CANADIAN SHIELD
A DIVISION OF SIG | SUSTAINABLE INFRASTRUCTURE GROUP

INDUSTRIAL · CS-540

WASH THE TOWER — CREW ON THE GROUND

A caged, umbilical-fed washing platform. Water up the line, evidence back down.

TREAT · PUMP · DELIVER · AGITATE · RINSE

20 kg	≈20 m	0	0
ALL-UP WEIGHT, WORKING CLASS 18–25 KG	WORKING HEIGHT, GROUND-FED (39 M THEORETICAL)	LITRES OF MISSION WATER CARRIED ALOFT	WARHEADS, FUZES OR ENERGETIC MATERIAL ANYWHERE IN THE SYSTEM

OVERVIEW

THE ONE AIRCRAFT IN THE ESTATE BUILT TO LEAN ON THE BUILDING.

> Part of the **4-system Industrial line** — shares its envelope and doctrine with Sprayer, Coater, Rock Scaler.

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The Washer is an uncrewed façade- and surface-washing platform: a caged multirotor that works close against glazing, curtain wall and industrial structure, fed by a single managed umbilical — water, power and comms in one bundle — from a ground station that treats, pressurizes and pays out the line.

The architecture starts from one blunt piece of arithmetic: a litre of water is a kilogram, and an aircraft that carries its wash water spends its lift budget hauling ballast. So the Washer does not carry its water. The umbilical delivers it continuously, power rides the same bundle for effectively unlimited on-station endurance, and the only water aloft is a small buffer for transitions and head purge. Every other choice — the perimeter cage, the sacrificial panels, the standoff wheels that touch the surface first, the strain-relieved hard point at the center of gravity — follows from living soaking wet at working standoff from someone else's expensive glass.

And the reason to build it is standing on the swing stage. Façade washing today means suspended access: bosun's chairs, rope access, davits and stages — people hanging in front of buildings in wind, for hours, to move a brush. Every hour this machine spends against the glass is an hour a person does not spend suspended in front of it. The operator runs the job from the ground, beside the station, with the umbilical as a physical, inspectable connection to the machine.

THE INVERSION

Every other aerial platform avoids the surface. This one works against it.

HOW IT WORKS

MECHANISM

HOW IT WORKS

FIVE STAGES — ONLY ONE OF THEM FLIES.

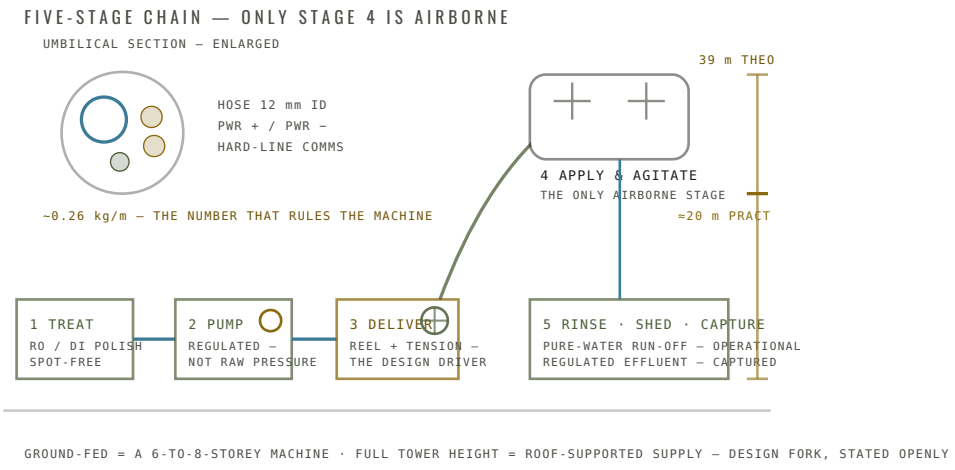
THE SIGNATURE MECHANISM · THE UMBILICAL

FIVE STAGES — ONLY ONE OF THEM FLIES

The Washer is a water-handling chain that happens to include an aircraft. Treat, pressurize, deliver, agitate, rinse — and only the fourth stage is airborne. Most of the system's value sits on the ground, on the treat-pump-reel station.

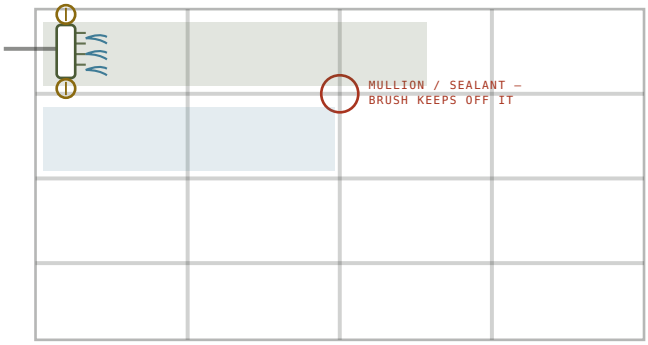
The ground station filters and polishes the supply to spot-free de-ionised water — DI drying is what makes an unattended finish viable on glass — then a regulated pump sends it up the umbilical: a 12 mm-bore hose, power conductors and hard-line comms in one managed jacket on a tensioning reel. The reel keeps the catenary loaded without ever pulling on the aircraft, and line tension is continuously sensed — the primary instrument for detecting a snag before it matters.

