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ABSTRACT

Removing paint is easy; removing paint while preserving the dimensional, metallurgical and cosmetic integrity of the part underneath is not. This paper cross-compares the three principal "soft media" stripping technologies across removal mechanism, media properties, substrate compatibility, consumable and waste economics, health-safety-environment factors and post-blast coating readiness. Verified data is drawn from the Pan Abrasives Abrasive Media Guide and PanBlast™ equipment catalogues, supplemented with published industry references for dry ice blasting. A selection matrix and equipment pathways conclude the analysis.

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1. EXECUTIVE SUMMARY

Conventional hard abrasives — garnet, aluminium oxide, steel grit — remove coatings quickly but cut an anchor profile into everything they touch. On structural steel that is exactly the objective. On aircraft skins, automotive panels, GRP hulls, alloy castings, moulds and electrical equipment, it is the failure mode: warped panels, dimensional loss, embedded media and destroyed cladding layers. Three "soft" stripping technologies exist to solve this problem, and they are routinely confused with one another.

Soda blasting uses friable sodium bicarbonate crystals (2.5 Moh) that fracture on impact, releasing energy that shears coatings off the surface with virtually no substrate erosion. It is a single-pass, expendable process whose water-soluble residue must be rinsed off before recoating. **Dry ice blasting** propels CO_2 pellets (≈2 Moh) that combine kinetic impact, thermal-shock embrittlement at −78.5 °C and explosive sublimation to lift coatings — leaving no media residue at all, because the media returns to gas. **Plastic media blasting (PMB)** uses engineered thermoset granules (3.0–4.0 Moh) sized to MIL-P-85891A, hard enough to chip paint yet softer than metallic substrates; it is the only one of the three that is genuinely recyclable, surviving 7–9 cycles in closed-loop equipment.

FINDINGS AT A GLANCE

Substrate safety: all three preserve base metal; PMB offers the finest control (down to 5 psi in PanBlast™ PMB cabinets) and true layer-by-layer selective stripping. **Waste economics:** PMB generates the least disposal volume per m² stripped because the media recycles and only paint solids leave the loop; soda adds its full media mass to the waste stream; dry ice adds none, but at the highest consumable and equipment cost. **Coating readiness:** soda demands a fresh-water rinse to remove sodium residue; dry ice demands dew-point management on chilled substrates; PMB leaves a dry, residue-free surface but negligible anchor profile — adhesion strategy must come from the coating system. **No single winner exists:** the correct choice follows from substrate, throughput, residue tolerance and waste-disposal cost, mapped in the selection matrix in Section 10.

WHY "GENTLE" IS AN ENGINEERING PROPERTY, NOT A SLOGAN

Every blasting process is an energy-transfer problem. Removal happens when the energy delivered per impact exceeds the adhesive/cohesive strength of the coating; damage happens when it exceeds the elastic limit of the substrate. Hard media (7–8 Moh garnet, 9 Moh aluminium oxide) sit far above both thresholds — fast, but indiscriminate. The three media in this paper are engineered to sit *between* the two thresholds: above the coating's failure point, below the substrate's. How each one manages that energy budget — fracture, phase change, or elastic rebound — determines everything else: strip rate, dust, residue, waste volume and cost per square metre. Those mechanisms are the subject of Section 2.

> **Scope note.** Data for sodium bicarbonate and LiteBlast™ plastic media is verified against the Pan Abrasives Abrasive Media Guide and PanBlast™ product catalogues. Dry ice equipment data is verified against the Pan Abrasives distributed range (Section 9.3); residual process-level dry ice figures (media hardness, noise) are indicative published industry values, flagged accordingly.

2. THREE REMOVAL MECHANISMS, ONE OBJECTIVE

The three processes look similar at the nozzle — compressed air, a hose, a stream of particles — but the physics of how each particle defeats the coating is fundamentally different, and each mechanism carries its own consequences downstream.

FRIABLE FRACTURE

SODA — SODIUM BICARBONATE

A soft (2.5 Moh), sharp-edged crystal that **shatters on impact**. The fracture releases energy laterally along the surface, shearing paint, grease and carbon deposits away in a scouring action. Because the particle destroys itself rather than the substrate, base-metal erosion is negligible — but every kilogram blasted is a kilogram consumed. Mildly alkaline chemistry adds a degreasing effect.

