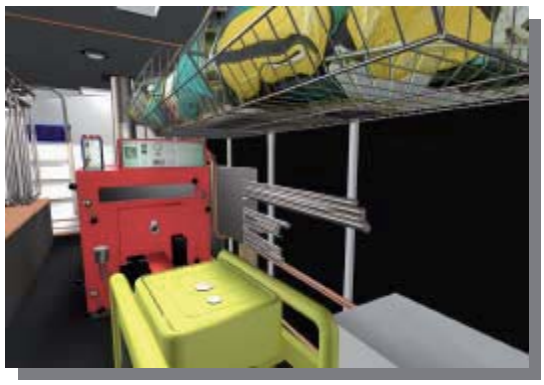
SWEDISH EMERGENCY DISASTER EQUIPMENT

DECON

UNIT III

A Self-Contained Mobile Mass Decontamination system



The Total Solution

FOR NUCLEAR, BIOLOGICAL & CHEMICAL EMERGENCIES

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Cargo Decontamination Unit version III

A self-contained, rapid deployment, adaptable and flexible Mobile Mass Casualty Decontamination unit that only requires a water supply to become fully operational. The unit can be deployed in almost any situation. It can be used at the scene of the incident as the exit point from the inner cordon or at the site of the casualty receiving hospitals.

The mobile decontamination unit specification was developed in Sweden by a chemical incident study team known as the ABC-group. The specification and unit capabilities called for:

- A self-contained storage system.
- A constant 35°C water supply at a flow rate of 120 litre per minute.
- A warm decontamination environment for casualty comfort.
- Controlled air-flow that prevents the build up of dangerous vapours.
- A straight line decontamination flow with segregated compartments that reduce the risk of cross contamination.
- Simultaneous decontamination of ambulant and non-ambulant casualties.
- All accessories to complete the decontamination task

Self-Contained Unit

The Cargo Decontamination Unit box body provides storage for all elements of the system. The box unit has two separate storage areas. The forward stowage area houses the decontamination facility accessories such as the flooring, catchments pools and curtains. It also provides stowage space for operator PPE. The rear storage area houses the integrated water and hot air management system, the electric generator, the decontamination facility tent poles and all the ancillary items such as the stretcher stands and shower pallets.

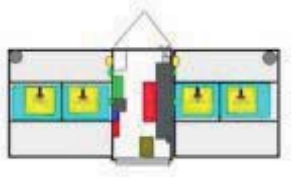
Integrated Water /Air Management System

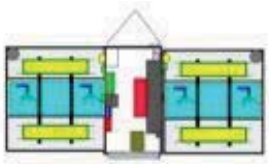
The diesel fired integrated water/air management system is powerful enough to supply water heated from as low as 0° C to +35° C to each of the two decontamination facilities within 2 minutes of turning the heater ignition key. Cold water enters the unit, passes through the heat exchanger and is distributed to the decontamination facilities via 2 shower bars, each fitted with 4 showerheads per facility, at a constant 35° C temperature and a minimum flow rate of 15 litres per minute. The heater can also provide a hot water supply up to 90° C for decontaminating itself, vehicles or equipment.

The heater also supplies hot air to the decontamination facilities. The temperature controlled airflow can maintain an internal environment at 20°C even when the external temperature is below -20°C. The heating system also creates an internal overpressure which exhausts out onto the dirty side preventing any build up of dangerous gases within the decontamination facility.

Simultaneous Decontamination of Ambulant and Non Ambulant Casualties

The Cargo Decontamination Unit provides two decontamination facilities that allows simultaneous decontamination of ambulant and non-ambulant casualties. Each facility can be arrange to provide either one non-ambulant decontamination lane or two ambulant decontamination lanes. The dual facility allows for separation of sexes, cultures and can be adapted to meet different scenarios.





The decontamination philosophy is to operate with three sections: Dirty Part, Decontamination Part and clean part. Each facility is divided into separate sections using curtains.

"Dirty Part" In this section the casualties clothing is removed and bagged for safe disposal. Valuables will be separately bagged in transparent plastic bags for later safe decontamination

"Decontamination Part" In this section the casualty will be washed with detergent soap and large amounts of water. The shower water is always 35° C and the surrounding temperature 20° C. The stretcher stand system allows the non-ambulant casualty to be moved easily through the system. The ambulant casualty stands on a grating to avoid standing in a pool of contaminated water. The contaminated water is collected in a pool and pumped to a 3000-litre collection tank for subsequent safe disposal.

"Clean Part" After completion of the decontamination process the casualties are passed into the clean section where they are dried and provided with clothing or blankets before being passed to the casualty clearing station.

