BLASTONE

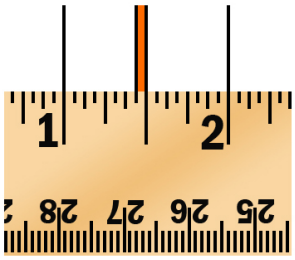
UNDERSTANDING THE TRUE COST

OF A WORN BLAST NOZZLE

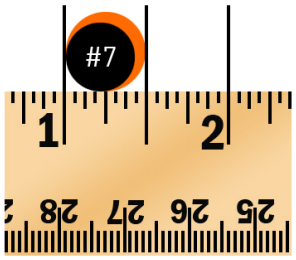
SAVE THOUSANDS!

HOW SMALL IS SIGNIFICANT?

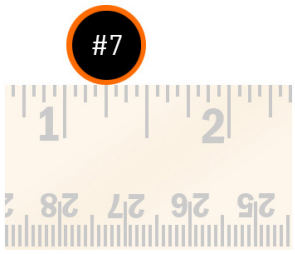
1/16 of an inch can cost you tens of thousands in wasted profits!



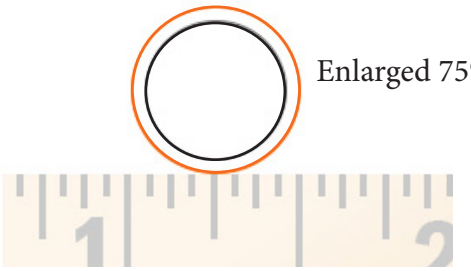
The difference between the diameter of a #7 (7/16") orifice and a #8 (1/2") orifice.



The size difference between a #7 & #8 nozzle



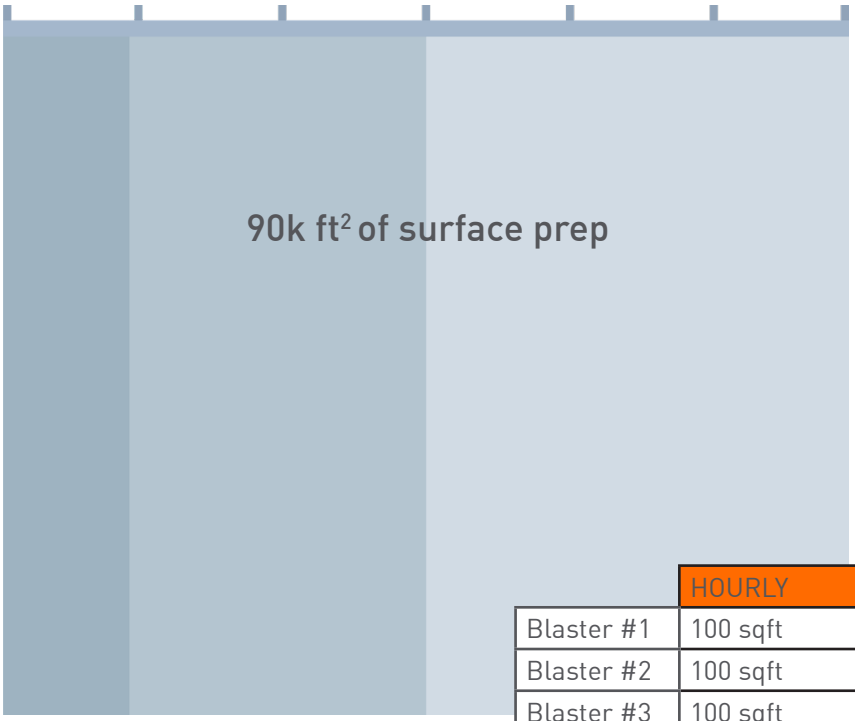
Aligned size difference between a #7 & #8 blast nozzle



The difference between the black circle and the orange circle costs companies tens of thousands in lost profits

