SPECIFICATION

ROSENBAUER TANK FIRE FIGHTING VEHICLE

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Chassis:

MAN	TGS 41.480 / 8x4
Diesel engine:	353 KW (480 HP)
Cabin, 2-doors:	1 + 1
Tyres, dual in the rear:	315/80R22,5
Gearbox:	Manual

Superstructure:

Water Tank, Polyester:	15.000 l
Foam Compound Tank, Polyester:	3.000 l
Centrifugal Fire Pump:	N 100
Automatic Foam system:	RVME 600
Water/Foam Monitor:	RM130

Illustration shows similar version

The data and information given in this specification are not covered by the automatic update Service. Rosenbauer reserve the right to make general design modifications and technical improvements.

Drawings and photographs may show optional equipment available at extra charge only.
Optional features, if selected, may influence the weight of the appliance.

1.) PREAMBLE

This specification covers the supply of a Rosenbauer Tank Fire Fighting Vehicle, mounted on the approved MAN chassis of the new generation, model TGS 41.480 / 8x4 with medium type cabin.

The tender has been designed for effective fire fighting in high fire risk areas, like Municipal Areas, Industrial Complexes, Refineries, and Petrochemical Installations.

It is equipped with a water tank and a foam compound tank, and is designed to operate from open water sources, fire hydrants or its own tank supplies.

The vehicle is capable of operating at high ambient temperatures and in salt laden, high humidity atmosphere.

All components of this vehicle are made of approved products, steadily improved and developed. This is the guarantee for absolute reliability and safety in performance.

The engineering and construction of all Rosenbauer products is conducted by procedures following the Standards of **ISO 9001**. Rosenbauer International holds the **Quality System Certificate** ÖQS-Reg. No. 143/0 of the European Network for Quality System assessment and certification. This Standard is recognised worldwide and is increasingly demanded by all Governments and Major Organisations.

Additionally, Rosenbauer has been certified to follow the Environmental Management Standards as laid down by **ISO 14001** / **EN 14001** - a firm ecological commitment towards protection of our environment.

2.) CHASSIS & ENGINE

Make:	MAN
Model:	TGS 41.480 / 8x4
Engine:	
Make:	MAN
Model:	D2676LF33
Exhaust fumes standard:	EURO 4
Method of Operation:	4-stroke Diesel engine, with direct injection and turbo charger.
Arrangement of cylinders:	6 cylinders, in-line
Piston displacement:	12.412 ccm
Maximum output:	353 kW (480 HP) at 1.800 RPM
Fuel tank:	Made of steel, 400 litres capacity, fitted with removable strainer
Cooling system:	water forced circulation by pump, tubular finned radiator with tropical thermostat.
Electric System:	
Voltage:	24 Volt

Alternator:	3-Phase current. Output: 3.360 Watt
Battery:	Number: 2, voltage and capacity: 12 V, 225 Ah, comes with a battery main switch.
Starter:	24 Volt
Clutch:	Single plate dry clutch
Gearbox:	manual gear shift system, comes with 16 forward gears and 2 reverse.
P.T.O.	Full torque, clutch independent PTO (NMV)
Wheel-drive:	8 x 4
Steering:	Hydraulic power steering, L/H drive. Steering column bracket adjustable.
Front axles:	Front axle straight 7,5 tons. Comes with stabiliser.
Rear axles:	Rear axle for 13 tons. Parabolic steel plate spring with stabiliser.
Differential lock:	In rear axle
Tyres:	Front axles: single tyres Rear axles: dual tyres 315/80R22,5
Brakes:	
Foot Brake:	Pneumatic brake system with ABS and ASR. Dual-circuit pneumatic disc type on front and drum brake for rear axle. Pipe break protection system.
Hand Brake:	Spring loaded and air controlled acting on the rear wheels.
Engine Brake:	With constantly open throttle valve.
Weights:	Permissible front axle: 2 x 7.500 kg Permissible rear axle: 2 x 13.000 kg Total permissible GVW: 41.000 kg
Dimensions (LxWxH):	10850 x 2500 x 3950 mm
Performance:	min. Ground Clearance approx. 280mm Braking Distance: 30-0 km/h: < 8m Acceleration: 0-60 km/h: < 35 sec. Max. Speed: approx. 100km/h Turning Circle: approx. 25m Longitude stability: approx. 20° Grade climbing: approx. 18°
Painting:	Cabin: fire red RAL 3000 Frame: novagrey as per MAN standard Rims: silver

N.B.: The special country code standards, which are laid down by the chassis manufacturer, have been considered. Rosenbauer has no influence upon these standards whatsoever.

