



SERIES
35

WRS
400

Water Recycling System



High Tech Cleaning Systems



WRS
400

RHINO WRS 400 WATER RECYCLING SYSTEM COMPACT, FAST, EFFICIENT

RHINO WRS 400, the hi-tech vehicle specifically designed to clean road surfaces and to remove oil, greasy substances, colour stains and residues that are normally extremely difficult to remove. The cleaning process is efficient and ecological and has a low impact on the environment. **Rhino** also offers a cost-effective solution in terms of use and disposal.

SPECIAL TECHNICAL FEATURES:

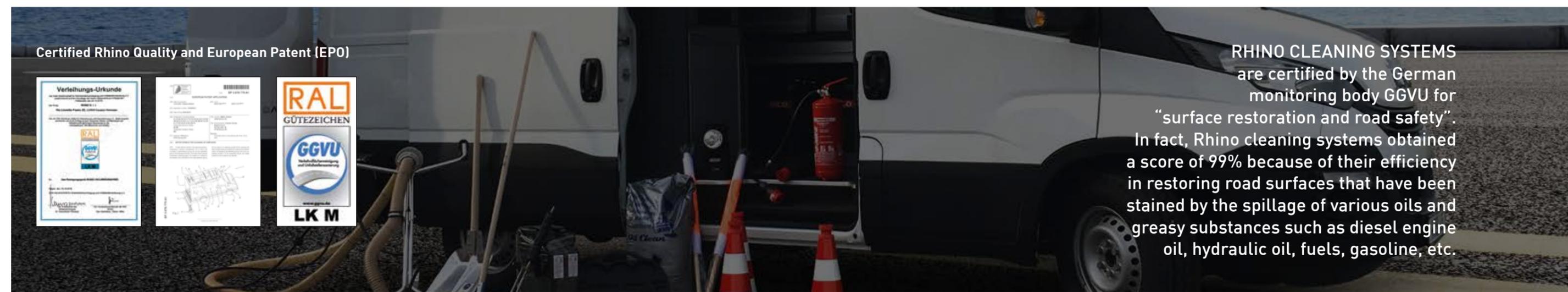
- Vacuum suction unit with water treatment system
- Extreme mobility thanks to the independent power supply with electric power generator
- Maximum efficiency and broad working range
- Low environmental impact and disposal costs
- High-pressure cleaning cycle with hot water and simultaneous vacuum suction
- Perfectly restores the original quality of any surface regardless of the type of stain and in all circumstances
- Ensures road safety and hygiene in the environments
- GGVU certification and European patent (EPO)



Certified Rhino Quality and European Patent (EPO)



RHINO CLEANING SYSTEMS are certified by the German monitoring body GGVU for “surface restoration and road safety”. In fact, Rhino cleaning systems obtained a score of 99% because of their efficiency in restoring road surfaces that have been stained by the spillage of various oils and greasy substances such as diesel engine oil, hydraulic oil, fuels, gasoline, etc.





FILTRATION SYSTEM
WRS/Water Recycling
System - High power reserve

Thanks to the machine's unique recycling system, the water can be reused multiple times. Once filtered, the water is recycled to be used in a new cleaning cycle, which allows the operator to use the vehicle non-stop and ensures maximum independence, without the need to top-up the water. This system of recycling the vacuumed water makes it possible to clean large surfaces while ensuring maximum flexibility of use. According to analyses conducted by the Institute for the Environment, the filtered water does not need to be treated or disposed of separately. Lab tests accredited according to the DIN EN ISO standard confirm that the water, once treated, is free of heavy metals, polycyclic aromatic hydrocarbons, aromatic hydrocarbons and halogenated volatile hydrocarbons.

TECHNICAL SPECIFICATIONS /CHARACTERISTICS



ELECTRICITY GENERATOR
Independent power
supply to provide
maximum flexibility

The special RHINO vehicles stand out because of their technical characteristics, including the mobile power supply.

A generator of 15 kW electricity mounted directly on the vehicle's engine and designed by RHINO powers the vehicle and system, making its operation independent.



BOILER AND HIGH PRESSURE
Perfection lies
in the details

The water-heating boiler (hotbox) is suspended with an all-aluminium frame at the centre of the vehicle in order to ensure that the weight and centre of gravity are perfectly balanced.

In addition, it is installed in such a way as to allow for the venting of the fuel gases through a flue on the roof. The display allows the operator to control and adjust the outlet water temperature.

The design and quality of the components «made in Italy» are guarantees of the perfection of every detail. The high-pressure pump is positioned on the back below the automatic winder, so that the water pressure can be easily adjusted by hand.



DISPLAY
Control and
Monitoring unit

The control unit monitors the system as a whole and makes all the information available to the operator on a display that is easy to use.

