

# Tack Coat

**Problems and Solutions**





Since 1898





**Asphalt Distributors**



**Asphalt Transports**



**Live Bottom Trailers**



**Chip Spreaders**



**Heavy Duty Trailers**

**E. D. Etnyre & Co. [www.etnyre.com](http://www.etnyre.com) 800-995-2116 email: [sales@etnyre.com](mailto:sales@etnyre.com)**

# 2017

## ASPHALT QUALITY MANAGEMENT SYSTEM



**MATERIALS AND TESTS UNIT**  
Asphalt QMS Manual



MISSISSIPPI  
17 949 L





# *Successful Tack Coat*

The Ultimate Goal:

Uniform, complete, and adequate coverage





# Slippage Failure



# *Types of Tack Coat Failures*

Delamination of overlay from underlying pavement



**Safe Operation  
Results From  
Knowledge of  
Materials and  
Equipment**



# ASPHALT

OIL WELL

CRUDE OIL



REFINERY

ASPHALT CEMENT

WATER

EMULSION PLANT

GAS

DIESEL

LUBRICATING OILS

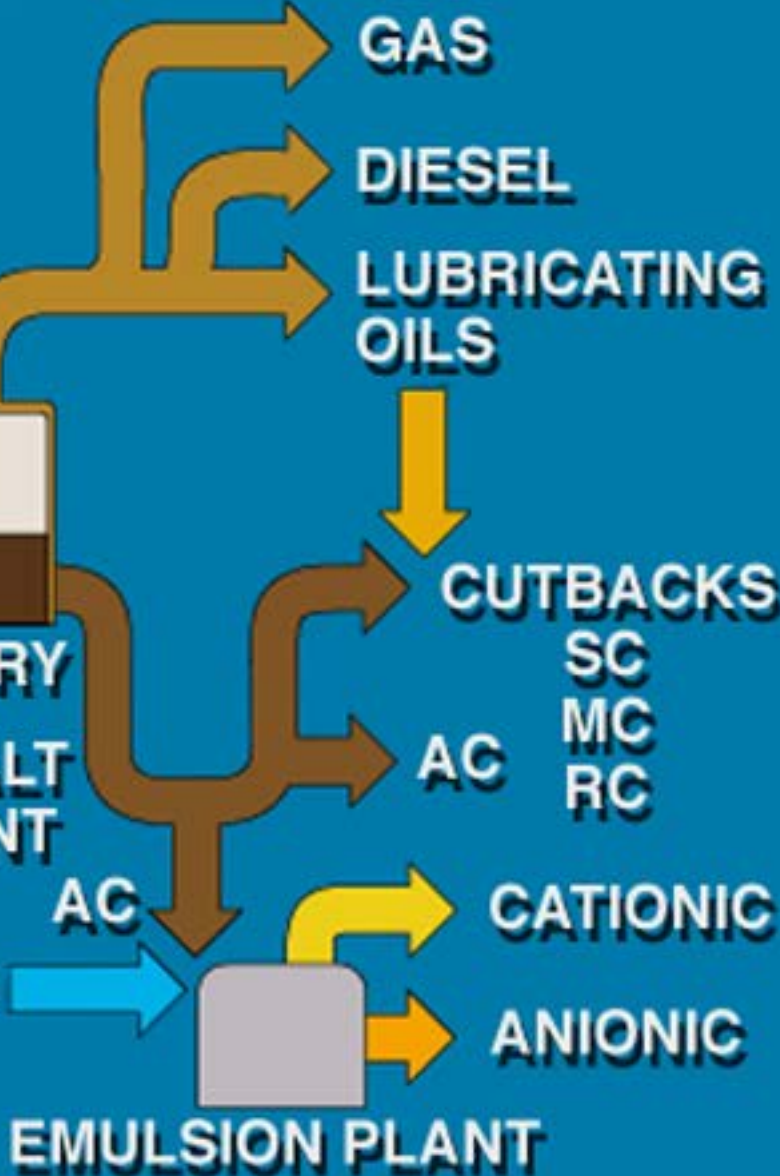
CUTBACKS

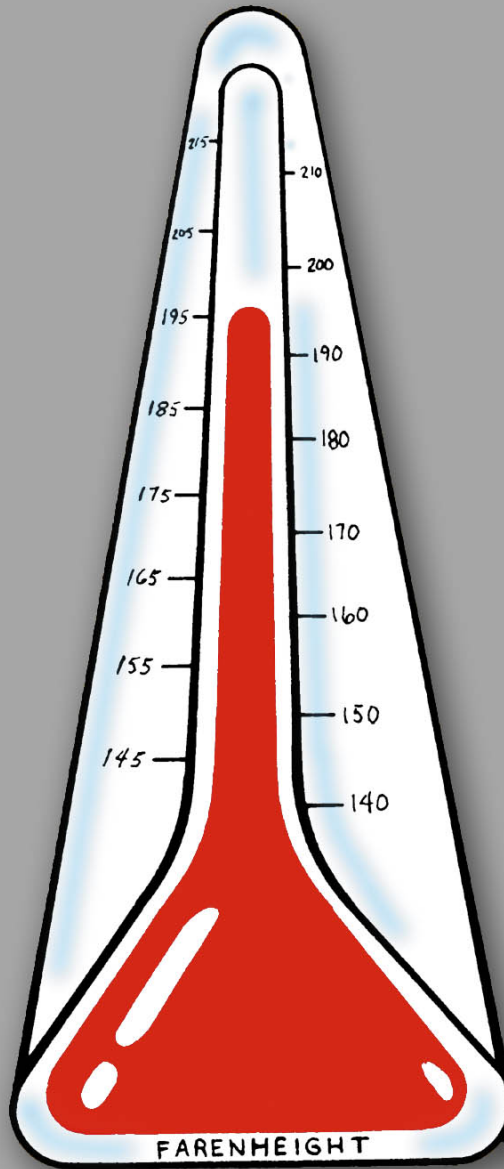
SC  
MC  
RC

AC

CATIONIC

ANIONIC





# ASPHALT CEMENT

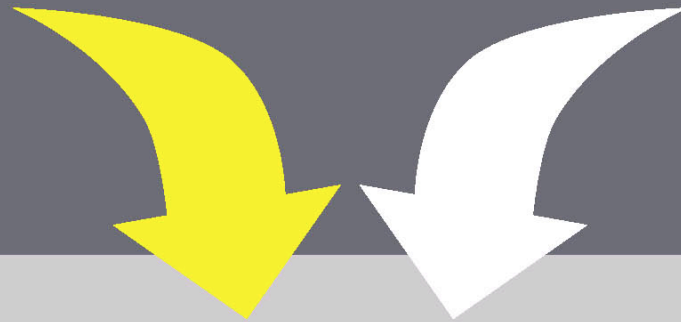
AC

325° – 400°

Multiple Grades

# CUT BACKS

**AC**



**FUEL**

- DIESEL
- BENZENE
- NAPHTHA

**SC, MC, RC**

# EMULSIONS

AC

WATER  
SOAP



ANIONIC

CATIONIC

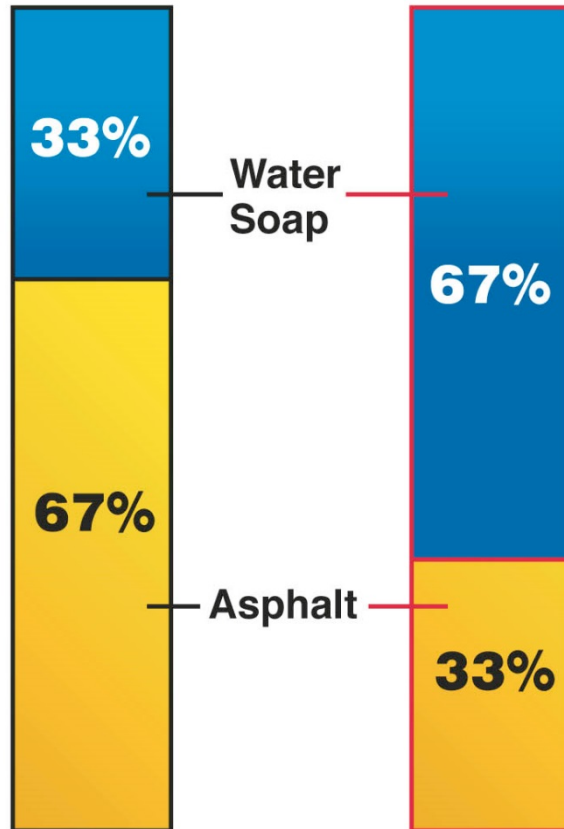








## EMULSION



## 50/50

**SHOT  
RATE**

**RESIDUAL**

$$0.05 = 0.034$$