3.) DRIVER'S and CREW CAB

Type: "M" type, forward control type, hydraulically operated tilting cabin in all steel construction, for a crew of 2 (one driver plus 1 fireman).

Design: The driver's cab is a rigid safety cell, offers well tuned suspension and ensures comfort almost equal to that of a passenger car. Modern design offers excellent all-round vision. The cab is adequately insulated against noise, vibration and extreme temperatures.

Doors: Two doors, with electrically operated roll-down windows with tinted glass.

Windshield: Safety glass, tinted.

Seats: Driver's seat air suspended, adjustable and upholstered.
Co driver's seat adjustable and upholstered.

Dashboard: The dashboard is equipped with all necessary gauges, pilot lamps and switches as per chassis manufacturers standards, and comprises:

* Speedometer
* Oil pressure gauge or warning lamp
* Diesel tank gauge
* Coolant temperature gauge
* Battery charging indicator
* Air pressure gauge
* Control light direction indicators
* Warning light braking system

Control panel: Located between the driver's and co-driver's seat, on the dashboard, there is a control panel for the fire fighting operations. The control panel includes a display and soft buttons for controls.

* Display for information
* Soft buttons for control of alarm system and all other functions
* PTO control switch (separate mount)

Alarm System: A separate control box, holding all controls and switches for the Public Address System, is dashboard mounted within easy reach of the driver or co-driver. This control box also holds controls and switches for adjusting the electronic siren just to the required signal and for simultaneous operation with the Public Address System.

Miscellaneous:
* Windshield wipers and washers
* Cab interior illumination
* Heating and ventilation unit, including windshield defroster.

* Two rear view mirrors
* Two sun visors
* Chassis manufacturer's standard air-conditioning system
* All in all the following 12 V and 24 V sockets are provided in the cabin: 1 x 12 V and 3 x 24 V
* 1 x cable preparation 24 V in the cabin (centrally at the dashboard). The cable is labelled with "24V".

4.) WATER TANK

Capacity: 15.000 litres

Design: The water tank is mounted completely torsion free, and is therefore suitable for even roughest cross-country operation. The tank is suitable for transport of drinking water.

Material: It is made of high quality laminated polyester material, 6 to 8 mm thick, glass fibre reinforced.

Advantages:

* Absolutely corrosion proof.
* UV-stabilised material is used throughout.
* No maintenance required.
* The exterior of the tank has flame retarding properties.
* The weight of the tank is approx. 35% less than comparable steel tanks.
* In case of damages, the tank can be repaired at your local workshop.

Fittings: The standard design of the tank includes:

* Two inspection manhole 450 mm diameter.
* Pressure and vacuum release.
* Overflow system with spilling prevention.
* Tank drain with 1" ball type valve.
* Electric tank level indicator "Fludometer".
* Baffle plates mounted in the tank's interior prevent a rolling motion of the contents.
* An anti-swirl plate or a suitable sump will prevent a funnel formation during suction operation.
* Eight hydrant filler inlets, with 3" coupling and blank coupling, four on each side of the vehicle in front of the 3rd axle. All filler inlets

provided with a 2,5" butterfly valve and removable strainer. One non return valve for each filling pipe.

* Automatic water tank levelling system

All connections and pipes are dimensioned so as to meet all flow requirements, and fitted with easily accessible drain valves.

5.) FOAM COMPOUND TANK

Capacity: 3.000 litres

Location: The tank is mounted in the rear part of the water tank and is an integral part of the water tank.

