Sponge Jet: An Environmentally Friendly, Innovative and Effective Substrate Blasting Preparation for Coating Application

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Presented to:
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Industry leaders SPECIFY Sponge-Jet…
Proper Surface Preparation:

Cleanliness (Visual)  Decontamination (Invisible)  Profile (Measurable)

CHLORIDES & SULFATES  OIL RESIDUE  Microns / Mils
LEAD  ASBESTOS  PEAK
PCBs  LOW-LEVEL RADIATION  VALLEY

“75% of coating failures are the result of poor surface preparation”
“It should be remembered that when defects are exposed by blast cleaning and subsequently removed by grinding, it is necessary to re-prepare the immediate area to retain the surface profile.”
“All coating systems will perform better on properly cleaned surfaces with a good surface profile”

SOURCE: NACE Coating Inspector Program (Level 1)
Why Do Coatings Fail?

- Surface Preparation: 75%
- Coating: 10%
- Wrong Coating Selection: 8%
- Wrong Application: 5%
- Environmental: 2%
Professional Associations have established standard descriptions for *visible contaminants*.

<table>
<thead>
<tr>
<th>Standard</th>
<th>SSPC</th>
<th>NACE</th>
<th>ISO</th>
</tr>
</thead>
<tbody>
<tr>
<td>White Metal Blast Cleaning</td>
<td>SP-5</td>
<td>NACE 1</td>
<td>Sa3</td>
</tr>
<tr>
<td>Near White Blast Cleaning</td>
<td>SP-10</td>
<td>NACE 2</td>
<td>Sa2.5</td>
</tr>
<tr>
<td>Commercial Blast Cleaning</td>
<td>SP-6</td>
<td>NACE 3</td>
<td>Sa2</td>
</tr>
<tr>
<td>Brush-Off Blast Cleaning</td>
<td>SP-7</td>
<td>NACE 4</td>
<td>Sa1</td>
</tr>
</tbody>
</table>
SSPC has established standard levels of defined cleanliness for *invisible contaminants*.

<table>
<thead>
<tr>
<th></th>
<th>Chloride</th>
<th>Soluble Ferrous</th>
<th>Sulfates</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC 1</td>
<td>0 µg/cm²</td>
<td>&lt;0 µg/cm²</td>
<td>&lt;0 µg/cm²</td>
</tr>
<tr>
<td>SC 2</td>
<td>&lt;7 µg/cm²</td>
<td>&lt;10 µg/cm²</td>
<td>&lt;17 µg/cm²</td>
</tr>
<tr>
<td>SC 3</td>
<td>50 µg/cm²</td>
<td>&lt;50 µg/cm²</td>
<td>n/a</td>
</tr>
</tbody>
</table>
Surface profile is a measurement of the average peak to valley distance, normally recorded in Microns or Mils.

Note: a *corroded* surface is NOT an (anchor) profiled surface.
## Different Technologies Produce Different Results

<table>
<thead>
<tr>
<th>TECHNOLOGY</th>
<th>VISIBLE CLEANLINESS</th>
<th>NON-VISIBLE CONTAMINATES</th>
<th>PROFILE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ultra-High Pressure Water</td>
<td>✓+</td>
<td>✓+</td>
<td>Ø</td>
</tr>
<tr>
<td>Dry Ice (CO₂)</td>
<td>✓</td>
<td>✓</td>
<td>Ø</td>
</tr>
<tr>
<td>Power Tools</td>
<td>✓-</td>
<td>Ø</td>
<td>✓-</td>
</tr>
<tr>
<td>Ordinary Abrasive</td>
<td>✓+</td>
<td>✓</td>
<td>✓+</td>
</tr>
<tr>
<td>Sponge Blasting</td>
<td>✓+</td>
<td>✓+</td>
<td>✓+</td>
</tr>
</tbody>
</table>
Ordinary Blasting versus Sponge Media Blasting

1. Ordinary Blasting
2. Sponge Blasting
3. Comparison of depth removal

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Sponge Blasting System
Dramatically Reduce Airborne Emissions

Sponge Blasting can reduce dust levels as much as 98% compared to ordinary abrasives.
Profile 0 to 150+microns (0 to 6+mils)

