

# Shot Peening Nozzle Performance

Flow Rate, Air Pressure, CFM, Etc.

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# Engineering Specifications

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9-67

## Nozzle Performance

FINE ABRASIVE: Glass Beads, Aluminum Oxide  
 SUCTION GUN: 3/16" Jet, 3/8" Nozzle  
 FEED VALVE: 1/8" Orifice

PSI at nozzle	20	30	40	50	60	70	80
<b>MESH SIZES</b>	<b>AIR CFM WITH ABRASIVE FLOW</b>						
All Abrasives	18	23.7	28.9	34.5	39.3	45.2	49.9
	<b>GLASS BEAD PEENING INTENSITY "N" STRIP</b>						
80	0.006	0.009	0.011	0.014	0.016	0.017	
100	0.006	0.008	0.01	0.012	0.014	0.015	
140	0.005	0.007	0.009	0.011	0.012	0.013	
200	0.005	0.006	0.008	0.009	0.01	0.011	
270	0.003	0.004	0.006	0.007	0.008	0.008	
400	0.002	0.003	0.003	0.004	0.005	0.005	
	<b>GLASS BEAD FLOW RATE: LBS/MIN.</b>						
80 thru 140	1.1	1.2	1.3	1.5	1.6	1.7	
200 thru 400	1.5	1.6	1.7	1.8	1.9	2	
	<b>ALUMINUM OXIDE FLOW RATE: LBS/MIN.</b>						
100,150		1.6	1.9	2.1	2.3	2.6	2.9
220 thru 320		1.9	2	2.2	2.3	2.5	2.6

# Engineering Specifications

X-91  
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## Nozzle Performance

### GLASS BEADS TO MILITARY SPECIFICATION: MIL-G-9954 A

FINE ABRASIVE: Glass Beads

SUCTION GUN: 3/16" Jet, 3/8" Nozzle

FEED VALVE: 1/8" Orifice

PSI at nozzle	20	30	40	50	60	70	80
BEAD SIZE	GLASS BEAD PEENING INTENSITY "A" STRIP						
3	0.004	0.006	0.007	0.009	0.011	0.013	0.015
4	0.003	0.005	0.006	0.008	0.009	0.011	0.012
5	0.002	0.004	0.005	0.006	0.007	0.008	0.01
6	0.002	0.003	0.004	0.004	0.005	0.006	0.007
7	0.002	0.002	0.003	0.004	0.005	0.005	0.006
8	0.001	0.002	0.003	0.003	0.004	0.005	0.005

#### NOTE:

#### SEE PAGE

For bead size No. 9 refer to Mesh Size 100

For bead size No. 10 refer to Mesh Size 140

For bead size No. 11 refer to Mesh Size 140 X-90

For bead size No. 12 refer to Mesh Size 200

For bead size No. 13 refer to Mesh Size 270

For actual screening sizes and tolerances X-116

# Engineering Specifications

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## Nozzle Performance

FINE ABRASIVE: Glass Beads, Aluminum Oxide

SUCTION GUN: 1/8" Jet, 5/16" Nozzle

FEED VALVE: 1/8" Orifice

PSI at nozzle	20	30	40	50	60	70	80
<b>MESH SIZES</b>	<b>AIR CFM WITH ABRASIVE FLOW</b>						
All Abrasives	8.1	10.5	12.9	15.2	17.6	20	22.3
	<b>GLASS BEAD PEENING INTENSITY "N" STRIP</b>						
80		0.003	0.004	0.006	0.007	0.009	
100		0.003	0.004	0.005	0.007	0.008	
140		0.003	0.004	0.005	0.006	0.007	
200		0.002	0.003	0.004	0.005	0.006	
270		0.002	0.003	0.004	0.005	0.006	
400		0.002	0.002	0.003	0.004	0.005	
	<b>GLASS BEAD FLOW RATE: LBS/MIN.</b>						
80 thru 140		0.6	0.7	0.9	1	1.2	
200 thru 200		0.8	1	1.1	1.3	1.4	
	<b>ALUMINUM OXIDE FLOW RATE: LBS/MIN.</b>						
100		0.5	0.9	1.2	1.6	1.9	2.3
150		0.3	0.4	0.6	0.7	0.9	1
220 thru 320		0.6	0.7	0.9	1	1.2	1.3

# Engineering Specifications

X-93  
9-67

## Nozzle Performance

FINE ABRASIVE: Glass Beads, Aluminum Oxide

PRESSURE NOZZLE: 3/16"

FEED VALVE: 3/32" Orifice

PSI at nozzle	20	30	40	50	60	70	80
<b>MESH SIZES</b>	<b>AIR CFM WITH ABRASIVE FLOW</b>						
As Below	18.5	22.5	26.5	31	35	39	43
	<b>GLASS BEAD PEENING INTENSITY "N" STRIP</b>						
80	0.015	0.019	0.021	0.023	0.024	0.025	
100	0.011	0.014	0.017	0.019	0.02	0.021	
140	0.011	0.014	0.017	0.018	0.019	0.02	
200	0.01	0.013	0.016	0.017	0.018	0.019	
270	0.007	0.01	0.012	0.013	0.014	0.014	
400	0.006	0.008	0.009	0.011	0.012	0.012	
	<b>GLASS BEAD FLOW RATE: LBS/MIN.</b>						
80 thru 400	1	1.1	1.2	1.3	1.4	1.5	
	<b>ALUMINUM OXIDE FLOW RATE: LBS/MIN.</b>						
100, 150	0.9	1	1.1	1.2	1.3	1.3	1.4
220 thru 320	1.2	1.3	1.4	1.5	1.6	1.7	1.8

