

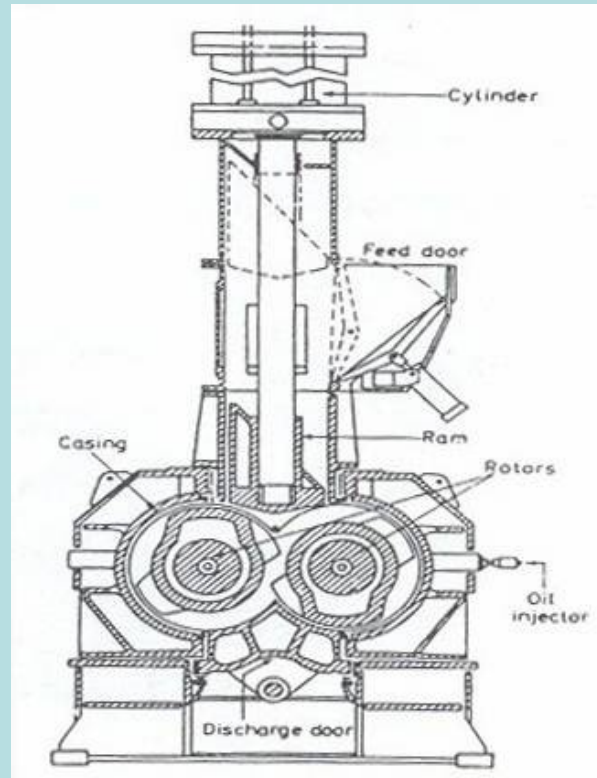


# Tire & Rubber Industry



## MAC

### Mixer Ram Optimization





# Tire & Rubber Industry

---



## Application

The purpose of the ram is to create pressure on the rubber forcing the rubber ingredients into the rotors of the mixer. Effective mixing does not start until such time as the pressure on the ram exceeds for forces generated by the rubber. Therefore, anything that is done to reduce the time to get “on pressure” reduces mix times.



# Tire & Rubber Industry

---



## Application

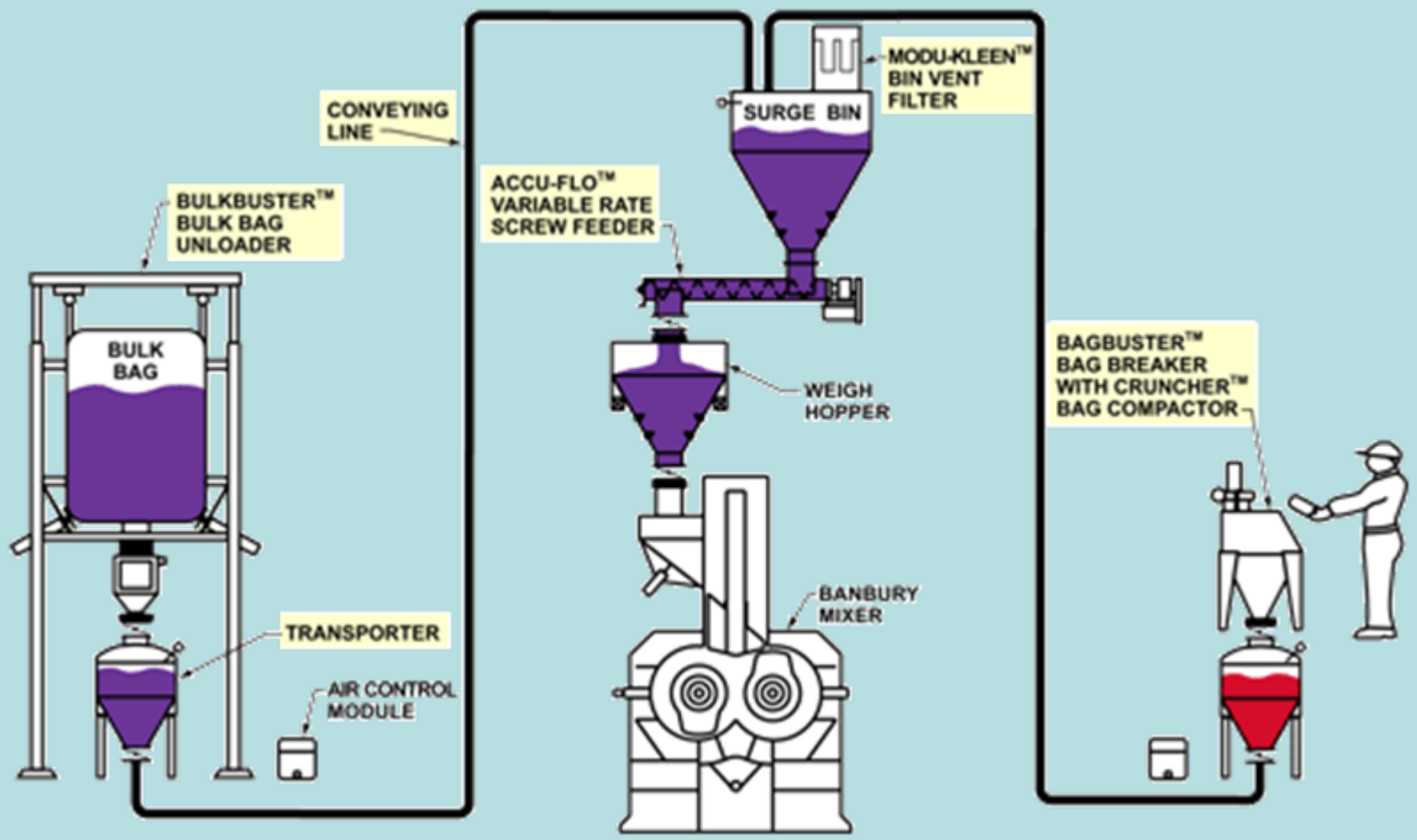
The industry standards are hydraulic and pneumatic rams. Within the pneumatic ram sector, which is the largest, a 2-½ inch Ross Series 27 valves or a 2-inch Sinclair Collins diaphragm valve is commonly used. Typically a three-way valve is used to raise and lower the ram. Ram pressures are adjusted via a manual regulator or a POR. The air is lubricated and filtered



