General description of the machine and prime function

The MineWolf (MW370) is produced by MineWolf Systems, the Swiss-German provider of mechanical mine clearance machines. It is a medium- to large-scale mechanical demining machine equipped with interchangeable flail and tiller and optional lifter attachment. It will withstand AP and AT mine detonations up to 15kg TNT. The easily interchangeable tiller and flail units are designed so that detonations cause minimum damage to the working tool. Protection of the operator and machine is assured by Armox steel and armoured glass. The machine can also be operated by remote control for manoeuvring. With its highly reliable 367hp V8 Deutz diesel engine and enhanced filtering and cooling instalments, the vehicle can withstand extreme conditions of hot, cold, dry and dusty environments.

The daily output has been recorded at 15,000m² to 30,000m² per day depending on the project characteristics (Class I to Class IV terrain with slopes up to 40°), corresponding to the size of two to four football fields. Clearance width is 2,800mm.

Standard features include automatic depth control, communications system, hydraulic winch, air-conditioning, and an automatic fire-fighting system. A GPS system, mine debris lifter and multi-function attachments (such as a fork or bucket) are also available. The system is designed for transport by road, rail, ship or air. A standard low-loader can be used for transporting between worksites.
Working methodology/Specifications

The tiller has 64 teeth mounted on an open-basket drum which rotates in the driving direction with a speed of 500–800rpm. It is designed so that every piece of ground is processed in a tight pattern to a depth of up to 350mm depending on machine speed and soil conditions. Depending on project requirements, a flail with 72 chains with hammers can be attached. The system is effective against vegetation up to 15cm in diameter. Automatic depth control facilitates consistent ground penetration quality.

Additional available working tools

In addition to the tiller and flail main working tools, the MW370 can also be fitted with a lifter attachment to the rear.

Engine, fuel and oil

The 367hp (270kw) Deutz diesel engine has:

V8 engine with exhaust turbo super-charger, water-cooled;

Oil sump, designed to accommodate a tilt angle of 45°;

Cold start equipment (motor built according to exhaust norm COM1);

Cooling systems for outside temperature up to 55°;

Direct mechanical drive via power take-off shaft;

Air filtering system optimised for desert conditions of extreme dust;

Tank volume of 440 litres including explosion prevention system to avoid tank detonations.

Fuel consumption is 40 to 50 litres per hour. The hydraulic system requires standard oil.

Factory support

The manufacturer provides all necessary training, documentation, workshop, consumables and spare parts to render any demining operation completely independent. Project management and consulting services are also available from the manufacturer.

Factory support includes:

Delivery of machines, support vehicles and hardware from the factory to point of delivery;
Decentralised warehousing in country of operation;
All major spare parts in stock and ready for shipment;
Predefined fast delivery schedules with renowned forwarding partners worldwide;
Warehousing and efficient resource planning software for customers;
Training schedules as well as spare part packages are discussed provided based on the customer’s resources;
Instruction manuals, documentation and SOP (according to IMAS) are available, on request in any language.
The spare part package anticipates long delivery times in remote areas. If necessary a fully equipped mobile workshop unit is also supplied. Only standard commercial off-the-shelf (COTS) components are used.

Machines in use to date
Since 2004, a substantial number of MineWolfs have been produced and deployed in the following countries: Afghanistan, Angola, Bosnia & Herzegovina, Chile, Croatia, Georgia, Iraq, Jordan, Rwanda, South Sudan, Turkey, United Arab Emirates

Maintenance and support
Daily, weekly and monthly maintenance checks are laid down in the operator’s manual. The manufacturer can also provide:
In-country support for major incidents;
Assistance on annual inspection with option for check-up of mechanical competence.

Test and evaluation
Test reports are available at www.minewolf.com/track-record/testing-and-trial-data.html

Reported limitations and strengths
The MineWolf (MW370) machine is provided with both tiller and flail attachments to be used as part of a System, interchangeable dependent upon conditions. Only the MineWolf with the tiller attachment was evaluated for this report due to testing resource limitations. … The machine had sufficient power for the task of ground penetration. In addition, the tiller configuration removes the possibility of the type of
skip zones experienced by a chain flail where the hammers are free to move laterally. While a flail may experience skip zones around harder pieces of ground or rocks, the tiller cannot. While the entire tiller head must move up if the ground cannot be penetrated, the manufacturer claims that this can be monitored and corrected by the operator.