$$0.075 = 0.05$$

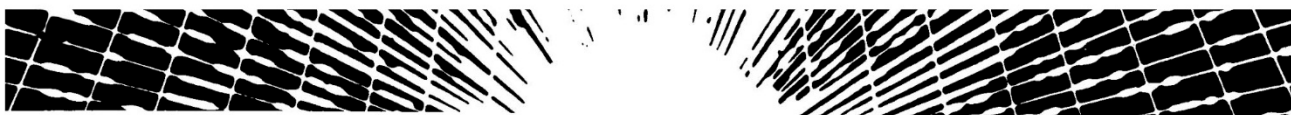
$$0.05 = 0.017$$

$$0.15 = 0.05$$

**TABLE 2—GUIDE FOR LOADING ASPHALT PRODUCTS**

Last Product In Tank	Product to be Loaded			
	Asphalt Cement	Cutback Asphalt	Cationic Emulsion	Anionic Emulsion
Asphalt Cement	OK to Load	OK to Load	Empty to no Measurable Quantity	Empty to no Measurable Quantity
Cutback Asphalt	Empty*	OK to Load	Empty to no Measurable Quantity	Empty to no Measurable Quantity
Cationic Emulsion	Empty*	Empty to no Measurable Quantity	OK to Load	Empty to no Measurable Quantity
Anionic Emulsion	Empty*	Empty to no Measurable Quantity	Empty to no Measurable Quantity	OK to Load
Crude Petroleum and residual fuel oils	Empty*	Empty to no Measurable Quantity	Empty to no Measurable Quantity	Empty to no Measurable Quantity
Any product not listed above	Tank must be cleaned	Tank must be cleaned	Tank must be cleaned	Tank must be cleaned

\* Any material remaining will produce dangerous conditions





**Proper Clothing — MSDA Sheets**



Let's Be  
**SAFE**

# Basic Functions

1. Fill the tank.
  2. Heat material in tank.
  3. Circulate material in tank.
  4. Circulate material in spray bar.
  5. Spray a metered amount of material.
  6. Handspray.
  7. Suck-back material from spray bar.
  8. Wash out.
  9. Transfer / unload.
- 
-



