FORCEARRAY 545

14-NOZZLE MODULAR DECONTAMINATION DELIVERY HEAD

MODEL: DF-FA545
STATUS: CONCEPT DEVELOPMENT
REV: PRELIMINARY 01

Controlled delivery—not pressure alone.

ForceArray 545 is a development-stage delivery-head concept for the Decon Force platform. The architecture organizes fourteen indexed discharge points across three coordinated rails, then adds serviceable cartridges, near-head pressure measurement, filtration, isolation, and controlled depressurization.

The system is intended to convert pump output into a **measurable target-plane pattern**. Final performance depends on liquid properties, nozzle selection, pressure, distance, environment, and operating method.

STATUS · Architecture and values shown are preliminary; no production pressure rating or efficacy claim is established.



Figure 1: Concept rendering; not manufacturing CAD.

5 / 4 / 5 coordinated nozzle geometry

MODULE	PRELIMINARY DESIGN INTENT
5 / 4 / 5 rails	Five upper, four center, and five lower indexed outlets support controlled overlap and target-plane tuning.
Balanced wet side	A central feed/plenum and controlled paths are intended to reduce rail-to-rail and station-to-station variation.
Modular cartridges	Keyed service units combine the atomizer, seal interface, last-chance filter, anti-drip element, and mode identification.
Pressure-safe control	Isolation, controlled SAFE-DUMP, near-head sensing, and filtration are developed as one pressure-management system.

MODE	PRELIMINARY DV0.5	INTENT
Precision Fog	Approx. 10–12 µm baseline estimate	Preserve referenced fine-fog behavior while improving distribution consistency.
Controlled Mist	Approx. 50–70 µm target	Increase target transfer with lower airborne persistence.
Surface Deposition	Approx. 140–200 µm target	Favor larger droplets where reduced drift matters more than suspension.

Test gates before specification release

PENDING · All values below require prototype verification.

METRIC	DEVELOPMENT TARGET	VALIDATION ROUTE
Rail pressure spread	≤ 3%	Simultaneous calibrated pressure logging at representative stations.
Station flow variation	Each outlet within ±5% of matched-set mean	Fourteen-channel timed mass collection at controlled inlet conditions.
Target-plane deposition	CV ≤ 10%; stretch < 7%	Fluorescent or gravimetric deposition map at defined distance and orientation.
Post-trigger discharge	≥ 90% mass reduction; no coherent jet	Collection method plus high-speed video after trigger release.
Residual head pressure	< 50 psi within 3 seconds	High-speed pressure trace following SAFE-DUMP actuation.
Operator wrist moment	≥ 30% reduction from baseline	Mass/center-of-gravity measurement and standardized operator fixture.

Wet-side concept

AREA	CANDIDATE / STATUS
Pressure rails & plenum	316/316L stainless steel; wall and joining method require pressure analysis.
Atomizer	Stainless impaction-pin or alternative mode cartridge; final geometry requires spray testing.
Seals	EPDM, FKM, or other formulation-specific elastomer selected through immersion and compression testing.
Structural frame	Passivated stainless or validated lightweight alternative.

Application-specific release

Before any pressure-rated or chemical-compatible specification can be issued, engineering requires the actual pump curve, regulator and relief settings, hose and fitting ratings, intended liquid formulations and SDS, dilution ranges, target surfaces, application distance, environmental limits, cleaning method, and pilot duty cycle.

Nozzle selection note. Extension guidance emphasizes that nozzle spacing, orientation, overlap, pressure, and calibration govern pattern quality; higher pressure alone is not a substitute for correct nozzle and application design. [1][2][3]

TECHNICAL INQUIRIES & PILOT INTEREST

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Development-stage notice. ForceArray 545 is a concept under engineering development. Renderings are illustrative. Pressure ratings, chemical compatibility, safety functions, droplet distributions, deposition performance, coverage rate, durability, ergonomic performance, certifications, and efficacy claims remain subject to engineering verification and application-specific validation. An expression of pre-order interest is not a purchase commitment.

Sources. [1] Kansas State University, Agricultural Spray Nozzles: Selection and Sizing. [2] Oklahoma State University, Calibrating a Low-Pressure Ground Sprayer. [3] North Dakota State University, Spray Equipment and Calibration.