Design: The foam compound tank is suitable for transport and storage of all known brands of synthetic and protein based foam compounds. The tank is mounted torsion free, and is therefore suitable for even roughest cross-country operation.

Construction: It is made of high quality laminated polyester material, 6 to 8 mm thick, glass fibre reinforced.

Fittings: The standard design of the tank includes:

* Inspection manhole 450 mm diameter, with quick action opener.
* Pressure and vacuum release
* Electric tank level indicator "Fludometer"
* Two inlets, with 2,5" coupling and blank coupling, one on each side.
* One drain connection
* Suction line to the foam proportioning system, with electro pneumatic controlled ball valve.

6.) CENTRIFUGAL FIRE PUMP

Model: Rosenbauer, Model N 100

Type: Single-stage centrifugal fire pump.

Material: Corrosion resistant light-alloy, sea water resistant. Pump shaft made of stainless steel.

Drive: By the vehicle's engine via the PTO

Output: 10.000 l/min. at 10 bar when operating from the tank according to RBI Standard
9.500 l/min at 10 bar when operating at 3m suction height according to RBI Standard.

Sealing: By means of a mechanical sealing.

Protection: Automatic thermal overheating protection system.

Pump drain: Pump drain with electro pneumatic ball valve.

Location: In the rear of the vehicle.

Manifolds:

* Suction line to the tank, comes with a 200 mm butterfly valve.
* Filling line to the tank, comes with ball type valve.
* Four suction inlets, 150 mm diameter, (for connection of suction hoses), with butterfly valve. All inlets are facing to the rear.
* Eight pressure outlets, 65 mm diameter, four connections each on the left and right hand side, lateral mounting. Provided with manual butterfly valves with screw type operation, 3" couplings and blank cap.
* Suction inlet for foam compound pick-up from foam compound barrels, with Storz-75 brass coupling and blank cap. The suction inlet is located in the rear below pump compartment and also serves as inlet for flushing the whole foam system with clean water.
* Connection to hose reels with manual valve.
* One outlet to the monitor.
* One outlet to the ground sweep nozzles.

Pipework: Water pipework is made of hot dipped galvanised steel, foam compound pipework is made of plastic material (Polypropylene) and stainless steel (according to DIN 1.4571). Pipe sizes and configurations are designed to produce a minimum friction loss when operating at full capacity.

Priming Device:

Type:	Double piston priming pump.
Control:	Automatic
Drive:	Via tooth belt and electromagnetic clutch
Suction lift:	3,0 m within 7 sec. (in compliance with DIN-standards). Maximum suction lift up to 9 m (attainable vacuum 90%)

Gearbox:

Make:	Rosenbauer
Material:	Light-alloy
Gear wheels:	Hardened steel
Lubrication:	Oil bath lubricated, oil level check by sight glass

DRE Pump Pressure Governor:

Make:	A Rosenbauer (DRE) automatic pump pressure governor will be installed.

Control Panel in Pump Compartment:

Location:	In the pump compartment.
Display:	The information and control for the automation / operation and visualisation will be shown on a display integrated in the pump locker. The language at the display can be changed between English and Hebrew. The control panel includes soft touch buttons for controls. Possible information: All tank levels of the vehicle (water tank, foam compound tank,...) Indication of used components (pump, foam admixing, monitor if fitted); Piping of pump including switch situation of valves. ..... Possible controls: Control for pump Control for priming device Control for foam admixing system Pressure governor .....
Lettering:	By means of pictograms.

Control Panel in Driver's Cabin:

Location: In the driver's cabin within easy reach of driver and co-driver.

Display: The information and control for the automation / operation and visualisation will be shown on a display located next to the driver.
The language at the display can be changed between English and Hebrew.
The control panel includes soft touch buttons for controls.

Possible information:
Indication of signal system
General vehicle information
All tank levels of the vehicle (water tank, foam compound tank,...)
Indication of used components (pump, foam admixing,....);
Piping of pump including switch situation of valves.
.....

Possible controls:
Control for signal system
Control for pump
Control for priming device
Control for foam admixing system
.....