# Engineering Specifications

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9-67

## Nozzle Performance

FINE ABRASIVE: Glass beads, Aluminum Oxide

PRESSURE NOZZLE: 3/16"

FEED VALVE: 1/8" Orifice

PSI at nozzle	20	30	40	50	60	70	80
<b>MESH SIZES</b>	<b>AIR CFM WITH ABRASIVE FLOW</b>						
As Below	18.5	22.5	26.5	31	35	39	43
	<b>GLASS BEAD PEENING INTENSITY "N" STRIP</b>						
80	0.013	0.016	0.019	0.021	0.022	0.022	
100	0.011	0.014	0.016	0.018	0.019	0.019	
140	0.01	0.013	0.015	0.017	0.018	0.018	
200	0.009	0.012	0.014	0.016	0.017	0.017	
270	0.006	0.008	0.01	0.011	0.012	0.013	
400	0.005	0.007	0.008	0.009	0.01	0.01	
	<b>GLASS BEAD FLOW RATE: LBS/MIN.</b>						
80 thru 400	1.9	2	2.1	2.2	2.4	2.5	
	<b>ALUMINUM OXIDE FLOW RATE: LBS/MIN.</b>						
100, 150	1.8	1.9	2		2.3	2.4	2.5
220 thru 320	2.2	2.4	2.5	2.6	2.7	2.8	3

# Engineering Specifications

X-95  
9-67

## Nozzle Performance

FINE ABRASIVE: Glass Beads, Aluminum Oxide

PRESSURE NOZZLE: 1/4"

FEED VALVE: 3/32" Orifice

PSI	20	30	40	50	60	70	80
<b>MESH SIZES</b>	<b>AIR CFM WITH ABRASIVE FLOW</b>						
As Below	28	36	44	52	60.5	68.5	76.5
	<b>GLASS BEAD PEENING INTENSITY "N" STRIP</b>						
80	0.018	0.022	0.025	0.027	0.028	0.029	
100	0.013	0.017	0.019	0.021	0.023	0.023	
140	0.012	0.016	0.018	0.02	0.022	0.022	
200	0.01	0.014	0.017	0.019	0.02	0.021	
270	0.009	0.012	0.014	0.016	0.017	0.018	
400	0.006	0.008	0.01	0.012	0.013	0.013	
	<b>GLASS BEAD FLOW RATE: LBS/MIN.</b>						
80 thru 400	1.8	2	2.2	2.4	2.5	2.7	
	<b>ALUMINUM OXIDE FLOW RATE: LBS/MIN.</b>						
100	1.6	1.8	2	2.2	2.4	2.6	2.9
150 thru 320	1.9	2.1	2.3	2.5	2.6	2.8	3

# Engineering Specifications

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9-67

## Nozzle Performance

FINE ABRASIVE: Glass Beads, Aluminum Oxide

PRESSURE NOZZLE: 1/4"

FEED VALVE: 1/8" Orifice

PSI at nozzle	20	30	40	50	60	70	80	
<b>MESH SIZES</b>	<b>AIR CFM WITH ABRASIVE FLOW</b>							
	As Below	28	36	44	52	60.5	68.5	76.5
	<b>GLASS BEAD PEENING INTENSITY "N" STRIP</b>							
	80	0.015	0.02	0.023	0.025	0.026	0.027	
	100	0.012	0.016	0.019	0.02	0.021	0.022	
	140	0.012	0.015	0.018	0.02	0.021	0.021	
	200	0.011	0.014	0.017	0.018	0.02	0.02	
	270	0.008	0.01	0.013	0.015	0.016	0.016	
	400	0.006	0.008	0.01	0.011	0.012	0.012	
	<b>GLASS BEAD FLOW RATE: LBS/MIN.</b>							
	80 thru 400	2.8	3.1	3.4	3.8	4.1	4.4	
	<b>ALUMINUM OXIDE FLOW RATE: LBS/MIN.</b>							
	100	2.7	2.9	3	3.2	3.3	3.5	3.6
	150 thru 320	3.2	3.4	3.7	3.9	4.2	4.4	4.7

# Engineering Specifications

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## Nozzle Performance

### GLASS BEADS TO MILITARY SPECIFICATION: MIL-G-9954 A

FINE ABRASIVE: Glass Beads

PRESSURE VALVE: 1/4"

FEED VALVE: 1/8" Orifice

PSI at nozzle	20	30	40	50	60	70	80
<b>BEAD SIZE</b>	<b>GLASS BEAD PEENING INTENSITY "A" STRIP</b>						
3	0.012	0.018	0.023	0.026	0.028	0.029	0.03
4	0.011	0.014	0.016	0.017	0.018	0.019	0.019
5	0.008	0.01	0.011	0.012	0.012	0.013	0.013
6	0.005	0.007	0.008	0.008	0.009	0.009	0.009
7	0.005	0.006	0.007	0.008	0.008	0.008	0.008
8	0.003	0.005	0.005	0.006	0.006	0.007	0.007

### NOTE:

### SEE PAGE

- For Bead Size No. 9 refer to Mesh Size 100
- For Bead Size No. 10 refer to Mesh Size 140
- For Bead Size No. 11 refer to Mesh Size 140
- For Bead Size No. 12 refer to Mesh Size 200
- For Bead Size No. 13 refer to Mesh Size 270

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1/4" Pressure nozzle can be used with 3/16" orifice for glass beads No.3 through No. 7.  
Peening intensities for 3/16" orifice are the same as with 1/8" orifice, coverage rate is slightly greater.