# Tire & Rubber Industry



## Application





# Tire & Rubber Industry

---



## Problem

The main performance issues are:

- Lack of supply volumes
- Piping configurations and restrictions
- Regulator and filter restrictions
- Cv's of the valves selected



# Tire & Rubber Industry

---

## Opportunity



Reduce mixing time by reducing the cycle time of the ram. In addition, offer compressed air savings, higher reliability and reduced valve cost.

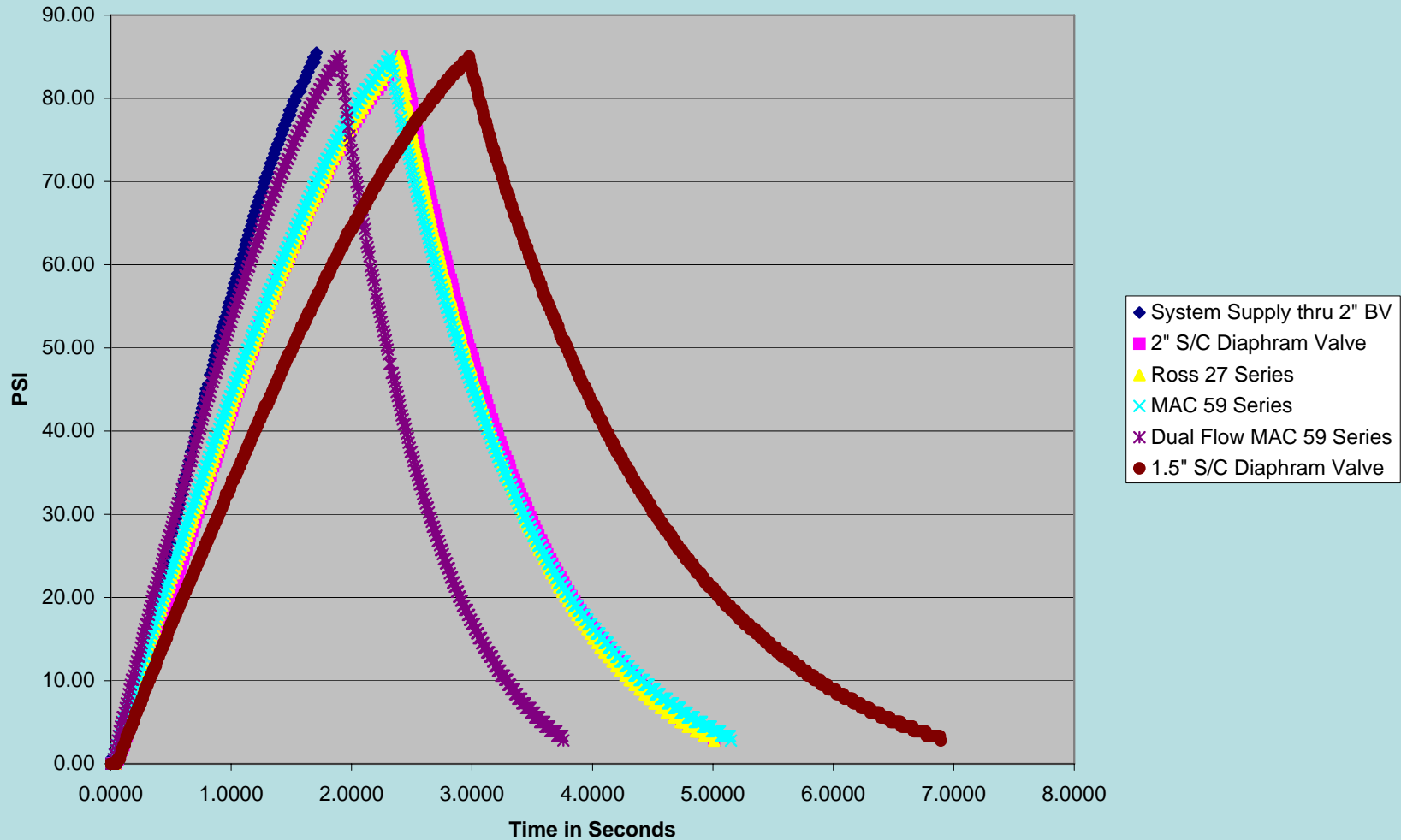


# Tire & Rubber Industry



## Valve Flow Testing Results

Time to Fill a 14 cu ft tank

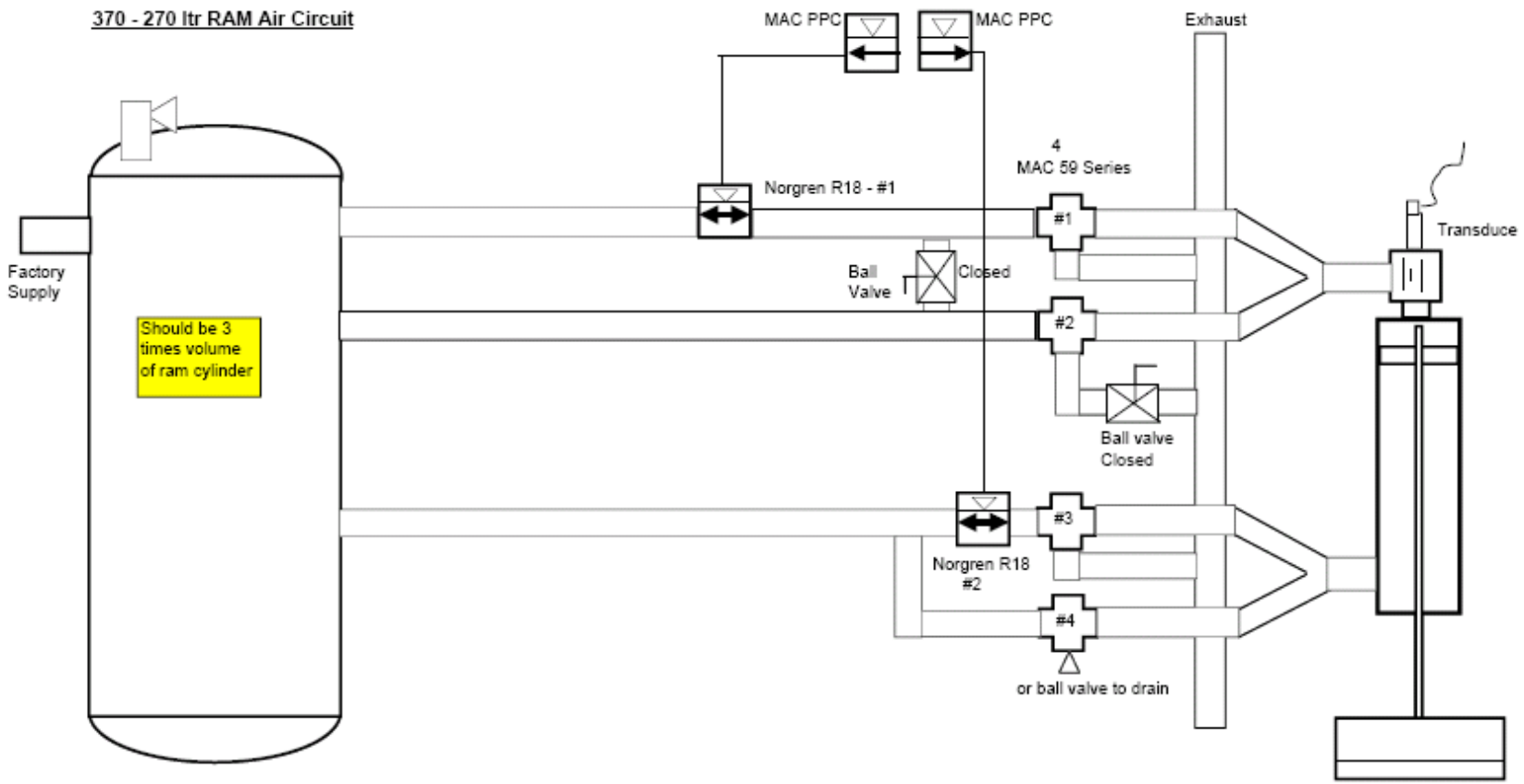