The umbilical is also the honest limit, and we publish the physics rather than hide it: the line's own weight, not its flow, caps how high a ground-fed Washer works — a six-to-eight-storey machine on the reference line. Full tower height is an open design fork: a roof- or davit-supported supply configuration, stated here rather than promised. At the hard point, strain relief decouples hose tension from the fluid coupling — a snag never becomes a burst — and a mechanical fuse releases below platform break strength, leaving the aircraft flyable and land-able on its reserve battery with the umbilical gone.



CS-540 · THE WASH CHAIN — THE UMBILICAL IS THE DESIGN DRIVER

SERPENTINE PASSES · WHEELS TOUCH FIRST · SINGLE-DIGIT bar



BRUSH BAR 0.6 m ACROSS THE FACE · TRAVERSE 0.15 m/s · STANDOFF 0.3–0.8 m

AGITATION DOES THE WORK, NOT PRESSURE · DI RINSE DRIES SPOT-FREE — NO SQUEEGEE PASS NEEDED

REACTION AT THE GLAZING POINT: ~2.3 N — ~1% OF MACHINE WEIGHT · HIGHER-PRESSURE DUTY IS FLIGHT-CONTROL-BOUNDED

CS-540 · THE ANCHOR HEAD — FLOW-THROUGH BRUSH + DI RINSE

SPECIFICATIONS

CAPABILITIES & SPECIFICATIONS

WASHER CS-540

DIMENSIONS & MASS

Designation	**CS-540 · Washer**
Configuration	**Caged multirotor · perimeter cage · forward work frame**
All-up weight	**18–25 kg working class · 20 kg reference**
Structure	**Glass-filled-nylon load path · recycled-PET sacrificial cage panels**

PERFORMANCE

Working height, ground-fed	**≈20 m practical (~6 storeys) · 39 m theoretical — hose weight, not flow, sets the limit**
High-rise route	**Roof- / davit-supported supply — an open design fork, stated, not promised**
Reserve battery	**Repositioning hops + controlled descent on umbilical disconnect — flyable and land-able, line gone**

NETWORK & POWER

Architecture	**Umbilical-fed — the platform does not carry its water; onboard volume is a transitions-and-purge buffer only, by rule**
Umbilical	**Water + power + comms, one managed bundle on a tensioning reel · 12 mm ID hose · ~0.26 kg/m**
Umbilical load budget	**≈100 N sustained, set against thrust margin on the reference weight**
Control & comms	**Hard-line comms in the umbilical · commercial RF C2 · GNSS — radio & GNSS permitted on this surface civil line, stated as a feature**

PAYLOAD & EFFECT

Delivery flow	**≈2.8 L/min at the reference coverage point — flow is never the constraint**
Ground pump	**15 bar class (glazing mission) — regulation, not raw pressure, is the requirement**
Anchor head	**Pure-water flow-through brush + rinse jets · single-digit bar · 6 bar / ~4 L/min reference point — agitation does the work**
Head bar · traverse	**0.6 m · 0.15 m/s**
Working standoff	**0.3–0.8 m brush · 0.5–2.0 m jet heads — wheels touch first and define the gap**
Nozzle reaction	**~2.3 N at the glazing point (~1% of weight) — higher-pressure washdown is bounded as a flight-control limit**
Head family	**Brush · rinse-only · washdown lance · reaction-balanced rotary · flat-array · inspection — one work frame, one interface, a head change never a platform change**

MATERIALS & CONSTRUCTION

Wetted path	**DI-compatible, low-leach engineered assembly**
Design rule FH-1	**No recycled-PET part touches process fluid — wet-service resin selection continues within this rule**

SIGNATURE & POWER

Safety	**Strain relief + mechanical fuse at the CG hard point · de-energized head changes · ground-fault protection at the station · closed work zone below — wet-industrial practice, pervasive from the first unit**

COMPLIANCE

Excluded, permanently	**Abrasive entrainment · cutting-class heads · any energetic content — pressure envelope bounded to cleaning duty (D19)**
Scope	**Wash chemistry, where specified, belongs to the client and the regulator — never to Canadian Shield**

COVERAGE AND WATER USE DEPEND ON THE GOVERNING VARIABLES STATED ABOVE — NO HEADLINE FIGURE IS PUBLISHED WITHOUT THEM. WASH CHEMISTRY, WHERE SPECIFIED, BELONGS TO THE CLIENT AND THE REGULATOR, NEVER TO CANADIAN SHIELD.