**FILL**

**Top load**

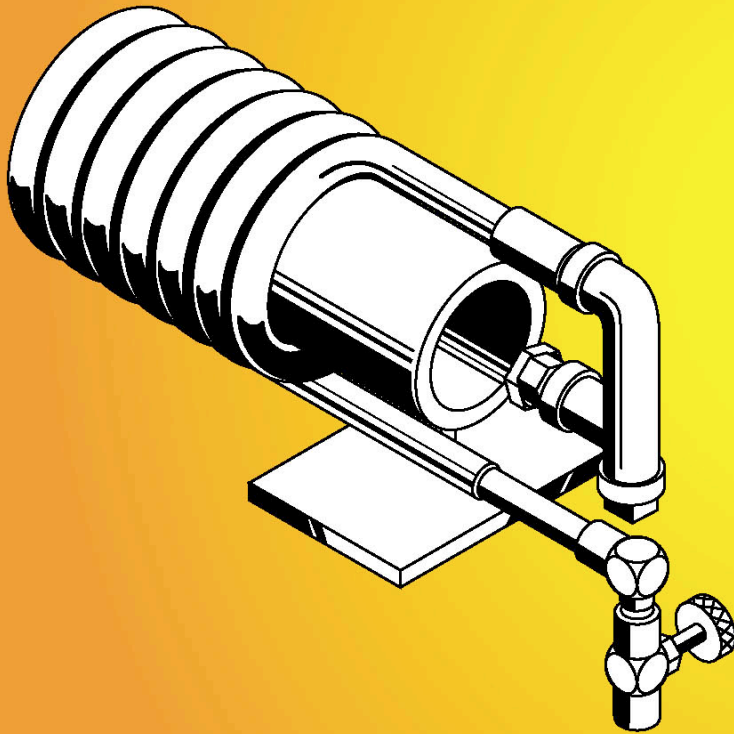


**Load with Pump**

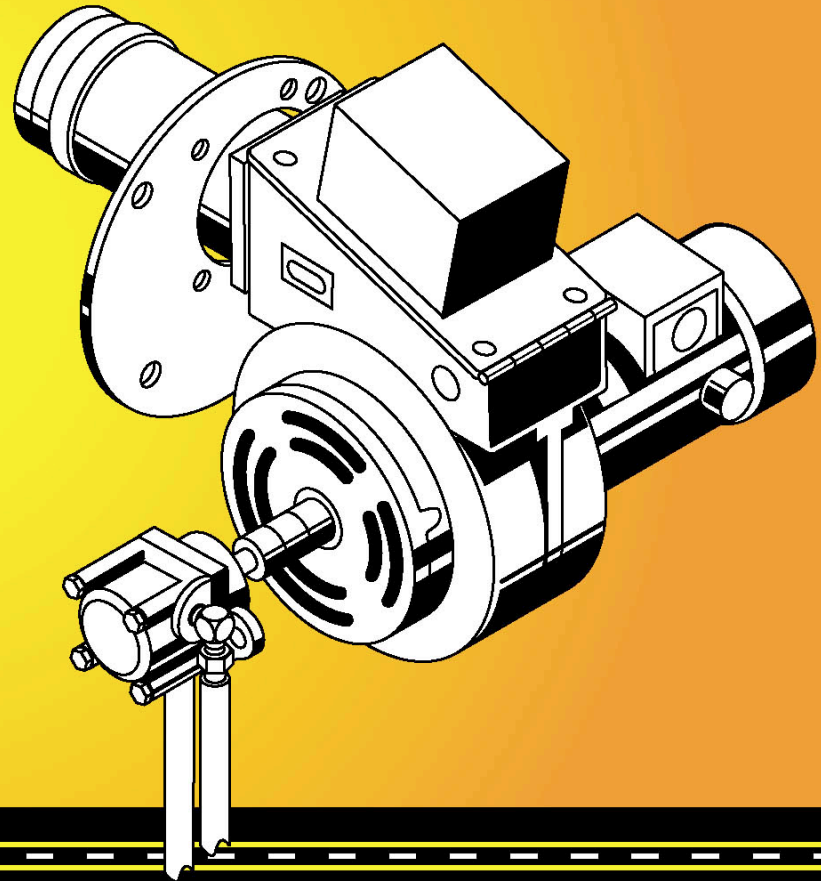


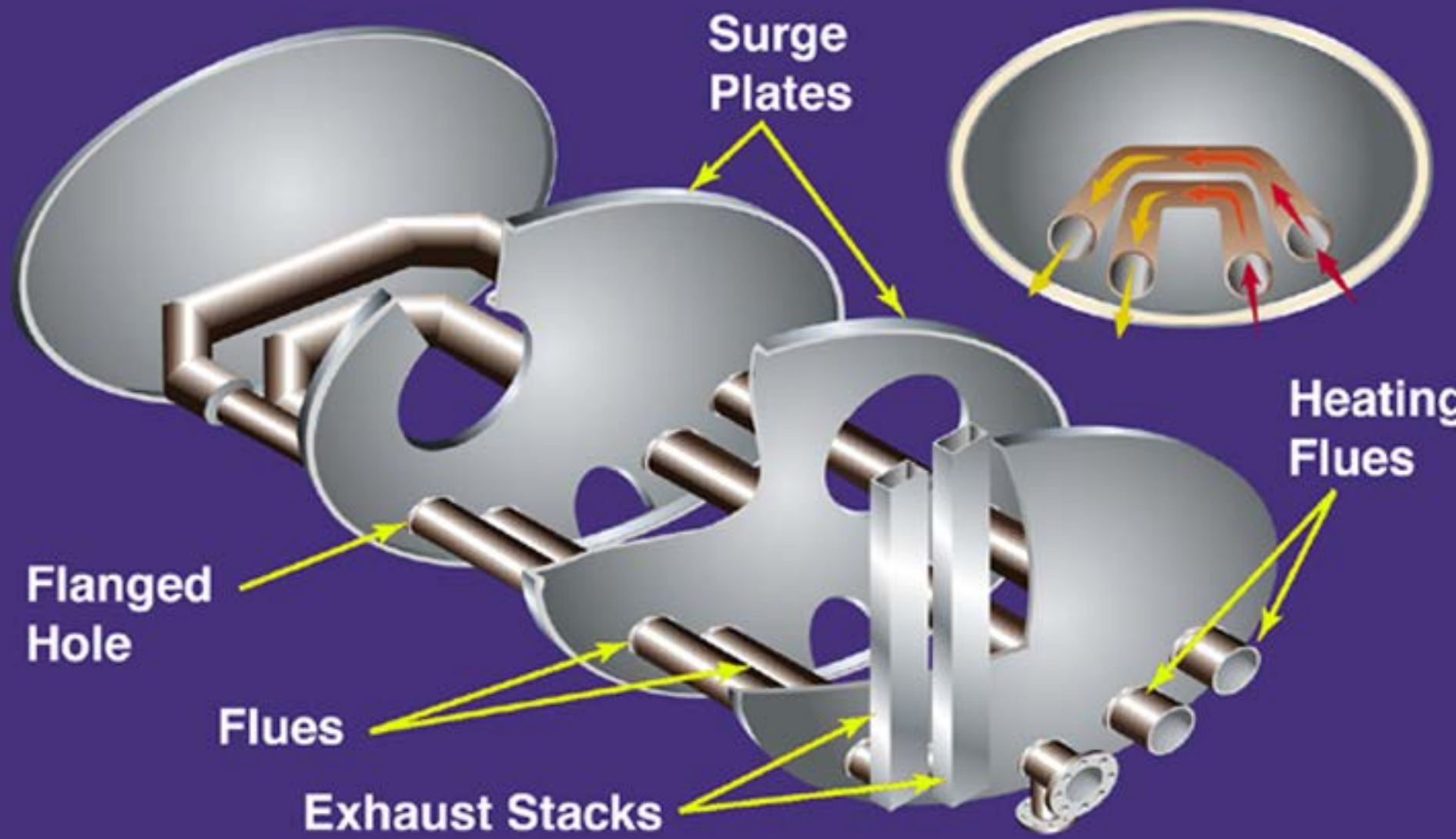