# Engineering Specifications

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## Nozzle Performance

COARSE ABRASIVE: Steel Shot  
SUCTION GUN: 3/16" Jet, 3/8" Nozzle  
FEED VALVE: 1/8" Orifice

PSI at nozzle	20	30	40	50	60	70	80
<b>SHOT SIZE</b>	<b>AIR CFM WITH ABRASIVE FLOW</b>						
All Abrasives	18	23.7	28.9	34.5	39.3	45.2	49.9
	<b>STEEL SHOT PEENING INTENSITY "N" STRIP</b>						
S-70	0.007	0.009	0.01	0.012	0.013	0.015	0.016
S-110	0.01	0.011	0.013	0.015	0.017	0.018	0.02
	<b>STEEL SHOT ABRASIVE FLOW RATE: LBS/MIN.</b>						
S-70, S-110	1.4	1.8	1.9	2.1	2.1	2.2	2.2

# Engineering Specifications

X-99  
9-67

## Nozzle Performance

COARSE ABRASIVE: Steel Shot  
SUCTION GUN: 1/8" Jet, 5/16" Nozzle  
FEED VALVE: 1/8" Orifice

PSI at nozzle	50	60	70	80
<b>SHOT SIZE</b>	<b>AIR CFM WITH ABRASIVE FLOW</b>			
All Abrasives	15.2	17.6	20	22.3
	<b>STEEL SHOT PEENING "N" STRIP INTENSITY</b>			
S-70	0.005	0.007	0.008	0.009
S-110	0.006	0.008	0.01	0.012
	<b>STEEL SHOT ABRASIVE LBS/MIN. FLOW RATE</b>			
S-70	2.2	2.7	2.9	2.9
S-110	1	1.2	1.4	1.6

# Engineering Specifications

X-100  
9-67

## Nozzle Performance

COARSE ABRASIVE: Steel Shot  
PRESSURE NOZZLE: 1/4"  
FEED VALVE: Adjustable

### COLUMN I

PSI at nozzle	20	30	40	50	60	70	80
<b>SHOT SIZE</b>	<b>AIR CFM WITH ABRASIVE FLOW</b>						
S-70 thru S-390	29.4	37.6	45.8	54.2	62.2	70.7	78.8
	<b>PEENING INTENSITY - "A" STRIP</b>						
S-70	0.006	0.009	0.011	0.012	0.014	0.014	0.015
S-110	0.006	0.009	0.011	0.013	0.014	0.015	0.016
S-170	0.01	0.014	0.016	0.018	0.02	0.021	0.021
S-230	0.012	0.016	0.019	0.021	0.023	0.024	0.025
S-330	0.014	0.018	0.022	0.024	0.026	0.025	0.027
S-390	0.014	0.019	0.023	0.025	0.027	0.028	0.029
	<b>ABRASIVE FLOW RATE: LBS/MIN.</b>						
S-70 thru S-390	4.2	5.2	6.4	7.3	8.3	9.3	10.4

COLUMN I: At maximum intensity  
COLUMN II: At maximum flow rate

### COLUMN II

20	30	40	50	60	70	80
<b>AIR CFM WITH ABRASIVE FLOW</b>						
20	26.4	33.1	39.2	46.3	52.8	59.5
<b>PEENING INTENSITY - "A" STRIP</b>						
0.004	0.006	0.007	0.008	0.009	0.01	0.01
0.004	0.006	0.008	0.009	0.01	0.011	0.011
0.008	0.01	0.013	0.015	0.016	0.017	0.018
0.009	0.012	0.015	0.017	0.018	0.019	0.02
0.011	0.015	0.018	0.02	0.021	0.022	0.023
0.011	0.015	0.018	0.02	0.022	0.023	0.024
<b>ABRASIVE FLOW RATE: LBS/MIN.</b>						
23.8	26.2	28.6	30.9	33.3	35.6	38

# Engineering Specifications

X-101  
9-67

## Nozzle Performance

COARSE ABRASIVE: Aluminum Oxide, Steel Grit

PRESSURE NOZZLE: 14"

FEED VALVE: Adjustable

### COLUMN I

PSI at nozzle	20	30	40	50	60	70	80
<b>MESH SIZES</b>							
<b>ALUMINUM OXIDE</b>	<b>AIR CFM WITH ABRASIVE FLOW</b>						
36 thru 80	25.4	31.4	37.3	43.5	49.5	55.5	61.5
	<b>ABRASIVE FLOW RATE: LBS/MIN.</b>						
36 thru 80	5.3	6.7	8.1	9.5	11	12.4	13.8
<b>STEEL GRIT</b>	<b>AIR CFM WITH ABRASIVE FLOW</b>						
G-50, G-80	24.6	32.5	40.3	47.8	55.5	63.3	71
	<b>ABRASIVE FLOW RATE: LBS/MIN.</b>						
G-50, G-80	5.9	8.5	11.2	13.8	16.5	19.1	21.8

COLUMN I: At minimum flow rate

COLUMN II: At maximum flow rate

### COLUMN II

20	30	40	50	60	70	80
<b>AIR CFM WITH ABRASIVE FLOW</b>						
20.2	24.9	29.4	34.2	38.8	43.6	48.6
<b>ABRASIVE FLOW RATE: LBS/MIN.</b>						
13.3	15	16.7	18.4	20.1	21.8	23.5
<b>AIR CFM WITH ABRASIVE FLOW</b>						
15.5	21.5	27.5	33.5	39.5	46	52
<b>ABRASIVE FLOW RATE: LBS/MIN.</b>						
18.7	21	23.4	25.8	28.1	30.5	32.8

# ENGINEERING SPECIFICATIONS

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## Nozzle Performance

COARSE ABRASIVE: Aluminum Oxide, Steel Grit

PRESSURE NOZZLE: 1/4"

FEED VALVE: Adjustable

**COLUMN III:**

At average flow rate.

