Hog Notes

A truck is only as good as its operator

Your Road Map to Continual Improvement

- Maximum Productivity
- Minimal Operational Cost
- No Surface Damage

What gets measured, gets improved

Caution:

Imagine Playing golf without an established par...

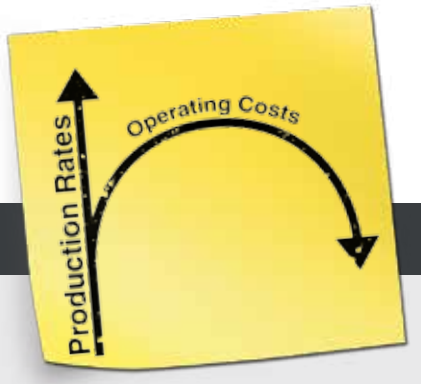
The goal of this imperfect guide is to begin to bring greater objectivity into an otherwise completely subjective industry.

Standard Production Rates - *Measure...Improve...Measure...Improve*

	12 GPM Square Feet Per Hour	6 GPM Square Feet Per Hour
Paint	3,500 - 4,800	1,750 - 2,400
Epoxy	2,600 - 3,250	1,300 - 1,625
Thermo Plastic	2,700 - 3,400	1,350 - 1,700
Tape / 3M Waffle	2,400 - 3,000	1,200 - 1,500
Cure Compound	10,000 - 12,500	5,000 - 6,250
Runway Rubber	10,000 - 20,000	5,000 - 10,000

Measured in Square feet / To calculate square meters divide by 10.76

- *These rates are routinely achieved by Experienced Licensed Operators (on single layer materials)*
- *Rates will vary dependent on material thickness, composition, age and surface underlayment.*
- *The key to continual improvement is to consistently measure your own performance against your own performance and against "par", the performance of others.*



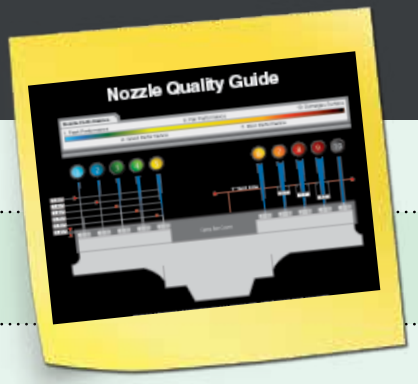
Standard Operating Costs

Waterblasting Technologies offers periodic Evaluation of your company's operating costs relative to consumables compared to Industry standards.

Model: ..... **S.O.C:** .....

Ask your Sales Rep. for the Standard Operating Cost for the model of your choice.

Tips & Tricks For Optimizing Production

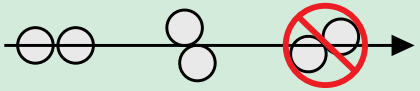


Maintain sharp cohesive nozzles (#1-4 on Nozzle Quality Guide)

Consider using a more aggressive spray bar and/or configuration if pavement condition is above a 50

The Spray bar should be no more than 2" wider than the width of the line being removed.

Position blasting heads in line or in tandem. Running with excessive overlap limits your forward speed to the area of single blast coverage while exposing the overlap areas with 2 X the needed blasting time.



Use two different widths of Spray Bars or offset heads only when removing a line with an extra heavy buildup in the middle of the line.

Recommended operating pressure is 36,000 - 40,000 psi. When performing removal on a weak surface reduce aggressiveness of nozzle configuration prior to reducing pressure. Reducing pressure is appropriate when CLEANING paint or cure compound and trying not to affect the glass bead embedded in traffic paint.

Once you are sure of 1.) PSI 2.) GPM (nozzle config) 3.) Standoff distance, Monitor removal and adjust 1.) RPM's of head 2.) Forward speed of truck "tuning" as necessary to achieve the standard production rates while maintaining a level 1-3 result according to the visual impact guide. Be sure to leave a tiny amount of marking material as this is the only indicator of max. speed / min surface impact.