PHASE CHANGE

DRY ICE — CO_2 PELLETS

Soft pellets (≈2 Moh, typically ~3 mm) at −78.5 °C strike the coating and act three ways: **kinetic impact** cracks it, **thermal shock** embrittles it and breaks the adhesion bond through differential contraction, and **instant sublimation** — a several-hundred-fold gas expansion — blows the fractured film off the surface. The media then ceases to exist: nothing to recover, recycle or dispose of except the paint itself.

SELECTIVE ABRASION

PLASTIC MEDIA — LITEBLAST™

Angular thermoset granules engineered to a hardness window (3.0–4.0 Moh) **above typical paint films but below metallic substrates**. Each impact chips coating away; the tough particle survives, rebounds and is recovered for reuse. Operated at low pressure the process strips **one layer at a time** — topcoat without primer, primer without anodise — which no other blast process does as controllably.

2.1 WHAT EACH MECHANISM IMPLIES IN PRACTICE

Soda's self-destructing particle is why it excels on the most delicate work — glass, chrome, thin-gauge panels, fire and mould restoration — and why the Pan Abrasives media guide classifies it for "low pressure blasting or stripping work on delicate substrates" and dust-sensitive areas. It is also why soda cannot be recycled: post-impact, the crystal is powder. The residue is water-soluble, which is both its cleanup advantage (dissolves with a wet head or rinse) and its coating-adhesion liability (Section 8).

Dry ice's phase-change trick makes it the only truly residue-free process — invaluable around live electrical gear, food lines and machinery that cannot be dismantled or wetted. The trade-offs follow the same physics: pellets cannot be stockpiled (they sublime in storage, with published loss rates of several percent per day), the process is among the loudest in industry, the expanding CO_2 displaces oxygen in enclosed spaces, and with no abrasive bite it slows dramatically on thick, elastic or well-adhered multi-coat systems.

PMB's surviving particle is the economic story: at a verified 7–9 recovery cycles and ~13% breakdown per cycle, one tonne of LiteBlast™ does the stripping work of many tonnes of expendable media, and the waste stream concentrates down to paint chips plus media fines — a decisive advantage when the coating being removed is the hazardous component (lead, chromates) and disposal is priced per kilogram. The mechanism's precondition is closed-loop equipment: cabinets, blast rooms or vacuum-recovery systems that reclaim and re-classify the media (Section 9).

> **Historical note.** PMB was developed for aerospace precisely to replace methylene chloride chemical stripping. Chemical immersion is non-discriminatory — it attacks everything it wets, including the base material. A directed plastic-media stream removes only what it is aimed at, with no solvent health risk and no waste-water treatment burden — the rationale documented in the Pan Abrasives media guide for LiteBlast™.

3. MEDIA PROPERTIES, SIDE BY SIDE

Table 1 consolidates the verified physical data. The hardness column is the headline: all three media sit at or below 4 Moh — beneath aluminium alloys and far beneath steel — which is what makes damage-free stripping possible at all.

TABLE 1 · CORE MEDIA PROPERTIES (VERIFIED SOURCES)

PROPERTY	SODIUM BICARBONATE (SODA)	DRY ICE (CO_2 PELLETS)	PLASTIC MEDIA (LITEBLAST™)
Material class	Manufactured friable crystal	Solid-phase carbon dioxide	Manufactured thermoset / thermoplastic granule
Hardness	2.5 Moh	≈2 Moh (indicative)	3.0 – 4.0 Moh by type
Bulk density	1,000 kg/m^3	≈1,560 kg/m^3 solid CO_2; pellet bulk lower, equipment-specific (indicative)	642 – 962 kg/m^3 by type
Particle form	Angular crystal, formulated blast grades	Extruded pellet — 1.7 / 3 / 6 / 16 mm standard sizes; 0.1–3 mm fine-adjust on CUBE Vario	Irregular angular granule, 8/16 to 100/270 mesh (53 – 2,360 µm)
Recyclability	**LOW** — expendable, single pass	**NONE** — sublimes on impact	**MEDIUM** — 7–9 cycles, ~13% breakdown/cycle
Residue on part	Water-soluble sodium film — must be rinsed	None (media phase-changes to gas)	None significant; dry, anti-static treated
Anchor profile	None to negligible on metals	None	Negligible on metals; light texture on soft substrates
Governing standards	Formulated blast grades (supplier spec)	Supplier/equipment spec	ASTM and MIL-P-85891A sizing
Storage life	Good if kept dry — cakes with moisture	Hours–days; loses several %/day in insulated storage (indicative)	Indefinite if dry

Soda and LiteBlast™ data: Pan Abrasives Abrasive Media Guide and PanBlast™ media type references. Dry ice pellet data: Pan Abrasives equipment range; remaining dry ice values indicative published data.