### COLUMN III

<b>PSI at nozzle</b>	20	30	40	50	60	70	80
<b><u>MESH SIZES</u></b>	<b><u>ALUMINUM OXIDE</u></b>						
	<b>AIR CFM WITH ABRASIVE FLOW</b>						
36 thru 80	22.8	28.2	33.4	38.4	44.2	49.1	55.1
	<b>ABRASIVE FLOW RATE: LBS/MIN.</b>						
36 thru 80	9.3	10.9	12.4	14	15.6	17.1	18.7
	<b><u>STEEL GRIT</u></b>						
	<b>AIR CFM WITH ABRASIVE FLOW</b>						
G-50, G-80	20.1	27	38.9	40.7	47.5	54.2	61.5
	<b>ABRASIVE FLOW RATE: LBS/MIN.</b>						
G-50, G-80	12.3	14.8	17.3	18.8	22.3	24.8	27.3

# Engineering Specifications

X-103  
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## Nozzle Performance

COARSE ABRASIVE: Steel Shot  
PRESSURE NOZZLE: 5/16"  
FEED VALVE: Adjustable

### COLUMN I

PSI at nozzle	20	30	40	50	60	70	80
<b><u>SHOT SIZES</u></b>							
	<b>AIR CFM WITH ABRASIVE FLOW</b>						
S-70 thru S-390	43.9	56.5	69.4	81.7	95	106.9	119.5
	<b>PEENING INTENSITY - "A" STRIP</b>						
S-70	0.007	0.01	0.012	0.014	0.015	0.016	0.017
S-110	0.007	0.01	0.013	0.015	0.017	0.018	0.018
S-170	0.014	0.018	0.021	0.022	0.024	0.024	0.025
S-230	0.016	0.02	0.023	0.026	0.027	0.028	0.028
S-330	0.017	0.022	0.026	0.028	0.03	0.031	0.032
S-390	0.018	0.024	0.027	0.03	0.032	0.033	0.034
	<b>ABRASIVE FLOW RATE: LBS/MIN.</b>						
S-70 thru S-390	7.6	8.8	9.9	11.1	11.9	13.4	14.4

COLUMN I: At maximum intensity  
COLUMN II: At maximum flow rate

### COLUMN II

20	30	40	50	60	70	80
<b>AIR CFM WITH ABRASIVE FLOW</b>						
25.9	34.9	43.7	52.6	61.8	70.5	79.4
<b>PEENING INTENSITY - "A" STRIP</b>						
0.004	0.005	0.006	0.007	0.007	0.008	0.008
0.004	0.006	0.007	0.008	0.009	0.009	0.009
0.006	0.008	0.01	0.012	0.013	0.014	0.015
0.009	0.012	0.015	0.017	0.019	0.02	0.02
0.01	0.013	0.016	0.018	0.02	0.021	0.022
0.012	0.015	0.018	0.02	0.022	0.023	0.023
<b>ABRASIVE FLOW RATE: LBS/MIN.</b>						
41.1	45.7	50.2	54.2	59.2	63.7	58.2

# Engineering Specifications

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## Nozzle Performance

COARSE ABRASIVE: Aluminum Oxide, Steel Grit

PRESSURE NOZZLE: 5/16"

FEED VALVE: Adjustable

### COLUMN I

PSI at nozzle	20	30	40	50	60	70	80
<b>MESH SIZES</b>	<b>AIR CFM WITH ABRASIVE FLOW</b>						
<b>ALUMINUM OXIDE</b>							
36 thru 80	32.7	42.7	52.4	62	72	81.9	91.7
	<b>ABRASIVE FLOW RATE: LBS/MIN.</b>						
36 thru 80	8.9	10.8	12.7	14.7	16.7	18.6	20.6
<b>STEEL GRIT</b>	<b>AIR CFM WITH ABRASIVE FLOW</b>						
G-50, G-80	36	48	60.3	72.3	84.3	96.5	108.5
	<b>ABRASIVE FLOW RATE: LBS/MIN.</b>						
G-50, G-80	11.1	13.9	16.7	19.5	22.2	24.9	27.7

COLUMN I: At minimum flow rate

COLUMN II: At maximum flow rate

### COLUMN II

20	30	40	50	60	70	80
<b>AIR CFM WITH ABRASIVE FLOW</b>						
26.5	34.8	43	51	59.3	67.6	76
<b>ABRASIVE FLOW RATE: LBS/MIN.</b>						
19.7	23.9	28.1	32.4	36.6	40.8	45
<b>AIR CFM WITH ABRASIVE FLOW</b>						
25	34	43	52	61	70	79
<b>ABRASIVE FLOW RATE: LBS/MIN.</b>						
29.9	34.9	39.9	44.9	50	55	60

# Engineering Specifications

X-105  
9-67

## Nozzle Performance

COARSE ABRASIVE: Aluminum Oxide, Steel Grit  
PRESSURE NOZZLE: 5/16"  
FEED VALVE: Adjustable

COLUMN III:  
At average flow rate

### COLUMN III

PSI at nozzle	20	30	40	50	60	70	80
<b><u>MESH SIZES</u></b>	<b><u>ALUMINUM OXIDE</u></b>						
	<b>AIR CFM WITH ABRASIVE FLOW</b>						
36 thru 80	28.6	38.8	47.7	56.5	65.7	74.8	83.9
	<b>ABRASIVE FLOW RATE: LBS/MIN.</b>						
36 thru 80	14.3	17.4	20.4	23.6	26.7	29.7	32.8
	<b><u>STEEL GRIT</u></b>						
	<b>AIR CFM WITH ABRASIVE FLOW</b>						
G-50, G-80	30.5	41	51.7	62.2	72.7	83.3	93.8
	<b>ABRASIVE FLOW RATE: LBS/MIN.</b>						
G-50, G-80	20.5	24.4	28.3	32.2	36.1	40	43.9