The depth control on the MineWolf appears to be effective when used.

The overall effectiveness of the MineWolf would likely have been higher with a lower forward speed. The average speed for these trials was 956 m/hr, which may be adequate to prepare the soil for follow-on operations, but should be reduced for ‘clearance’ operations.

Limitations
Over longer distances the system requires transportation on a low bed trailer. The flail creates dust clouds, as with all flail systems in dry environments.

Strengths
Proven effective against AP and heavy AT mines with minimum damage to the working tool (German Army, ITEP, CROMAC, RUAG, EOD trials). Consistent ground penetration quality. Effective against dense vegetation and various terrains (hard, rocky, soft, sandy). Maximum flexibility: tiller or flail working tool. High safety standard for the operator (German Army Biometric Survivability Trial). Rugged design based on mature technology, proven in challenging terrain. Tiller working tool minimises dust generation for improved visibility. Low running-costs as compared to flail-only systems. Additional multi-purpose attachments available.

Technical specification
Machine
Model
MineWolf (MW370)

Machine Category
Mine clearance machine

Machine weight
Medium (5000 – 20’000 kg)

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**Dimensional data**

Length without attachment
6200 mm

Length total
With flail: 7680; with tiller 7820 mm

Width without attachment
2600 mm

Land clearance width
2800 mm

Height overall
3795 (with cabin) ; 2920 (for transportation) mm

Mass basic vehicle
21800 kg

Mass detachable unit(s)
Flail: 4800; tiller: 4500 kg

Mass overall with tracks
With flail: 26600; with tiller: 26300 kg

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**Operational data**

Wheels

Tracks

Ground bearing pressure tracks
0.7 kg/cm²

Hill climbing ability (max gradient degrees)
40

Number of chains
72

Number of chisels
64

Beat pattern at different operating speeds (hits per m²)
With tiller: 570 at 0.9km/h; with flail 510
Length of chains
950 - 1115 mm
Diameter of tiller drum
1100 mm
Rotation speed (rpm) From
330 rpm
Rotation speed (rpm) To
740 rpm
Working speed for light soil with medium vegetation (m²/h) To
3800
Working speed for medium soil with medium vegetation (m²/h) To
2500
Working speed for heavy soil with dense vegetation (m²/h) To
1200
Control of clearance depth
Yes
Additional attachable working tools
Lifter (quality control tool), fork lift, bucket, sifter bucket, dozer shield
Armour
Armour steel: 6, 10, 25 mm; Armour glass: 54 mm
Remote controlled
 ✔
Greatest distance
1000 m
Transport method for short distances
Standard means of transport

System status and deployment

Machines in use
29
Other types
Mini MineWolf (MW240), Medium MineWolf (MW330), Micro MineWolf (MW50)
Location of use
Afghanistan, Angola, BiH, Chile, Croatia, Georgia, Iraq, Jordan, Turkey, South Sudan, Sudan, U.A.E,
Total cleared land area so far (m²)
>20,000,000

Engine
Engine description
Deutz Diesel 8 cylinder, 270 kw (367 hp)

Engine power at the flywheel
367 hp

Fuel capacity
440 ltr

Fuel consumption
40 - 50 ltr/h

Separate engine for working unit
No

Cooling system
Yes

Oil capacity (platform engine)
45 ltr

Hydraulic oil capacity (platform engine)
Not given ltr

Costs

Base price for the system
On request

Costs for training for operators (USD/Euro)
On request

Costs for training for mechanics (USD/Euro)
On request

Costs for spare part, set chains, belts (USD/Euro)
On request

Repair costs for one year (USD/Euro)
On request

Availability for hire
On request

Other

Operator comfort
Radio communication, depth control, superior view, 4-point safety belt, sound and heat insulation, pressurised to keep out dust, joystick steering integrated in armrest, GPS (optional)

Air conditioning
Yes

Record updated on: 08 November 2016
Record id: 544
The GICHD would like to thank the Government of the Federal Republic of Germany for its generous financial support for this project.