# BURNERS

LPG

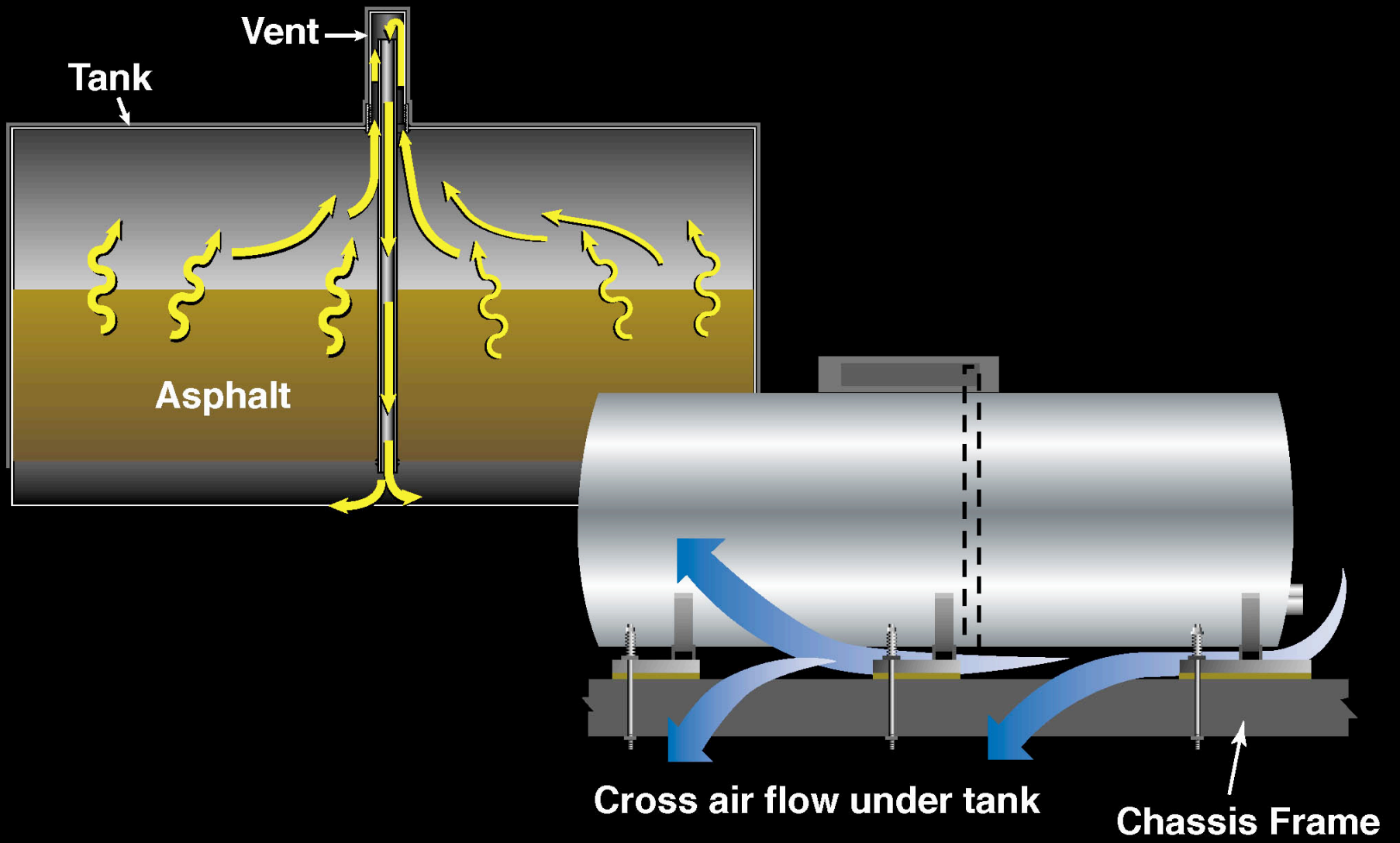


Fuel Oil







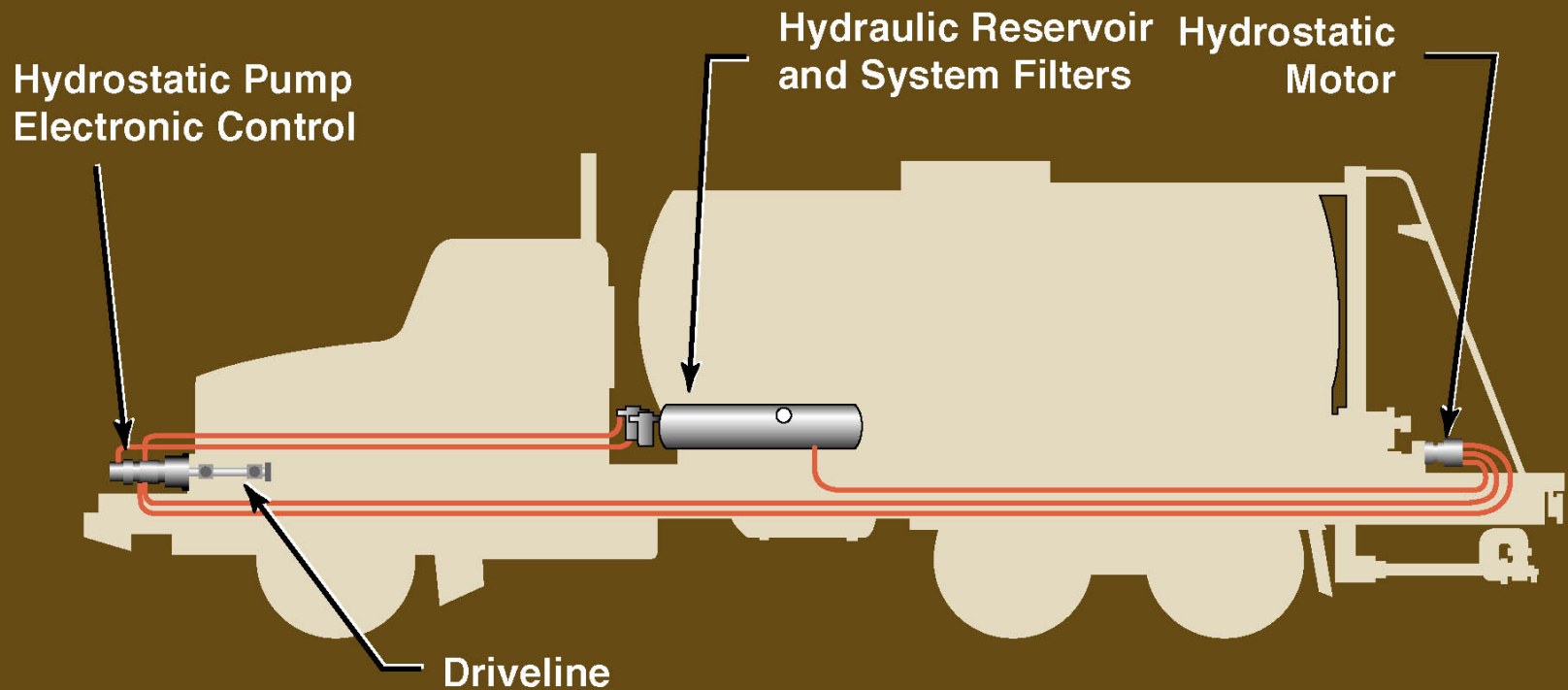


# HEATING TIPS

- Knowledge of operation and material
  - Fire extinguisher
  - Vent broadside to wind
  - Flues covered
  - Attend to burners
  - Circulate material in tank
-



