



Two sweeping machines in one.

Combined vacuum and mechanical action
to revolutionize urban and industrial hygiene

with the exclusive Comac  **twinaction**[®] technology
system

CS140 Twin Action, the 3,5 m³ sweeping machine developed to clean urban and industrial areas



CS140 Twin Action, 3,5 m³, combines the performance of two machines in one single particularly compact machine, thus providing two actions in one solution and ensuring maximum quality results.

Roads, parking lots and large squares are currently cleaned using mechanical or suction collection machines. These two systems are suitable for different types of cleaning: mechanical machines are more suitable for heavier waste and suction machines are more suitable for lighter waste, therefore selection of one or the other inevitably entails a compromise in terms of the resulting quality.

Consequently, for optimum cleaning both systems have to be used and currently two machines are required to obtain the two actions, thereby doubling times, costs and consumption.

The exclusive “Twin Action System”, designed and patented by Comac, combines the strength of mechanical action to collect larger waste and the efficiency of the suction action for finer dust to provide excellent results, reducing water consumption and facilitating use even in the most difficult conditions.

A sweeping machine designed to respect the environment



ATTENTION TO ENVIRONMENT AND SAFETY ARE THE MAIN CHARACTERISTICS OF CS140 TWIN ACTION

CS140 Twin Action ensures:

- **REDUCTION OF WATER CONSUMPTION**

unlike traditional sweeping machines, with CS140 the side brushes have an auxiliary function (only used along edges and pavements) consequently reducing the use of water which is employed only in a nebulized state and only to control dust, without wetting the ground.

- **ELIMINATION OF DUST FROM THE AIR RETURNED TO THE ENVIRONMENT**

thanks to the use of a large size filter, which is less susceptible to clogging, and with a highly efficient cleaning system which practically eliminates the need for maintenance.

- **REDUCTION OF FUEL CONSUMPTION AND ATMOSPHERIC EMISSIONS**

thanks to the high performance hydraulic system and the Perkins engine, specific for industrial applications, certified in accordance with the strictest atmospheric emissions standards in its category (Tier 37 Stage IIIA standard).

- **GREATER OPERATOR COMFORT AND REDUCTION OF STRESS EVEN DURING THE LONGEST WORK SHIFTS**

thanks to the position of the engine, located at the rear of the vehicle, the sound proof cab and the use of hydraulic suspensions.



THE INNOVATIVE TECHNOLOGY DEVELOPED AND PATENTED BY COMAC

CS140 Twin Action:
two combined actions to achieve 100% productivity and maximum quality.

The innovative combined **“Twin Action” system developed by Comac** includes the central brush and two screw conveyors which operate simultaneously with suction operation to guarantee maximum efficiency in dirt collection.

The mechanical action consists in the movement of the **central brush (1)** which collects the material from the ground and conveys it to a hopper where the **two screw conveyors (2)** bring it into the central area of the **container (3)**.

At this point, by means of the **suction action (4)**, the material is raised to the **collection hopper (5)**, while **the sucked air is filtered (6) and returned to the environment perfectly clean (7)**.

The constant suction ensures the capture even of the finest dust, leaving behind a perfectly clean street without the need of a second pass.

FLEXIBILITY OF USE

The Twin Action system allows operation even on bumpy road surfaces: tree roots or protruding manholes are not a problem. No rigid element (suction outlet support wheel or metallic holding plates) is in contact with the ground, therefore no breakage or excessive wear can occur during work; only the central brush touches the ground and thanks to its characteristics it follows the profile of the ground smoothly.

CS140 Twin Action ensures excellent results both on streets and in industrial environments



INNOVATION



Besides operating in the urban environment **CS140 Twin Action** can also be successfully used in cleaning phases before asphaltting, on road work sites, and in

industrial environments, including metallurgy plants and cement factories.

The perfect combination of:

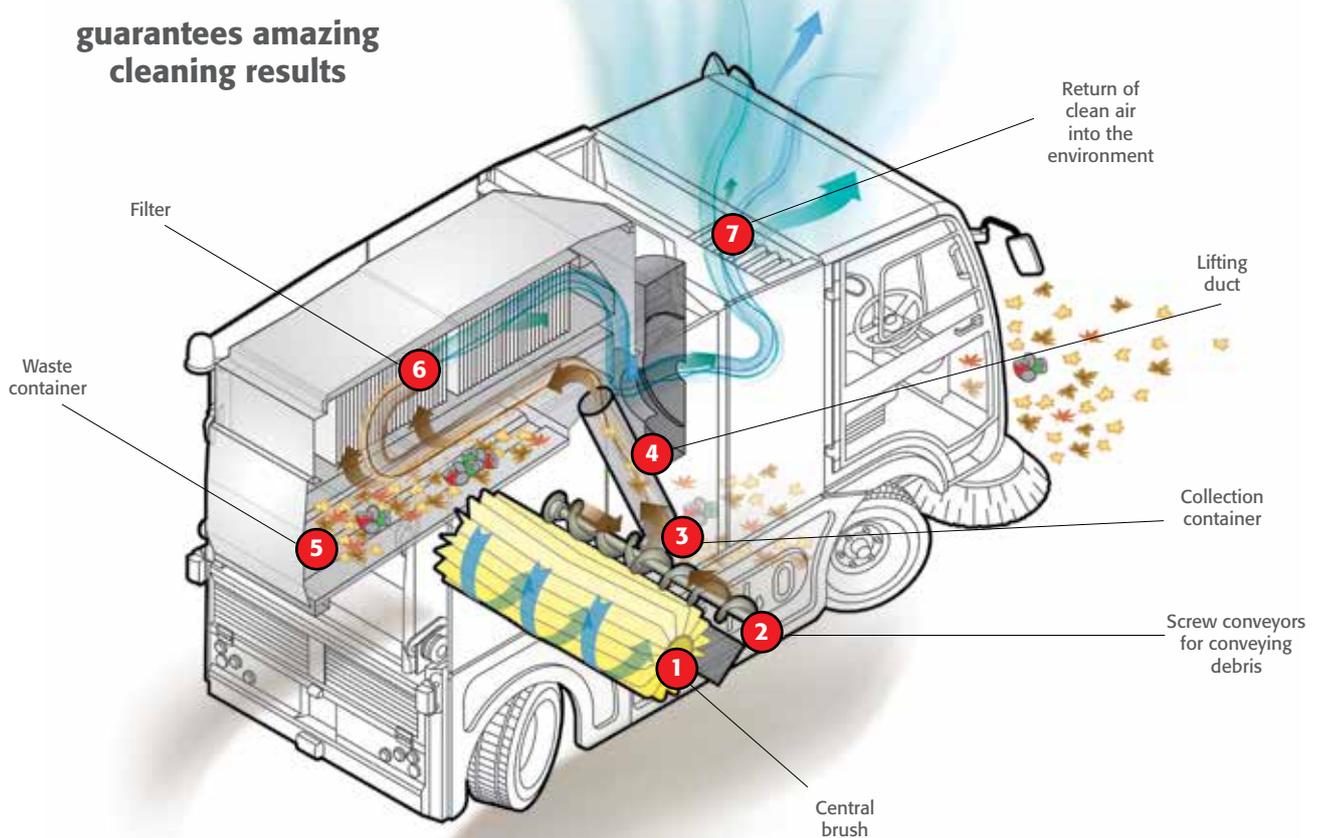


guarantees amazing cleaning results



With the new collection system, wear on the mechanical parts and maintenance are drastically reduced

The screw conveyors (2) consist of two steel shafts, both equipped with a spiral which, hydraulically moved, rotate on the same axis, conveying dirt and debris of different dimensions close to the suction outlet



The side brushes are used only to convey the dirt from the edges (pavements or walls) to the operating area of the central brush, which collects both debris and dust thanks to the highly efficient suction action



UNIFORM CLEANING AND COLLECTION OF SMALL AND LARGE WASTE WITH THE INNOVATIVE CENTRAL BRUSH SYSTEM

CS140 Twin Action uses the central brush continuously, thereby ensuring higher quality cleaning because it is uniform for the entire width of the brush and higher productivity because it can clean more quickly than a conventional sweeping machine which has to use the two side brushes. It is available in various combinations of synthetic fibres or steel and has a diameter of 600 mm with a width of 1400 mm.

The technical solutions adopted, such as the hydraulic support and the presence of the flaps, ensure a constant pressure on the ground for the brush independently of wear or the terrain; the machine can also be positioned at 3 height levels allowing removal of different types of waste: leaves, pine needles, bottles, etc.



THE THIRD BRUSH (optional)

Designed for operation only on the right side of the machine in order to avoid damage due to poor visibility of the operator, who will also find manoeuvring simplified: the brush needs only to be moved to collect waste far from the sweeping machine, while lifting, lowering and rotation are automatic.



The side brushes can be equipped with special nozzles for spraying water (optional) which are effective for controlling dust during sweeping



Joystick to control the third brush

AUXILIARY ACTION OF THE SIDE BRUSHES

In view of the innovative system which concentrates work on the central brush and limits the use of the side brushes, the machine comes standard equipped with only the RH side brush, while the LH brush is optional.

The limited use of the side brushes helps to reduce fuel consumption.