3.1 THE LITEBLAST™ FAMILY — MATCHING TYPE TO COATING

PMB is not one product but a graded family. Selection follows the same logic as the technology itself: choose the hardest type that still cannot mark the substrate.

TABLE 2 · LITEBLAST™ PLASTIC MEDIA TYPES (PAN ABRASIVES ABRASIVE MEDIA GUIDE)

TYPE	MATERIAL	HARDNESS (MOH)	BULK DENSITY (KG/M^3)	PARTICLE S.G.	TYPICAL STRIPPING ROLE
I	Polyester	3.0	642 – 802	1.15 – 1.25	Gentlest thermoset; delicate skins
II	Urea Formaldehyde	3.5	930 – 962	1.47 – 1.52	General-purpose stripping workhorse
III	Melamine Formaldehyde	4.0	930 – 962	1.47 – 1.52	Hardest type; aged multi-coat systems
V	Acrylic	3.5	642 – 802	1.1 – 1.2	Aerospace-associated; gentle on alloys
VI	Poly Carbonate	3.0	642 – 802	1.28 – 1.33	Soft, tough; sensitive work
X	Thermoset Acrylic	3.2	642 – 802	1.1 – 1.2	Intermediate hardness variant
A	Melamine Formaldehyde	4.0	642 – 802	1.47 – 1.52	Melamine variant, lighter bulk
L	Acrylic	3.5	642 – 802	1.1 – 1.2	Acrylic variant grade

Ordering: stock code ALB-XYY-ZZW (type · upper/lower mesh · grade C/E/P/W). Packaging: 20 kg bags/cartons or 125 kg fibre drums. Dry-use media is pre-treated with an anti-static agent to prevent particle adhesion and wastage.

4. PROCESS & STRIPPING PERFORMANCE

Strip rate is the most-quoted and least-transferable number in this field: it swings by an order of magnitude with coating type, thickness, age, adhesion, nozzle size and pressure. The honest comparison is therefore behavioural — how each process responds to the variables that dominate real jobs.

TABLE 3 · OPERATING ENVELOPE AND STRIPPING BEHAVIOUR

PARAMETER	SODA	DRY ICE	PLASTIC MEDIA (PMB)
Typical working pressure	Low — commonly 20–90 psi; PanBlast™ SB-Series pots rated 125 psi with differential-pressure soda metering	Wide verified envelope — CUBE bench units 1–12 bar (≈15–175 psi); PowerJet mobile units 3–20 bar (≈44–290 psi)	Very low — 15–40 psi typical for selective stripping; PanBlast™ PMB cabinets blast down to 5 psi (35 kPa)
Single-layer (selective) stripping	**LIMITED** — controllable but media is spent regardless	**PARTIAL** — favours poorly-adhered top layers; struggles mid-film	**EXCELLENT** — the defining PMB capability; layer-by-layer at low pressure
Thick / multi-coat systems	**MODERATE** — consumption rises steeply with film build	**SLOW** — no abrasive bite; elastic coatings absorb impact	**GOOD** — Type III / II at higher pressure; media recycles through repeat passes
Brittle, poorly adhered films	**GOOD**	**VERY GOOD** — thermal shock exploits weak adhesion	**GOOD**
Grease, carbon, soot, mould release	**VERY GOOD** — alkaline scouring action	**VERY GOOD** — cleans without wetting	**FAIR** — mechanical only; contaminants load the media
Wet operation option	Yes — PanBlast™ AIN nozzle or Wet Head suppresses dust and dissolves residue in-stream	Inherently dry (moisture is the enemy of pellet handling)	Yes — usable in wet and dry equipment; dry closed-loop preferred for recovery
Media metering behaviour	Fine, cohesive powder — needs dedicated metering (Corsa II with Soda-Sleeve, pot vibrator, multiport sleeve)	Purpose-built pellet feeder/hopper only	Free-flowing granule — standard metering (Fina II / Corsa II), steep-cone pot recommended

PanBlast™ equipment references: SB316-2 / SB600-2 soda blast pots (CAT-01); PB1000PMB / PB1500PMB cabinets (CAT-06). Dry ice envelope: Pan Abrasives PowerJet / CUBE range data (pan-abrasives.com).