# Hydrostatic Drive







**FPM**

**GPM**

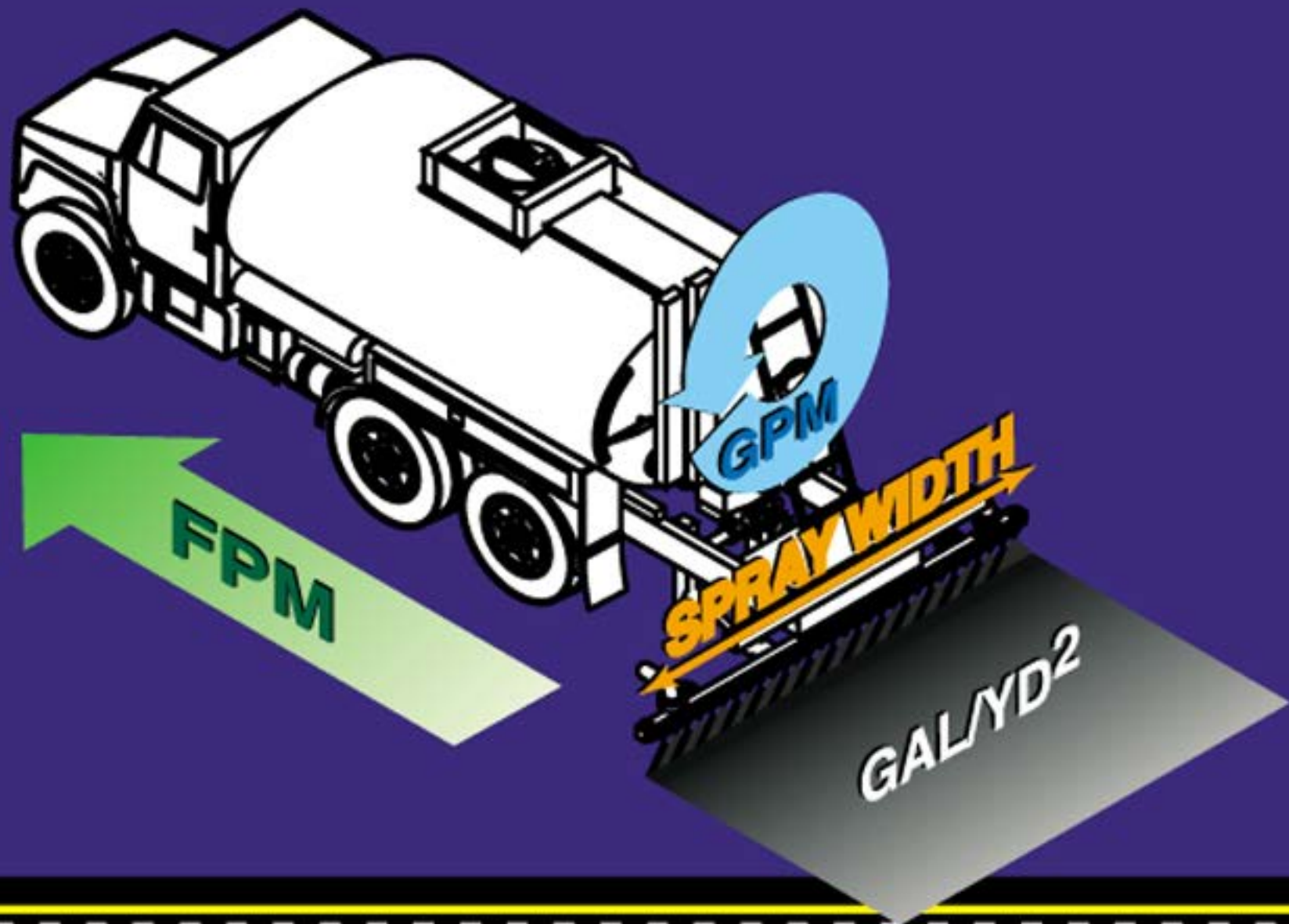