7.) FOAM PROPORTIONING SYSTEM "ROSENBAUER RVME 600"

Design: This fully automatic "Around-the-Pump" electronic foam proportioner makes it possible to induct foam compound to the water at the correct proportioning ratio, independent of pump pressure and/or discharge. After the pump has been engaged, only the foam system has to be switched on, and the correct percentage of foam compound will automatically be admixed.

Advantages:

* Since the admixing of foam compound is not done manually, there is no waste of foam compound.

* The foam proportioning system "RVME 600" is suitable for all protein based foam compounds, as well as for synthetic foam compounds, including AFFF.

* The automatic foam proportioning is done with low pressure loss and operates within the pump output range of 500 l and 10.000 l/min, as well as at pump pressures between 5 bar and maximum pump pressure.

* Magnetic inductive flowmeters made of corrosion resistant material for water and foam measuring.

* The percentage rate can be adjusted via a selector switch between 0 and 10%. (Max. percentage rate at 10.000 l/min pump output = 6%)

* You only have to push a button to produce foam. This is the simplest, safest and most economic way of foam production.

8.) FOAM / WATER MONITOR

Model: Rosenbauer RM 130

Type: Single barrel design

Location: above the pump compartment

Material: Corrosion resistant light alloy

Drive: electric motors with hand wheels for emergency actuations
In case of electric failure, the monitor can be operated manually from the working deck of the vehicle, by a worm gear control, resp. by a rotating lever.

Operation ranges: measured at farest point

Foam straight stream	throw: 105 m / RBI Standard
Water straight stream	throw: 115 m / RBI Standard

Nozzle: O-stream nozzle

Output: 10.000 l/min at 10 bar according to RBI Standard

Foam barrel: made of light alloy, with integrated aspiration plates to improve the foam quality. Deflectors for jet adjustments.

Rotation: max. 360 degrees

Elevation: -20 - 70 degrees (max. values)

Depression: From zero to maximum minus 20°. Due to the special shape of the cab and the contours of the working deck, the depression angle may be smaller when measured over the rotating beacons, ladder fixtures etc.

Electric system: CAN-Bus controlled (fully integrated in the vehicle CAN-Bus)

Control: electronic control via wireless remote control

Searchlight: Two LED lights mounted in the design housing

9.) UNDERTRUCK NOZZLES

Front Axle: 3 undertruck nozzles will be mounted in front of the front axle

1st Rear Axle: 2 undertruck nozzles will be mounted in front of the 1st rear axle

2nd Rear Axle: 2 undertruck nozzles will be mounted between 1st and 2nd rear axle

Discharge: 75 l/min per nozzle

Actuation: The nozzles can be actuated from the driver's cab

10.) FIRST AID INSTALLATION (Hose Reel)

Design: Two hose reels, mounted in the pump locker, for use with normal pressure water or foam. The reels are fitted with a reliable drum brake, and electric rewind mechanism.

Hose: Each hose reel holds 30 m of rubber hose 32 mm internal diameter. The end of the hose is fitted with a 1,5" male coupling made of light alloy.

Nozzles: Coupled to the hose is a Rosenbauer SelectFlow nozzle 1,5", model RB 101. A flow selection control ring with detents can be set for a flow of 115, 230, 360, 475 l/min or flush (all flow figures refer to a nozzle pressure of 7 bar). Change of flow or flush is possible without shutting down. A special horseshoe type control valve allows for positive shut-off. The SelectFlow Nozzle delivers the same flow for straight stream, narrow or wide angle fog.
A moulded bumper ring in front of the nozzle can easily be turned to produce straight stream, narrow or wide angle fog - allowing for man protection water curtain. Heavy duty and replaceable spinning teeth for very fine fog pattern.

Guide rollers: In order to facilitate unwinding of the hose and to protect the pump control panel, light metal guide rollers are provided.

11.) PUMP LOCKER

Design: The pump room, situated in the rear of the vehicle, is closed by a door, hinged at the top, which provides extra protection to the pump operator against rain and sun. The pump locker also holds the hose reel.
Additional access is made possible by 2 lateral roller shutters.
Fixed steps are installed below the lateral compartments.