PROVING THE COSTLY WASTE

Example Project Scenario: **Storage Tank(s)**



	HOURLY	DAILY	WEEKLY	9 WEEKS
Blaster #1	100 sqft	500 sqft	2,500 sqft	22,500 sqft
Blaster #2	100 sqft	500 sqft	2,500 sqft	22,500 sqft
Blaster #3	100 sqft	500 sqft	2,500 sqft	22,500 sqft
Blaster #4	100 sqft	500 sqft	2,500 sqft	22,500 sqft
TOTALS	**400 sqft**	**2,000 sqft**	**10,000 sqft**	**90,000 sqft**

CONTRACTOR TIMELINE EXPECTATION: 90k of surface = 9 weeks

LABOR COSTS

Labor Costs: Hourly costs including wage, insurance, payroll tax, etc

= $465/HR
(75x5)+90

Expected Schedule

- 8 hours per day
- 5 hour of nozzle time per blaster
- 5 days per week

Labor Expectations

- Minimum 100 sqft of surface prep / blaster / per hour
- 5 hours time on tools per day
- 2,000 sqft of team suface prep per day
- 10,000 sqft of team surface prep per week

CONTRACTOR PRODUCTIVITY EXPECTATION: 10,000 ft² surface prep per week

= $465/HR X 8 hours/day X 5 days/week X 9 weeks

HOURLY	DAILY	WEEKLY	9 WEEKS
$465	$3,720	$18,600	$167,400

CONTRACTOR LABOR EXPECTATION: Labor will roughly cost $167,400

EQUIPMENT COSTS

Equipment Costs: Let's suggest the ONLY equipment cost for the contractor is a 1600 cfm compressor and the diesel fuel needed to run it full bore

DAILY	WEEKLY	9 WEEKS
	$3,400	$23,800

* Not including non-use weekend costs

Approx 25 gallons/hr
@ $3.29 / gallon
X 6 hours
$494 / day

DAILY	WEEKLY	9 WEEKS
$494	$2,468	$22,208

= $23,800 + $22,208 = **$46,008**

CONTRACTOR EXPECTATION: Equipment & Fuel will roughly cost **$46,008**

ABRASIVE and DISPOSAL COSTS

The chosen abrasive will of course affect the cost and the disposal costs.

So let's establish a generic scenario for example sake.

ABRASIVE

800lbs / hour / blaster

@ $0.15 per lb

DAILY	WEEKLY	9 WEEKS
$2,400	$12,000	$108,000

DISPOSAL

$50 per ton

800lbs/hr x 5hrs x 4 blasters = 8 tons

DAILY	WEEKLY	9 WEEKS
$400	$2,000	$18,000

CONTRACTOR ABRASIVE + DISPOSAL EXPECTATION:

DAILY	WEEKLY	9 WEEKS
$2,800	$14,000	$126,000

TOTAL EXPECTED COSTS

	DAILY	WEEKLY	9 WEEKS
LABOR	$3,720	$18,600	$167,400
COMPRESSOR	N/A	$3,400	$23,800
DIESEL FUEL	$494	$2,468	$22,208
ABRASIVE	$2,400	$12,000	$108,000
DISPOSAL	$400	$2,000	$18,000
TOTALS		**$38,468**	**$339,408**

So what happens when the nozzle wears out 1/16”?

Understanding the relationship between the orifice size, cfm airflow, pressure, and efficiency is key to understanding the invisible thief stealing your profits.

