface treated according to separate procedure.

FIBRE ROPES shall be visually inspected and replaced if found necessary. See separate procedure.

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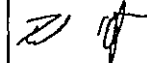
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System

OIL BAG

Subject

PORTABLE VERSION

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FIVE YEAR INSPECTION

The storage container

As for annual inspection.

The bag

The bag shall be fully inspected every fifth year.

Prepare the area intended to be used during the inspection as described elsewhere in this document.

All seams and areas where it is suspected that there might be a leakage shall be tested for leakage with a soap solution when the bag is inflated with air.

Any defects found shall be repaired in accordance with specifications.

Dry and repack the bag in accordance with separate instruction.

The FRONT

As for annual inspection.

Towing equipment

As for annual inspection.

MAINTENANCE AFTER USE

UOBs that have been used and which are intended to be stored for later use, shall be discharged, cleaned and packed according to separate procedures.

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OIL BAG	CLEANING PROCEDURES			92-00-990	

This cleaning procedure is a general description for all UNITOR OIL BAG® (UOB) systems for filling volumes up to include 1000 m³. The procedure gives guide lines for cleaning and packing. Packing is covered in a separate chapter.

Needless to say, this general procedure can not cover all possible situations, and should special conditions occur prior to and during cleaning, please do not hesitate to contact UNITOR ENVIRO TEAM.

This procedure does not relief the owner for any of his obligations to ensure proper and safe handling of the BAG, waste liquids and gasses according to local, national and international legislation.

CLEANING PREPARATION

Before the cleaning of UOB can begin, certain preparations has to be done:

1. Cleaning area

An area which is large enough for the actual bag has to be located. The area has to be relatively smooth and completely free for sharp objects or any other object that may damage the bag. In addition, the whole cleaning area should be covered with tarpaulins to protect the bag.

Consideration should be paid to select a suitable cleaning area to minimize the consequences of a accidental oil spillage.

2. Ventilation

An UOB that has been used for transportation of oil products may contain hydrocarbons even if it has been cleaned. To avoid any dangerous situations, the area selected should be a well ventilated space with small risks of collecting flammable gases.

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System

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Ref.

OIL BAG

CLEANING PROCEDURES

92-00-990

3. Permission

Permission to use the area for cleaning of the bag should be obtained from local authorities prior to commencement of the cleaning.

4. Electrical equipment

As an used UOB may contain flammable gases, all electrical equipment used inside or in the near vicinity of the UOB should be suitable for use in such areas.

5. Use of open flame

All use of open flame inside or in the near vicinity of the UOB is strictly prohibited.

6. Air blowing equipment

A fan able to blow air into the bag must be available.

The fan must produce a static pressure 100 mm water gauge, and a air volume 2000 m³/H.

7. Washing equipment

For cleaning operations water and waste liquid receiver according to the local legislation is required.

The filling/discharging hose must be available.

8. Detergents

The detergent to use on the UOB is the UNITOR OIL BAG CLEANER, and presents the next generation of multi-purpose cleaning and degreasing agents. It is non-toxic, non-caustic, free from hydrocarbon solvents, and fully biodegradable giving complete safety to the environment and persons handling it.

The dosage rate is approx. 10 L pr. m³ water filled in the BAG. See also separate specification of the UNITOR OIL BAG CLEANER, AQUABREAK PX.

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OIL BAG	CLEANING PROCEDURES			92-00-990	

Only cleaning detergents approved by UNITOR AS are recommended. Use of any other detergent will leave all guaranties void.

9. Lifting arrangement

The empty bag must be lifted by the special lifting weak links in the aft.

10. Personnel protection equipment

Personnel entering the BAG whilst there are any traces of hydro carbons or other gases must wear self contained breathing apparatus.

Protective equipment required for use in connection with the detergent must be obtained according to the manufacturers instructions.

Persons entering the BAG should at any time carry a sharp knife to cut the bag open in a case of an emergency evacuation, such as e.g. collapse of the bag.

WARNING: Personnel entering the bag must wear shoes free from sharp objects or edges. Failure to comply with the above may cause damage to the bag.



CLEANING

The cleaning procedure is divided into two phases as follows:

1. Discharging the UOB for remaining oil

In order to empty the UOB completely, it is necessary to fill the bag with water. Wait for the oil and water to separate before discharging the remaining oil, using the standard discharging procedure.

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OIL BAG	CLEANING PROCEDURES			92-00-990	

Note: The filling level of water may vary substantially depending on sea conditions, temperature etc.

This process may be repeated until the discharged water is sufficiently free from oil.

2. Cleaning the UOB with detergents

Fill the UOB with detergent and water while the bag still is in the water. Then wait for the detergent to decompose the oil film from the bag surface (approx. 20 min) before discharging. The cleaning process can be speeded up by towing the bag around with the liquid inside, commonly known as the "rock and roll" method.

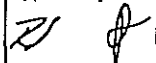
Do the same operation once more, and evaluate if the discharged water is sufficiently clean. The operation should be repeated until the water is free from any oil content.

When the water is sufficiently clean, lift the UOB out of the water. Be careful not to over stress or damage the bag.

The lifting operation should be carried out by lifting the bag by the separate weak lings in the aft end. Do not lift faster than the water can escape through the hoses in the front. Lift the bag out of the water and place it on a selected spot.

WARNING: The UOB must only be lifted out of the water under calm wind conditions. Lifting in heavy wind may cause hazard to the surrounding equipment and personnel.

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3. Removing the FRONT

Remove the FRONT from the bag, take out any solid objects and other debris from the inside of the bag. Clean the UOB in accordance to the above described procedure.

Take great care not to damage the UOB.

4. Inflate bag

Inflate the UOB by inserting air hoses into the bag. Close the remaining opening using aluminium flatbars and Vice Grip wrenches.

WARNING: Attempts to blow air into the BAG with the front opening blocked may cause the fabric to rupture.

5. Washing the bag

Apply detergent on the inside and the outside, then flush the bag on both sides thoroughly with fresh water, e.g. by using fire hoses.

WARNING: Never use High Pressure Cleaners or other high pressure equipment at close distance. This will damage the bag.

WARNING: Always inflate the bag indoors. If done outdoors, it must be secured by ropes to avoid the UOB to be caught by the wind.

DRYING AND INSPECTION

After the UOB has been properly cleaned as described above, the UOB should be inspected for punctures. Use soap water to detect leakages if it is found necessary.

Dry the UOB by blowing air into the bag. Mopping of water may reduce the drying time.

The time for drying may vary substantially depending on the environmental conditions.

The bag has also to be dried completely on the outside.

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OIL BAG	CLEANING PROCEDURES			92-00-990	

PACKING PREPARATION

Inspect the UOB for weaknesses or damages, and repair the bag if required.

The FRONT shall be subject to a thorough visual inspection. Pay special attention to the following:

- Connection points between the towing arrangement and the front.
- Fastening arrangement for the bag, with special attention to welds and the bolts.
- Other mechanical damages to the FRONT.

MPI, UT and X-RAY inspection shall be used if required to confirm/reject faults or suspected faults found during the visual inspection. Defects found during inspection shall be repaired.

Reconnect endcover etc. after they have been checked. Equipment found to malfunction shall be serviced or replaced.

Connect the FRONT to the bag and seal the connection with Sikaflex. Bolts and nuts shall be lubricated with silicone grease.

Towing equipment and bridle lines should be visually inspected and serviced/replaced when required. If the towing equipment is replaced, see separate specification for correct dimensions.

The UOB should be packed according to separate procedure.

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System

OIL BAG

Subject

FIBRE ROPES
CARE AND MAINTENANCE

Ref.

92-06-991

GENERAL

One of the main objects while designing the UNITOR OIL BAG® (UOB) has been to keep the requirement for maintenance as low as possible.

However, some regular maintenance will always be required and below we have specified what would normally be required at certain intervals for the fibre ropes.

ANNUAL INSPECTION

Inspect ropes for damage and/or moisture. If damaged, the ropes must be replaced with ropes with the same technical specifications as for the original ones.

The splices must be carefully inspected.

If moisture, the rope must be gently dried before repacking.

IN USE

Avoid contact with sharp edges and rough surfaces that can damage the rope. Avoid getting any knots on the rope. If possible avoid greases, oils or chemicals of any type that may cause reduction of the ropes properties.

AFTER USE

Inspect ropes and splices. If damaged or they have been in contact with greases, oils or any chemicals, replace the ropes with new ones with technical specifications equal to the ropes originally supplied. Ropes that has only been in contact with water may be reused and must be dried before packing.

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OIL BAG	PACKING INSTRUCTION			92-20-990	

GENERAL

A proper packing of the UNITOR OIL BAG® (UOB) is important to ensure a smooth and problem free launching. A correctly packed bag should float upright, and fold it self out during a launching operation. It is therefor important that the following packing procedure is followed.

Before the packing procedure can begin, the bag must be cleaned and dried in accordance with the valid instructions. We recommend that a pallet with the exact packing measurers for the actual bag size is obtained. This will ease the packing procedure by giving the correct packing measures.

EQUIPMENT REQUIRED

The following equipment is needed:

- a truck and crane with sufficient lifting capacity.
- canvas to cover the packing area.
- a round steel bar (approx 3-4 m long and 40 mm in diameter) for lifting purpose.
- two lifting straps.
- lifting canvas.
- one wooden pallet (recommended).

PROCEDURE

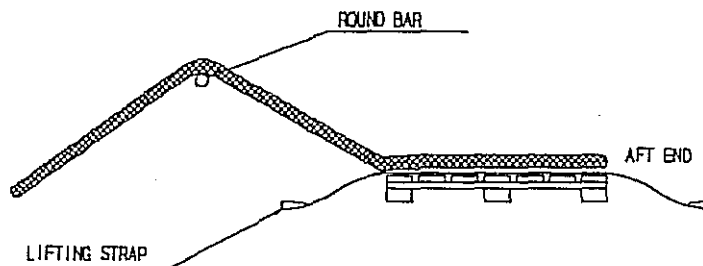
This description should be read in conjunction with the enclosed " packing instruction " data-sheet. Do as follows:

- find a large enough area were the bag can be fully folded out.
- flush the area with fire hoses.
- spread out the canvas to protect the bag from any sharp objects that can cause damage to the fabric.
- be careful to fold the bag out with the topside up.
- try to stretch the bag out as much as possible to avoid folds and bulges in the fabric.
- follow the instruction valid for the actual bag size, fig. 2 and fig. 3 for correct folding of the edges.

UNITOR

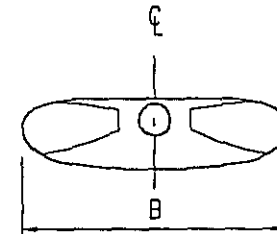
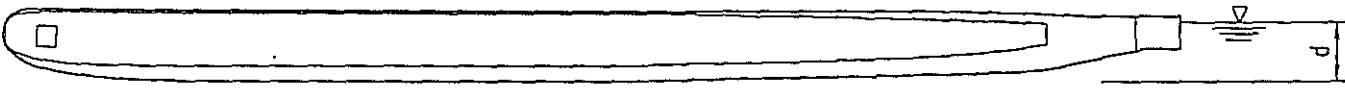
Type of document				Document no.	
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OIL BAG	PACKING INSTRUCTION			92-20-990	

- check that the breadth of the bag now is less than 2.1 m along the length.
- put the lifting straps flat on the pallet with approx 1.2 m space in between.
- put the aft end of the bag on top of the straps as illustrated in fig. 4 in the data-sheet.
- start to fold the bag in correct lengths with the help of the round bar (illustrated in fig. 5. data-sheet and below). In order to make the folding operation easier a truck could be used to move the pallet back and fourth.

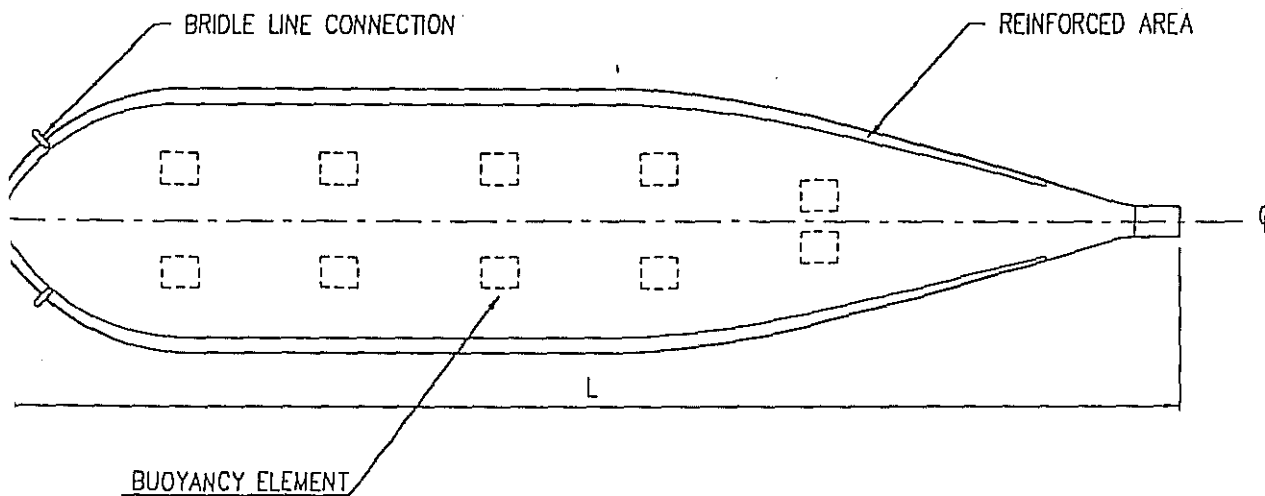


- Make sure that the lengths of each overlap are less than the maximum measure given in the data-sheet.
- use the lifting straps to lift the bag onto the lifting canvas. Then lift the bag into the container.
 - make sure that the front is placed on the top, with the towing connection facing the opening of the container.

The right to make engineering refinements on all products is reserved. Dimensions and details are subject to change without prior notice. When dimensions are critical, the dimensions should be confirmed by UNITOR.



FRONT VIEW



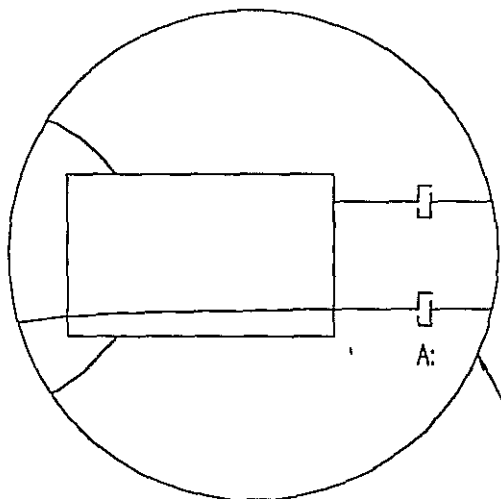
- DRAFT INFORMATION BASED ON SEA WATER DENSITY 1025 KG/M³.
- ALL MEASUREMENTS ARE APPROX. VALUES AND WILL VARY DEPENDING ON FILLING DEGREE, DENSITY OF LIQUID, ETC.
- 1: CARGO DENSITY 800 KG/M³.
- 2: CARGO DENSITY 1015 KG/M³.
- BUOYANCY ELEMENT NUMBER AND POSITIONING VARIES WITH THE BAG SIZE.