Suction inlets: 4 suction inlets (facing to the rear 2 pcs. each side) are installed to enable suction operation.

12.) STORAGE LOCKER

Design: The space between the driver's cab and the water tank is constructed as a through-type storage locker closed by 2 lateral roller shutters and holds all accessories delivered with the vehicle.

Brackets: Quick release brackets, ensuring positive fixture and fast removal of the accessories, are provided for those accessories, they are delivered with the vehicle.

13.) BODYWORK IN GENERAL

Manufacturer: Rosenbauer

Construction: The versatile lightweight and modular superstructure consists of self-supporting canted aluminium sheets. The superstructure is mounted onto a auxiliary frame which is fixed to the chassis frame by means of rubber/steel cone bearings. All plates are bent and shaped to increase the torsion resistance and are joined together by gluing technology and screwed or bolted wherever necessary. Stainless steel screws are used throughout. The modular design increases the mobility of the vehicle, reduces the weight for the material, lowers the centre of gravity and offers better corrosion resistance.

Design: The bodywork is designed in such a way as to allow maximum accessibility to all areas to be serviced and inspected. Provision is made

for all major vehicle components to be removed in an easy way. For this purpose, lifting eyes are provided wherever feasible. This ensures that removal and replacement do not entail unacceptable downtime.

Working deck: The tank roof is covered with a special sand/plastics coating, which is extremely slip resistant.

Access: A ladder, in the rear of the superstructure, gives access to the working deck. Hand grips where necessary.

Roof box: On the roof of the superstructure one box made of aluminium is mounted. The box is designed to hold a huge quantity of bulky equipment. The box is equipped with a hinged cover and an illumination.

Bumpers: Heavy duty steel bumpers, connected with the chassis frame, are provided in the front and the rear part of the truck.

Foot boards: Adequate access to the storage lockers is provided by foot boards. The front compartment is equipped with hinged foot boards, they be stored back into the locker compartment while driving situations.
The maximum load capacity of each fold-down step is 250 kg

Shutters: Dust- and water proof light-alloy roller shutters, all provided with a bar lock. The dual-skinned design guarantees that the roller shutter can always be opened, also if e.g. a tool has come off its brackets, which normally would block the roller shutter. The profiles are embedded in a special type of plastic material, extremely low on noise, and smooth running. When opening a roller shutter, an automatic switch ensures immediate illumination of the respective locker.

Mud guards: Made of steel, GRP or light-alloy sheet and provided with rubber mud flaps.

Underride protection : An underride protection is mounted at the rear of the vehicle (made of tested underride beams).

14.) ELECTRICAL and COMMUNICATION EQUIPMENT

Traffic installation: In compliance with national highway codes, comprising head lights, brake/stop lights, turn indicators, reverse light, and licence plate illumination.
Additional brake lights, turn indicators and reverse light are mounted at the upper part of the bodywork.

CAN Bus: The vehicle is equipped with a CAN-Bus control system (Controller Area Network). The system is shockproof and resistant against temperatures between - 30°C up to + 80°C.
The main advantage of the CAN bus system is the availability of identical information for all electronic interfaces.

Rosenbauer Logic Control System (RLCS):
This system is based on the CAN bus system and provides comprehensive information of all functions of the fire fighting

superstructure as well as engine data, overview of vehicle and assistance.

Illumination: Lighting system for the interior of the cab, pump compartment and storage lockers. Automatic switching on when doors or roller shutters are opened.

Signal system:

Signal lights: 2 LED flash lights, red, are installed on top in the front, integrated in the design roof
2 additional beacon lights, red, are installed on the top of the driver's cab.
2 LED flash lights, red, are installed on top in the rear of the superstructure covered with a design protection

Speaker: A 100 Watt loudspeaker will be mounted on top of the cabin. This loudspeaker serves for transmission of the siren signals, and is also part of the Public Address system.

P.A. system: Integrated Public Address system, complete with a cabin mounted hand microphone and external loudspeaker.