4.1 READING THE TABLE FOR A STRIPPING JOB

For **production stripping of complete paint systems** — MRO shops, rail, defence, component remanufacture — PMB dominates: the media survives repeated passes, the 5–40 psi window protects the substrate, and hardness escalates by type as the coating demands. For **one-off, on-site, mixed-contamination work** — fire restoration, graffiti, tank externals, timber and masonry — soda's expendable simplicity wins: any SB-Series pot, no recovery infrastructure, residue that rinses away. For **in-situ cleaning where nothing may remain** — energised switchgear surrounds, food-processing lines, printing presses, live production machinery — dry ice is frequently the only admissible choice, and its high hourly cost is paid for by eliminating disassembly and downtime rather than by strip rate.

> **On quoted strip rates.** Published single-coat figures cluster around fractions of a square metre per minute per nozzle for all three processes — but a thick elastomeric or a well-cured two-pack epoxy can halve or quarter them. Specify a witness-panel trial on the actual coating system before committing a programme; Pan Abrasives supports media trials for this purpose.

5. SUBSTRATE COMPATIBILITY

Substrate tolerance is where the three technologies most clearly diverge from hard abrasives — and subtly from each other. The matrix below rates suitability for paint removal from common substrates; ratings assume correct parameters (pressure, angle, stand-off, media grade) for each process.

TABLE 4 · SUBSTRATE SUITABILITY FOR PAINT STRIPPING

SUBSTRATE	SODA	DRY ICE	PLASTIC MEDIA	NOTES
Aluminium sheet & alloy panels	EXCELLENT	EXCELLENT	EXCELLENT	PMB Types V / I at low pressure for thin skins; rinse soda residue promptly — alkaline dwell can stain aluminium
Structural / carbon steel	GOOD	GOOD	GOOD	All strip without profiling; if the spec needs an anchor profile, a hard-abrasive sweep must follow
Stainless & corrosion-resistant steels	GOOD	EXCELLENT	EXCELLENT	All ferrous-free; optional magnetic grid separation keeps tramp iron out of recycled PMB
GRP / fibreglass & composites	GOOD	CAUTION	EXCELLENT	PMB at 15–30 psi is aerospace-proven; trial dry ice thermal shock on laminates/gel coats
Timber	VERY GOOD	FAIR	GOOD	Soda is the restoration standard; minimal grain raising at low pressure
Masonry, brick, concrete coatings	VERY GOOD	FAIR	FAIR	Soda handles graffiti/fire soot without opening the surface; PMB recovery impractical outdoors
Chrome, brightwork, glass	EXCELLENT	EXCELLENT	GOOD	Soda's signature application — strips paint from chrome and glass without etching
Zinc, galvanising, thermal-spray coatings to be preserved	GOOD	GOOD	GOOD	All remove paint over-coats while retaining the metallic layer — align with SSPC-SP 16 practice
Live electrical / electronic equipment	NO	SUITABLE*	NO	*Non-conductive, residue-free — the standard method; follow OEM and electrical-safety procedures
Rubber, elastomers, soft plastics	FAIR	GOOD	FAIR	Cold embrittlement lifts films from flexible substrates that absorb abrasive impact

5.1 THE PROFILE QUESTION

None of the three processes generates a meaningful anchor profile on metals — soda and dry ice none at all, PMB a negligible-to-light texture. That is the point of using them, and also the constraint: **the stripped surface is clean but smooth**. Where the recoat spec demands a measured profile, follow the strip with a light hard-abrasive sweep (fine EnviroGrit™ garnet or aluminium oxide), or specify a coating system qualified for smooth substrates. SSPC-SP 16 formalises this for non-ferrous surfaces with a minimum ~19 µm (0.75 mil) profile — soft media alone will not achieve it.