Tips & Tricks For Reducing Operating Costs

Component	Life Expectancy (Avg)	Recommended Maintenance
Brushes	**40 Hours**	Change as needed to maintain vacuum. Brushes should barely tickle the surface.
Shrouds	**Approx 6 Months**	Change as needed to maintain proper distance (barely touching the surface) and when walls become too thin.
Nozzles	**16 Hours**	Check prior to your shift and when productivity is low. Change worn nozzles that are not a 1-4 quality rating. Never allow anti-seize or dirt particles to enter nozzles. Check pressure with the spraybar protectors and rotation off. Tighten nozzles as needed to insure there are NO leaks. Carefully protect the inlet with tape or plug during storage.
Spraybar Protectors	**Varies by surface type**	Check daily. Change when the protector exposes the spray bar to direct impact.
Debris Bag	**4-8 Hours**	Dump when bag approaches 3/4 full or more. Inspect prior to and at the end of your shift.
Swivel Seals	**16 Hours**	Change when blown and when water leakage exceeds 1 drop per second. Consider changing brass back-up ring and or tit if seal life is poor.
Brass Back-up Rings	**75 Hours**	Change every 4 swivel seals or when it is visibly deformed in shape or damaged.
Packings	**200 Hours**	Change only when blown. If less than life expectancy inspect Plunger and carbide back-up ring carefully and replace as needed.
Valves	**1,000 Hours**	Remove and lap every 100 hours. (1 hour job) Replace if cracked or worn beyond repair.
Plungers	**1,500 Hours**	Change when scored/scratched deep enough to feel with your fingernail.
Carbide Bushings	**300 Hours**	Change if cracked or chipped at all.
Hoses	**6 Hours**	Change when leaking becomes a pressure loss issue.
Water Filters	**8-12 Hours**	Change when discolored