C29	50	17.7	4.1	0.9	1.1	PROTEX 092	350	6	5	SP-920	
	100	22.2	5.1	1.1	1.4	PROTEX 092	550/2/2	5	8	5	SP-920
	200	27.8	6.4	1.4	1.8	PROTEX 092	870	12	5	SP-920	
	300	31.7	7.3	1.6	2.0	PROTEX 092	1150	16	5	SP-920	
	500	37.5	8.7	1.9	2.4	PROTEX 092	1600	22	5	SP-920	
C290	1000	47.4	10.9	2.4	3.0	PROTEX 092	2550	30	34	50	SP-920
	SIZE (M ³)	L (M)	B (M)	d (M) ¹	d (M) ²	MATERIAL	WEIGHT (KG)	NO. OF B. ELEMENTS	FRONT SIZE	EDP NO.	

MATERIAL : PROTEX 092
 BUOYANCY ELEMENT MATERIAL : POLYETHYLENE FOAM
 COLOUR : RED RAL 3000

UNITOR DATA SHEET Data sheet no. 92-01-011	04	Drawn by/date [Signature] 24.01.93 Issued by/date [Signature] 24.01.93 Approved by/date [Signature] 24.01.93	ORIGINAL Drawn by/date I.L.S. 23.07.91 Issued by/date O.P.S. 23.07.91 Approved by/date J.T.A. 23.07.91	System UNITOR OIL BAG	Component OIL BAG
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92-09-001

STORAGE CONTAINER



92-01-011

92-02-XXX

92-04-001

92-00-301

FILLING/DISCHARGING HOSE

TOWING CONNECTION LINE

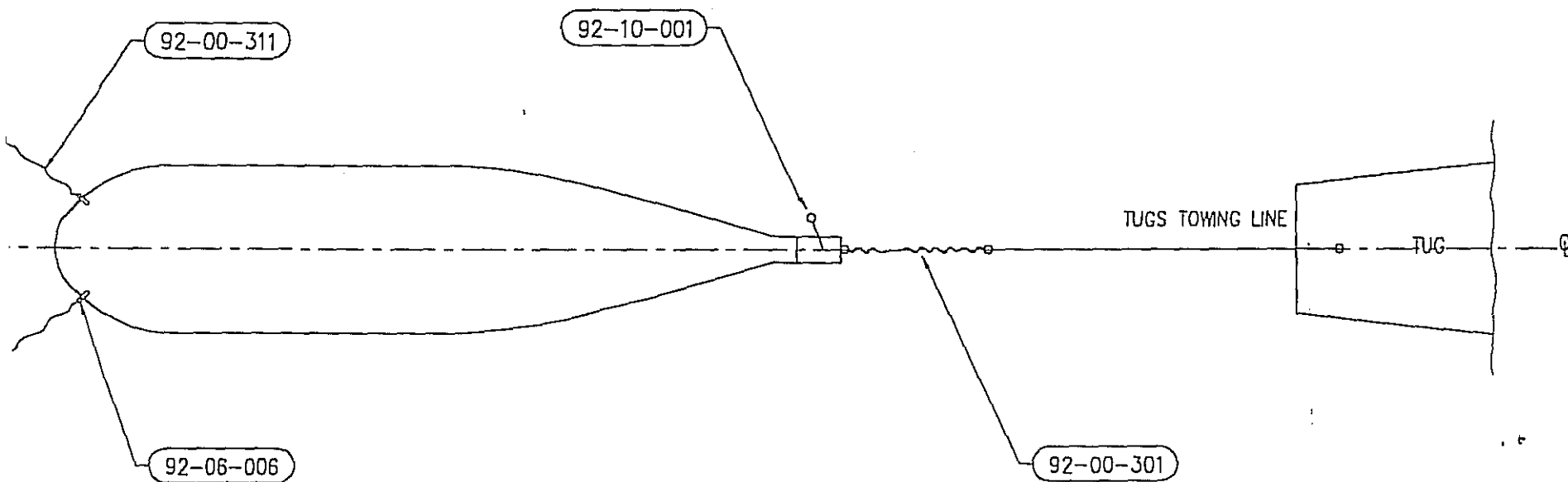
DECANTING HOSE

92-04-041

92-04-042

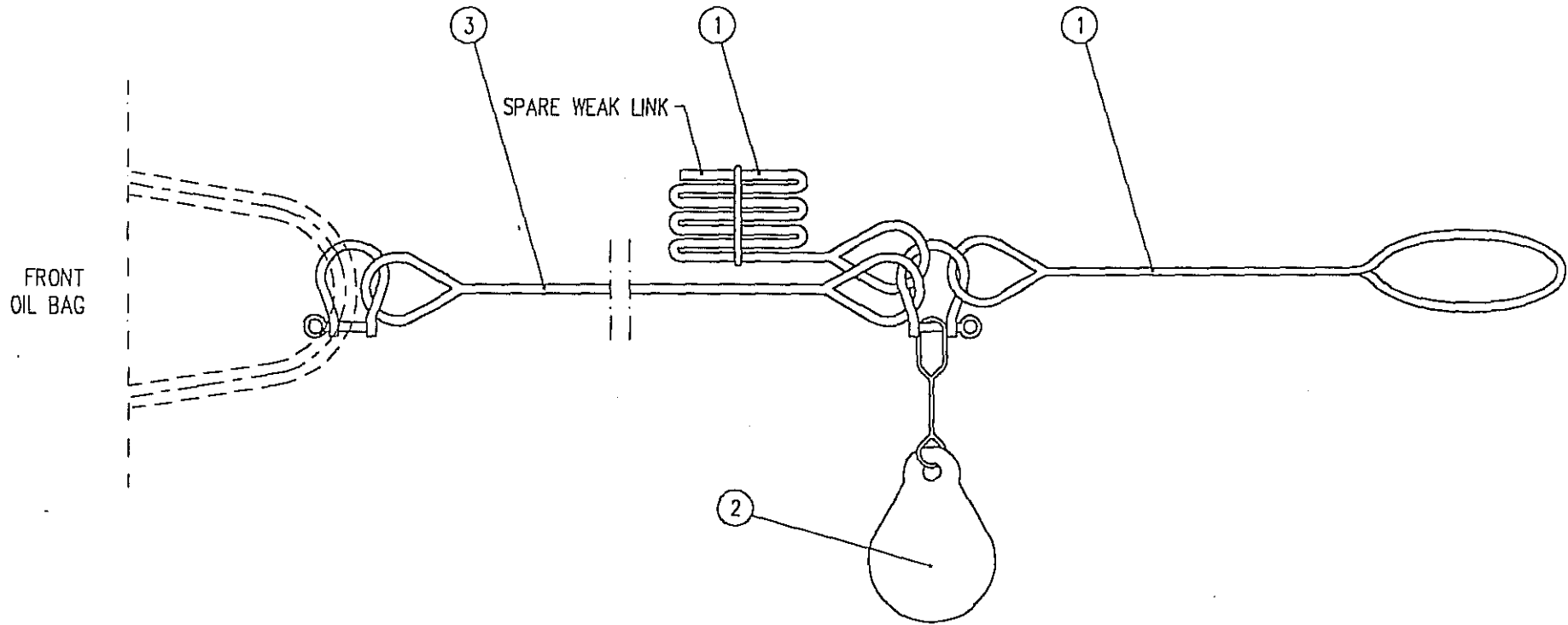
■ A: DECANTING HOSE AND CONNECTION OPTIONAL

SP-920	04	Drawn by/date	08.12.91	ORIGINAL	Drawn by/date	B.S.S 06.07.91	System	UNITOR OIL BAG	Component	SYSTEM ARRANGEMENT PORTABLE VERSION	DATA SHEET
		Issued by/date	08.12.91		Issued by/date	P.K.P 06.07.91					
		Approved by/date	08.12.91		Approved by/date	J.T.A. 06.07.91					
		Rev. no.									
Data sheet no. 92-00-021											



-920 TOR	04	Drawn by/date <i>R1</i> 31.08.92	ORIGINAL	Drawn by/date B.S.S 27.06.91	System UNITOR OIL BAG	Component PRINCIPAL TOWING ARRANGEMENT	DATA SHEET
		Issued by/date <i>R1</i> 31.08.92		Issued by/date P.K.P 27.06.91			
		Approved by/date <i>[Signature]</i> 31.08.92		Approved by/date J.T.A. 27.06.91			
						Data sheet no. 92-00-201	

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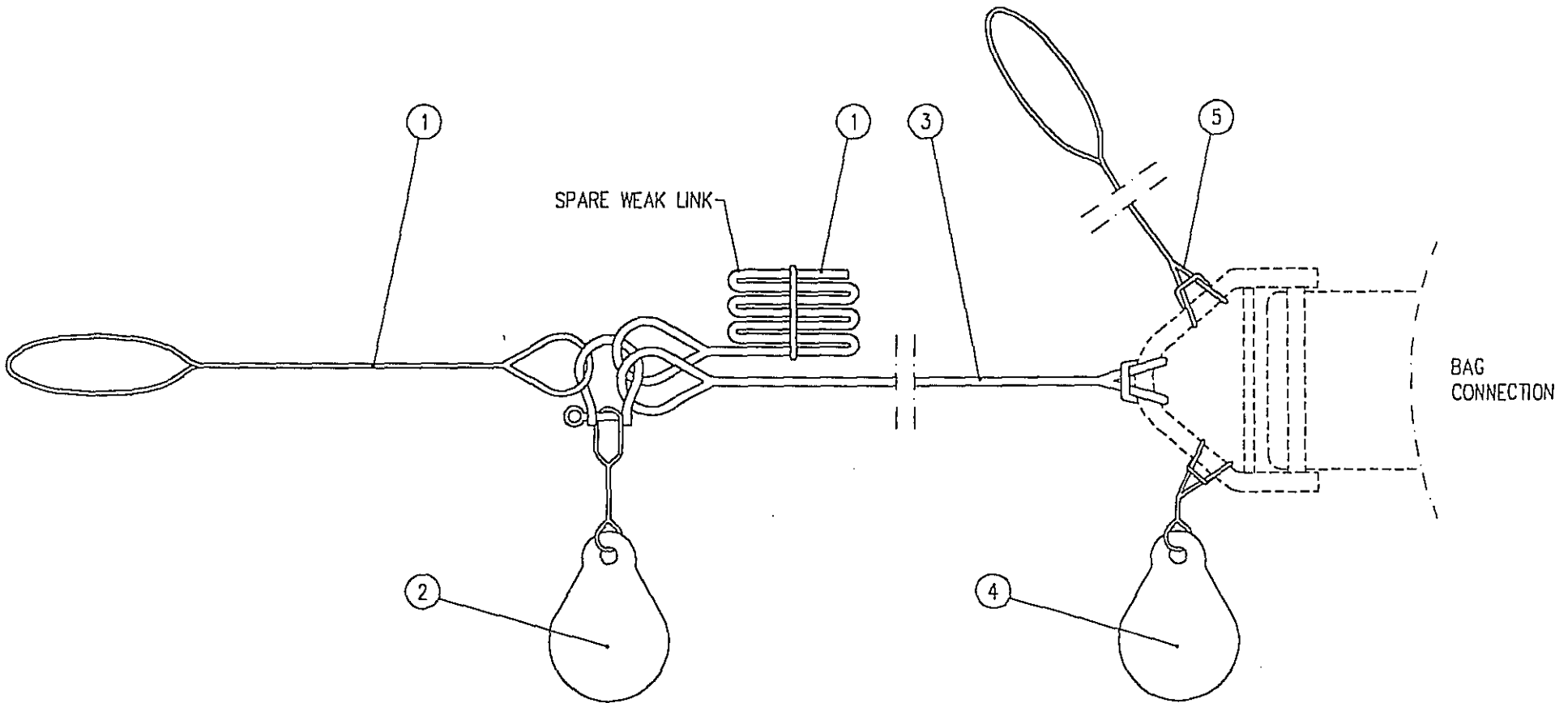


BAG SIZE M ³	WEAK LINK TYPE	BUOY TYPE	ELASTIC LINE TYPE
50 ≤ 200	W2	B1	E1
200 ≤ 500	W2	B1	E2
1000 ≤ 2000	W4	B2	E3

ITEM	NO. OF	DESCRIPTION	MATERIAL	DATA SHEET
3	1	ELASTIC LINE	NYLON ROPE	92-06-002
2	1	BOUY	SOFT PVC	92-06-005
1	2	WEAK LINK	ESTALON FIBRE ROPE	92-06-001

SP-920 UNITOR	03	Drawn by/date 08.12.92	ORIGINAL	Drawn by/date B.S.S 12.07.91	System UNITOR OIL BAG	Component TOWING LINE ARRANGEMENT	DATASHEET
		Issued by/date 08.12.92		Issued by/date O.P.S 12.07.91			
		Approved by/date 08.12.92		Approved by/date J.T.A. 12.07.91			
Data sheet no. 92-00-301							

The right to make engineering refinements on all products is reserved. Dimensions and details are subject to change without prior notice. When dimensions are critical, the dimensions should be confirmed by UNITOR.