> **Rule of thumb.** Choose the process for the substrate first, the coating second, the logistics third. A process that strips twice as fast but writes off the panel has infinite cost per square metre.

6. CONSUMABLES, RECYCLABILITY & WASTE ECONOMICS

Media price per kilogram is the least useful cost number in blasting. What drives project economics is **how many square metres each kilogram strips before it becomes waste** — and what that waste costs to dispose of, especially when the removed coating is classified hazardous (lead, chromate, TBT antifoulings).

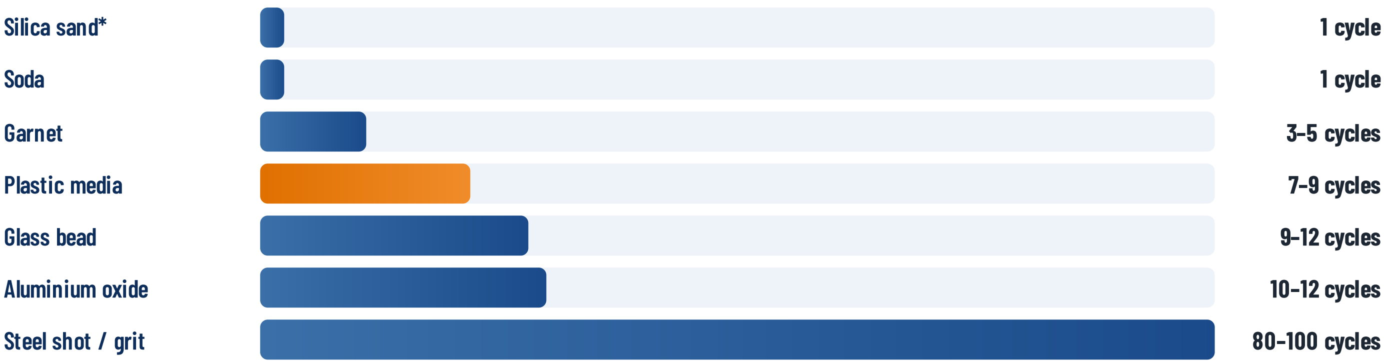

Figure 1 · Media life in recovery cycles (PanBlast™ abrasive breakdown reference data; plastic media ≈13% breakdown per cycle). Dry ice: zero cycles by definition — the media sublimes. *Silica sand shown for reference only; prohibited for blasting in many jurisdictions.

TABLE 5 · CONSUMABLE AND WASTE PROFILE PER STRIPPING CAMPAIGN

FACTOR	SODA	DRY ICE	PLASTIC MEDIA (PMB)
Media consumption	High — every kg blasted is consumed; consumption scales directly with area and film build	High and continuous — machine ice capacities of 12–150 kg/h across the Pan Abrasives range, plus storage sublimation losses	Low steady-state — only ~13%/cycle top-up once the loop is charged
Solid waste generated	Full media mass + paint solids (soluble fraction can be separated by dissolution where permitted)	Paint solids only — the minimum physically possible	Paint solids + media fines only; media stays in the loop
Hazardous-waste leverage	Large waste volume dilutes the hazardous fraction — more tonnage to manifest	Smallest volume — concentrated coating debris	Small volume — coating debris concentrated by the reclaim classifier
Recovery infrastructure needed	None (open blast); wet head for dust/residue control	None for media; extraction/collection for the debris cloud	Essential — cabinet, blast-room floor recovery, or closed-circuit vacuum head with cyclonic re-classification
Cost structure	Low capex (standard pot + soda conversion), high per-m^2 media cost	High capex or hire (pelletiser/feed unit), high per-hour media + logistics cost	Higher capex (recovery loop), lowest per-m^2 media cost at volume
Break-even character	Wins on small, dispersed, one-off jobs	Wins where downtime/disassembly cost dominates media cost	Wins on repeat production volume; the loop amortises fast

The environmental picture follows the same lines. Soda is non-toxic and water-soluble, but soluble is not the same as benign: sodium-laden runoff raises soil pH, stresses vegetation, and still carries the paint waste — containment and collection remain mandatory. Dry ice adds no media to the environment (the CO_2 is typically industrially recovered gas), leaving only the debris cloud to capture. PMB's closed loop keeps the media out of the environment entirely; its discipline point is dust-collector management, since the reclaim fines concentrate whatever was in the coating.