Siren: Model PA 300. This siren is an advanced, efficient and full-featured electronic siren. The siren is protected against all failure modes by a fuse that is replaceable without tools.

Selector switch functions:

RADIO: Incoming radio messages are amplified by the PA 300 and rebroadcast over the external speaker.

MANUAL: Siren may be activated by the siren switch on the dashboard, or by the vehicle's horn control on the steering wheel.

WAIL: Continuous "wailing" up and down in frequency.

YELP: Continuous rapid "warbled" tone.

HI-LO: Distinctive two-tone sound

HORN/SIREN: Up position activates the electronic air horn sound and down position activates peak-and-hold sound in any mode except radio.

Searchlight: Two searchlights LED mounted on top of the vehicle provide a good illumination for the working deck. The searchlights are removable, pivoted, and comes complete with cable and plug.

Battery charging system:
An automatic battery recharger 230 V, with overcharge protection and an intelligent charging monitoring is installed.

An automatically release connection system for 230V / air external power supply is installed on the L/H side.

Radio gear:
* Voltage transformer 8 A from 24 to 12 Volt.
* Battery connection with fuse protection.
* Mobile antenna, cab roof mounted, complete with 4,5 m coaxial cable and plug.

Reverse camera: A colour reverse camera is mounted in the rear of the truck the picture is shown on the control panel display.

Miscellaneous:
* Battery main switch electrically operated
* Low voltage protection for charging devices
* 1 radio
* Side positioning lights
* 24 V socket for foam filling pump
* 3 red and blue strobe lights on both side of the vehicle

15.) FINISH

Design:
Cabin and superstructure red RAL 3000
Rosenbauer new design red – grey / silver
Fenders and bumpers according to manufacturer standards
Rims silver according to manufacturer standards
Frame grey or black according to manufacturer standards
Light alloy unpainted, natural colour
Underbody and cavity protection for superstructure and cabin

Lettering: In English language or with symbols

Stripping: A high reflective safety stripping is installed around the vehicle for a better visibility during night operations.

16.) DOCUMENTATION

Chassis:

Chassis operation manual, in hard and soft copy

Chassis repair manual (contains instruction of fixing normal issues, assembly and disassembly of main component like engine, brake, pneumatic system, etc.), in hard and soft copy

Spare part catalog for chassis, in soft copy

Chassis quality guarantee and after-sales service instruction, in soft copy

Certificate of chassis quality, in soft copy

Chassis tools list, in soft copy

Chassis electrical schematic diagram, in soft copy

Superstructure:

Superstructure and equipment operation manual, in soft and hard copy; language in English.

Repair manuals for superstructure and equipment, in soft and hard copy; language in English

Spare part catalog for superstructure and equipment, in soft copy

Vehicle quality guarantee and after-sales service commitment

Equipped assembly and accessory quality certificate and operation manual

17.) VEHICLE EQUIPMENT AND ACCESSORIES

All items will be securely mounted in/on heavy duty brackets that will allow for fast removal.

* 1 set of standard chassis tool kit, including of wheel changing equipment.
* 1 set of keys
* 1 first aid kit
* 1 spare wheel in same dimensions will be delivered loose with the vehicle.
* 1 pc. electrical driven foam filling pump with connection hose.
* 1 pc. powder extinguisher 2kg
* 1 pc. foam suction hoses, 5m long
* 1 pc. electric charging cable

18.) WARRANTY

Rosenbauer will provide the following warranties:

* 2 years pump warranty
* 2 years anti-corrosion warranty for the superstructure
* 2 years for the water and foam tank
* 2 years chassis warranty

Rosenbauer will undertake to remedy any defect resulting from faulty design material or workman ship appearing during the warranty period.
This guarantee is only valid if the Rosenbauer guarantee terms and conditions are observed.

19.) FIRE FIGHTING and RESCUE EQUIPMENT

A full set of basic fire fighting and rescue equipment as per below recommended equipment lists can be delivered with the vehicle as option at extra charge.

Quick release brackets, ensuring positive fixture and fast removal of the accessories, are provided for all equipment, which will be delivered with the vehicle.