COVERAGE & WATER USE — THE GOVERNING RULE

We do not publish a headline square-metres-per-day or litres-per-job figure, because on this machine those numbers are not properties of the machine. They are governed by variables that change building to building — and a productivity claim without them attached is meaningless, so we decline to make one. What we will state is the shape of the answer: on a ground-fed job, rigging and repositioning cadence set the pace, not flow.

THE TRADES, STATED

ONE SHOP FLOOR. TWO PAY-CHEQUES.

Canadian Shield's thesis is that manufacturing is the decisive capability. The Washer is that thesis earning a civil living: the same sovereign Canadian production base, pointed at the side of a building instead of the sky over one.

The overlap is physical, not rhetorical. The 5-axis shop that cuts moulds for the defence fleet cuts the Washer's structural moulds. Its fluid-handling module — tank, pump and metering grammar, the wetted-path rule, the hard-point rule — is one shared design canon with the Sprayer and Coater lines, drawn once and instanced three ways. Its cage and braced-stance control heritage comes straight from the Rock Scaler, the estate's other contact-tolerant airframe. Civil revenue and defence readiness draw on the same tooling, the same materials rules and the same machines — which is exactly the point.

And up here, the estate's radio boundary runs the other way. The no-radio rule governs the defence, underground and tethered platforms without exception — but the Industrial line is the surface civil exception where radio and GNSS are permitted, and the Washer uses both openly: commercial RF and GNSS for command, navigation and the work record, with hard-line comms in the umbilical besides, because a wire beside the hose beats any RF link downtown. A city street is not a jammed battlefield, and we do not price it like one.

THE SAFETY CASE

The machine hangs off the building — so nobody else has to.

DEPLOYMENT

DIRTY GLASS IN. A SPOT-FREE FACE OUT.

A Washer job is a ground operation with an airborne stage: the station sets up at the base, the machine climbs the face on its line, and the crew never leaves the pavement. Here is the day, end to end.

1 · ARRIVE

THE STATION SETS, THE ZONE CLOSES

The crew arrives by truck: aircraft, treat-pump-reel station, umbilical on its reel, heads in their cases. The work zone beneath the face is closed and coned, the station plumbs to site water and power, and the RO/DI train polishes the supply to spot-free before the first rotor turns.

2 · WORK

WHEELS TOUCH, THE FACE GETS WORKED

The platform rises on the paying-out line, wheels touch first to set the standoff, and the brush works serpentine passes at single-digit bar — agitation doing the cleaning, DI rinse sheeting behind it to dry spot-free. Reel tension holds the catenary; sensed line tension watches for snags the whole time.

3 · RECOVER

PURGE, REEL IN, ROLL AWAY

At the end of the face the head purges from the onboard buffer, the platform descends with the reel taking up line, and the umbilical — a wear item with a defined retirement life — is inspected as it winds. Captured effluent leaves in its module on regulated jobs; pure-water run-off has already dried off the glass.

Scenario illustrates the design intent of the operating loop. Cleaning performance across glazing types, coatings and soil loads — and flight authorization for close-proximity urban work — are exactly what the bench and flight program exists to establish, jurisdiction by jurisdiction.

THE FAMILY

RELATED SYSTEMS

CS-560 · INDUSTRIAL

SPRAYER

Full-width boom, drift-reduction nozzles, a metered rate held across the pass. The broadcast tool for the uniform job.

CS-550 · INDUSTRIAL

COATER

An umbilical-fed applicator platform. The pressure stays on the ground; the machine flies the last few hundred millimetres.

CS-530 · INDUSTRIAL

ROCK SCALER

A contact-tolerant aerial platform sets the hook. A ground-anchored winch does the pulling.

Washer CS-540: patent pending · a civil work platform on the surface Industrial line, where radio and GNSS are permitted. A washing tool — no warhead, no fuze, no energetic material and no terminal-effect system; pressure bounded to cleaning duty: no abrasive entrainment and no cutting-class heads, in any variant, ever. Wash chemistry belongs to the client and the regulator.

WASH THE TOWER — CREW ON THE GROUND

WASHER · INDUSTRIAL · CS-540

A caged, umbilical-fed washing platform. Water up the line, evidence back down.

01

REQUEST A TECHNICAL EXCHANGE

A working session with engineering, not sales — bring your engagement problem, we bring the mechanism.

02

REQUEST THE INDUSTRIAL FAMILY DATA PACK

Drawings, tolerances and test basis for Washer and its siblings, gated behind export screening.

03

DISCUSS A TRIAL QUANTITY

Tell us end-user, jurisdiction, quantity band and timeline — we respond against your program, not a price list.

SALES
sales@cdnshield.ca

GENERAL
info@cdnshield.ca

WEB
cdnshield.ca

Direct lines, named points of contact and facility details are shared with qualified programs following screening — not withheld, sequenced.

Canadian Shield is a defence and industrial drone company, backed by SIG: four-domain uncrewed systems built for jammed, GPS-denied environments — no-radio by design, manufactured for cost and salvo depth.

Washer CS-540
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Product specification R1.0 · 2026-08-15 · © Canadian Shield, a division of SIG (Sustainable Infrastructure Group).