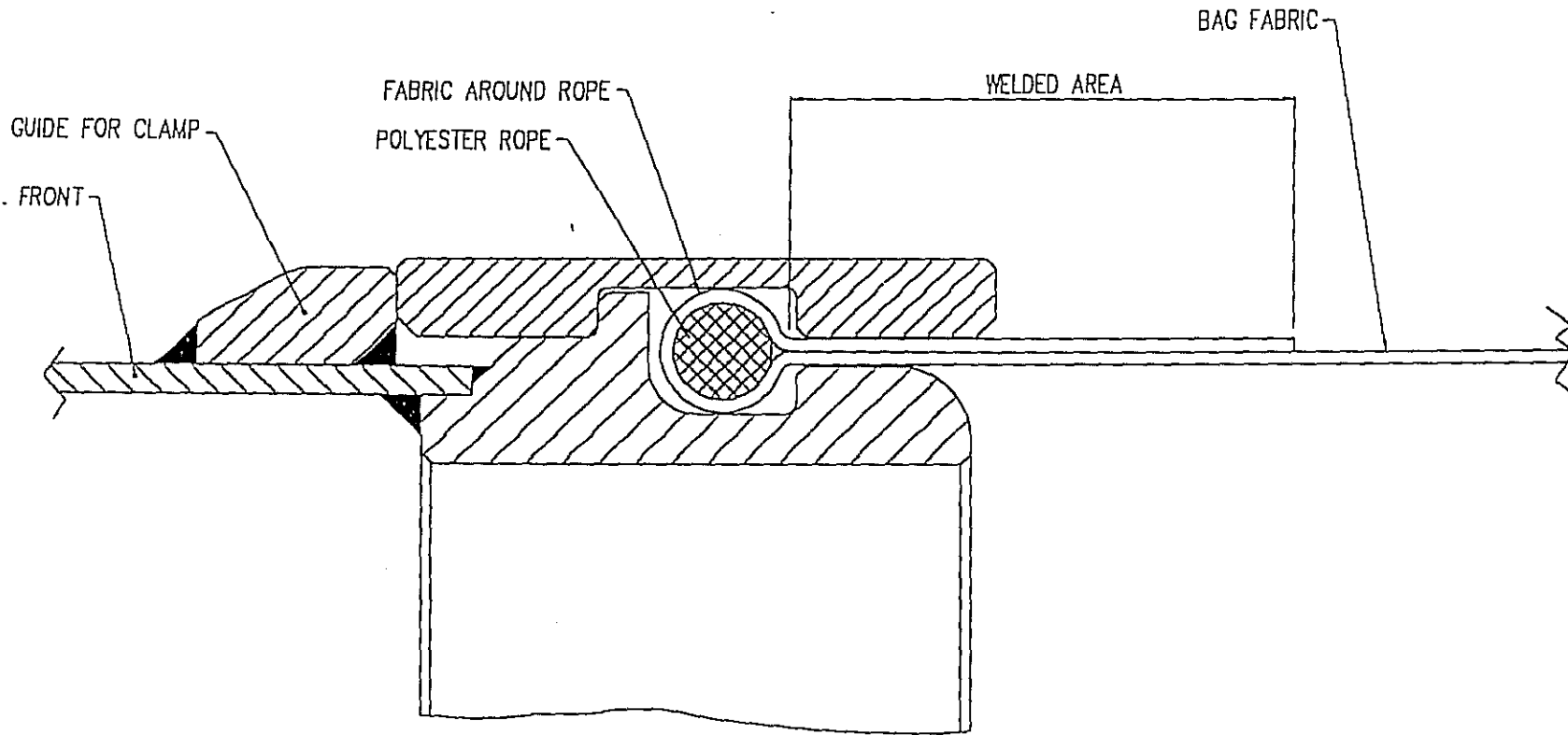


BAG SIZE M ³	WEAK LINK		BUOY TYPE		ELASTIC LINE TYPE
	ITEM 1	ITEM 5	ITEM 2	ITEM 4	
50 < 200	W1	W51	B1	B51	E51
201 < 500	W1	W51	B1	B51	E52
1000 < 2000	W2	W51	B2	B51	E53

ITEM	NO. OF	DESCRIPTION	MATERIAL	DATA SHEET
5	1	WEAK LINK	ESTALON FIBRE ROPE	92-06-001
4	1	BOUY	SOFT PVC	92-06-005
3	1	ELASTIC LINE	NYLON ROPE	92-06-007
2	1	BOUY	SOFT PVC	92-06-005
1	2	WEAK LINK	ESTALON FIBRE ROPE	92-06-001

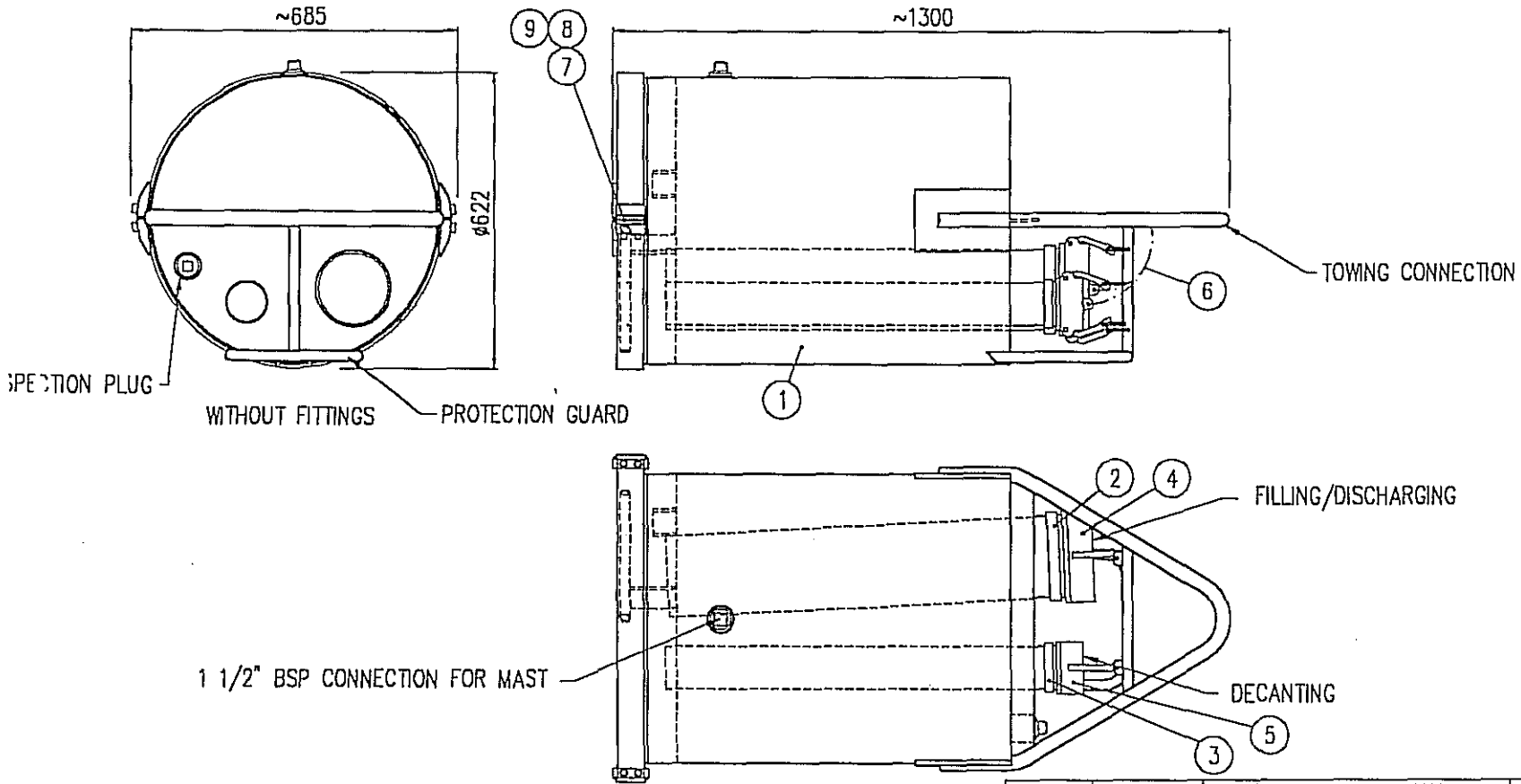
SP-920	04	Drawn by/date	08.12.92	ORIGINAL	Drawn by/date	B.S.S 16.07.91	System	UNITOR OIL BAG	Component	BRIDLE LINE ARRANGEMENT	DATASHEET	
		Issued by/date	08.12.92		Issued by/date	O.P.S 16.07.91						
		Approved by/date	08.12.92		Approved by/date	J.T.A. 16.07.91						
		Approved by/date	08.12.92		Approved by/date	J.T.A. 16.07.91						
											Date sheet no.	92-00-311

ITOR



120	02	Drawn by/date	Drawn by/date	System	Component	DATA SHEET
		Issued by/date	Issued by/date			
		Approved by/date	Approved by/date			
FOR		31.08.92	O.P.S. 09.01.92	UNITOR OIL BAG	PRINCIPAL CONNECTION OF BAG TO FRONT	Data sheet no.
		31.08.92	O.P.S. 09.01.92			92-02-501
		31.08.92	J.T.A. 09.01.92			

The right to make engineering refinements on all products is reserved. Dimensions and details are subject to change without prior notice. When dimensions are critical, the dimensions should be confirmed by UNITOR.

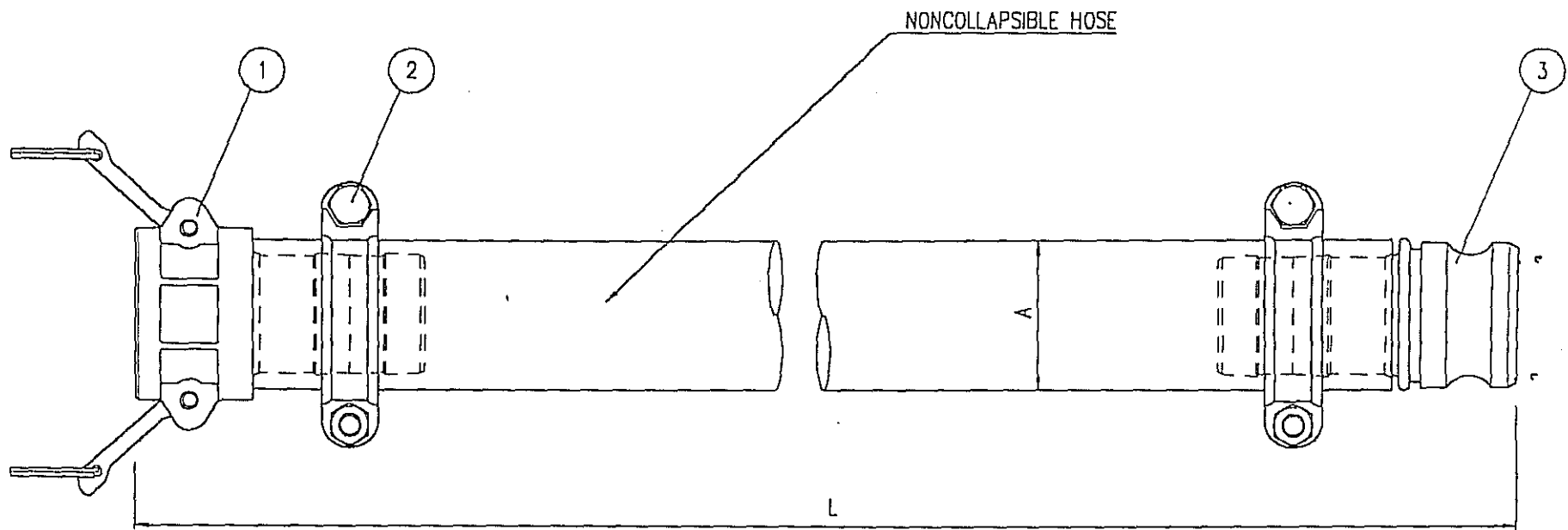


9	8	WASHER DIN 127 B M12	AISI 316	
8	4	NUT DIN 934 M12	AISI 316	
7	4	HEX- HEAD CAP SCREW DIN 933 M12 x 60 CLASS 70	AISI 316	
6	2	CHAIN	AISI 316	92-20-001
5	1	END COVER, 3"	BRASS	92-05-004
4	1	END COVER, 6"	BRASS	92-05-004
3	1	MALE ADAPTER, 3"	BRASS	92-05-011
2	1	MALE ADAPTER, 6"	BRASS	92-05-011
1	1	BODY SK 5, F6/S3	MILD STEEL	92-02-202
ITEM	NO. OF	DESCRIPTION	MATERIAL	DATA SHEET

SURFACE TREATMENT : SANDBLASTING SA 2.5
 1 LAYER OF PRIMER
 1 INTERMEDIATE LAYER
 1 LAYER OF TOPCOAT
 COLOR : SIGNAL YELLOW RAL 1021
 BUOYANCY : 30 KG
 WEIGHT : 170 KG

	Rev. no. 03 Drawn by/date 19.01.93 Issued by/date 19.01.93 Approved by/date 19.01.93	ORIGINAL Drawn by/date A.B. 07.01.92 Issued by/date O.P.S. 07.01.92 Approved by/date J.T.A. 07.01.92	System UNITOR OIL BAG	Component FRONT SK 5, F6/S3 SKIMMING VERSION	DATA SHEET Data sheet no. 92-02-002
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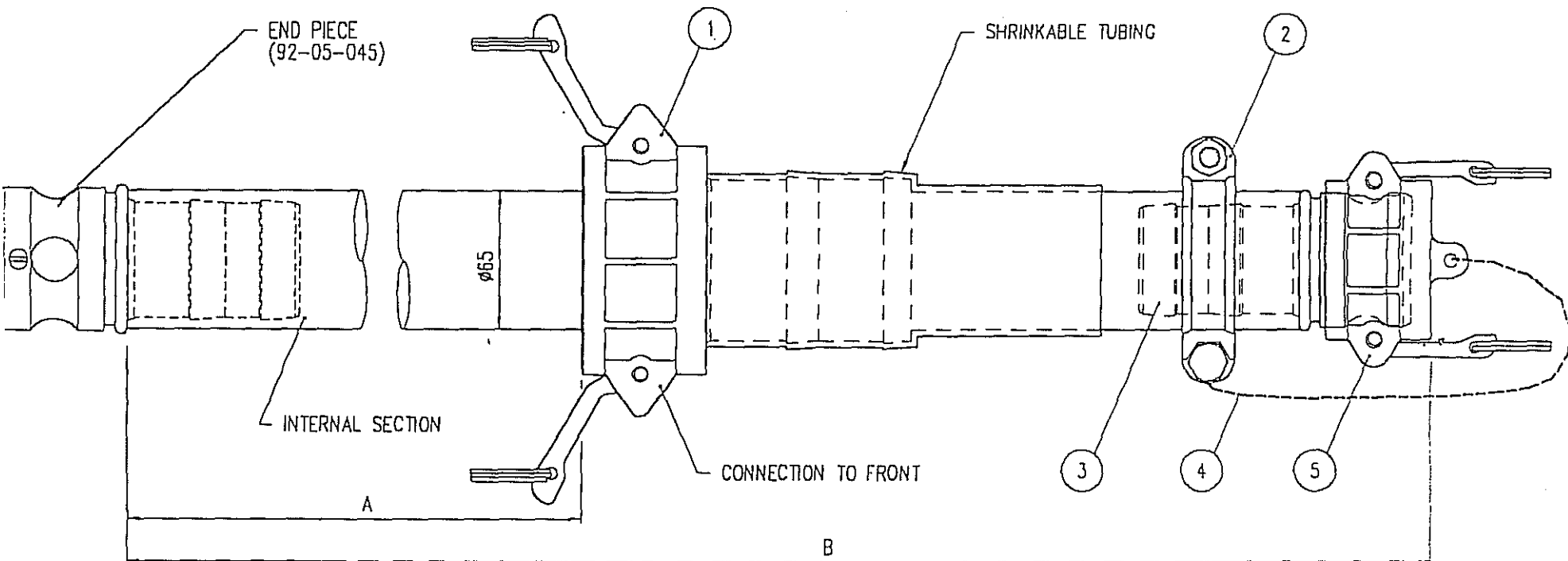
MATERIAL : CONNECTOR: BRASS
 HOSE: NITRILE RUBBER
 REINFORCEMENT: SYNTHETIC FIBRES WITH
 ELECTRO CONDUCTIVE WIRE

SIZE BSP	A	LENGTH L (M)	WEIGHT KG	EDP NO.
4"	ø118	15	81	SP-920
4"	ø118	30	147	SP-920
4"	ø118	60	280	SP-920
6"	ø172	15	134	SP-920
6"	ø172	30	256	SP-920
6"	ø172	60	490	SP-920

ITEM	NO. OF	DESCRIPTION	MATERIAL	DATA SHEET
3	1	HOSE SHANK	BRASS	92-05-041
2	2	HOSE CLAMP	STEEL	92-20-002
1	1	HOSE SHANK	BRASS	92-05-031

TABLE UNITOR	03	Drawn by/date 08.12.92 Issued by/date 08.12.92 Approved by/date 08.12.92	ORIGINAL Drawn by/date O.P.S. 07.01.92 Issued by/date O.P.S. 07.01.92 Approved by/date J.T.A. 07.01.92	System UNITOR OIL BAG	Component FILLING/DISCHARGING HOSE FOR POB	DATA SHEET Data sheet no. 92-04-001
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The right to make engineering refinements on all products is reserved. Dimensions and details are subject to change without prior notice. When dimensions are critical, the dimensions should be confirmed by UNITOR.