7. HEALTH, SAFETY & ENVIRONMENT

None of the three media contains free silica — LiteBlast™ is certified silica-free, soda is a pure bicarbonate crystal, dry ice is CO_2. That removes the silicosis hazard of sand, but it does **not** make any of them a low-PPE process: in paint stripping, the dominant airborne hazard is usually the **coating being removed**, not the media. Lead, chromate, isocyanate and antifouling dusts govern the respiratory-protection decision regardless of which media liberates them.

TABLE 6 · HSE COMPARISON

HAZARD AXIS	SODA	DRY ICE	PLASTIC MEDIA (PMB)
Media dust	Fine soluble dust cloud; visibility drops — wet head / AIN nozzle suppresses effectively	None from media; debris cloud only	Low — tough particle, ~13% fines/cycle captured by the reclaim dust collector
Coating-derived dust	**Present in all three — assess the existing coating (lead/chromate testing) before method selection; PMB's enclosed loop and dry ice's small debris volume simplify capture**		
Atmosphere hazard	Nuisance dust; mildly alkaline	**CO_2 displaces oxygen** — confined/poorly-ventilated spaces require forced ventilation and gas monitoring; occupational exposure limits for CO_2 apply (5,000 ppm 8-h TWA is the widely used benchmark)	Nuisance dust; anti-static treatment mitigates static build-up in dry systems
Noise	Typical air-blast levels — hearing protection mandatory	Among the loudest industrial processes; published levels frequently exceed 110 dB(A) at the nozzle (indicative)	Typical air-blast levels; cabinet enclosure contains most noise
Thermal / contact	—	−78.5 °C media: cryogenic burns on skin contact; insulated gloves and handling procedures required	—
Operator protection	**Open blasting in all cases: supplied-air respirator (PanBlast™ Titan II / Cosmo SAR with certified airline filtration to breathing-air grade), blast suit, gloves, hearing protection**		
Runoff / ground	Contain and collect — soluble sodium raises pH, harms vegetation; runoff still carries paint waste	No media runoff; collect debris	Recover media (it is the asset); sweep-loss on open ground is the main loss route

7.1 COMPRESSED AIR QUALITY — THE SHARED PREREQUISITE

All three processes are only as good as the air behind them. Moisture cakes soda into an unmeterable mass, degrades plastic-media flow and reclassification, and is fatal to dry ice pellet transport. Air treatment to the appropriate ISO 8573.1 class — moisture separation at the pot as a minimum, refrigerated drying for production systems, and certified breathing-air filtration for the operator line — is common infrastructure across every option in this paper, and is specified in the PanBlast™ compressed-air preparation range (CAT-05).

> **Practical consequence.** When tendering stripping work on pre-1990s coatings, price the hazardous-dust controls first — containment, extraction, waste manifesting, medical surveillance where applicable. The media choice then optimises within that envelope; it does not replace it.

8. POST-BLAST SURFACE CONDITION & COATING READINESS

A stripped part is not yet a paintable part. Each process leaves the surface in a characteristically different state, and recoat failures trace back to skipping the corresponding conditioning step far more often than to the stripping itself.

TABLE 7 · SURFACE STATE AFTER STRIPPING AND REQUIRED CONDITIONING

ASPECT	SODA	DRY ICE	PLASTIC MEDIA (PMB)
Residue	Water-soluble sodium bicarbonate film over the whole surface	None from media; loose paint debris only	Dry, essentially residue-free; trace fines blow off
Mandatory conditioning	**Fresh-water rinse** until residue is fully removed, then dry — sodium residue left under a coating compromises adhesion; note the residue also gives steel brief flash-rust holdover, which must not be mistaken for a primer	**Dew-point management** — the chilled substrate can fall below dew point and condense moisture (flash-rust risk on steel); allow temperature recovery or control RH before coating	Blow-down / tack-off; verify no media lodged in crevices and fasteners on complex parts
Profile delivered	None	None	Negligible-light
Adhesion strategy	**Smooth-substrate coating systems (etch/wash primers, adhesion promoters) — or a fine hard-abrasive sweep to cut profile where the spec requires it (Sa 2.5 / SP-10 recoats; ≥0.75 mil per SSPC-SP 16 on non-ferrous)**		
Climate control tie-in	**For enclosed stripping-to-coating workflows, dehumidification (PanBlast™ DH-Series) holds the space above dew point between strip and prime — critical after dry ice, prudent after soda rinsing**		