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Technical Data

Technical specification CARGO	*DECONTAMINATION UNIT version III*
A. Trailer	
Total weight	3000 kg.
Total length incl. drawbar	6.65 m.
Total breadth	2.35 m.
Total height incl. chimney	2.74 m.
Body breadth	1.87 m.
Body length	4.72 m.
Length cargo space	4.60 m.
Breadth cargo space	1.81 m.
Height cargo space	1.85 m.
Loading measure backrollerdoor	1.60 x 1.40 m.
Isolation	30 mm Isopat.
Tyre dimension	185/80 x R14C
Towing hook	50 mm (Tow-eyelets alternative))
Chassi	AL-KO Kober, self-supporting with crossbeam
B. Tent.	
Breadth	4.70 m.
Deep	3.30 m.
Height	2.40 m.
Opening in gable, PVC-zipper	4 st. 1.0 x 2.1 m. (BxH)
Roof gradient	7 degree
Tent canvas	**Canvas of PVC-covered polyester fabric.**
Thickness	0,6 mm. 650 g/m2.
Weight/Tent	25 kg.
Fabric	1100 dtex, polyester.
Thread per cm2	4,5 x 4,5.
Tear strength	DIN 53363. 250/225 N.
Draw strength	DIN 53354. 177/1500 N/5 cm SFS 2984.
Adhesive	100 N/5 cm.
Temp.durability	+ 70 to - 30 degree
Quality number	551350.
Flame protection	See type approve 1289/87.

Technical Data

Floor	**PVC-polyester canvas.**
Thickness	0,65 mm. 750 g/m2.
Quality number	551350 S.P. 570
Flame protection	Self extinguish
C. Stand.	
Stand	Pipe frame of stainless steel
D. Water heater.	
Model	Given by SWEDE
Fuel	Diesel oil.
Fuel consumption	27/h in use.
Effect	278 KW.
Measure date: L x B x H	1880 x 860 x 1300
Voltage	220 V, 1,1 A single-phase.
Effect consumption useful	260 w.
Water pressure	From 1 bar.
Reduction valve water pressure	Incl. adjustable.
E. Hot-air unit.	
Model	Given by SWEDE
Fuel	Integrated with WW-heater throw heat exchanger, aero temper
Effect	19,8 KvA at 0 degrees.
Measure date: L x B x D	480 x 465 x 352 mm.
Weight	15 kg.
Voltage	220 V single-phase. (115 V available)
Effect consumption useful	70 W
Airflow	1160 kbm/h.
Temperature outgoing air	47 degrees at 0 degrees

Technical Data

H. Electric-station on wheel.	
Model	Given by SWEDE
Effect	Max 5000 W, kont 4400 W
Voltage	230 v. (115 available)
Power	19.1 A.
Power Point	2 p.c.
Tank volume	16.6 litre.
Fuel consumption	2.9 litre/h.
Working time/tank	5,7 h.
Fuel meter	Incl.
Oil level guard	Incl.
Measure date L x B x H	660 x 470 x 585 mm
Start	El/Manual.
AC voltmeter	Incl.
DC point	Incl.
AC/DC fuse	Incl.
Weight	76 kg.

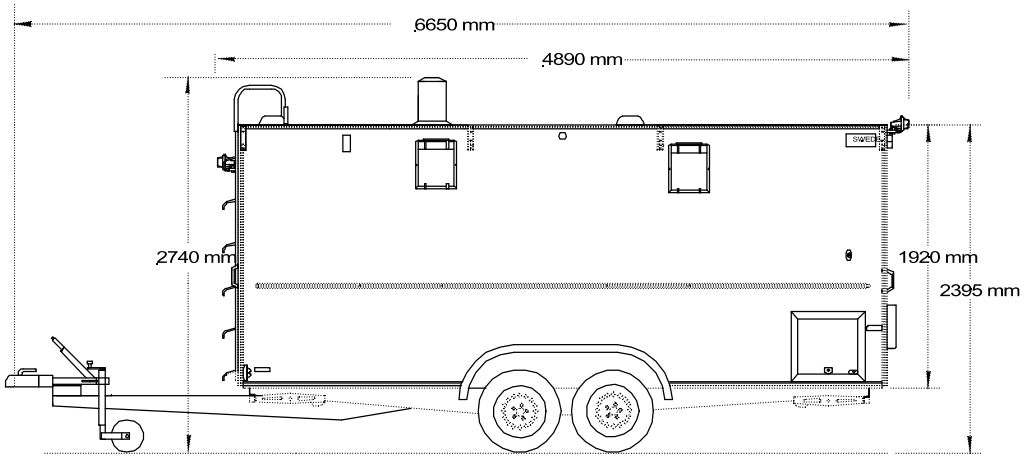
I. Shower line	
Shower line with two body shower and two hand shower	2 p.c.
Material	Stainless steel