WITH TWIN ACTION THE USE OF WATER IS SIGNIFICANTLY REDUCED

With the Twin Action system the use of water is limited only to the external part of the side brushes in a nebulized state in order to control flying dust. As a consequence CS140 Twin Action is equipped with a tank of only 200 litres.

Excellent manoeuvrability thanks to the 4 turning wheels

PRODUCTIVITY



CS140 Twin Action, has **an integral steering system on all 4 wheels** with symmetrical front and rear angles (the same centre of rotation for the two axles) and a turning circle of 4.25 m. Together with the reduced dimensions, these characteristics provide great manoeuvrability, even near walls or fences, and guarantee the necessary ease of handling to operate in places where space is limited such as historical town centers or cluttered areas, at the same time guaranteeing maximum vehicle stability during transfer even at the highest speed.

3 positions for maximum optimisation of the different working conditions

PRODUCTIVITY



Comac has produced a special device to control the vehicle height from the ground which, acting separately on the four wheels, maintains constant the height from the ground, optimizing work and stability. This device can also maintain the height of the vehicle unchanged even when the load varies. The operator can position the machine on three different pre-established levels in order to meet various needs.

1. WORKING POSITION

the machine is in the lowest position with the rubber flap close to the ground in order to avoid dust release.



2. MOVING POSITION

the machine is raised about 40 mm in order to avoid possible contact with the ground and therefore rubber flap wear.



3. MAINTENANCE POSITION

the machine is raised another 70 mm (beyond the moving position height) in order to facilitate replacement of the central brush.



SUCTION HOSE (optional)

CS140 Twin Action is equipped with a suction hose which allows specific operations as necessary. The operator can use the suction hose to collect material accumulated in areas difficult to be reached with the machine (benches, grassy areas, covered corners, etc.); also, thanks to the large diameter of the hose, it can suck up waste of various dimensions such as paper, leaves, bottles and cans.



**Large filtering surface
to guarantee a clean air return into the environment**



Button for activation of the filter shaking

THE SUCTION SYSTEM

Operated by a hydraulic motor which can reach up to 14,000 m³/h.

The air, sucked up from the ground, is channelled into a duct which is circular to reduce energy loss, and with a large diameter to allow the passage of larger waste. The air flow and the material collected follow a path which slows the speed down causing the fall of heavier dirt, reducing the quantity of particles which arrive at the filter.

THE FILTER

The filtering unit has a surface of 50 sq.m and is equipped with 2 filter shaking for cleaning. These characteristics, together with the choice of materials (polyester and cotton) and the fact that the filter operates dry, virtually eliminate the need for routine maintenance; **they also ensure the return of perfectly clean air into the environment.**

The filter is made of polyester and cotton and therefore comes under class L, with filtration capacity of up to 5 µm. The large filtering surface and the efficiency of the dusty air intake distribution system over the entire surface ensure continuity of performance over time. For specific needs (dust with high temperature waste, fine dust) other materials are available (nomex, teflon).

**With CS140 Twin Action suction is even possible
in wet road conditions
thanks to the filter "By Pass" system**

PERFORMANCE



The "By-pass" system allows deviation of the air flow in order to bypass the filter when working in wet road conditions, for example in the event of rain. By selecting this mode, the flow of damp air, which is obviously dust-free, does not go through the filter, thus avoiding damage.

**CS140 Twin Action has a high capacity collection hopper
which guarantees many hours of continuous non-stop operation**

**Ultra-reliable
top emptying system
at heights**



Hopper emptying buttons

The collection hopper is emptied by lifting it on vertical guides up to 180 cm.

The lifting system, similar to that of a forklift, allows significant reduction of stress on the frame and unloading at any intermediate height, according to the characteristics of the unloading area.

THE HOPPER

The total volume is approximately 3.5 m³, a capacity which reduces the down time required for emptying, and therefore also the total cleaning time.

It is horizontally divided into two parts: the lower part is designed for collection of material while the upper part houses the filter.



The central console is designed to ensure that all the commands are within easy reach

COMFORT



The cab is comfortable because it is spacious and insulated with anti-vibration supports. **It is comfortable to drive, and the large windscreen provides maximum external visibility for the operator,** making manoeuvring and control over the collection area easier.

The activation commands, simple and intuitive, are grouped on a central console. The others are on the front part of the roof, both easily accessible from the working position. On request the machine can be customized

with a climate control system, radio and useful colour camera which covers the rear of the machine in order to aid reversing and emptying operations, also allowing constant monitoring of cleaning effectiveness.

The operator can work in maximum safety thanks both to the complete visibility provided by the windows and the possibility of entering the machine from both sides.



Maximum accessibility for simple quick maintenance operations



MAINTENANCE

THE SUCTION FILTER

The filter component materials, the dimensions and the absence of water in the collection **eliminate ordinary maintenance operations.**

However, if the filter material has to be changed, since it is a completely pre-assembled unit, it can be removed by lifting it out of the upper part of the hopper; a position which significantly simplifies the operation.