9. EQUIPMENT PATHWAYS

9.1 SODA — PANBLAST™ SB-SERIES

Soda's cohesive powder defeats standard grit valves, so the SB-Series pots are purpose-configured: **SB316-2** (100 L, stock BEP-PS-0028-00) and **SB600-2** (200 L, stock BEP-PS-0021-00), both 125 psi-rated with Tandem inlet/exhaust valves, AirStop deadman control, pneumatic pot vibrator, and the **Corsa II metering valve fitted with the Soda-Sleeve**, regulated by differential-pressure flow correlation. A multiport sleeve adapts orifice size to media grade; the optional **AIN water-induction nozzle or Wet Head** suppresses dust and dissolves residue at the point of blast. The SB-Series stays dedicated to soda duty; where one pot must cover both soda and plastic media, step up to the dual-media **MB600-2** (Section 9.2).

9.2 PLASTIC MEDIA — CLOSED-LOOP PMB SYSTEMS

For component work, the **PB1000PMB / PB1500PMB cabinets** are engineered for plastic media: dump valve permitting blasting down to **5 psi (35 kPa)**, 28 L steep 60° cone pot, Fina II metering, cyclonic media cleaning, reverse-pulse cartridge dust collection, and an optional **magnetic grid separator** that strips tramp ferrous from the recycled charge. For larger parts, the **MB600-2** open-blast pot (200 L, stock BEP-PS-0022-00 / BEP-PS-PB-0012) is the catalogue's dual-media unit — 60° pot-shell cone, low-pressure process control with air-driven pop-up valve, and Corsa II urethane-sleeve metering — rated for plastic media, baking soda and other light-density abrasives. Spent plastic media returns to the loop through the **MINI Abrasive Vacuum Recovery System**: a 10 m vacuum hose feeds an adjustable air-wash reclaimer with oversize screens, dropping out paint debris and fines so cleaned media is fed straight back to the pot. For dust-free spot stripping, fully enclosed **closed-circuit blasters (AER85 / AER215 Nuovo)** confine media and debris at a blast-and-vacuum head, feeding a multi-cyclone reclaim.

9.3 DRY ICE — DISTRIBUTED EQUIPMENT RANGE

Dry ice blasting completes the trio within the Pan Abrasives programme, through a distributed range covering the full workflow from pellet production to blast delivery. The **Dry Ice Pelletizer** produces blast-ready pellets on site in four standard sizes at up to 120 kg/h, directly answering the technology's principal logistical weakness (Section 2): pellets sublime in storage, so point-of-use production converts a perishable consumable into an on-demand one. Delivery is matched to the job — the mobile **PowerJet Blaster** for site and workshop stripping, and the compact **CUBE Bench Type Blaster** for component-scale work, the CUBE Vario adding fine pellet-size adjustment down to 0.1 mm for the most delicate surfaces. Residual process-level figures (media hardness, noise) remain indicative published values.

TABLE 8 · PAN ABRASIVES DRY ICE BLASTING RANGE

UNIT	MODELS & ICE CAPACITY	COMPRESSED AIR (AS PUBLISHED)	CONTROL & BUILD
Dry Ice Pelletizer	Pellet production up to 120 kg/h @ 3 mm; standard pellet sizes 1.7 / 3 / 6 / 16 mm	— (electrical: 380 VAC 3-phase, 5.5 kW)	Colour touch screen; stainless steel frame & housing, 750 × 1060 × 1800 mm
PowerJet Blaster (mobile)	12/3 — 40 kg/h · 16/10 — 100 kg/h · 16/10 Plus — 100 kg/h · 20/20 — 150 kg/h	12/3: 2,000–6,000 L/h @ 3–12 bar · 16/10 & Plus: 2,000–10,000 L/h @ 3–16 bar · 20/20: 3,000–20,000 L/h @ 3–20 bar	Rotary dial (12/3, 16/10) or touch screen (Plus, 20/20); single 6 m hose & gun, internal filters, SEW motors, 110/230 VAC
CUBE Bench Type Blaster	12/2 — 12 kg/h · 12/2 Plus — 24 kg/h · Vario — 40 kg/h	500–1,200 L/h @ 1–12 bar	Rotary dial (12/2) or touch screen (Plus, Vario); Vario pellet-size adjustment 0.1–3 mm; single 5 m hose & gun, internal filters, 2 SEW motors, 110/230 VAC

Source: pan-abrasives.com dry ice blasting product pages. Air-consumption figures quoted as published by the manufacturer.