# Engineering Specifications

X-106  
9-67

## Nozzle Performance

COARSE ABRASIVE: Steel Shot  
PRESSURE NOZZLE: 3/8"  
FEED VALVE: Adjustable

### COLUMN I

PSI at nozzle	20	30	40	50	60	70	80
<b>SHOT SIZE</b>	<b>AIR CFM WITH ABRASIVE FLOW</b>						
S-70 thru S-390	58	70	92	109	127	142	158.5
	<b>PEENING INTENSITY - "A" STRIP</b>						
S-70	0.006	0.009	0.011	0.012	0.014	0.014	0.015
S-110	0.006	0.009	0.011	0.013	0.014	0.015	0.016
S-170	0.01	0.014	0.016	0.018	0.02	0.021	0.021
S-230	0.012	0.016	0.019	0.021	0.023	0.024	0.025
S-330	0.014	0.018	0.022	0.024	0.026	0.026	0.027
S-390	0.014	0.019	0.023	0.025	0.027	0.028	0.029
	<b>ABRASIVE FLOW RATE: LBS/MIN.</b>						
S-70 thru S-390	10	11.5	13.1	14.3	15.3	17	16.2

COLUMN I: At maximum intensity

COLUMN II: At maximum flow rate

### COLUMN II

20	30	40	50	60	70	80
<b>AIR CFM WITH ABRASIVE FLOW</b>						
31.5	43	54	65	75.5	87	98.5
<b>PEENING INTENSITY - "A" STRIP</b>						
0.004	0.006	0.007	0.008	0.009	0.01	0.01
0.004	0.006	0.008	0.009	0.01	0.011	0.011
0.008	0.01	0.013	0.015	0.016	0.017	0.018
0.009	0.012	0.015	0.017	0.018	0.019	0.02
0.011	0.015	0.018	0.02	0.021	0.022	0.023
0.011	0.015	0.018	0.02	0.022	0.023	0.024
<b>ABRASIVE FLOW RATE: LBS/MIN.</b>						
57	65	71.8	78	85	91	98.3

# Engineering Specifications

X-107  
9-67

## Nozzle Performance

COARSE ABRASIVE: Aluminum Oxide, Steel Grit

PRESSURE NOZZLE: 3/8"

FEED VALVE: Adjustable

### COLUMN I

PSI at nozzle	20	30	40	50	60	70	80
<b><u>MESH SIZES</u></b>	<b>AIR CFM WITH ABRASIVE FLOW</b>						
<b><u>ALUMINUM OXIDE</u></b>	<b>ABRASIVE FLOW RATE: LBS/MIN.</b>						
36 thru 80	40	54.5	67	79.5	94	107.5	120.5
36 thru 80	12.3	14.9	17	19.6	22.5	24.7	27.8
<b><u>STEEL GRIT</u></b>	<b>AIR CFM WITH ABRASIVE FLOW</b>						
G-50, G-80	47	63.5	80	97	113.5	128.5	145
G-50, G-80	16.1	18.8	22	25	27.8	30.2	33.2

COLUMN I: At minimum flow rate

COLUMN II: At maximum flow rate

### COLUMN II

20	30	40	50	60	70	80
<b>AIR CFM WITH ABRASIVE FLOW</b>						
32	44.5	56.5	69.5	79	90.5	102.5
<b>ABRASIVE FLOW RATE: LBS/MIN.</b>						
25.6	32.3	39.8	46.4	52.5	59.8	66
<b>AIR CFM WITH ABRASIVE FLOW</b>						
34.5	46	58	70	82	93.5	105.5
<b>ABRASIVE FLOW RATE: LBS/MIN.</b>						
40.9	48.1	55.8	64	71.2	78.8	86.6

# Engineering Specifications

X-108  
9-67

## Nozzle Performance

COARSE ABRASIVE: Aluminum Oxide, Steel Grit

PRESSURE NOZZLE: 3/8"

FEED VALVE: Adjustable

COLUMN III:

At average flow rate

### COLUMN III

PSI at nozzle	20	30	40	50	60	70	80
<b>MESH SIZES</b>	<b>ALUMINUM OXIDE</b>						
	<b>AIR CFM WITH ABRASIVE FLOW</b>						
36 thru 80	36	49.5	61.8	79.5	86.5	99	111.5
	<b>ABRASIVE FLOW RATE: LBS/MIN.</b>						
36 thru 80	19	23.6	28.4	33	37.5	42.3	46.9
	<b>STEEL GRIT</b>						
	<b>AIR CFM WITH ABRASIVE FLOW</b>						
G-50, G-80	40.8	54.8	69	83.5	97.8	111	125.3
	<b>ABRASIVE FLOW RATE: LBS/MIN.</b>						
G-50, G-80	28.5	33.5	38.9	44.5	49.5	54.5	59.9

# Engineering Specifications

X-109  
9-67

## Nozzle Performance

COARSE ABRASIVE: Steel Shot  
PRESSURE NOZZLE: 1/2"  
FEED VALVE: Adjustable

### COLUMN I

PSI at nozzle	20	30	40	50	60	70	80
<b>SHOT SIZES</b>							
	<b>AIR CFM WITH ABRASIVE FLOW</b>						
S-70 thru S-390	87	111	138.5	165	192.5	212.5	238
	<b>PEENING INTENSITY - "A" STRIP</b>						
S-70	0.006	0.009	0.011	0.012	0.014	0.014	0.015
S-110	0.008	0.009	0.011	0.013	0.014	0.015	0.016
S-170	0.01	0.014	0.016	0.018	0.02	0.021	0.021
S-230	0.012	0.016	0.019	0.021	0.023	0.024	0.025
S-330	0.014	0.018	0.022	0.024	0.026	0.026	0.027
S-390	0.014	0.019	0.023	0.025	0.027	0.028	0.029
	<b>ABRASIVE FLOW RATE: LBS/MIN.</b>						
S-70 thru S-390	15.8	17.8	19.8	21	22.4	24.4	25.6