The individual components can be operated separately and the display shows the exact **level of water** in the clean water and waste water tanks and the level in the additional diesel tank that fuels the boiler.



SET-UP
To store away everything
in the right place

The boiler's design has been studied carefully and is customisable to meet the individual needs of the customer and to make the vehicle compact and ensure its flawless use. The cabinets, storage compartments and drawers are made of aluminium and allow you to store and transport all your working tools safely. The work plan, 230V electric sockets and LED lighting allow the operator to use PCs, printers and the work tools.

The storage compartments feature a quick roller closure in aluminium and each tool is located in its own housing. 3 waste collection bins are placed in a storage space with stainless steel tank to collect the liquids.



WATER FLOW
Water flow
control

The flow of clean water and waste water is constantly monitored by a set of digital metres that allow the operator to always check the system's condition and the water filtration process.

Reducing the flow of water informs the operator that the filter is being replaced and the filter replacement process is fast and simple.



SERVICE CONDUCTORS
Cleaning and Suction of
liquids and solids

The suction hose reel designed by Rhino is entirely made of aluminium and can accommodate up to **21 metres** of hose.

The high-pressure hose reel is made of stainless steel and has the same length. Both conductors allow you to work up to a **radius of 21 metres**, offering abundant flexibility, which comes in handy for a variety of tasks.



SERVICE DOOR
Handiness and cleanliness

An external hatch is included to enable water supply, filling of the additional diesel-fuel tank for the boiler and the discharge of waste water in an easy and rapid way, without dirtying the inside of the vehicle.



TELESCOPIC LED HEADLIGHT
Non-stop operation

The Fireco telescopic headlight is made entirely of aluminium and with its maximum height of more than 4 metres and power range allows you to perform tasks even at night. The headlight is remote control.

A dedicated control panel allows you to adjust the height of the column and to lower the head of the 100-Watt headlight. The air pressure is generated by a "super-silent" compressor installed inside the vehicle.



TECHNICAL COMPARTMENT
Perfection
in every detail

The floor inside the technical compartment is made of highly resistant, washable and insulated PVC. Inside the compartment are 2 stainless steel wells to discharge any excess water. The main work tools hang in their relevant anchor

points to allow for their safe transportation and to allow the operator to easily access them from the outside.

WRS
400



ROAD SAFETY

Restoring a road after an accident is essential to ensure road safety.



ROAD ACCIDENTS IN ITALY ACCORDING TO ISTAT (ITALIAN NATIONAL INSTITUTE OF STATISTICS)

In 2016, 175,791 road accidents involving personal injuries occurred in Italy, causing 3,283 deaths and 249,175 wounded. Among the victims are cyclists (+ 9.6%), moped riders (+ 10.5%), and bikers (657, -15.0%).

WHAT IS ROAD WASTE?

If we were to provide a summarised definition, "road waste" are the solid parts that are dispersed during an accident, plus liquids such as oil, lubricants, fuels, coolants, etc. But whereas solid waste is more simple to remove because it is visible, liquid waste is harder to remove.

The dispersion of this type of waste on the road considerably affects the adhesion coefficient, especially when the road surface is wet, and involves a high level of risk. This applies especially to the most vulnerable road users, such as moped riders and bikers. In fact, repairing the road surface involves removing any greasy substance such as lubricants, oil and grease.

It is not enough to spread absorbent or sand, because the oil that seeps into the pores of the soil will return onto the road surface when it next rains, creating a highly dangerous emulsion and endangering our lives.

According to statistics, 7% of accidents involving deaths or injuries take place in the exact same spot of the road because the compromised safety of the road in those spots had not been restored properly. **Rhino also helps to reduce the risk of accidents** because its systems **restore 99% of the road surface**, as proven by the GGVU certification (German monitoring body for road restoration and safety).

WRS STANDS FOR WATER RECYCLING SYSTEM

Rhino Srl is very sensitive to environmental protection and ever since it was first established has been designing its systems with the **utmost respect for the environment** and in such a way that their function does not generate unnecessary waste of water.

WRS stands for "**Water Recycling System**"... but it also means protecting our environment and creating a clean and better world, because water is a precious commodity.