# Tire & Rubber Industry Solution



370 - 270 ltr RAM Air Circuit

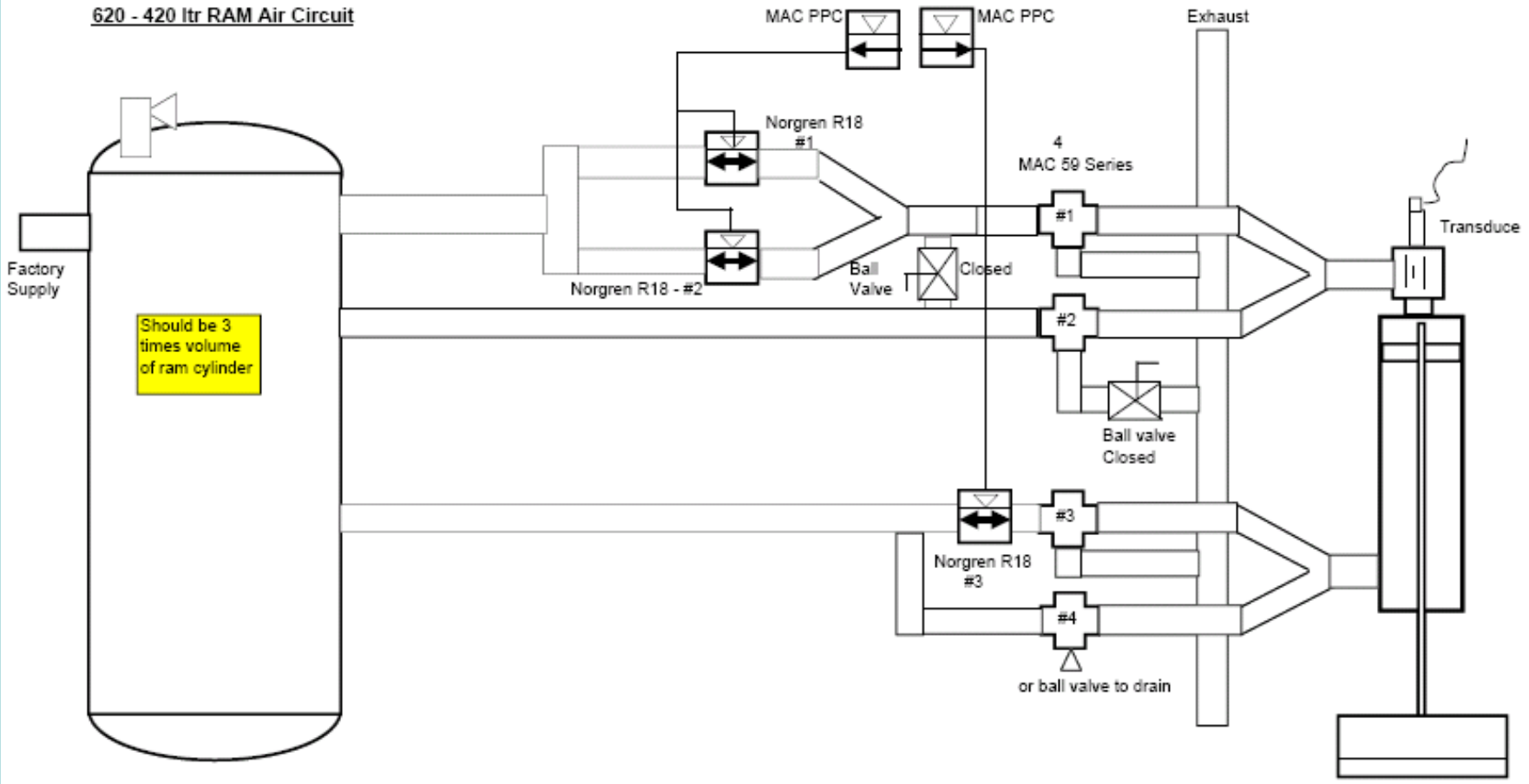




# Tire & Rubber Industry Solution



620 - 420 ltr RAM Air Circuit





# Tire & Rubber Industry Solution



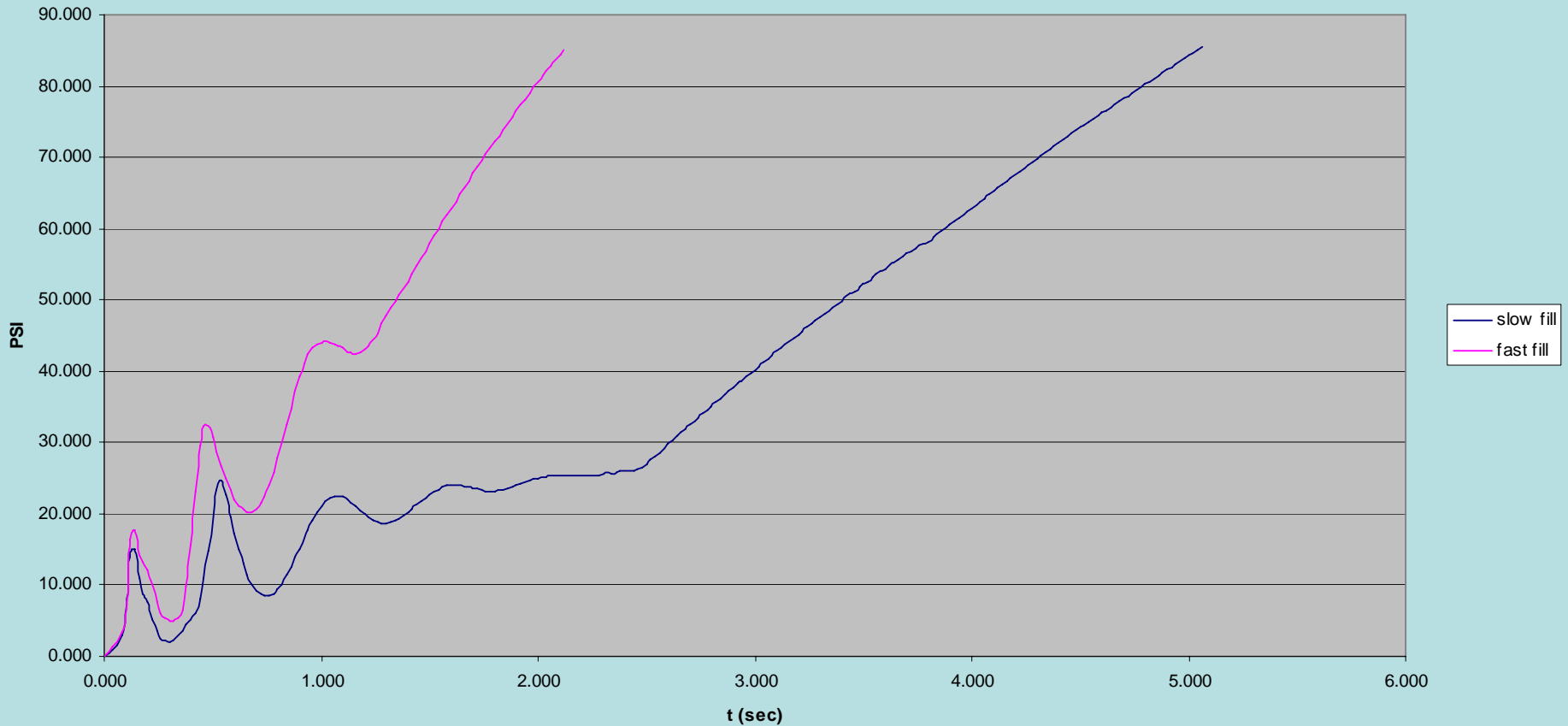


# Tire & Rubber Industry



## Solution

F270 Ram Pressure





# Tire & Rubber Industry



## Solution

### Benefit Of Reduced Ram Cycle Times

**CHANGE ONLY THE BLUE NUMBERS**

No. of Mixers	2
No. of Batches per 8 Hrs(all mixers)	700
Avg. No. of Batches per Mixer per 8 Hrs	350
Avg. Time per Batch in seconds	82.3
Batches per 24 hours	2,100