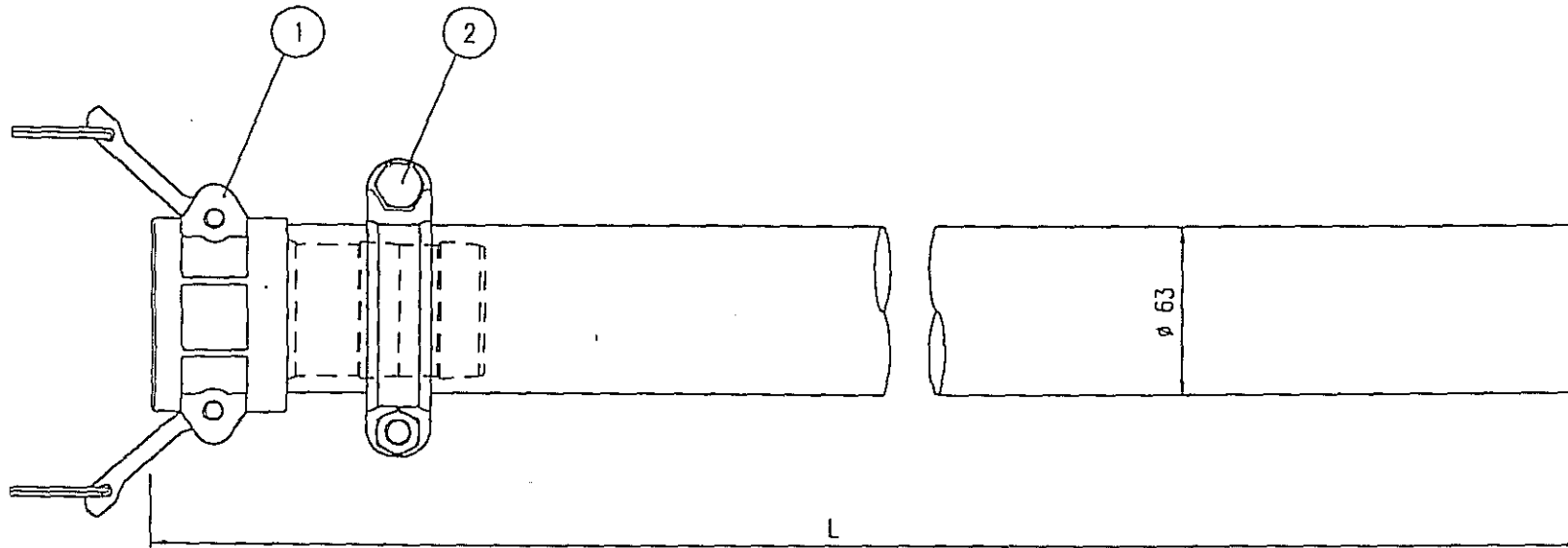
■ WEIGHT AND LENGTH ARE APPROX. AS LENGTH WILL BE ADJUSTED.

BAG SIZE M ³	A	B	WEIGHT KG	EDP NO.
50	~8800	~9200	20	SP-920
100	~10600	~11000	23	SP-920
200	~13300	~13800	30	SP-920
300	~15200	~15600	31	SP-920
500	~17900	~18300	35	SP-920
1000	~22300	~22700	42	SP-920
2000	~28800	~29200	53	SP-920

ITEM	NO. OF	DESCRIPTION	SIZE BSP	MATERIAL	DATA SHEET
5	1	END COVER	2"	BRASS	92-05-004
4	1	CHAIN		AISI 316	92-20-001
3	1	HOSE SHANK	2"	BRASS	92-05-041
2	1	HOSE CLAMP	2"	STEEL	92-20-002
1	1	HOSE SHANK	3"	BRASS	92-05-031

SERIAL : CONNECTOR: BRASS
 HOSE: NITRILE RUBBER
 REINFORCEMENT: SYNTHETIC FIBRES
 WITH ELECTRO CONDUCTIVE WIRE

REVISION TABLE 	05	Drawn by/date Issued by/date Approved by/date 24.01.93 24.01.93 24.01.93	ORIGINAL Drawn by/date Issued by/date Approved by/date B.S.S. 19.08.91 O.P.S. 19.08.91 J.T.A. 19.08.91	System UNITOR OIL BAG	Component DECANTING HOSE INTERNAL SECTION	DATA SHEET Data sheet no. 92-04-041
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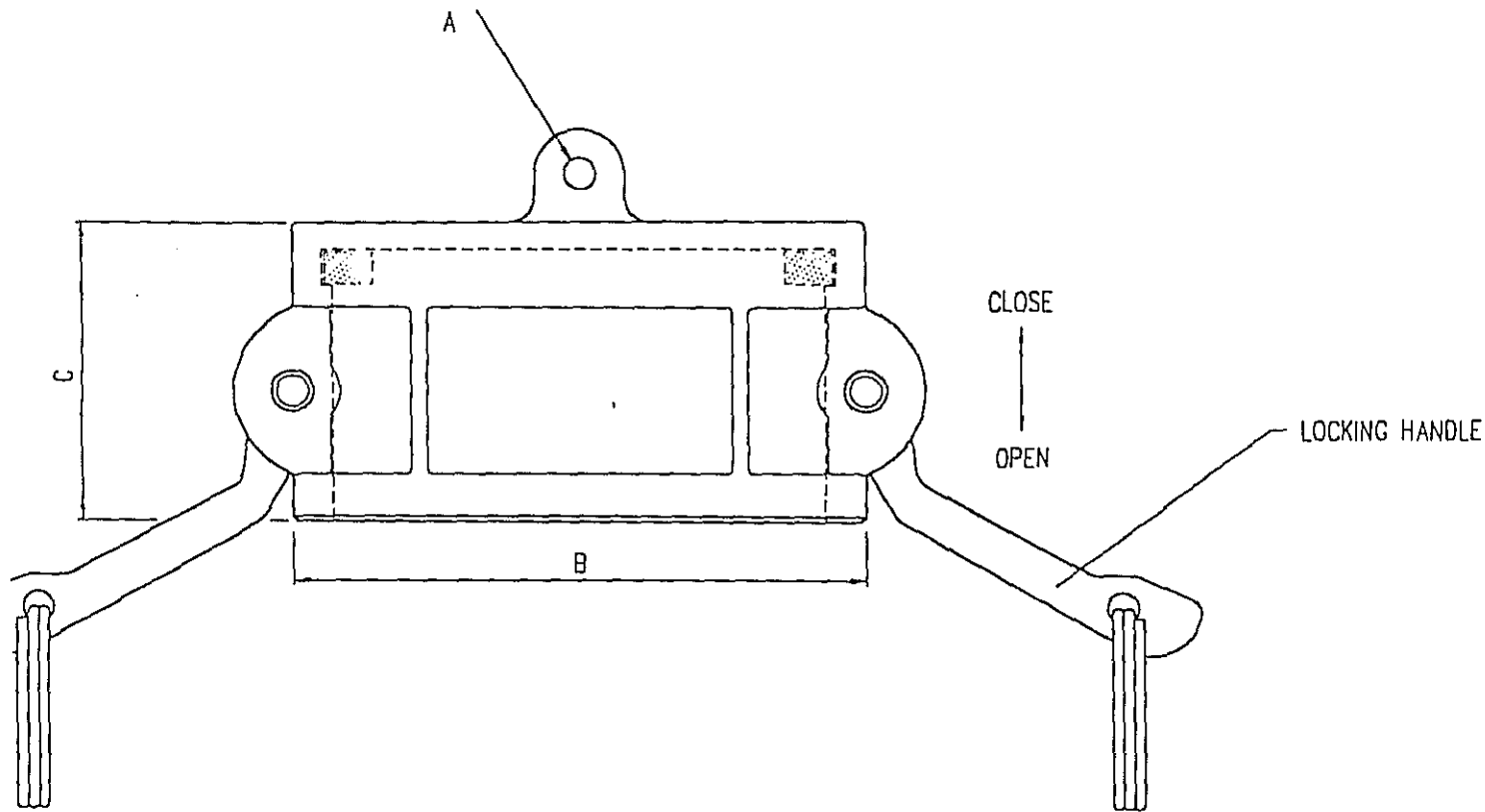
OR : BRASS
 : NITRILE RUBBER
 ELEMENT : SYNTHETIC FIBRES WITH
 ELECTRO CONDUCTIVE WIRE

SIZE BSP	A	LENGTH L (M)	WEIGHT KG	EDP NO.
2"	ø63	15	26	SP-920
2"	ø63	30	51	SP-920
2"	ø63	60	100	SP-920

ITEM	NO. OF	DESCRIPTION	SIZE BSP	MATERIAL	DRAWING NO.
2	1	HOSE CLAMP	2"	STEEL	92-20-002
1	1	HOSE SHANK	2"	BRASS	92-05-031

UNITOR TABLE	01	Drawn by/date <i>RI</i> 01.09.92 Issued by/date <i>RI</i> 01.09.92 Approved by/date <i>RI</i> 01.09.92	ORIGINAL Drawn by/date B.S.S. 13.09.91 Issued by/date O.P.S. 13.09.91 Approved by/date J.T.A. 13.09.91	System UNITOR OIL BAG	Component DECANTING HOSE EXTERNAL SECTION	DATA SHEET Data sheet no. 92-04-042
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Fig. 10 make engineering refinements on all products it restores. Dimensions and details are subject to change without prior notice. When dimensions are critical, the dimensions should be confirmed by UNITOR.



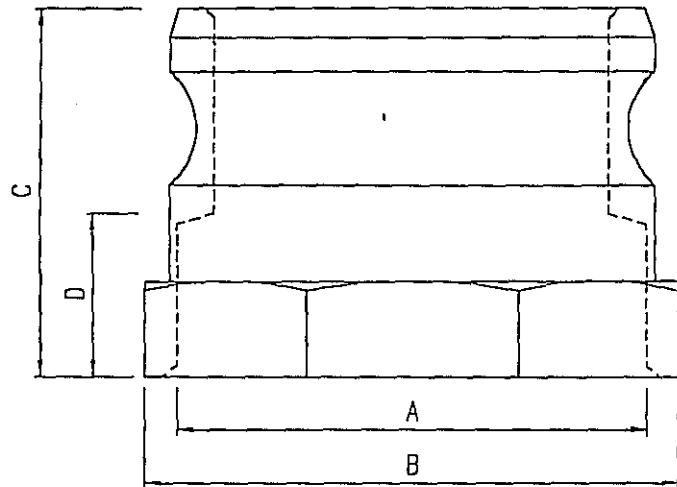
: BODY: BRASS
 GASKET: NEOPRENE
 ON : MIL-C-274B7F

■ SPARE GASKET, DATA SHEET NO. 92-19-001

SIZE BSP	A	B	C	WEIGHT KG	EDP NO.
2"	ø 5	75	51	0.74	SP-920
3"	ø 6	108	58	1.4	SP-920
4"	ø 6	138	62	2.2	SP-920
6"	ø 8	223	62	5.6	SP-920

BLE	01	Drawn by/date <i>ON</i> 31.10.91	ORIGINAL	Drawn by/date B.S.S. 17.06.91	System UNITOR OIL BAG	Component END COVER	DATA SHEET
		Issued by/date <i>ON</i> 31.10.91		Issued by/date O.P.S. 17.06.91			
		Approved by/date <i>ON</i> 31.10.91		Approved by/date J.T.A. 17.06.91			
							Issue sheet no 92-05-004

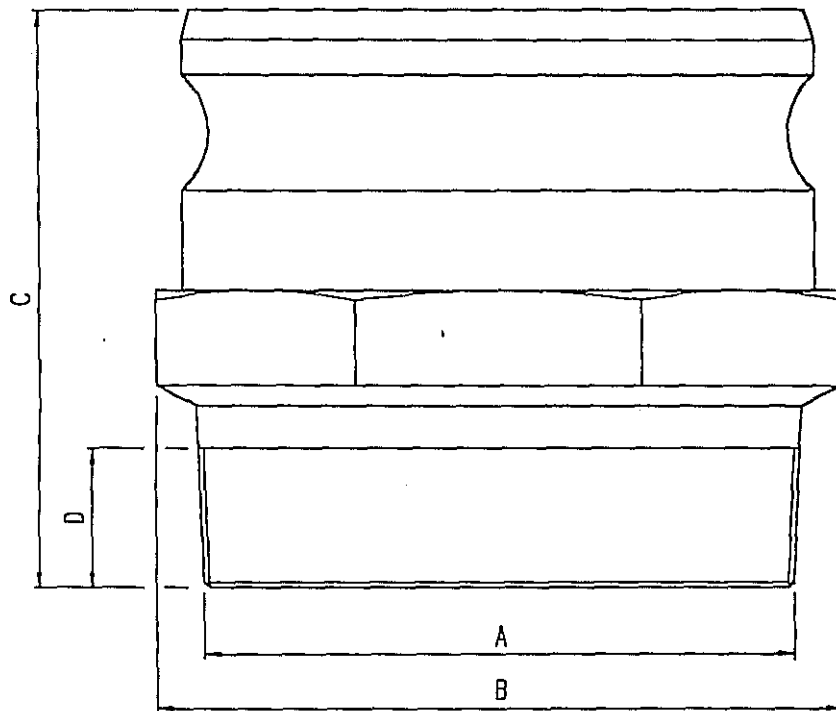
OR
service AS



Material : BRASS
 Specification : MIL-C-27487F

SIZE	WORKING PRESS. BAR	A BSPT	B	C	D	WEIGHT KG	EDP NO.
3"	8.6	3"	100	71	29	1.0	SP-920
4"	6.9	4"	128	76	31	1.8	SP-920
6"	5.2	6"	200	84	41	3.8	SP-920