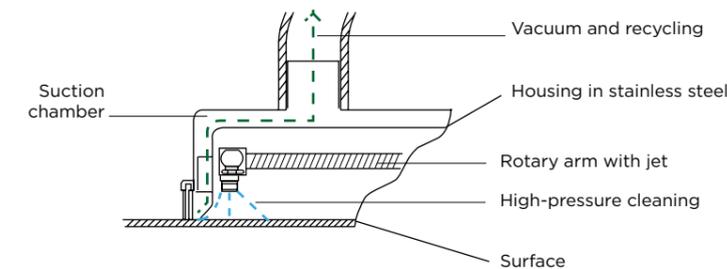
A SMART WAY OF USING WATER

Water may "seem" as a renewable resource because it always comes back with rains and across rivers, but the amount of useful and "good" fresh water available on the planet decreases every year. Human activities have an impact both in terms of the quantity - volumes sampled - and quality of water. The water, in fact, often flows back into streams that have been degraded by waste and toxic substances and in any case, never in the condition we first received it. It is increasingly important, therefore, to come up with responsible management strategies to limit withdrawals, use and waste and to ensure at the same time that the standards of quality are preserved. Saving water should not appear as a constraint, but as a priority that affects the lives of each of us and our future.

POLLUTION

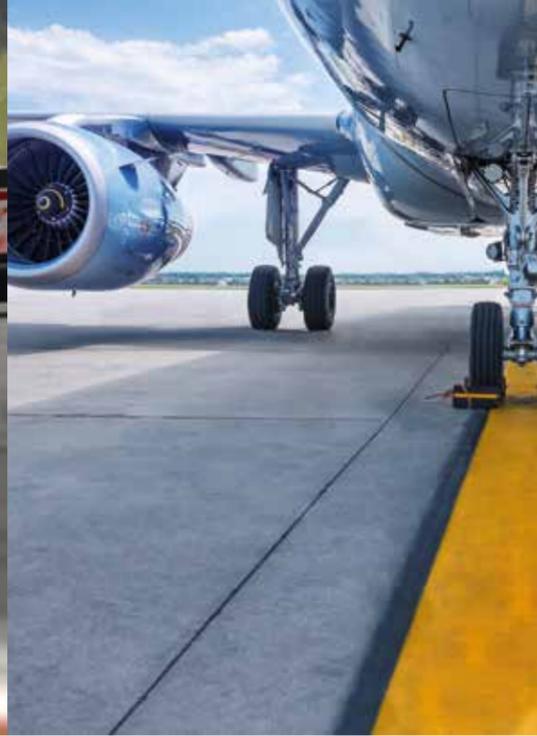
Simultaneous suction ensures that toxic residues are vacuumed and collected to ensure that they do not contaminate the soil or are spilled in the environment, damaging the surrounding ecosystem.

Rhino cleaning systems ensure that during the cleaning cycle, all the liquids are aspirated and deposited in the tank. The Skimmer separates the oil inside the tank. The oil is then stored up in a container and disposed of, while the water undergoes a series of treatments including filtration and is recycled so that it then can be used again. According to analyses conducted by the Institute for the Environment, the filtered water does not need to be treated or disposed of separately. Lab tests confirm that the water, once treated, is free of heavy metals, polycyclic aromatic hydrocarbons, aromatic hydrocarbons and halogenated volatile hydrocarbons (lab tests accredited according to the DIN EN ISO standard).





FIELDS OF APPLICATION



GAS STATIONS

Cleaning gas stations, motorway services and rest areas is critical to the prevention of fires and accidents.

RHINO WRS 400 removes residues of oil, fuels and greasy substances from all surfaces quickly and efficiently in full compliance with the applicable environmental laws and regulations.

SPORTING EVENT TRACKS AND CIRCUITS

During a sporting event and in the prepare phase, it often happens that after an accident or technical issues with the race vehicles, the track gets dirty due to engine oil leaks.

RHINO WRS 400 systems can rapidly intervene even during the race and restore the mantle of the track, in order to guarantee maximum grip and driver safety.

AIRPORTS

The frequency of traffic and rubber residues left by tyres during landing make the aggregate of the track gradually thinner, wearing away the micro-fabric and potentially causing slipperiness.

RHINO WRS 400, thanks to its simultaneous cleaning and vacuum system, is suitable for the treatment of landing and take-off areas in airports.

DRAINING SURFACES

Our system can be used as a unique solution for the removal of grout or pigmentation of permeable concrete within 12-24-36 hours after the surface treatment. The WRS system helps restore the natural permeable colour of concrete surfaces. It also ensures its structural functionality and draining effect.

ROADS AND HIGHWAYS

The cleaning and restoration of roads and motorways require the use of special equipment, in compliance with the applicable regulations of the highway code.

RHINO WRS 400 quickly and effectively restores the road surface whenever a spillage of liquids and solids occurs, ensuring road safety.

PARKING LOTS, WAREHOUSES AND DEPARTMENT STORES

These areas should be kept clean and free from any kind of dirt or debris.

RHINO WRS 400, thanks to its cutting-edge equipment, allows the cleaning of grease stains, oil spills and fuel residues in a simple, fast and eco-friendly manner.

SWIMMING POOLS

L'igiene e la sicurezza in piscina dipende dalla manutenzione.