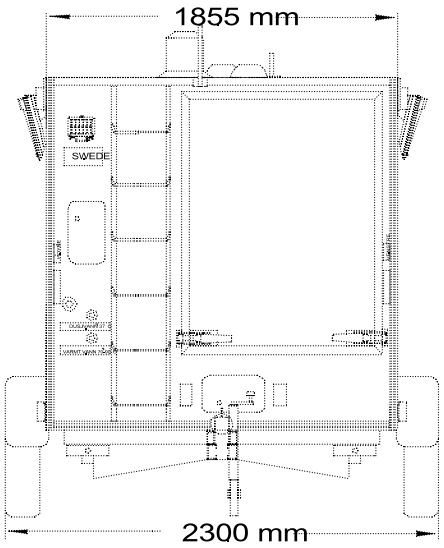
J. Drain-pumps.	
Model	Given by SWEDE
Capacity	4000 l/h.
Max. pressure height	5.8 m.
Max. sink deep	6,0 m.
Level switch	Incl.
Drain tube	2 x 16 m. Heliflex, grey, 25 mm, Incl..

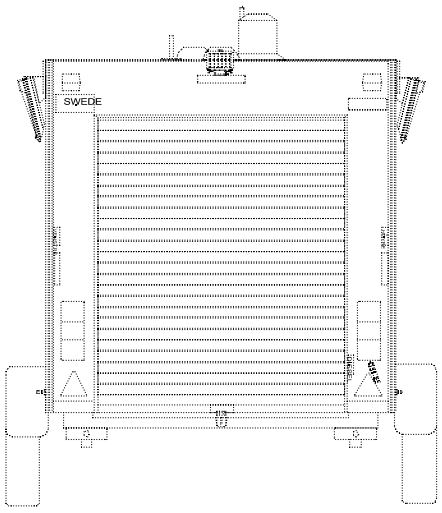
K. Remaining.	
External lighting	Side: 2 x 230 V Low energy lights on each side. Rear: 1 x 230 V Low energy light + 1 x 12 V lamp. Front: 1 x 230 V Low energy light
Internal lightning	3 x 230 V fluorescent lightings + 3 x 12 V lamps.
Stretcher stand	1 p.c. Stainless steel.
Shower pallets	2 p.c. Stainless steel.
Sack holder	2 p.c. Stainless steel.
Decontamination / Shower stretcher	1 p.c. Stainless steel, sleeping mat of PVC
Chair	2 p.c. Stainless steel
Collecting pools for the showers	2 p.c. PVC inflatable.
Reservoir for contaminated water	1 p.c. 3000 l.
Electric cable	1 p.c. 20 m.
Water hose for internal use	1 p.c. 25 m.
Ground security bags to be filled with water	10 p.c. PVC.
Soap holder	4 p.c. incl. installation.
Connection	Incl.
Ladder 4	2 p.c. Aluminium

CAPACITY:	
Capacity shower water:	120-140 l/min
Temperature shower water:	35 degrees Celsius
Maximum water temperature raising:	35 degrees Celsius (0-35 is possibly)
Body showers:	4
Water flow in body showers:	20-25 l /min
Hand showers:	4
Water flow hand showers	15-20 l /min
Temperature hot water:	80-90 degrees Celsius
Water flow hot water:	30-40 l /min.