COLUMN I: At maximum intensity

COLUMN II: At maximum flow rate

### COLUMN II

20	30	40	50	60	70	80
<b>AIR CFM WITH ABRASIVE FLOW</b>						
44	80	75	90.5	104.5	121	138
<b>PEENING INTENSITY - "A" STRIP</b>						
0.004	0.006	0.007	0.008	0.009	0.01	0.01
0.004	0.006	0.008	0.009	0.01	0.011	0.011
0.008	0.01	0.013	0.015	0.016	0.017	0.018
0.009	0.012	0.015	0.017	0.018	0.019	0.02
0.011	0.015	0.018	0.02	0.021	0.022	0.023
0.011	0.015	0.018	0.02	0.022	0.023	0.024
<b>ABRASIVE FLOW RATE: LBS/MIN.</b>						
90	103.6	115.2	125.2	136.1	146.5	159.2

# Engineering Specifications

X-110  
9-67

## Nozzle Performance

COARSE ABRASIVE: Aluminum Oxide, Steel Grit

PRESSURE NOZZLE: 1/2"

FEED VALVE: Adjustable

### COLUMN I

PSI at nozzle	20	30	40	50	60	70	80
<b>MESH SIZES</b>							
<b>ALUMINUM OXIDE</b>	<b>AIR CFM WITH ABRASIVE FLOW</b>						
36 thru 80	54	77	96.5	116.5	138	160.5	179.5
	<b>ABRASIVE FLOW RATE: LBS/MIN.</b>						
36 thru 80	19	23	25.6	29.5	33.8	36.4	41.8
<b>STEEL GRIT</b>	<b>AIR CFM WITH ABRASIVE FLOW</b>						
G-50, G-80	69	94.5	119.6	146	171	193	219
	<b>ABRASIVE FLOW RATE: LBS/MIN.</b>						
G-50, G-80	26.2	28.9	32.1	36.1	38.7	41.2	44.9

COLUMN I: At minimum flow rate

COLUMN II: At maximum flow rate

### COLUMN II

20	30	40	50	60	70	80
<b>AIR CFM WITH ABRASIVE FLOW</b>						
43.5	64	83	104	119	137.5	156.5
<b>ABRASIVE FLOW RATE: LBS/MIN.</b>						
37.9	49.9	63	74.5	85	98	109
<b>AIR CFM WITH ABRASIVE FLOW</b>						
54	70	88	107	124.5	141.5	159.5
<b>ABRASIVE FLOW RATE: LBS/MIN.</b>						
62.9	75.3	88	102.4	114.9	127.5	141

# Engineering Specifications

X-111  
9-67

## Nozzle Performance

COARSE ABRASIVE: Aluminum Oxide, Steel Grit  
PRESSURE NOZZLE: 1/2"  
FEED VALVE: Adjustable

COLUMN III:  
At average flow rate

### COLUMN III

PSI at nozzle	20	30	40	50	60	70	80
<b><u>MESH SIZES</u></b>	<b><u>ALUMINUM OXIDE</u></b>						
	<b>AIR CFM WITH ABRASIVE FLOW</b>						
36 thru 80	48.8	70.5	89.8	110.3	128.5	149.5	168
	<b>ABRASIVE FLOW RATE: LBS/MIN.</b>						
36 thru 80	28.5	36.5	44.3	52	59.4	67.2	75.4
G-50, G-80	<b><u>STEEL GRIT</u></b>						
	<b>AIR CFM WITH ABRASIVE FLOW</b>						
G-50, G-80	62.5	82.3	103.8	126.5	147.8	167.3	189.8
	<b>ABRASIVE FLOW RATE: LBS/MIN.</b>						
G-50, G-80	44.6	52.1	60.1	69.3	76.8	84.4	93

# Engineering Specifications

X-112  
9-67

## AIR FLOW IN CUBIC FEET PER MINUTE

### PRESSURE AT NOZZLE - POUNDS PER SQUARE INCH

	20	30	40	50	60	70	80	90	100
1/8	8.1	10.5	12.9	15.2	17.6	20	22.3	24.7	27
5/32	12.6	16.5	20.2	23.9	27.5	31.2	34.9	38.2	44.7
3/16	18	23.7	28.9	34.5	39.3	45.2	49.9	55.2	60.8
7/32	25	32.4	39.5	46.7	54	61.3	68.4	75	82.8
1/4	32.4	42	51.7	61.2	70.4	79.8	89.3	98.7	108.2
9/32	41	53.5	65.2	77	89.3	100.8	113.4	123.9	136.5
5/16	50.6	65.9	80.6	95.3	110.3	125	139.7	153.3	169.1
11/32	61.2	78.8	97.5	115.4	133.4	151.2	169.1	184.8	204.8
3/8	72.5	94.5	115.5	136.5	158.6	179.6	200.6	221.6	243.6
13/32	85.1	111.3	136.5	160.7	186.9	211.1	236.3	258.3	285.6
7/16	98.7	129.2	157.5	186.9	216.3	244.7	273	300	330.8
13/32	85.1	111.3	136.5	160.7	186.9	211.1	236.3	258.3	285.6
7/16	98.7	129.2	157.5	186.9	216.3	244.7	273	300	330.8
15/32	113.4	149.1	181.7	214.2	247.8	281.4	314	344.4	380.1
1/2	129.2	169.1	205.8	243.6	281.4	319.2	357	394.8	432.6
9/16	163.8	214.2	261.5	308.7	357	404.3	451.5	495.6	547.1
5/8	202.7	264.6	322.4	382.2	441	499.8	558.6	616.4	675.2
11/16	244.7	319.2	389.6	461	533.4	603.8	665.7	741.3	816.9
3/4	290.9	380.1	464.1	548.1	634.2	719.3	803.3	885.2	971.3
7/8	406.9	517.7	631.1	745.5	863.1	976.5	1054.2	1202.3	1324.1
1	518.7	677.3	824.3	976.5	1123.5	1275.8	1428	1575	1729.4
HP/CFM	0.081	0.103	0.122	0.137	0.153	0.168	0.182	0.192	0.207