RHINO WRS 400 elimina i depositi di alghe, residui calcarei, grassi e fluidi corporei, cosmetici e creme abbronzanti che si depositano sulle superfici rendendole unte e scivolose.

Gli spazi esterni sono invece soggetti a inquinanti ambientali, foglie, insetti, pioggia e polveri.

GRAFFITI

RHINO WRS 400 is a practical and efficient system when it comes to cleaning and removing gum residue and graffiti on most surfaces, including stone, concrete and cementitious materials to the more delicate ones of historic monuments.



WRS 400 - TECHNICAL SPECIFICATIONS

SUCTION POWER AND VOLUME		ALUMINIUM VACUUM SYSTEM	
Vacuum	650 mbar	Clean water capacity	420 Litres
Air volume	750 m³/h	Dirty water capacity	450 Litres
Power	380 Volt, 2.2 kW		
WATER HEATER-BOILER: 3,034		CLEANING DEVICE	
Power supply	220V 50Hz	High-pressure rotary brush and suction L+S	
Water flow	35 Litres/Min.	Available and combinable diameters: Ø750 mm, Ø520 mm, Ø410 mm, Ø300 mm, Ø210 mm	
Outlet temperature	150 C°	HAND SPEAR	
Heating power Kcal/h	90000	With quick closing up to 300 bar	
Maximum pressure	250 bar	15KW POWER GENERATOR	
HIGH PRESSURE 13/200 BAR MH3061		Drive	Drive via PTO
Power	4,5 KW 50Hz	Type of voltage	400V-50Hz
Pressure	200 bar	Constant voltage	15000 VA
Water flow	13 Litres/min.	Starting voltage	20000 VA
Max. outlet temperature	150° C	Weight	92 Kg
AUTOMATIC HOSE REEL		Dust and moisture protection	IP 69
Suction hose ø 50 mm	21m	BASIC VEHICLE	
High-pressure hose	21m	Iveco Daily	
Deep suction	up to 10 m in depth	VW Crafter	
WRS (WATER RECYCLING SYSTEM)		Mercedes Sprinter	
Average reserve no changing filters	3,200 l (7 cycles)	or other vehicles fitted with power take-off	
Recycling and filtration	50 litres/min		
Maximum rated power reserve without replacing the filters and in normal operating conditions	up to 15,000 litres		



VACUUM SUCTION SYSTEM

Perfection alone is not enough...

The vacuum suction unit is a masterpiece completely made of aluminium in order to respect the total mass of the vehicle.

The system has been designed and developed down to the smallest detail. It consists of two separate tanks for clean water and waste water, a liquid and solid separation sector and another area in which the mechanical skimmer separates oil from the water intake and a chamber that deflects the vacuum-packed drafts called the "Vacuum". A true work of art that contributes to the features of an advanced and hi-tech system. The Vacuum tank is patented for the specific function and type of construction. The Rhino system is always adjusted to the body type or frame, as in this case, and placed in the centre of the vehicle to achieve perfect COG distributed on both axes and balanced on each wheel. These technical details not only represent the highest standard of quality, but make riding the vehicle a comfortable experience even when it is fully loaded, making it ideal for long trips on the highway and at high speeds.

The type of vehicle and washing systems of the **RHINO WRS** ensure agility and flexibility to perform any kind of service task.

They allow the operator to easily access any area, external and internal, to clean the areas that are extremely dirty with oily and greasy substances, to make the environment clean and safe as it was originally, with ecological water consumption and extended range.

The **RHINO WRS** system also ensures proper disposal of liquids and polluting materials.





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Antonio Maffei, owner and founder of **RHINO S.r.l.**, grew up in Germany and studied in Stuttgart and Konstanz, where in 1994 he received his Master's degree in the Design and Construction of Vehicles.

After over 20 years of international experience in project management in the automotive industry, such as with the development and design of vehicles, product quality and the dynamic analysis of accidents, he decides to design and build his own brand of vehicles, including special vehicles for road surface cleaning, that distinguish themselves from conventional vehicles that were then available in the market. Following the motto: "Road safety saves lives!", in 2014 he develops a set of special and innovative vehicles for road cleaning with advanced technological features.

Ideas, in fact, can only be successful if developed by focusing on the quality of the components. Thanks to his technical expertise and talent, Maffei was able to develop and build specific components that make Rhino vehicles unique, both in terms of the concept that has guided their development and their function.

To date, the result of this process is a new concept: power supply using clean energy, treatment and recycling of water, respect for the environment, special suction vacuum system, top quality of the cleaning process, all optimised and available in small vehicles weighing between 2500 to 3500 kg authorised to operate under a full load without any plumbing. Rhino's special vehicles open new frontiers and vocational sectors and thus present a unique, reliable and high-quality solution that guarantees users an efficient and profitable use in the long term.