TABLE UNITOR	REV. NO. 03	Drawn by/date <i>[Signature]</i> 01.09.92	ORIGINAL	Drawn by/date B.S.S. 18.06.91	System UNITOR OIL BAG	Component MALE ADAPTER FEMALE THREADS	DATASHEET
		Issued by/date <i>[Signature]</i> 01.09.92		Issued by/date O.P.S. 18.06.91			
		Approved by/date <i>[Signature]</i> 01.09.92		Approved by/date J.T.A. 18.06.91			
							Data sheet no. ° 92-05-011

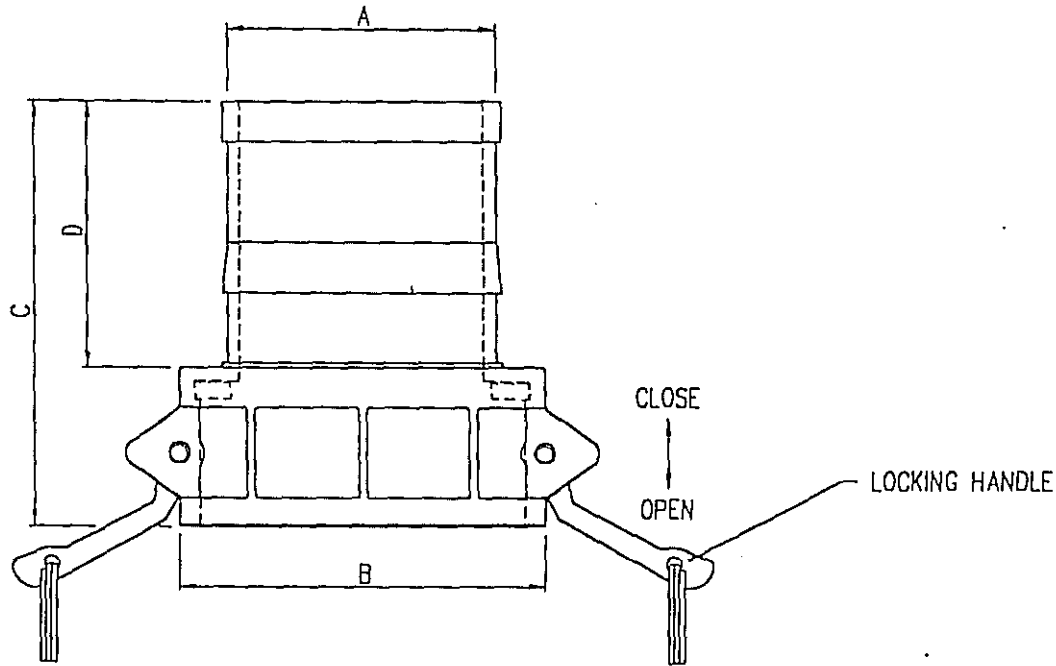


MATERIAL : BRASS
 DESIGNATION : MIL-C-27487F

SIZE	WORKING PRESS. BAR	A BSPT	B	C	D	WEIGHT KG	EDP NO.
4"	6.9	4"	128	112	26	2.5	SP-920
6"	5.2	6"	200	128	30	5.1	SP-920

UNITOR TABLE 02 Rev. no.	Drawn by/date <i>[Signature]</i> 26.03.92	ORIGINAL	Drawn by/date B.S.S. 19.06.91	System UNITOR OIL BAG	Component MALE ADAPTER MALE THREADS	DATA SHEET Data sheet no. 92-05-021
	Issued by/date <i>[Signature]</i> 26.03.92		Issued by/date O.P.S. 19.06.91			
	Approved by/date <i>[Signature]</i> 26.03.92		Approved by/date J.T.A. 19.06.91			

no more engineering refinements on all products it reserved. Dimensions and details are subject to change without prior notice. When dimensions are critical, the dimensions should be confirmed by UNITOR

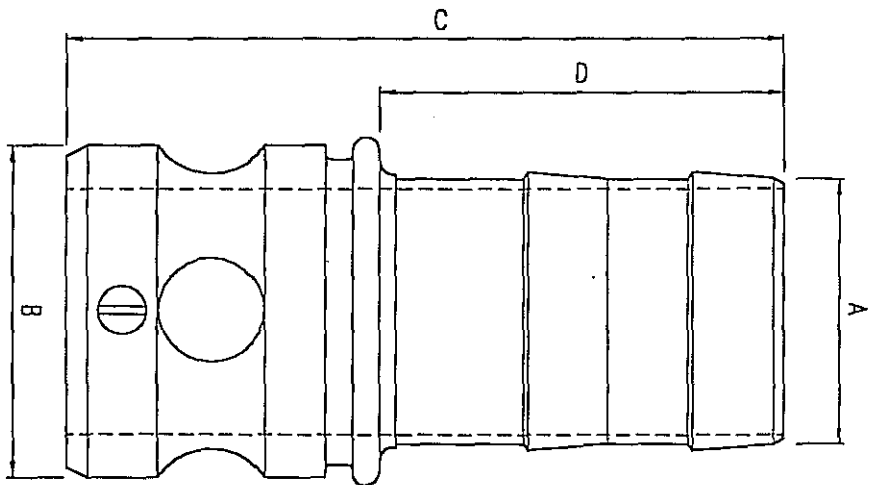


: BODY: BRASS
 PACKING: NEOPRENE
 ON : MIL-C-27487F

SIZE BSP	WORKING PRESS. BAR	A	B	C	D	WEIGHT KG	EDP NO.
2"	17.2	50	75	127	76	1.1	SP-920
3"	8.6	76	108	156	97	2.2	SP-920
4"	6.9	100	136	160	100	2.9	SP-920
6"	5.2	149	223	224	164	7.2	SP-920

	01	Issued by/date <i>OK</i> 29.10.91	ORIGINAL	Drawn by/date B.S.S. 20.06.91	System UNITOR OIL BAG	Component HOSE SHANK FEMALE COUPLER	
		Issued by/date <i>OK</i> 29.10.91		Issued by/date O.P.S. 20.06.91			
		Approved by/date <i>OK</i> 29.10.91		Approved by/date J.T.A. 20.06.91			
							Data sheet no 92-05-031

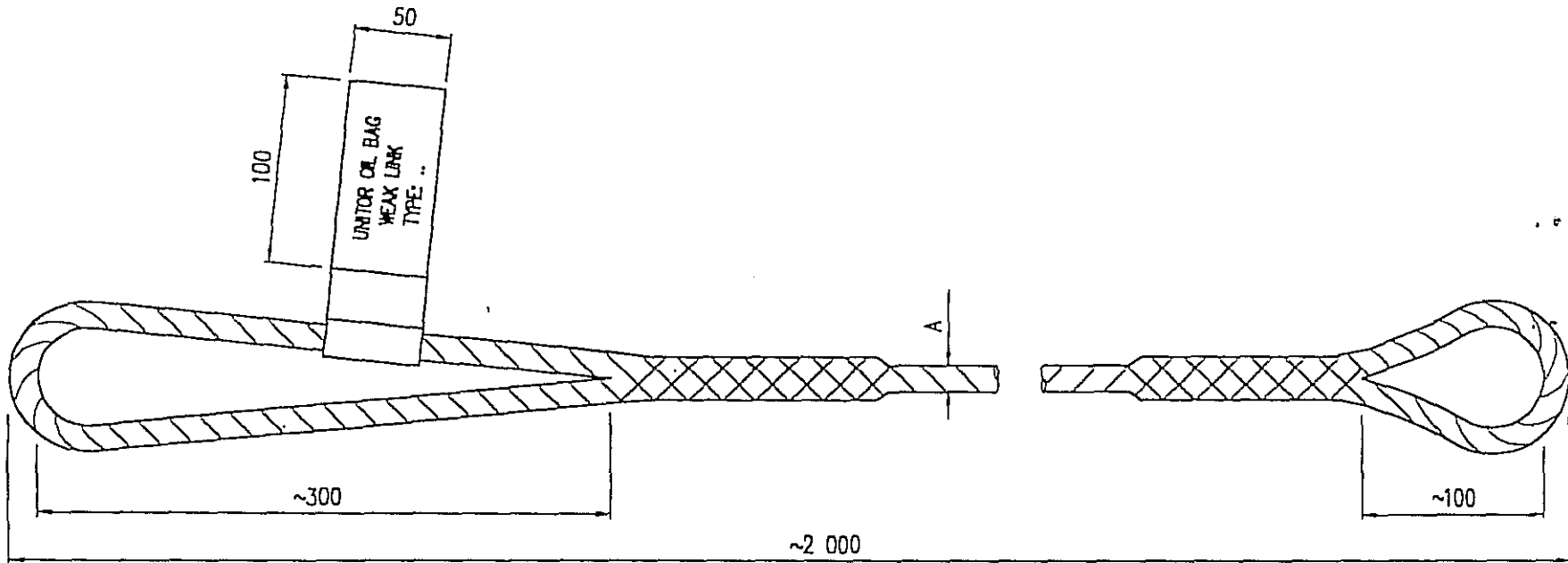
The right to make engineering refinements on all products is reserved. Dimensions and details are subject to change without prior notice. When dimensions are critical, the dimensions should be confirmed by UNITOR.



MATERIAL : BODY: BRASS
 SPECIFICATION : MIL-C-27487F

SIZE BSP	WORKING PRESS. BAR	A	B	C	D	WEIGHT KG	EDP NO.
2"	17.2	51	63	130	76	0.85	SP-920

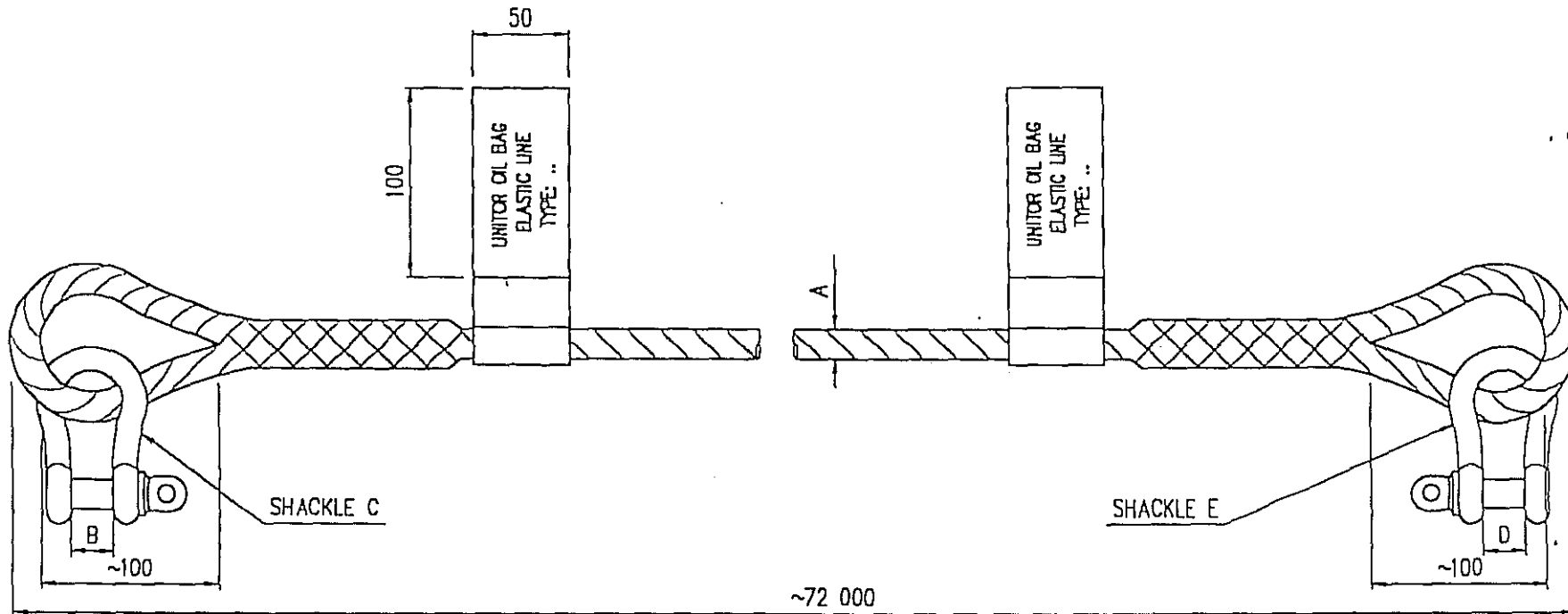
	P-920	00	Drawn by/date [Signature] 04.11.92 Issued by/date [Signature] 04.11.92 Approved by/date [Signature] 04.11.92	ORIGINAL Drawn by/date RJ 04.11.92 Issued by/date RJ 04.11.92 Approved by/date J.T.A. 04.11.92	System UNITOR OIL BAG	Component END PIECE DECANING HOSE	DATA SHEET		
	Data sheet no. 92-05-045								



MATERIAL : ESTALON
 COLOR OF ROPE : ICE BLUE

WEAK LINK TYPE	A	WEIGHT KG	MIN. BREAKING LOAD (KN)		EDP NO.
			WEAK LINK	ROPE	
W1	ø8	0.1	12	14	SP-920
W2	ø16	0.3	49	54	SP-920
W4	ø32	1.3	165	185	SP-920
W51	ø12	0.2	27	30	SP-920