Air Consumption (CFM) per Blast Nozzle Using Garnet Abrasive

Nozzle Size		Nozzle Pressure										
		50 psi	60 psi	70 psi	80 psi	90 psi	100 psi	110 psi	120 psi	130 psi	140 psi	150 psi
No.2	1/8”	14	17	19	21	24	26	28	30	32	34	37
No.3	3/16”	32	37	42	47	52	57	62	67	72	77	83
No.4	1/4”	57	66	75	84	93	103	111	119	127	136	185
No.5	5/16”	89	103	117	131	145	158	172	186	200	214	229
No.6	3/8”	129	149	169	189	209	229	249	269	289	309	330
No.7	7/16”	176	203	230	258	285	312	339	367	394	422	451
No.8	1/2”	229	265	300	336	371	407	442	478	513	549	586
No.10	5/8”	356	412	468	524	580	632	688	744	800	856	914
No.12	3/4”	516	596	676	756	836	916	996	1076	1156	1236	1318
EFFICIENCY		**47%**	**55%**	**64%**	**74%**	**86%**	**100%**	**115%**	**130%**	**145%**	**165%**	**175%**

For industrial sandblasting, 100% efficiency occurs at 100psi nozzle pressure regardless of orifice size.

Air Consumption (CFM) per Blast Nozzle Using Garnet Abrasive

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For a 1600 cfm compressor, #7's are the largest nozzles the 4 blasters can use to achieve 100% efficiency.

	BLASTER 1	BLASTER 2	BLASTER 3	BLASTER 4
Max CFM	400	400	400	400
Probable CFM	320-360	320-360	320-360	320-360

Nozzle Size		Nozzle Pressure										
		50 psi	60 psi	70 psi	80 psi	90 psi	100 psi	110 psi	120 psi	130 psi	140 psi	150 psi
No.7	7/16"	176	203	230	258	285	312	339	X	X	X	X
No.8	1/2"	229	265	300	336	X	X	X	X	X	X	X
EFFICIENCY		**47%**	**55%**	**64%**	**74%**	**86%**	**100%**	**115%**	**130%**	**145%**	**165%**	**175%**

NOTICE: Depending on hose length, blast pot piping diameter, air motor for air prep, breathing air accessories, etc... let's assume we have enough CFM left over to achieve 100psi at each #7 nozzle to achieve 100% efficiency. And this is what is driving the 10,000 ft²/week production.

Nozzle Size		Nozzle Pressure										
		50 psi	60 psi	70 psi	80 psi	90 psi	100 psi	110 psi	120 psi	130 psi	140 psi	150 psi
No.7	7/16"	176	203	230	258	285	312	X	X	X	X	X
EFFICIENCY		**47%**	**55%**	**64%**	**74%**	**86%**	**100%**	**115%**	**130%**	**145%**	**165%**	**175%**

But once the nozzle orifice increase 1/16" to #8... the highest efficiency it can reach is 74%

Nozzle Size		Nozzle Pressure										
		50 psi	60 psi	70 psi	80 psi	90 psi	100 psi	110 psi	120 psi	130 psi	140 psi	150 psi
No.8	1/2"	229	265	300	336	X	X	X	X	X	X	X
EFFICIENCY		**47%**	**55%**	**64%**	**74%**	**86%**	**100%**	**115%**	**130%**	**145%**	**165%**	**175%**

100 percent efficiency
<u>- 74 percent efficiency</u>
Equals 26 percent efficiency loss

CONTRACTOR EXPECTATION:
10,000 FT²/Week
@ 26% loss
= 7,400 FT²/Week

90,000 FT²/ 7,400 FT² = 12 WEEKS

TIMELINE HAS INCREASED FROM 9 WEEKS TO 12 WEEKS!

Extrapolating 41% decrease in productivity
increases time line, labor, equipment, fuel, abrasives and disposal.

		EXPECTED COSTS	ACTUAL COSTS
	WEEKLY	9 WEEKS	12 WEEKS
LABOR	$18,600	$167,400	$223,200
COMPRESSOR	$3,400	$23,800	$30,600
DIESEL FUEL	$2,468	$22,208	$29,616
ABRASIVE	$12,000	$108,000	$144,000
DISPOSAL	$2,000	$18,000	$24,000
TOTALS	**$38,468**	**$339,408**	**$451,416**

DIFFERENCE DUE TO EXPANDED NOZZLE ORIFICES

$112,008 EXTRA