Visual Impact Guide

Improve Results through Improved Awareness

Road Surface Prior To Marking Removal

Marking penetration into pavement surface

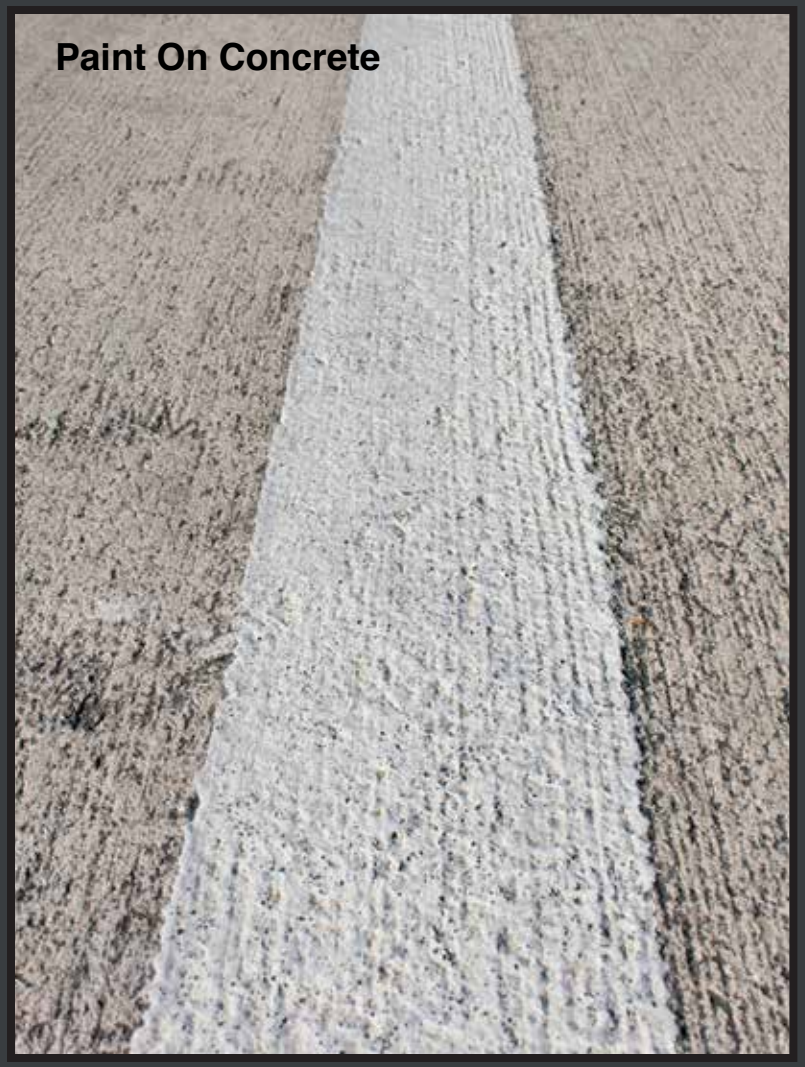
Actual Photograph

Key

Existing Marking

Aggregate

Cross Section of A/C Base


Paint On Concrete


Thermoplastic
On Asphalt

Level 1 Removal (Using UHP Waterblasting)

- The Goal: 98% removal *(2% remains)*
- No damage
- Some discoloration has occured

Limits of removal

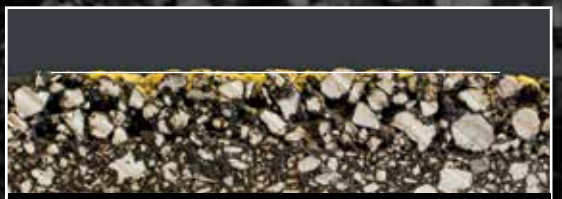
Limits of removal

Allowing 2% to remain tells the operator he has reached maximum removal speed.

Actual Photograph

Key

- **Removed Marking**
- **Impacted Area**
- **Aggregate**



Cross Section of A/C Base

Examples of Level 1 Removal

Level 2 Removal (Using UHP Waterblasting)