UNITOR E TABLE	03	Drawn by/date <i>OH</i> 27.03.92 Issued by/date <i>OH</i> 27.03.92 Approved by/date <i>[Signature]</i> 27.03.92	ORIGINAL	Drawn by/date B.S.S 27.08.91 Issued by/date O.P.S 27.08.91 Approved by/date J.T.A. 27.08.91	System UNITOR OIL BAG	Component WEAK LINK	DATA SHEET Data sheet no. 92-06-001
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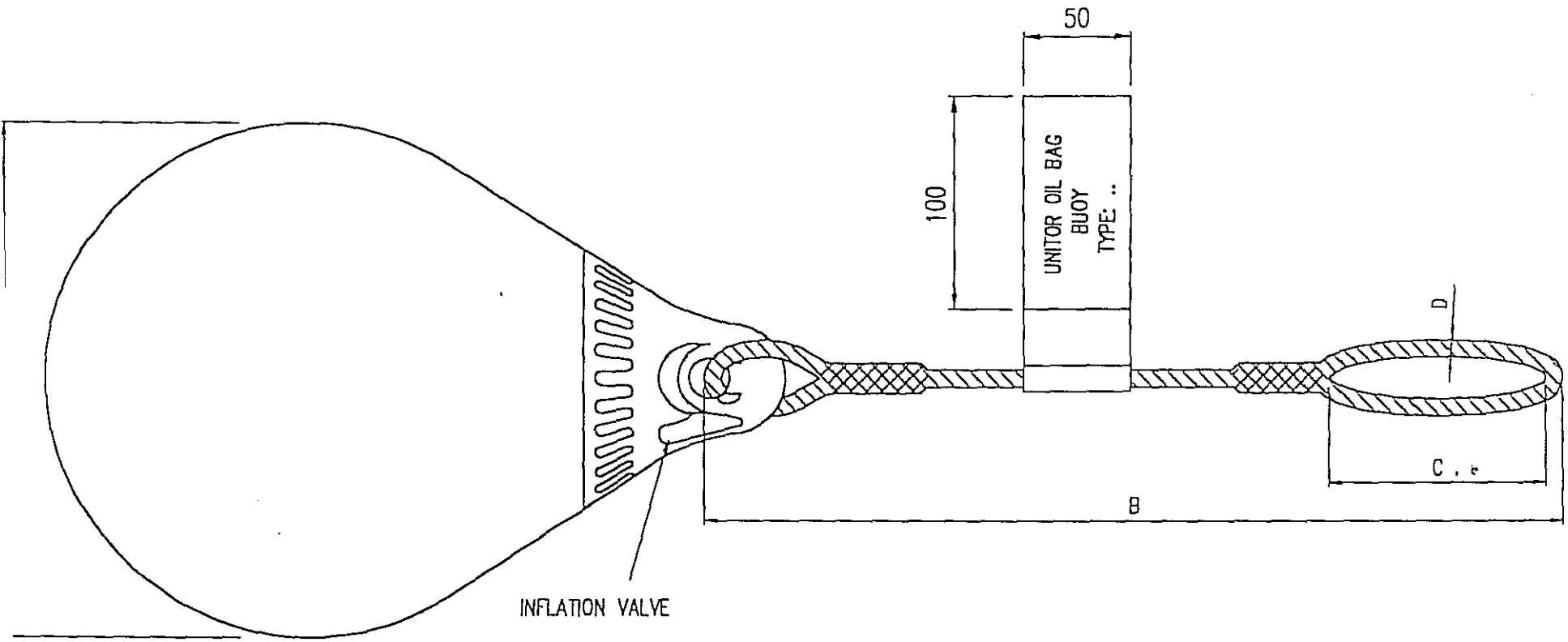


MATERIAL : ROPE : NYLON
 : SHACKLE : GALVANIZED STEEL
 SPECIFICATION : RR-C-271B TYPE IV CLASS 1
 COLOR OF ROPE : WHITE
 ELONGATION : 45%

ELASTIC LINE TYPE	A	B	SWL(T) C	D	SWL(T) E	WEIGHT KG	MIN. BREAKING LOAD (KN)	EDP NO.
E1	ø20	34	6.5	34	6.5	22.0	73	SP-920
E2	ø28	34	6.5	34	6.5	40.5	140	SP-920
E3	ø44	60	17	60	17	109.0	320	SP-920
E4	ø56	60	17	60	17	165.0	490	SP-920

UNITOR TABLE 03	Drawn by/date <i>[Signature]</i> 27.03.92	ORIGINAL	Drawn by/date B.S.S 27.08.91	System UNITOR OIL BAG	Component ELASTIC LINE	DATA SHEET Data sheet no. 92-06-002
	Issued by/date <i>[Signature]</i> 27.03.92		Issued by/date O.P.S 27.08.91			
	Approved by/date <i>[Signature]</i> 27.03.92		Approved by/date J.T.A. 27.08.91			

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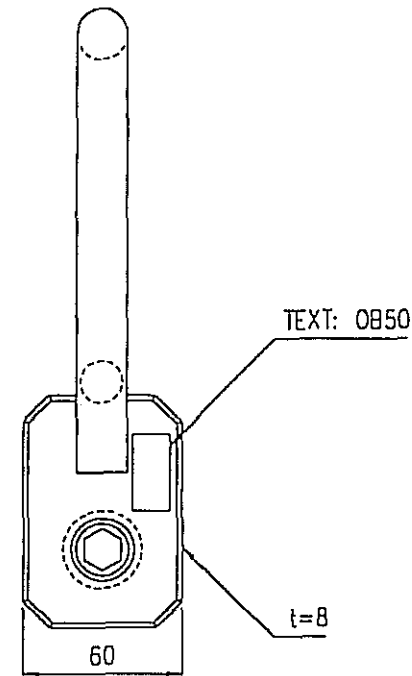
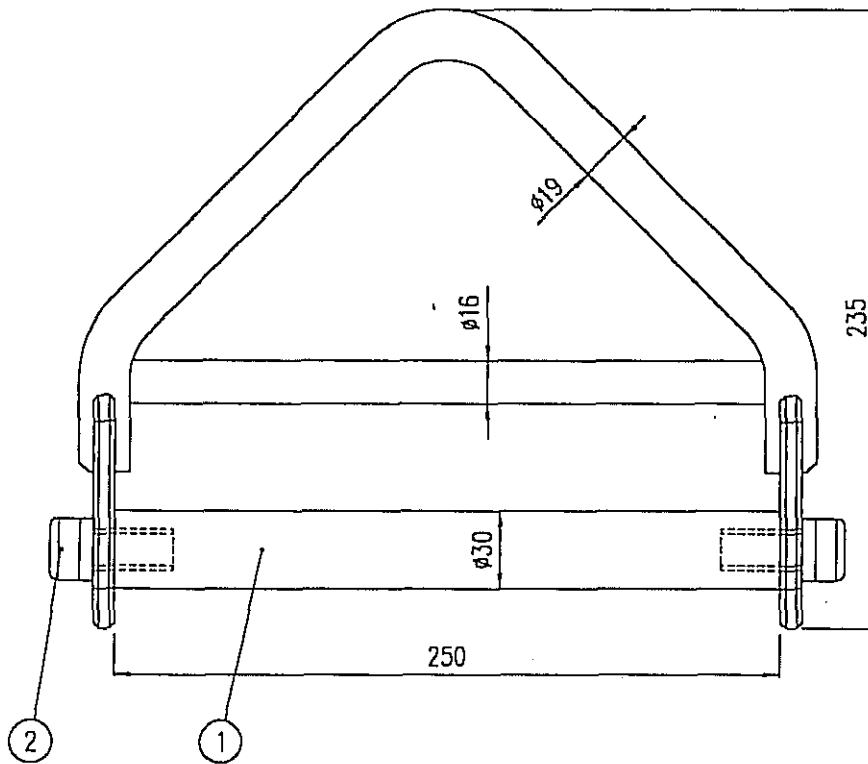


SERIAL BUOY : SOFT PVC
 SERIAL ROPE : ESTALON
 OUR BUOY : RED
 OUR ROPE : ICE BLUE

BUOY TYPE	A	B	C	D	MIN. BREAKING LOAD (KN)	BUOYANCY KG	WEIGHT KG	EDP NO.
B1	400	400	100	10	21	34		SP-920
B2	480	400	100	12	30	60		SP-920
B51	240	800	500	8	14	8	0.8	SP-920

UNITOR Rev. no. 02	Drawn by/date <i>[Signature]</i> 31.03.92	ORIGINAL	Drawn by/date B.S.S 28.08.91	System UNITOR OIL BAG	Component BUOY WITH LINE	DATA SHEET Data sheet no. 92-06-005
	Issued by/date <i>[Signature]</i> 31.03.92		Issued by/date O.P.S 28.08.91			
	Approved by/date <i>[Signature]</i> 31.03.92		Approved by/date J.T.A. 28.08.91			

The right to make engineering refinements on all products is reserved. Dimensions and details are subject to change without prior notice. When dimensions are critical, the dimensions should be confirmed by UNITOR.

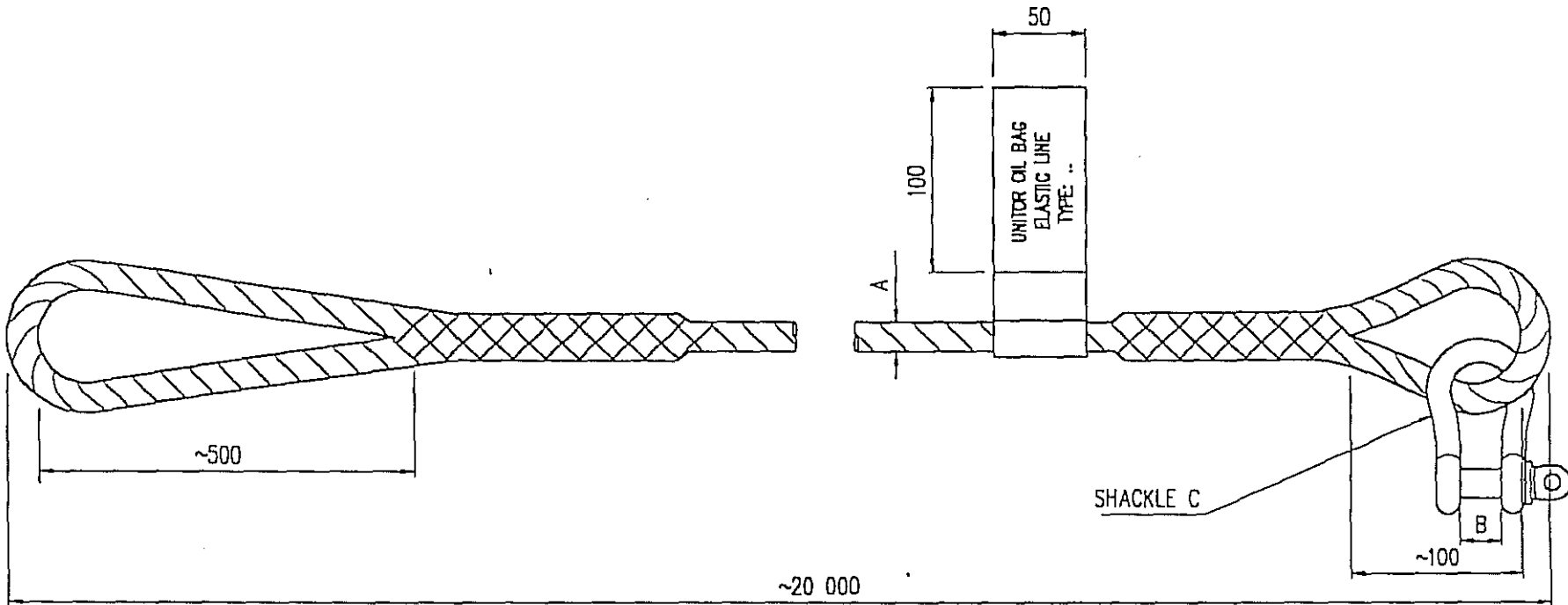


SURFACE TREATMENT : SANDBLASTING SA 2.5
 1 LAYER OF PRIMER
 1 INTERMEDIATE LAYER
 1 LAYER OF TOPCOAT
 COLOR : SIGNAL YELLOW RAL 1021
 WEIGHT : 2.9 KG

2	2	SOCKET HEAD CAP SCREW M16x30 CLASS 70	STEEL AISI 316
1	1	BRIDLE LINE CONNECTION	STEEL NVA
ITEM	NO. OF	DESCRIPTION	MATERIAL

SP-920	05	Drawn by/date 19.01.93 Issued by/date 19.01.93 Approved by/date 19.01.93	ORIGINAL Drawn by/date B.S.S 12.09.91 Issued by/date O.P.S 12.09.91 Approved by/date J.T.A. 12.09.91	System UNITOR OIL BAG	Component BRIDLE LINE CONNECTION	DATA SHEET Data sheet no. 92-06-006
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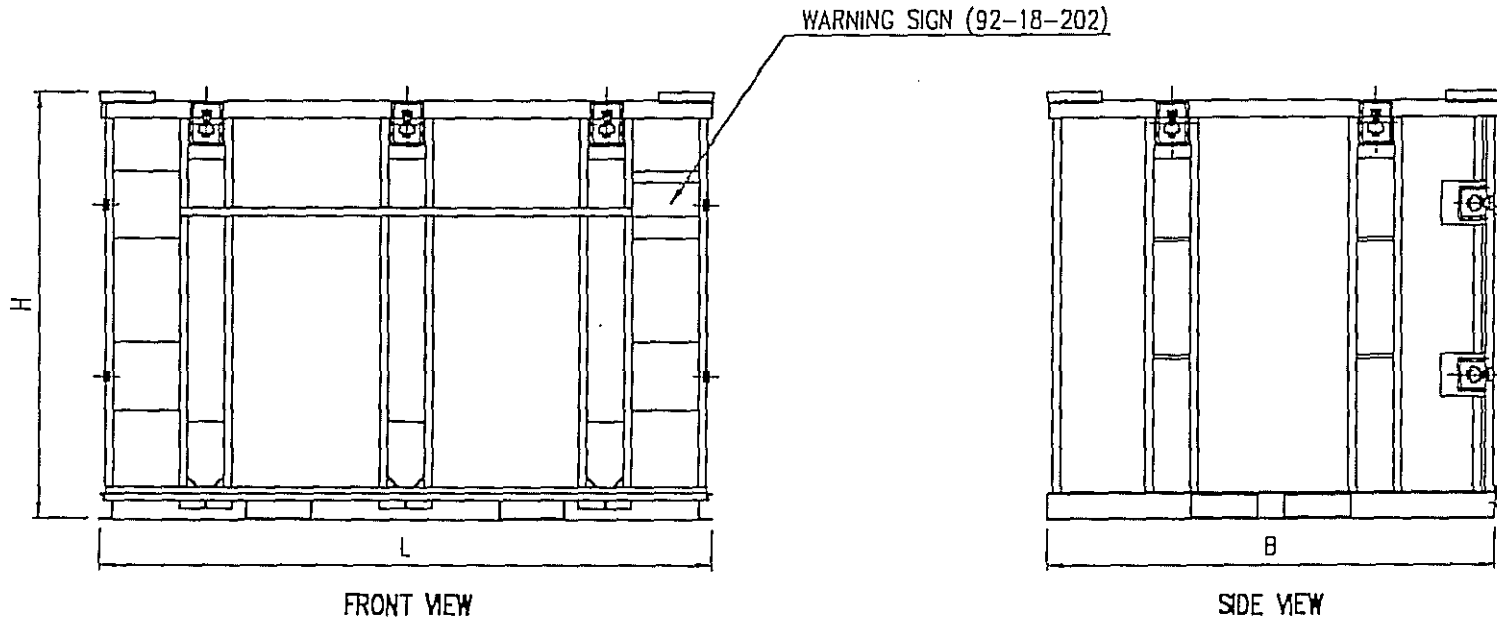


MATERIAL : ROPE : NYLON
 : SHACKLE : GALVANIZED STEEL
 TECHNICAL SPECIFICATION : RR-C-271B TYPE IV CLASS 1
 COLOR OF ROPE : WHITE
 ELONGATION : 45%