**GLASS BEAD SIZES**  
**MILITARY SPECIFICATION: MIL-G-9954 A**

<u>Bead Number</u>	<u>SIZE</u>	<u>SCREEN APERTURE</u>
1	All pass 10 mesh	0.0787
	85% retained on 14 mesh	0.0555
	Maximum 5% through 20 mesh	0.0331
2	All pass 12 mesh	0.0661
	85% retained on 20 mesh	0.0331
	Maximum 5% through 30 mesh	0.0234
3	All pass 14 mesh	0.0555
	85% retained on 30 mesh	0.0234
	Maximum 5% through 40 mesh	0.0165
4	All pass 20 mesh	0.0331
	85% retained on 40 mesh	0.0165
	Maximum 5% through 50 mesh	0.0117
5	All pass 30 mesh	0.0234
	85% retained on 50 mesh	0.0117
	Maximum 5% through 60 mesh	0.0098
6	All pass 40 mesh	0.0165
	85% retained on 70 mesh	0.0083
	Maximum 5% through 80 mesh	0.007
7	All pass 50 mesh	0.0117
	85% retained on 80 mesh	0.007
	Maximum 5% through 100 mesh	0.0059
8	All pass 60 mesh	0.0098
	85% retained on 100 mesh	0.0059
	Maximum 5% through 120 mesh	0.0049
9	All pass 70 mesh	0.0083
	85% retained on 120 mesh	0.0049
	Maximum 5% through 140 mesh	0.0041
10	All pass 80 mesh	0.007
	85% retained on 170 mesh	0.0035
	Maximum 5% through 200 mesh	0.0029
11	All pass 100 mesh	0.0059
	85% retained on 200 mesh	0.0029
	Maximum 5% through 230 mesh	0.0025
12	All pass 120 mesh	0.0049
	85% retained on 230 mesh	0.0025
	Maximum 5% through 325 mesh	0.0017
13	All pass 140 mesh	0.0041
	85% retained on 325 mesh	0.0017
	Maximum 5% through 400 mesh	0.0015

Note: Sieve aperture tolerances are U.S. Standard fine.

Apertures:  
 0.0787 to 0.046 are +/- 3%  
 0.039 to 0.0117 are +/- 5%  
 0.007 to 0.0015 are +/- 6%

**CAST STEEL GRIT SIZES**

**SAE RECOMMENDED PRACTICE**

<b><u>GRIT NO.</u></b>	<b><u>SIZE</u></b>	<b><u>SCREEN APERTURE</u></b>
G-10	All pass 7 mesh 80% retained on 10 mesh Maximum 10% through 12 mesh	0.111 0.0787 0.0661
G-12	All pass 8 mesh 80% retained on 12 mesh Maximum 10% through 14 mesh	0.0937 0.0661 0.0555
G-14	All pass 10 mesh 80% retained on 14 mesh Maximum 10% through 16 mesh	0.0787 0.0555 0.0469
G-16	All pass 12 mesh 75% retained on 16 mesh Maximum 15% through 18 mesh	0.0661 0.0469 0.0394
G-18	All pass 14 mesh 75% retained on 18 mesh Maximum 15% through 25 mesh	0.0555 0.0394 0.028
G-25	All pass 16 mesh 70% retained on 25 mesh Maximum 20% through 40 mesh	0.0469 0.028 0.0165
G-40	All pass 18 mesh 70% retained on 40 mesh Maximum 20% through 50 mesh	0.0394 0.0165 0.0117
G-50	All pass 25 mesh 65% retained on 50 mesh Maximum 25% through 80 mesh	0.028 0.0117 0.007
G-80	All pass 40 mesh 65% retained on 80 mesh Maximum 25% through 120 mesh	0.0165 0.007 0.0049
G-120	All pass 50 mesh 60% retained on 120 mesh Maximum 30% through 200 mesh	0.0117 0.0049 0.0029
G-200	All pass 80 mesh 55% retained on 200 mesh Maximum 35% through 325 mesh	0.007 0.0029 0.0017
G-325	All pass 120 mesh 20% retained on 325 mesh	0.0049 0.0017

NOTE: Sieve Aperture Tolerances are  
Apertures:  
0.111 to 0.046 are +/- 3%  
0.039 to 0.0117 are +/- 5%  
0.007 to 0.0017 are +/- 6%