- Acceptable
- Minimal scarring
- Very little aggregate and fines removed

Limits of removal

Limits of removal

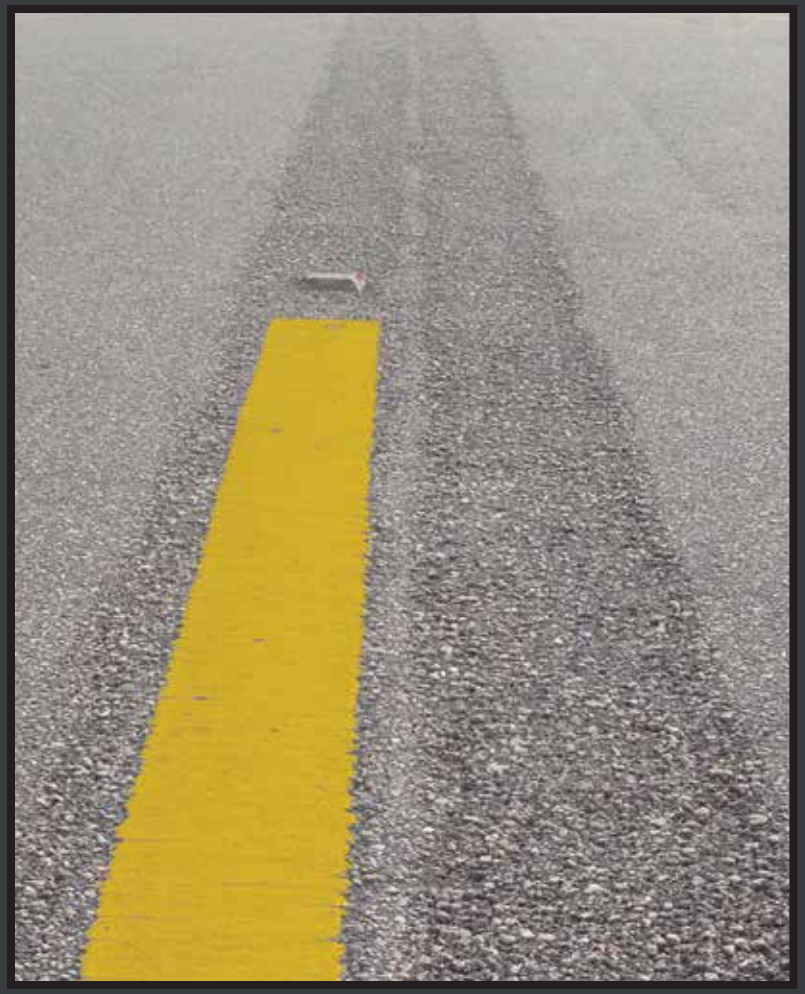
Actual Photograph

Key

- Removed Marking
- Impacted Area
- Aggregate

Cross Section of A/C Base

Examples of Level 2 Removal



Level 3 Removal (Using UHP Waterblasting)

- Moderate scarring
- Aggregate and fines have obviously been removed
- Some rutting is occurring

Limits of removal

Limits of removal

Actual Photograph

Key

- Removed Marking
- Impacted Area
- Aggregate

Cross Section of A/C Base

Examples of Level 3 Removal

Level 4 Removal (Using UHP Waterblasting)

- Unacceptable
- Call your supervisor
- Do not continue unless directed in writing by the engineer or owner

Limit of removal

Limits of removal

Actual Photograph

Key

- Removed Marking
- Impacted Area
- Aggregate

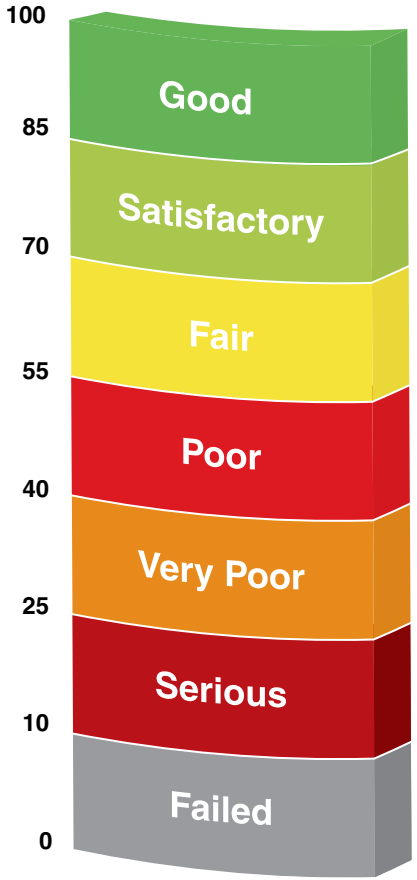
Cross Section of A/C Base

Examples of Level 4 Removal

Pavement Condition Index

The integrity of the underlying surface will have a direct affect on the ability of the operator to remove the markings while causing minimal surface impact.

Pavement Condition Index (PCI)



The impact guide is directly related to the pavement condition index as the beginning condition of the pavement is crucial to the end result.

- The PCI was developed in the late 1970's by the US Army COE.
- It is the accepted methodology used by the aviation industry, transportation civil engineering and military to visually assess pavement condition in North America and throughout the world.
- Trained and experienced inspectors gather consistent and repeatable data.

PCI 100 – Excellent

This rating indicates that the roadway shows no signs of distress

PCI 70-100 – Very Good to Excellent

This rating means that the road surface has occasional to frequent distress, but mostly limited to open cracks.

PCI 40-70 – Fair

This rating means that the road surface has occasional to frequent distress, but mostly limited to open cracks.

Level 1 removal on level 3 pavement

PCI 0 – 40 – Poor to Failed

This rating means that the road surface is frequently distressed, but can be traversed at posted speeds, albeit with a noticeably rough ride. There are numerous cracks in the pavement. Although UHP can be effective you may want to consider other methods of removal when this condition exists.

Level 4 removal on level 4 pavement

Notes

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This guide was established as a beginning point in bringing objectivity to the industry. Paint trucks don't paint crooked lines any more than waterblasting trucks damage pavement surfaces. It is our hope that the industry will come together to establish standards that will protect the rightful reputation waterblasting has earned as the leading method of removing pavement markings with minimal surface impact.