ELASTIC LINE TYPE	A	B	SWL(T) C	WEIGHT KG	MIN. BREAKING LOAD (KN)	EDP NO.
E51	φ12	23	2.0	2.3	26	SP-920
E52	φ14	23	2.0	3.1	36	SP-920
E53	φ24	34	6.5	9.7	110	SP-920
E54	φ28	34	6.5	12.5	140	SP-920

ORIGINAL Drawn by/date O.P.S. 30.03.92 Issued by/date O.P.S. 30.03.92 Approved by/date J.T.A. 30.03.92	System UNITOR OIL BAG	Component ELASTIC LINE	DATA SHEET Data sheet no. 92-06-007	
				Date 30.03.92
				Approved by/date J.T.A. 30.03.92





- THE CONTAINER IS NOT DESIGNED TO BE LIFTED IN THE TOP-COVER HANDLES
- MAX. STACKING HIGHT IS TWO CONTAINERS

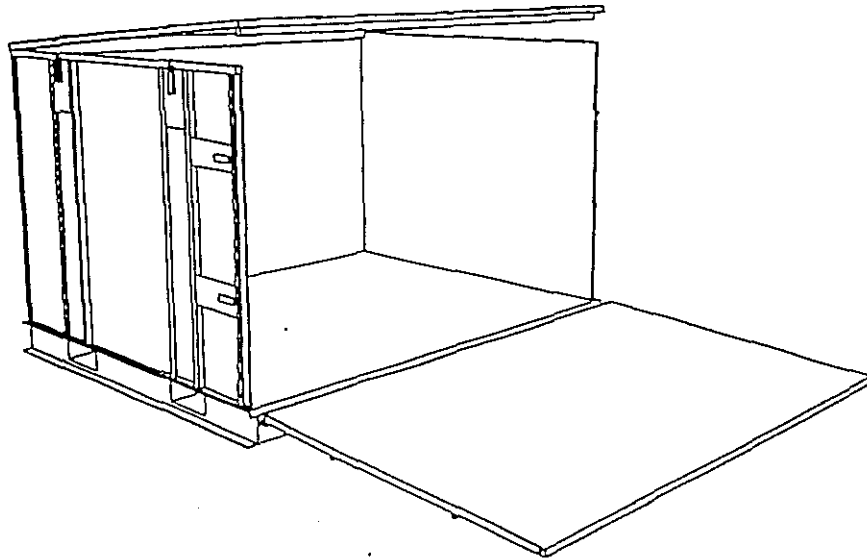
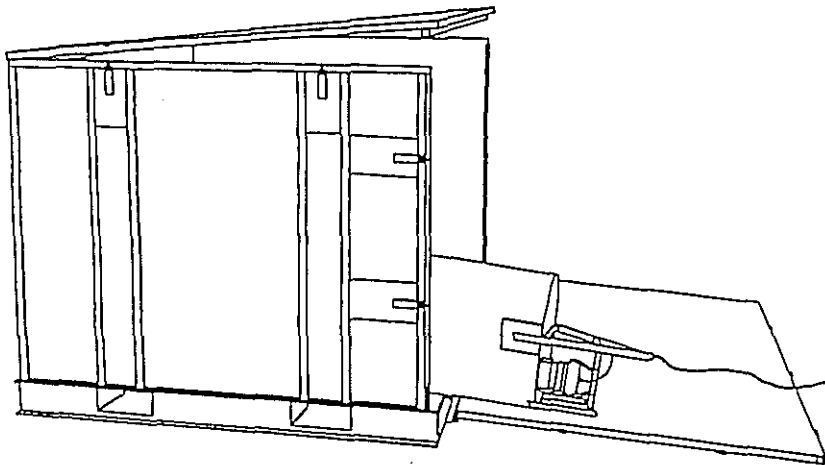
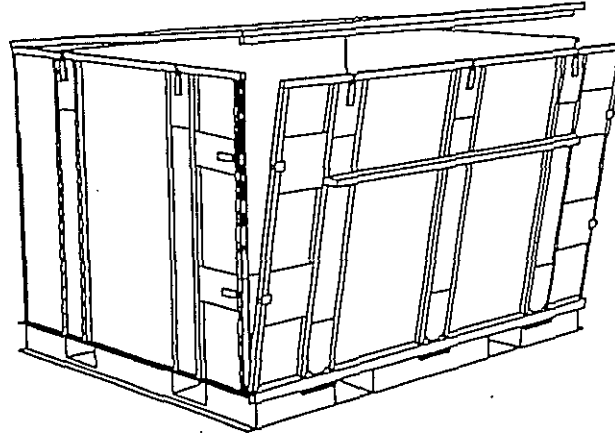
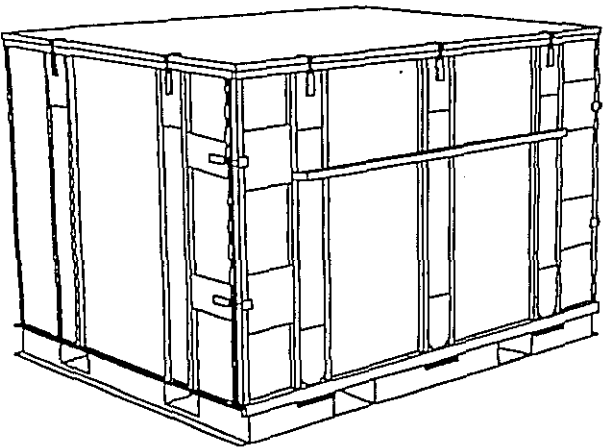
BAG SIZE (M ³)	LENGTH L (MM)	BREATH B (MM)	HEIGHT H (MM)	VOLUME NET. (M ³)	WEIGHT (KG)	HINGED FRONT	EDP NO.
50<200	2300 _{7.5}	1690 _{5.5}	1650 _{5.4}	5.1	622	YES	SP-920
201<500	2300	2290	2250	10.2	834	YES	SP-920
501<1000	2300 _{7.5}	3290 _{10.5}	2250 _{7.4}	14.8	1060	YES	SP-920

MATERIAL : MILD STEEL
 SURFACE TREATMENT : SANDBLASTING SA 2.5
 1 LAYER OF PRIMER
 1 INTERMEDIATE LAYER
 1 LAYER OF TOPCOAT
 COLOR : WHITE RAL 9010

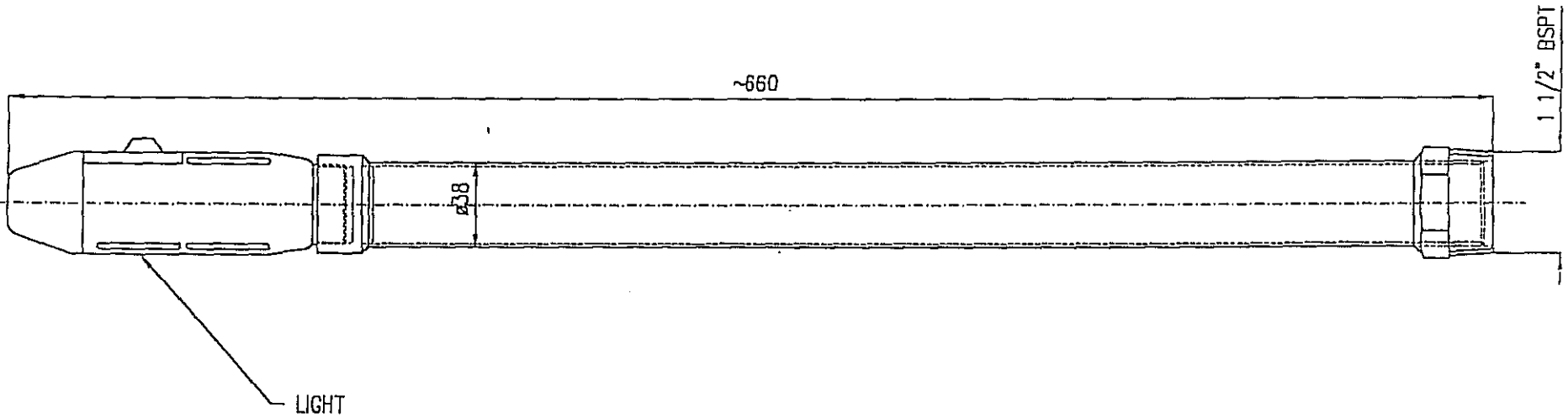
P-920	02	Drawn by/date	19.01.93	ORIGINAL	Drawn by/date	A.B. 07.01.92	System	UNITOR OIL BAG	Component	STORAGE CONTAINER	DATA SHEET Data sheet no. 92-09-001
		Issued by/date	19.01.93		Issued by/date	J.P.J. 07.01.92					
		Approved by/date	19.01.93		Approved by/date	J.T.A. 07.01.92					



The right to make engineering refinements on all products is reserved. Dimensions and details are subject to change without prior notice. When dimensions are indicated, the dimensions should be confirmed by UNITOR.

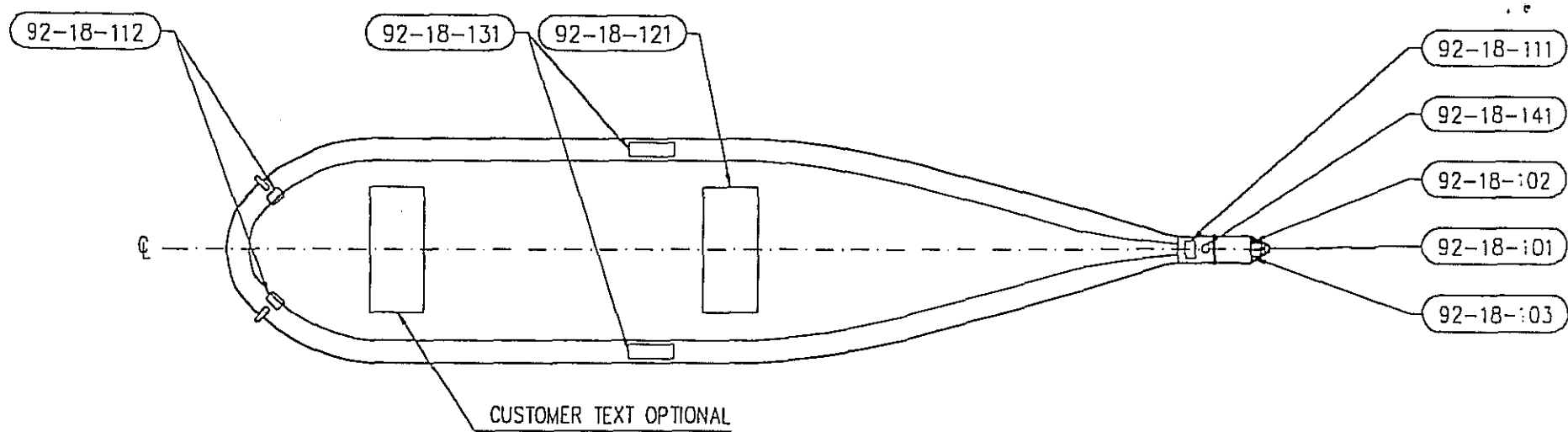


	01	Drawn by/date <i>[Signature]</i> 07.09.92 Issued by/date <i>[Signature]</i> 07.09.92 Approved by/date <i>[Signature]</i> 07.09.92	ORIGINAL	Drawn by/date A.B. 14.01.92 Issued by/date O.P.S. 14.01.92 Approved by/date J.T.A. 14.01.92	System UNITOR OIL BAG	Component LAUNCHING PRINCIPAL OF UOB	DATA SHEET Data sheet no. 92-09-901



- MATERIAL : MAST: AISI 316
- : FLASHING, XENON GAS LIGHT WITH DAY-LIGHT SWITCH
- POWER SOURCE: BATTERY TYPE LR14A (IEC) 12 HRS
- WATER PROOF: 500 METER DEPTH
- VISIBILITY: 360°, 10 KM
- COLOUR: WHITE
- LIGHT INTENSITY: 36000 CANDELA (CD)
- WEIGHT : 1.4 KG

920 UNITOR	02 M.F. NO.	Drawn by/date <i>RI</i> 02.09.92	ORIGINAL	Drawn by/date A.B. 16.10.91	System UNITOR OIL BAG	Component MAST WITH LIGHT TYPE A	DATA SHEET
		Issued by/date <i>RI</i> 02.09.92		Issued by/date O.P.S. 16.10.91			
		Approved by/date <i>[Signature]</i> 02.09.92		Approved by/date J.T.A. 16.10.91			
							Data sheet no. 92-10-001



NO 92-18-121 OPTIONAL

UNITOR	02	Drawn by/date <i>[Signature]</i> 19.01.93	Drawn by/date O.P.S. 02.04.92	System UNITOR OIL BAG	Component MARKING PLAN SKIMMING VERSION BAG SIZE 50 TO 1000 M3	DATA SHEET
		Issued by/date <i>[Signature]</i> 19.01.93	Issued by/date O.P.S. 02.04.92			
		Approved by/date <i>[Signature]</i> 19.01.93	Approved by/date J.T.A. 02.04.92			
		ORIGINAL				Data sheet no. 92-18-001

USE ONLY MIN. 25

TOWING ARR

COMPONENT SPECIFICATION

TYPE E3-B2-W4

TYPE SPECIFICATION

TEXT : BLACK

UNITOR	01	Drawn by/date <i>R</i> 02.09.92	ORIGINAL	Drawn by/date O.P.S. 21.04.92	System UNITOR OIL BAG	Component MARKING ON BAG TOWING ARRANGEMENT	DATA SHEET
	Rev. no.	Issued by/date <i>R</i> 02.09.92		Issued by/date O.P.S. 21.04.92			Data sheet no. 92-18-111
		Approved by/date <i>J</i> 02.09.92		Approved by/date J.T.A. 21.04.92			

MIN. 25

USE ONLY

BRIDLE LINE ARR.