## CAST STEEL SHOT SIZES

### SAE RECOMMENDED PRACTICE

<u>GRIT NO.</u>	<u>SIZE</u>	<u>SCREEN APERTURE</u>
1320	All pass 4 mesh 90% retained on 6 mesh Maximum 3% through 7 mesh	0.187 0.132 0.111
1110	All pass 5 mesh 90% retained on 7 mesh Maximum 3% through 8 mesh	0.157 0.111 0.0937
930	All pass 6 mesh 90% retained on 8 mesh Maximum 3% through 10 mesh	0.132 0.0937 0.0787
780	All pass 7 mesh 85% retained on 10 mesh Maximum 3% through 12 mesh	0.111 0.0787 0.0661
660	All pass 8 mesh 85% retained on 12 mesh Maximum 3% through 14 mesh	0.0937 0.0661 0.0555
550	All pass 10 mesh 85% retained on 14 mesh Maximum 3% through 16 mesh	0.0787 0.0555 0.0469
460	All pass 10 mesh 80% retained on 16 mesh Maximum 4% through 18 mesh	0.0787 0.0469 0.0394
390	All pass 12 mesh 80% retained on 18 mesh Maximum 4% through 20 mesh	0.0661 0.0394 0.0331
330	All pass 14 mesh 80% retained on 20 mesh Maximum 4% through 25 mesh	0.0555 0.0331 0.028
230	All pass 18 mesh 75% retained on 30 mesh Maximum 3% through 35 mesh	0.0394 0.0234 0.0197
170	All pass through 80 mesh 75% retained on 40 mesh Maximum 3% through 45 mesh	0.0331 0.0165 0.0138
110	All pass 30 mesh 70% retained on 50 mesh Maximum 10% through 80 mesh	0.0234 0.0117 0.007
70	All pass 40 mesh 70% retained on 80 mesh Maximum 10% through 120 mesh.	0.0165 0.007 0.0049
NOTE:	Sieve Aperture Tolerances are U.S. Apertures: 0.187 to 0.046 are +/- 3% 0.039 to 0.0117 are +/- 5% 0.007 to 0.0017 are +/- 6%	.

# Engineering Specifications

X-119  
9-67

## ABRASIVE DENSITY

### COARSE ABRASIVES (80 mesh and coarser)

<u>ABRASIVE</u>	<u>SOLID DENSITY</u> <u>Lbs/Cu. Ft.</u>	<u>BULK DENSITY</u> <u>Lbs./Cu. Ft.</u>
Steel Shot	488	280
Steel Grit	488	230
Aluminum Oxide	240	150
Garnet	280	130
Sand	-	100
Walnut Shell	-	40
Glass Beads	155	90
Garnet	280	110
Aluminum Oxide	240	125

# Engineering Specifications

X-120  
9-67

## ABRASIVE BREAKDOWN LOSS PER NOZZLE AT 80 PSI: LBS/HR.

ABRASIVE	NOZZLE SIZE: INCHES					
	3/16	1/4	5/16	3/8	7/16	1/2
Steel Grit or Shot	1.5	2	3	5	6	8
Chilled Cast Iron	3	4	7	9	12	14
Aluminum Oxide	30	60	105	150	195	240
Garnet	80	155	270	390	500	620
Walnut Shell	25	50	85	120	155	190
Sand (NO recovery)	500	900	1200	1700	2200	3000

# Engineering Specifications

X-121  
9-67

## ABRASIVE CLEANING RATE

(INDEPENDENT of Nozzle Size or Pressure)

### COARSE ABRASIVES (80 mesh and coarser)

Steel Grit	10 pounds/ sq. ft.
Aluminum Oxide	6 pounds/ sq. ft.

### FINE ABRASIVES (100 mesh and finer - - Dry Honer machines only)

	<u>PRESSURE</u> <u>MACHINE</u>	<u>SUCTION MACHINE</u>
Aluminum Oxide	3.6 pounds/ sq. ft.	9 pounds/ sq. ft.
Glass Beads	5.4 pounds/sq. ft.	7 pounds/sq. ft.

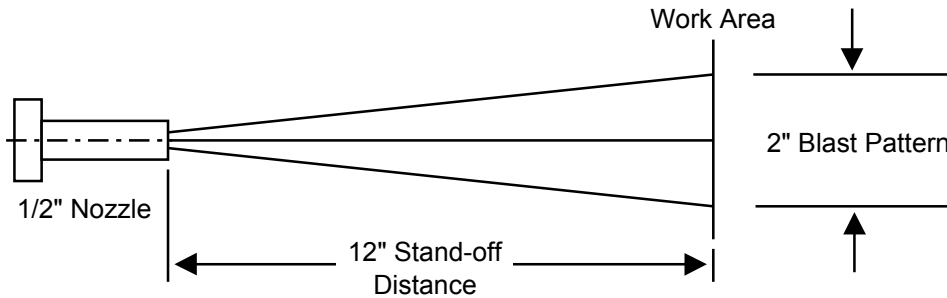
### NOTE:

To find cleaning rate in square feet/minute use the following formula:

$$\frac{\text{Flow Rate}}{\text{Cleaning Rate}} = \frac{\text{pounds/minute}}{\text{pounds/sq.ft.}} = \frac{\text{square feet}}{\text{minute}}$$

## NOZZLE PATTERN WIDTH

Blast patterns are determined by:  $1/8$  distance from work area plus the diameter of the nozzle.



### EXAMPLE:

12" distance away from work area:

$$1/8 \times 12" + 1/2" = 1 1/2" + 1/2" = 2"$$

### SELECTION OF BLAST HOSE SIZE

Nozzle area to hose area should be ratio 1 to 9.

Example:  $5/16"$  nozzle area .0767 sq. in.

Hose area should be  $.0767 \times 9$  or .6903 sq. in. or 1" hose next commercial size.

### NOZZLE DIAMETER

### HOSE ID

1/8" bore	3/8"
5/32" bore	1/2"
3/16" bore	1/2"
1/4" bore	3/4"
5/16" bore	1"
3/8" bore	1" to 1-1/4"
7/16" bore	1-1/4"
1/2" bore	1-1/4" to 1-1/2"
Three nozzles 1/4"	1-1/4"
Three nozzles 5/16"	1-1/2"