10. SELECTION MATRIX & RECOMMENDATIONS

TABLE 9 · FIRST-PASS PROCESS SELECTION

IF THE JOB IS DEFINED BY...	CHOOSE	BECAUSE
One-off / on-site stripping, mixed substrates, no recovery possible	**Soda**	Expendable simplicity; any SB-Series pot; residue rinses away; dust controllable with wet head
Repeat production stripping of components or airframes	**PMB**	7–9 media cycles crush per-m^2 cost; 5–40 psi window; selective layer stripping; hazardous waste minimised
Nothing may remain on or around the part (electrical, food, in-situ machinery)	**Dry ice**	Only residue-free option; non-conductive; no wetting; strips and cleans without disassembly
Delicate decorative substrates — chrome, glass, timber, brightwork	**Soda**	Softest practical media with a scouring fracture action; restoration track record
Thin alloy skins / composites where layer control is critical	**PMB**	Type V / I at low pressure; MIL-P-85891A aerospace lineage; anodise and cladding preserved
Heavy grease + paint + carbon combined contamination	**Soda or Dry ice**	Alkaline scouring (soda) or dry degreasing (CO_2); PMB media would load with contaminant
Hazardous coating (lead/chromate) with disposal priced per kg	**PMB**, else **Dry ice**	Both concentrate the waste to (near-)coating-only; soda multiplies manifested tonnage
Recoat spec demands a measured anchor profile	**Any + hard-media sweep**	No soft media cuts profile; finish with fine garnet/oxide or specify a smooth-substrate coating system

10.1 CLOSING RECOMMENDATIONS

1. Test the coating before choosing the weapon. Adhesion, thickness, elasticity and hazard content of the existing system decide more than any brochure figure. Witness-panel trials on the actual part are cheap insurance. **2. Price the whole loop, not the media bag.** Include recovery, waste manifesting, rinse water, air treatment, PPE and downtime — the cheapest media per kilogram is frequently the most expensive per square metre. **3. Engineer the recoat from the moment of stripping.** Rinse verification after soda, dew-point control after dry ice, profile or primer strategy after all three. **4. Protect the operator identically in all cases.** Certified supplied-air respiratory protection and coating-hazard controls are process-independent.

REFERENCES & SOURCE BASIS

Pan Abrasives *Abrasive Media Guide* (LiteBlast™ Plastic Media, properties, sizes ALB coding; NaturalGrit™; EnviroGrit™) · PanBlast™ Catalogue CAT-01 *Blast Pots* (SB316-2, SB600-2 soda configurations; MB600-2 dual soda / plastic media) · CAT-06 *Blast Cabinets* (PB1000PMB, PB1500PMB) · CAT-08 *Closed Circuit Blasters* (AER85, AER215 Nuovo) · CAT-05 *Compressed Air Preparation* · Engineered Products Catalog EPC-0202-00 (*MINI Abrasive Vacuum Recovery System*) · PanBlast™ training references: *Abrasive Media Types, Open Blasting, Cabinet Blasting, Abrasive Media Recovery & Closed Circuit Blasting, Compressed Air Treatment & Dust Control, Operator Protection, Surface Preparation Standards (SSPC/NACE)* · MIL-P-85891A plastic media sizing standard · SSPC-SP 16 *Brush-Off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals* · Pan Abrasives dry ice range: Dry Ice Pelletizer, PowerJet Blaster 12/3-20/20, CUBE Bench Blaster 12/2-Vario (www.pan-abrasives.com) · Residual dry ice parameters (hardness, noise): indicative published data.

TALK TO US

Pan Abrasives supplies the media, PanBlast™ supplies the machine, and both are backed by application engineering: media trials, equipment configuration for soda and PMB conversion, recovery-system sizing and operator-protection compliance. One stop, local supply, global product. **www.panblast.com · www.pan-abrasives.com**