COMPONENT SPECIFICATION

TYPE E53-B2-W2

TYPE SPECIFICATION



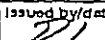
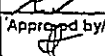
BUOY TYPE B51

TYPE SPECIFICATION

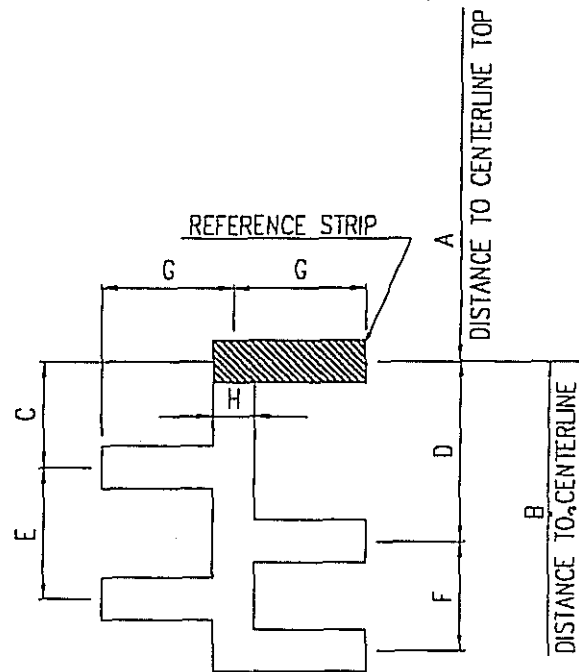
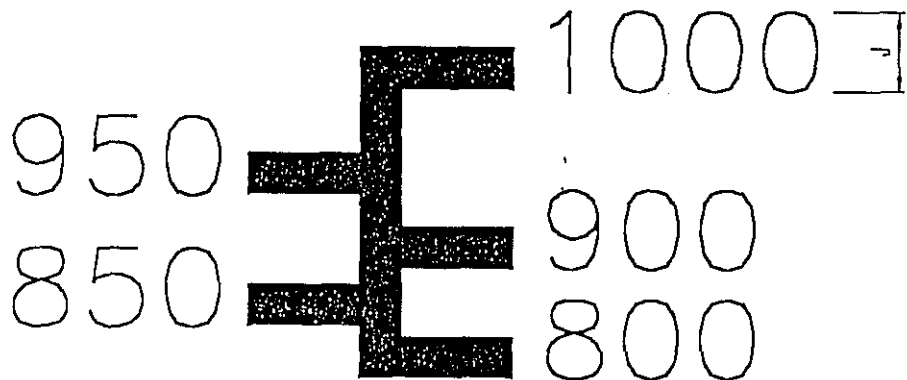
WEAK LINK W51

TYPE SPECIFICATION

TEXT : BLACK

	01	Drawn by/date  02.09.92	ORIGINAL	Drawn by/date O.P.S. 21.04.92	System UNITOR OIL BAG	Component MARKING ON BAG BRIDLE LINE ARRANGEMENT	DATA SHEET Data sheet no. 92-18-112
		Issued by/date  02.09.92		Issued by/date O.P.S. 21.04.92			
		Approved by/date  02.09.92		Approved by/date J.T.A. 21.04.92			

FULL W.L. VS. $\frac{1}{3}$
 CARGO (KG/M³)

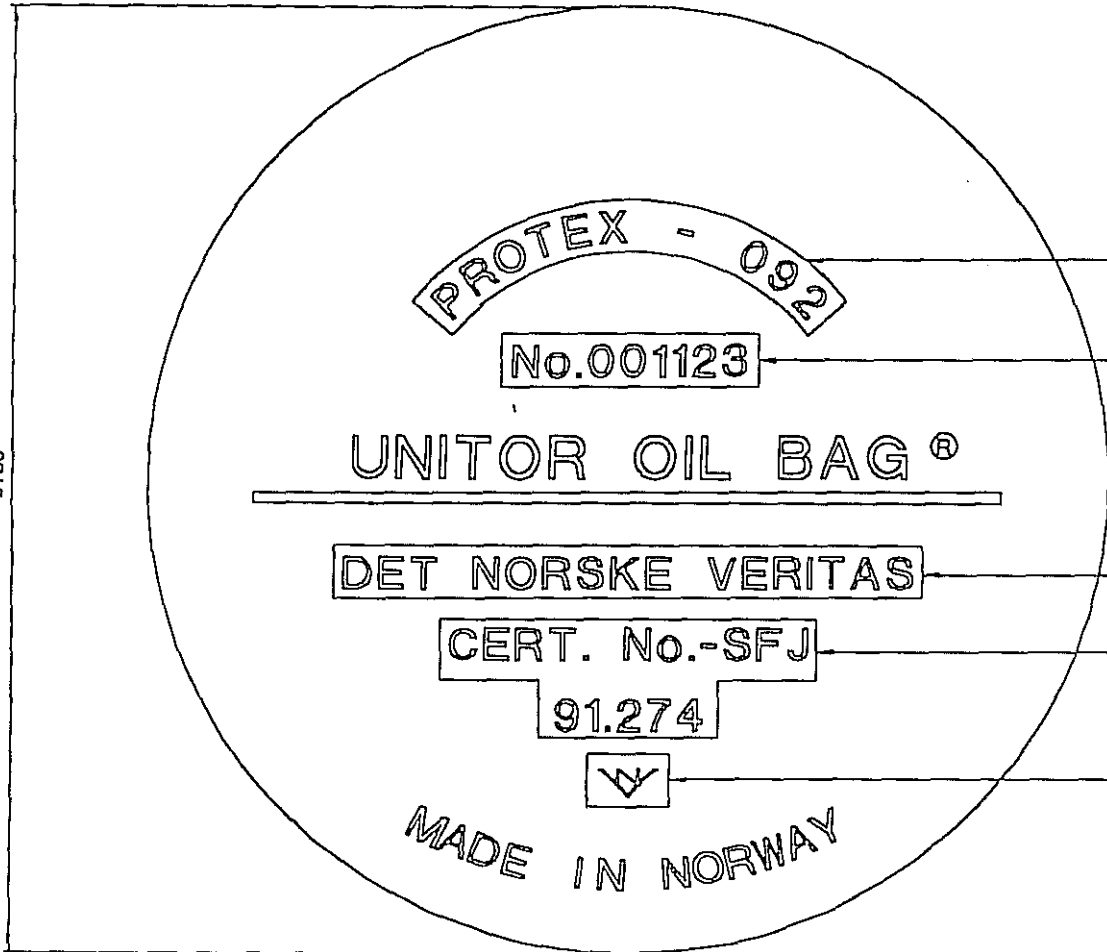


BAG SIZE M ³	A	B	C	D	E	F	G	H	I	J
50	1 770	2 755	90	160	120	100	140	40	35	70
100	2 230	3 470	120	200	140	120	150	50	45	90
200	2 810	4 400	150	250	170	150	190	60	55	110
300	3 210	5 010	170	290	210	180	225	70	65	130
500	3 810	5 940	200	340	250	210	250	80	75	150
1 000	4 800	7 480	260	430	310	270	360	100	100	200

OUR SYMBOL : WHITE RAL 9010
 TEXT : BLACK RAL 9017

TOR	02	Drawn by/date <i>[Signature]</i> 24.01.93	ORIGINAL	Drawn by/date O.P.S. 21.04.92	System UNITOR OIL BAG	Component FILLING MARK	DATASHEET	
	Rev. no.	Issued by/date <i>[Signature]</i> 24.01.93		Issued by/date O.P.S. 21.04.92				Data sheet no.
		Approved by/date <i>[Signature]</i> 24.01.93		Approved by/date J.T.A. 21.04.92				92-18-131

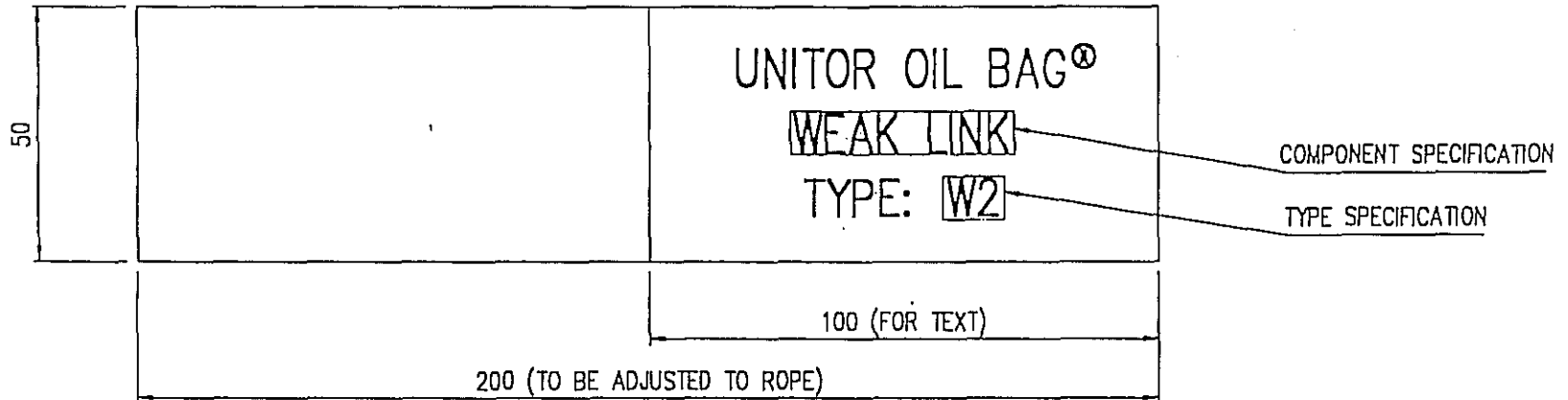
~g180




- MATERIAL SPECIFICATION
- BAG SERIAL NO.
- CERTIFYING AUTHORITY
- CERTIFICATE NO.
- MARK OF CERTIFYING AUTHORITY

AL: PROTEX 092

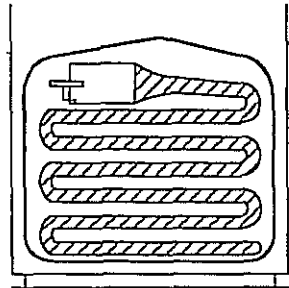
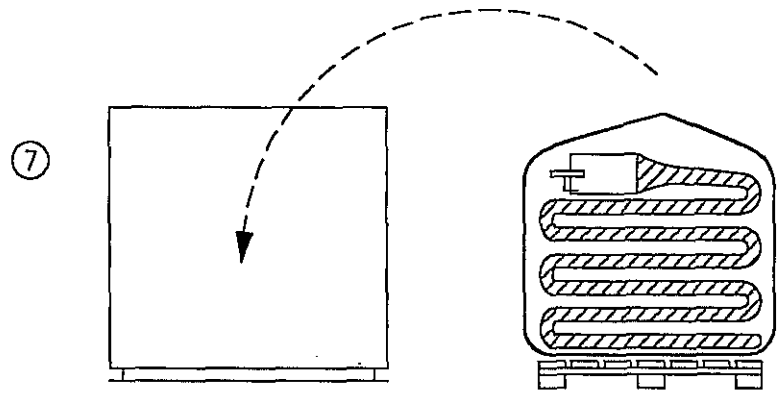
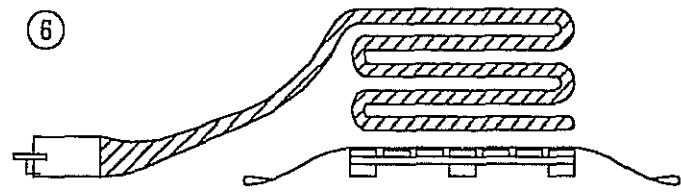
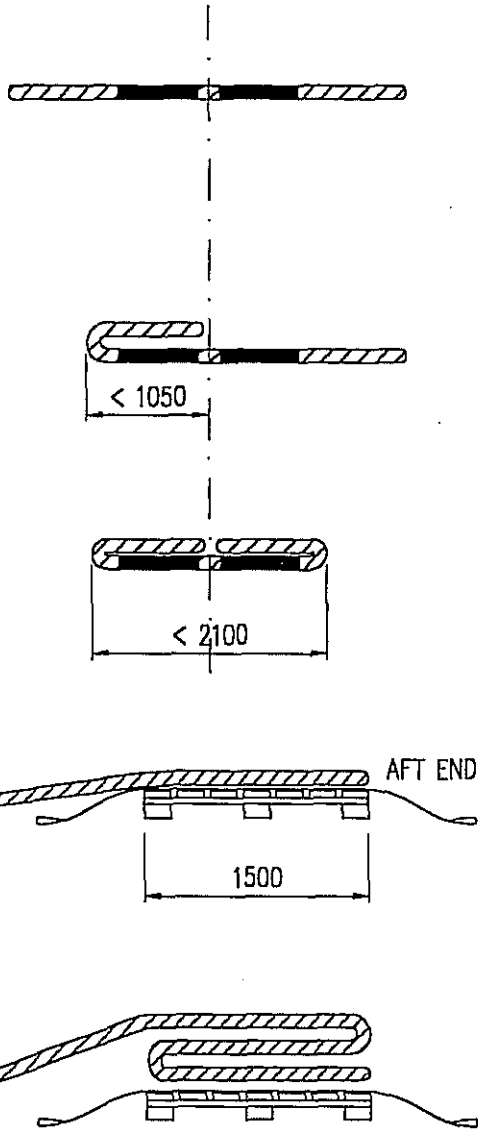
UNITOR	01	Drawn by/date <i>RI</i> 03.03.92	Drawn by/date A.M.J. 03.03.92	System UNITOR OIL BAG	Component MARKING LABEL BAG	DATASHEET	
	Rev. no.	Issued by/date <i>RI</i> 03.03.92	Issued by/date O.P.S. 03.03.92				ORIGINAL
		Approved by/date <i>f</i> 03.03.92	Approved by/date J.T.A. 03.03.92				
						Data sheet no. 92-18-141	



LABEL PATCH : PVC COTED POLYESTER FABRIC
 FABRIC : ORANGE
 FONT : HELVETICA BOLD 30 PKT.

	REV. NO.	00	Drawn by/date <i>[Signature]</i> 01.04.92 Issued by/date <i>[Signature]</i> 01.04.92 Approved by/date <i>[Signature]</i> 01.04.92	ORIGINAL	Drawn by/date O.P.S. 01.04.92 Issued by/date O.P.S. 01.04.92 Approved by/date J.T.A. 01.04.92	System UNITOR OIL BAG	Component MARKING LABEL	DATA SHEET Data sheet no. 92-18-151
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The right to make engineering refinements on all products is reserved. Dimensions and details are subject to change without prior notice. When dimensions are critical, the dimensions should be confirmed by UNITOR.



1. LAY THE BAG FLAT OUT WITH THE BOTTOM DOWN.
2. FOLD ONE SIDE OF THE BAG TOWARDS THE MIDDLE, UNTIL THE FOLDING EDGE RUNS APPROX 1 M FROM THE CENTER LINE OF THE BAG.
3. REPEAT THE PROCESS ON THE OTHER SIDE.
4. PUT THE LIFTING STRAPS ON A PALLET (1.6 x 2.2 M)
5. PUT THE AFT END OF THE BAG ON THE PALLET, AND BEGIN TO FOLD THE BAG IN 1.5 M LENGTHS.
6. CONNECT THE FRONT TO THE BAG.
7. LIFT THE UOB INTO THE CONTAINER.

SP-920	00	Drawn by/date RJ 06.08.92	ORIGINAL	Drawn by/date RJ 06.08.92	System UNITOR OIL BAG	Component PACKING INSTRUCTION FOR UOB 50M ³	DATA SHEET
		Issued by/date RJ 06.08.92		Issued by/date RJ 06.08.92			
		Approved by/date J.T.A. 06.08.92		Approved by/date J.T.A. 06.08.92			
	Rev. no.						
							Data sheet no. 92-20-100