<table>
<thead>
<tr>
<th>Sponge Media</th>
<th>Silver 80 Sponge Media</th>
<th>Silver Areo-Alox™ 320 Sponge Media</th>
<th>Silver 60 Sponge Media</th>
<th>Silver 30 Sponge Media</th>
<th>Silver 16 Sponge Media</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROFILE (on Aluminum):</td>
<td>±62.5micron (±2.5mil)</td>
<td>Blast Pressure: 3.4bar(50psi)</td>
<td>ABRASIVE AGENT:</td>
<td>80-Grit Aluminum Oxide</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;12micron (&lt;.5 mil)</td>
<td>Blast Pressure: 5.5bar(80psi)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>±62.5micron (±2.5mil)</td>
<td>Blast Pressure: 5.5bar(80psi)</td>
<td>ABRASIVE AGENT:</td>
<td>60-Grit Aluminum Oxide</td>
<td></td>
</tr>
<tr>
<td></td>
<td>±75micron (±3 mil)</td>
<td>Blast Pressure: 5.5bar(80psi)</td>
<td>ABRASIVE AGENT:</td>
<td>30-Grit Aluminum Oxide</td>
<td></td>
</tr>
<tr>
<td></td>
<td>±100micron (±4 mil)</td>
<td>Blast Pressure: 5.5bar(80psi)</td>
<td>ABRASIVE AGENT:</td>
<td>16-Grit Aluminum Oxide</td>
<td></td>
</tr>
</tbody>
</table>

To learn more visit Sponge-Jet, Inc. at www.spongejet.com; call 603-610-7950 or in Europe call +44-1253-390731
Sponge Blasting is a Dry Abrasive Blasting Process

- Blast near sensitive equipment
- Work near active electrical components
- Reduce fugitive emissions (dust)
- Eliminate water, slurry or runoff problems
Project Costs

- Media
- Handling Costs
- Disposal Costs
- Air Management
- Containment
- Overblast & Re-work
Total Project Costs (Including Hidden Costs)

Disruption of Operations
- Loss of production capacity
  - Equipment breakdown
  - Loss of productivity
- Health and safety liability
- Environmental non-compliance
- Long-term asset corrosion

Media Handling Costs
Disposal Costs
Air Management
Containment
Overblast & Re-work
Protect What’s Important

The REAL COST of Ordinary Abrasive Blasting

- Hazardous Emissions
- Corrosion
- Equipment Breakdown
- Eye Injuries
- Pollution
- Downtime

$276 BILLION PER YEAR
$25 MILLION PER MONTH
$1 MILLION PER DAY
How can you expect first-pass quality if you can’t see your work? Sponge Blasting lets you see clearly and gives you the ultimate control.
Remove Chlorides Faster

Test after test, Sponge Blasting achieves specified levels without the need to water rinse and re-blast as with ordinary abrasives.
Sponge Blasting reduces ricochet causing less collateral damage to adjacent surfaces and sensitive machinery.

Blast Where You Want

Blast Where You Don’t Want to Blast Again!
Residual Chloride Comparison - B

20 µg/cm²

Blasted with Sponge Media
Blasted with Coal Slag

15

10

5

Panel 1  Panel 2  Panel 3  Panel 4
Airborne Contaminant Comparison

60 mg/m³

Sand Blasting
Sponge Blasting

40

20

0.05
One Abrasive System... Many Capabilities

Abrasive System Features:

- Abrading/Profiling
- Selective Stripping
- Cleaning and Micro-abrasion
- Contaminant Removal

- **IN MINUTES** - change from one of 20 different Sponge Media types/sizes/grits to another

**As a result...**

- **Profile**: 0-150+ microns (0-6+ mils)
- **Achieve all abrasive Levels of Surface Cleanliness**
Broad Ranging in Size and Capability

RASP Xtreme™
400-HP Feed Unit™

100-HP Feed Unit™

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Sponge Blasting System

Sponge-Jet Feed Unit™ / Sponge-Jet Recycler™ / Sponge-Jet Sponge Media™
The **Sponge-Jet Feed Unit™**