No. of Batches per 350 days	735,000

<u>Potential Gain from Reduced Ram Cycle Time</u>		<u>Gain</u>	
<u>Potential Savings per Ram Cycle in Seconds</u>	3.0		
<u>Avg No. of Ram Cycles per Batch ??</u>	1		
New No. of Batches per 8 Hrs(all mixers)	726	26	batches
New Avg. No. of Batches per Mixer per 8 Hrs	363	13	batches
New Avg Cycle per Batch in seconds	79.3	3.0	seconds
New Batches per 24 hours	2,179	79	batches
New No. of Batches per 350 days	762,811	27,811	batches

Calc Table			
24hrs x 60 min. x 60 seconds =	86400	seconds	
8 hrs x 60 min. x 60 seconds =	28800	seconds	





# Tire & Rubber Industry



## Solution

### RESULTS – Air Saving Leakage

100 PSI Leak		Rs Cost of Compressed Air per 1000 cu.ft.
Leak Dia.	cu.ft./mo.	<u>0.20</u>
0.03	45,508	9.10
0.06	182,272	36.45
0.13	740,210	148.04
0.25	2,920,841	584.17

If your cost per 1000 cu.ft. is different than blue cost, enter the amount and the costs will adjust automatically.

25 PSI Leak		Rs Cost of Compressed Air per 1000 cu.ft.
Leak Dia.	cu.ft./mo.	<u>0.20</u>
0.03	11,377	2.28
0.06	45,568	9.11
0.13	185,053	37.01
0.25	730,210	146.04

You can Change the Blue PSI Leak number at the LEFT to any reduced pressure you desire.

Leak Size in Inches	6.35mm 0.25"	3.3mm 0.13"	1.5mm 0.06"	0.76mm 0.03"
100 PSI Air Loss Cost for 1 year =	7,010.02	1,776.50	437.45	109.22
25 PSI Air Loss Cost for 1 year =	1,752.50	444.13	109.36	27.30
<b>Cost Savings per Year =</b>	<b>5,257.51</b>	<b>1,332.38</b>	<b>328.09</b>	<b>81.91</b>



# Tire & Rubber Industry Solution

---



## Bill of Materials

QTY	Part #
4	59C-33-XXXX
2	PPC5C-AAA-MGEB-CBB-EE

Total MAC Dollars - \$3000



# Tire & Rubber Industry

---

## Specialists



Steve William – MDN

[swlpe@aol.com](mailto:swlpe@aol.com)

Dick McKee – MDN

[radickmckee@aol.com](mailto:radickmckee@aol.com)

Mike McCormick – MAC

[mike.mccormick@macvalves.com](mailto:mike.mccormick@macvalves.com)