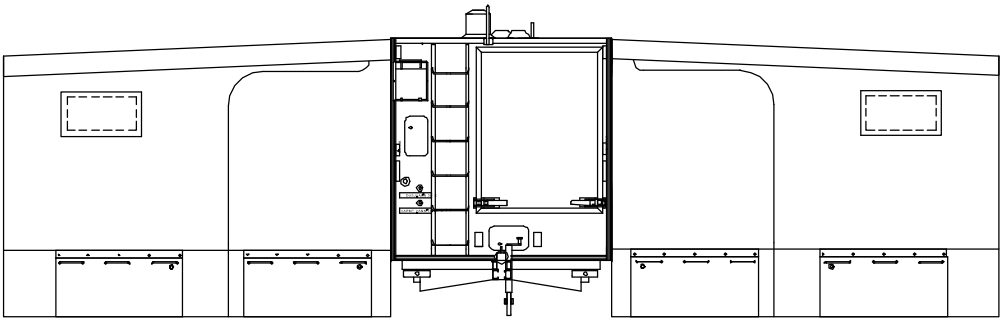
Drawings

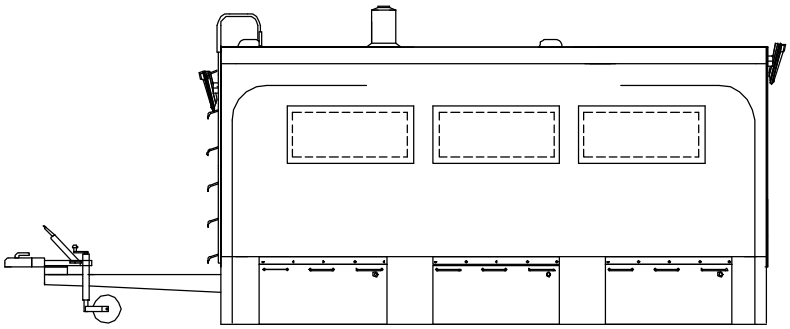

6650 mm
4890 mm
2740 mm
1920 mm
2395 mm


1855 mm
SWEDE
2300 mm


SWEDE

Drawings



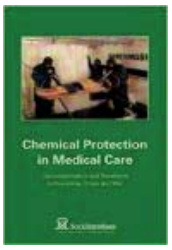


The Swedish Concept

The decontamination of chemically contaminated casualties is a problem that can arise anywhere in the world.

The Swedish National Board of Health and Welfare (SNBHW) have always allocated Disaster Management a high priority. In 1990 the SNBHW produced a general advise booklet on the "Care of Casualties in Chemical Accidents" in which they stressed the importance of decontamination facilities being available both at the scene of an incident and at all the hospitals and health care centres in the area where the incident takes place.

The SNBHW produced two further reports in 1995 and 1998 entitled "Chemical Protection within Medical Care" The reports were written by a chemical incident study team known as the ABC group. Representation on this team included: The SNBHW, The National Rescue Services Board, The Swedish National Defence Research Institute and The Poison Information Centre.



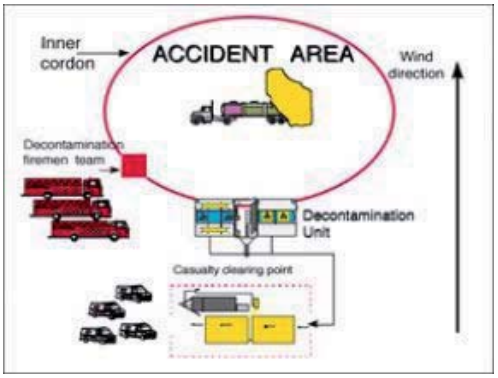
When considering the need for decontamination facilities the group posed themselves three questions:

WHY?

The risk of a chemical accident within industry or during the transportation of chemicals on roads, rail, air or sea is already very great and as the volumes of chemicals used and transported increase, so do the risks. Again, while the likelihood of chemical warfare has receded the risk of terrorist action involving the use of toxic chemicals is ever present; as was demonstrated in Tokyo in 1995. Similarly, the possibility of radioactive contamination resulting from an industrial accident, or even terrorist action, cannot be ignored because the result of any of these events will inevitably be: CONTAMINATED CASUALTIES.

WHERE?

The requirement is that decontamination facilities are provided both at the scene of the incident and at casualty receiving hospitals: At the scene of the incident: It is clearly to the advantage of casualties that toxic contamination is removed from their bodies with the minimum of delay, and it is also a necessity to decontaminate casualties before transporting them to hospitals thereby avoiding the contamination of ambulance vehicles. By placing a Mobile Decontamination Unit upwind of the area of extreme toxicity, and by utilising a standard operating procedure which allows for the casualties to be brought to the Unit by those dressed in appropriate protective clothing, the medical specialists can provide aid to the casualties without delay in a safe area, while requiring a much lower level of protection for themselves against toxic substances. The Unit will be the only exit from the risk area.



At Casualty Receiving Hospitals: It is axiomatic that in an incident involving large number of casualties there will be some who will by-pass the casualty collection system and self-refer to hospitals, and this applies as much to large numbers of chemical injuries as to incidents where chemicals are not involved. Similarly, in a small incident involving only a few chemically contaminated casualties it is likely that the injured will be delivered to hospitals without them having been decontaminated. In these circumstances it is essential that decontamination facilities are available, mobile or built in.

HOW?

Effective decontamination requires that it is carried out in an area safe from further contamination, in warm surroundings to avoid increasing the amount of trauma suffered by the casualties, and with a plentiful supply of warm water to ensure that the contaminant is easily removed. The decontamination process must also allow for the use of decontamination detergents and other substances, such as Personal Decontamination Substances.

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