- Delivers Sponge Media particles to the surface
- Monitors specific flow characteristics
- Optimizes production and rebound
- Controls mixture of Sponge Media particles and air
The Sponge-Jet Media Recycler™

- Prepares and cleans Sponge Media particles for reuse
- Separates media into three categories:
  ▪ Oversized debris
  ▪ Reusable Sponge Media
  ▪ Fines: spent media contaminants
The B-VAC™ Pro 3
High-Production System:

• Automatic Recovery, Recycling and Reloading System

• Save time, labor and money by accelerating blasting and painting operations

• Recover Sponge Media™ abrasive in the work area

• Automatically removes contaminants

• Reusable media is reloaded the Feed Unit for reliable blasting
The CVR P220 Continuous VAC-Recovery System™:

• Automatic vacuum/recovery for reduced handling and labor costs

• Recovers, separates and stores, dust, waste and Sponge Media™ which has been vacuumed from remote job sites

• Users any Sponge-Jet Recycler™ and Sponge-Jet Feed Unit™ - most waste drums and dumpsters

• For recovery up to 100m (300ft) or 30m (100ft) vertically; 3800mm WC (11in of Hg) maximum suction
RASP Xtreme™ Team:

- Integrated, light and mobile blasting and recycling system
- Includes pneumatic 25-P Recycler™ and RASP Xtreme™ Feed Unit™
- Designed to allow for:
  - Complete blasting and recycling in remote and/confined areas
  - Quick in-service maintenance on deployable assets like ships and offshore platforms
The KwietKave™ In-shop B-VAC and Noise Control System:

- Similar to B-VAC Pro with added noise control, enhanced media handling system and blast room
- Costs less than most conventional grit blasting/air-handling systems
- No need to erect new foundation; no buried conveyors/raised floors; installs on existing flat surfaces
- With less noise exposure, install system adjacent to personnel
- Lowering heating/air conditioning costs with HEPA quality filters that re-circulate air within system
Clean Abrasive Blasting Process

• Simplify surface preparation
• Blast in sensitive surroundings
• Reduce fatigue on the blaster
• Enjoy fast, easy clean-up
Easier and Faster Cleanup

Support personnel sweep or vacuum Sponge Media™ abrasive (and trapped dust particulate) more easily than traditional abrasives.
Sponge Media™ abrasives absorb rebound energy, reducing media ricochet, allowing for less extensive containment.
No Collateral Damage

✓ Prepare weld seams and repair coating blisters
✓ Remove corrosion and coating products
✓ Clean the surface
✓ Produce the required profile
✓ Provide a smooth coating transition (*feathering*) without cracking or fracturing the surrounding intact coatings
✓ Blast around rotating equipment, electrical boxes, other trades
✓ Ergonomically sound

*White Metal Prep*  
*Feathered into primer*
The Sponge-Jet Process:
Cleaning or preparing a surface with pneumatic propulsion of sponge/abrasive composite particles

Sponge-Jet Media: A composite of open-cell, polyurethane foam (sponge) and abrasive

Sponge-Jet Equipment:
• Feed Unit: A modified abrasive blast unit designed to reliably blast Sponge Media. *Primary difference*: actuator in pressure vessel and screw auger below vessel - providing improved and controlled flow of media.
• Recycler: A vibratory, multi-deck classifier separates and cleans Sponge-Media for reuse.

*All Patented in the US and Europe*
Applications

Industrial Coating Maintenance
– Bridge and industrial structures
– Railcars and mass-transportation
– Water and waste-water plants
– Offshore structures
– Petrochemical facilities
– Marine vessels
– Military - ground, sea and air segments
– Food processing
– Pulp and paper mills
Applications

Abatement

– Lead abatement
– Asbestos abatement
– PCB abatement
Cleaning and Restoration
- Fire damage / soot removal
- Machine cleaning
- Parts refurbishment
- Interior and exterior wall; ceiling cleaning
Value-added Benefits

- Blast near other trades and operating equipment
- Limit over-blasting and re-work
- Increase the reliability of rotating equipment and compressors
- Reduce transportation and disposal costs by recycling
- Eliminate most risks related to surface preparation methods
Conclusion

Blast Where You Want…When You Want

www.spongejet.com