FILTERING SURFACE
50 m²

THE WATER RADIATOR

The radiator is positioned in the front part of the machine in an area protected from the presence of dust and easily accessible by tipping the cab.



The engine air filter and the hydraulic oil radiator are located in the rear of the machine and can be accessed by means of a door which can be opened even with the hopper lowered.

This position has been chosen to keep these parts exposed to a flow of clean air in order to avoid clogging and overheating and to reduce the possibility of damage.

For other routine and extraordinary maintenance operations, the hopper can be simply raised and locked in its highest position. In this way maintenance operations such as simple oil checks can be performed both on the hydraulic part and the mechanical part.

CS140 Twin Action is not afraid of continuous heavy-duty jobs, even for 8 hours non-stop

MECHANICS



The engine, manufactured by PERKINS, delivers 100HP (75 KW) at only 2200 rpm with maximum torque of 1400 and 4400 cc displacement.



THE ENGINE

For CS140 Twin Action the designers chose to install the **Industrial Open Power** engine version which is specifically sized for continuous applications at constant speed with reduced consumption: for this reason it is suited to continuous heavy-duty work, **even for a daily cycle of eight hours non-stop**. The solutions adopted (use concentrated on the central brush and engine rpm) allow operation with minimum power and the lowest rpm, thus ensuring **long engine life and low noise levels**.

DRIVE

Traction is completely hydraulic, provided by two motors installed directly on the rear wheels and a variable capacity pump to adjust the speed from 0 to 40 km/h.

Speed control is driven simply by means of two pedals, one for forward movement and the other for reverse. The manual adjustment of the diesel engine accelerator allows selection of the optimum rpm in order to reduce consumption according to the required level of performance.

The suspensions and the braking system guarantee driving in complete safety with excellent road holding, even when fully loaded

THE SUSPENSIONS

The suspensions are hydraulic with MacPherson system on all four wheels. Each wheel has a hydraulic cylinder and accumulator which ensure **optimal absorption of road surface irregularities without using springs**.

THE BRAKES

CS140 Twin Action has disc brakes on the front and drum brakes in the back. The negative type emergency and parking brakes also operate on the rear wheels: they cut in and block the machine in the event of a breakdown or in the event of lack of pressure to the hydraulic braking system.



Configurations and Technical data



CONFIGURATIONS

With 1 RH side brush
(standard)



With 2 side brushes
(LH brush optional)



With third brush
(optional)



Working width:
Central brush 1400 mm
With 1810 mm RH side brush
With two 2220 mm side brushes
With 2620 mm Third Brush

TECHNICAL DESCRIPTION

CLEANING TRACK

Central brush working width	mm	1400
Working width with 2 side brushes	mm	2220
Working width with side brushes + third brush	mm	2620
Cylindrical central brush diameter	mm	600
Side disc brushes diameter	mm	700

WASTE CONTAINER

Volume	l	3500
Bin lifting maximum height	mm	1800

SUCTION

Air flow	m ³ /h	14000
Filtering surface	m ²	50
Suction motor rated power	KW	45

PERFORMANCE

Maximum speed	Km/h	40
Maximum gradient when empty	%	20
Working speed	Km/h	12

MOTORIZATION

Engine	-	Perkins
Fuel	-	Diesel
Engine power	HP/KW	100/75
Engine	rpm	2000

DIMENSIONS AND WEIGHTS

Machine length with RH side brush	mm	4480
Machine width	mm	1755
Machine height when in operation	mm	2500
Machine height in transfer	mm	2550
Machine weight in running order	Kg	4500

GENERAL SPECIFICATIONS OF THE VEHICLE

Turning circle	mm	4250
Service brake	-	Hydraulic
Parking and emergency brake	-	Hydraulic
Rear wheel traction	-	Hydraulic
Wheels	-	205/65 R17.5
Suspensions	-	Hydraulic and independent
Machine height control	-	on all 4 wheels
Diesel tank capacity	l	105
Water tank capacity	l	200

OPTIONAL ACCESSORIES

Air conditioning	-	
Radio with CD player	-	
Rear colour camera	-	
LH side brush	Ø mm	700
Third travelling side brush	Ø mm	700
Spray system on the brushes complete with tank	l	200
Suction hose Ø and length	mm	100x4500



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and visit our web-site

The machines are manufactured in compliance
with the directives 2006/42/EC, 2006/95/EC,
2004/108/EC and with the standards IEC 60335-1
and IEC 60335-2-72.

The steel parts are subject to treatment
which guarantees a long life and makes
the parts oxidation-proof.



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