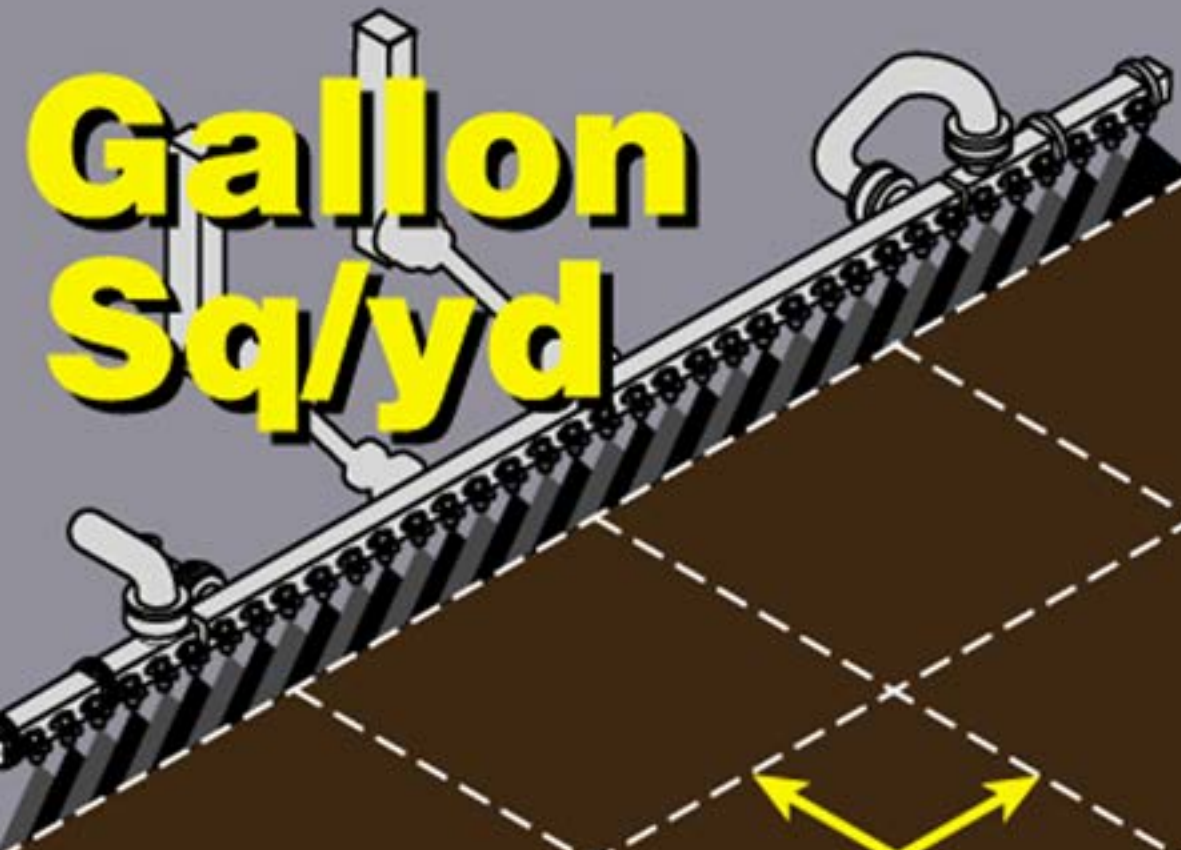


# Metering System

Four important features need to be considered:

- 1) Desired Application Rate - Gallon/Yard
- 2) Forward Ground Speed - Feet Per Minute
- 3) Asphalt Pump Output - Gallons Per Minute
- 4) Width of Spray - Feet



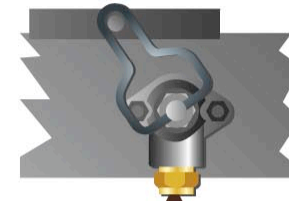
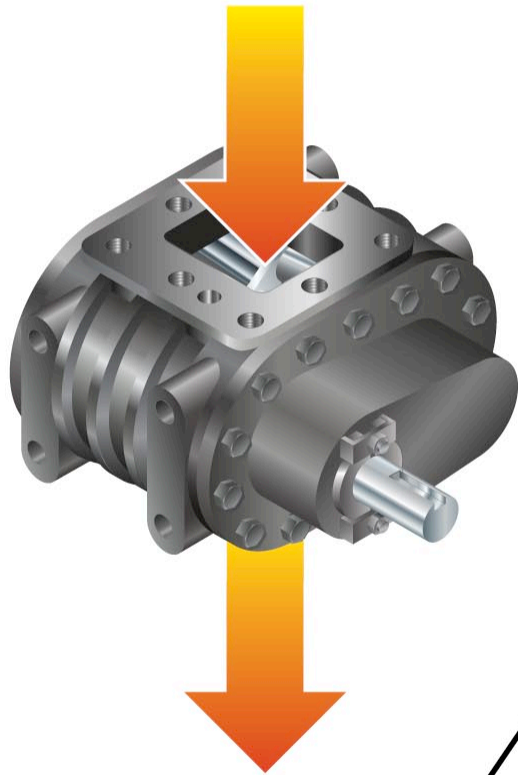


**Gallon  
Sq/yd**

**.04 → 1.0**

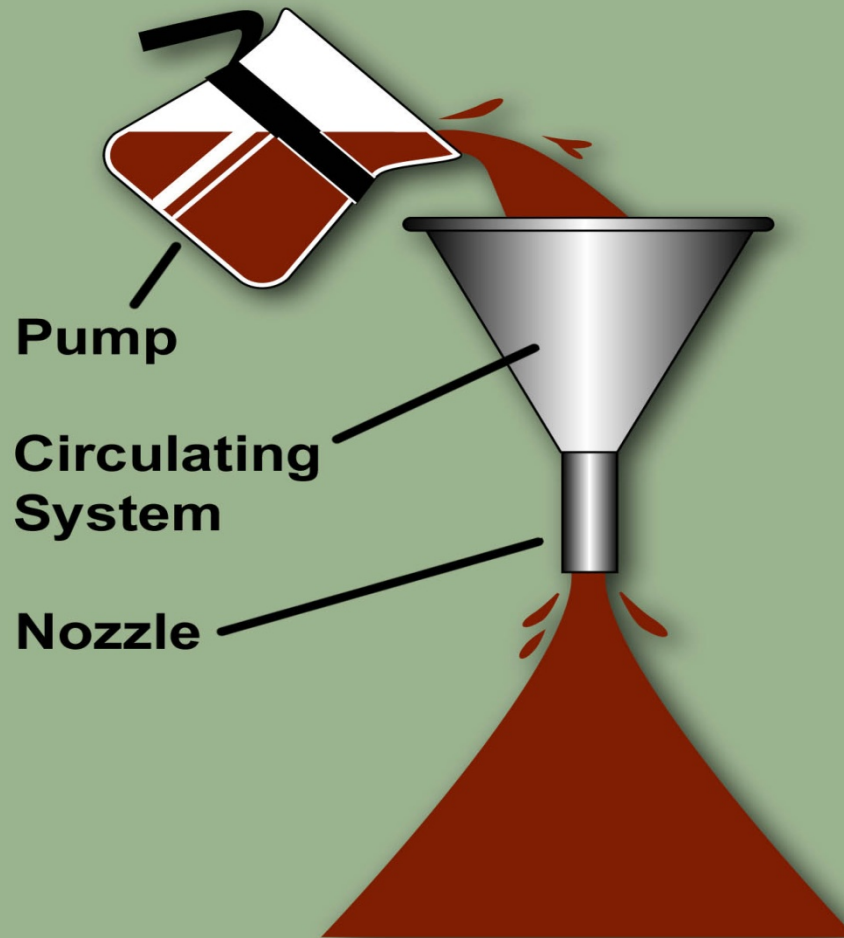


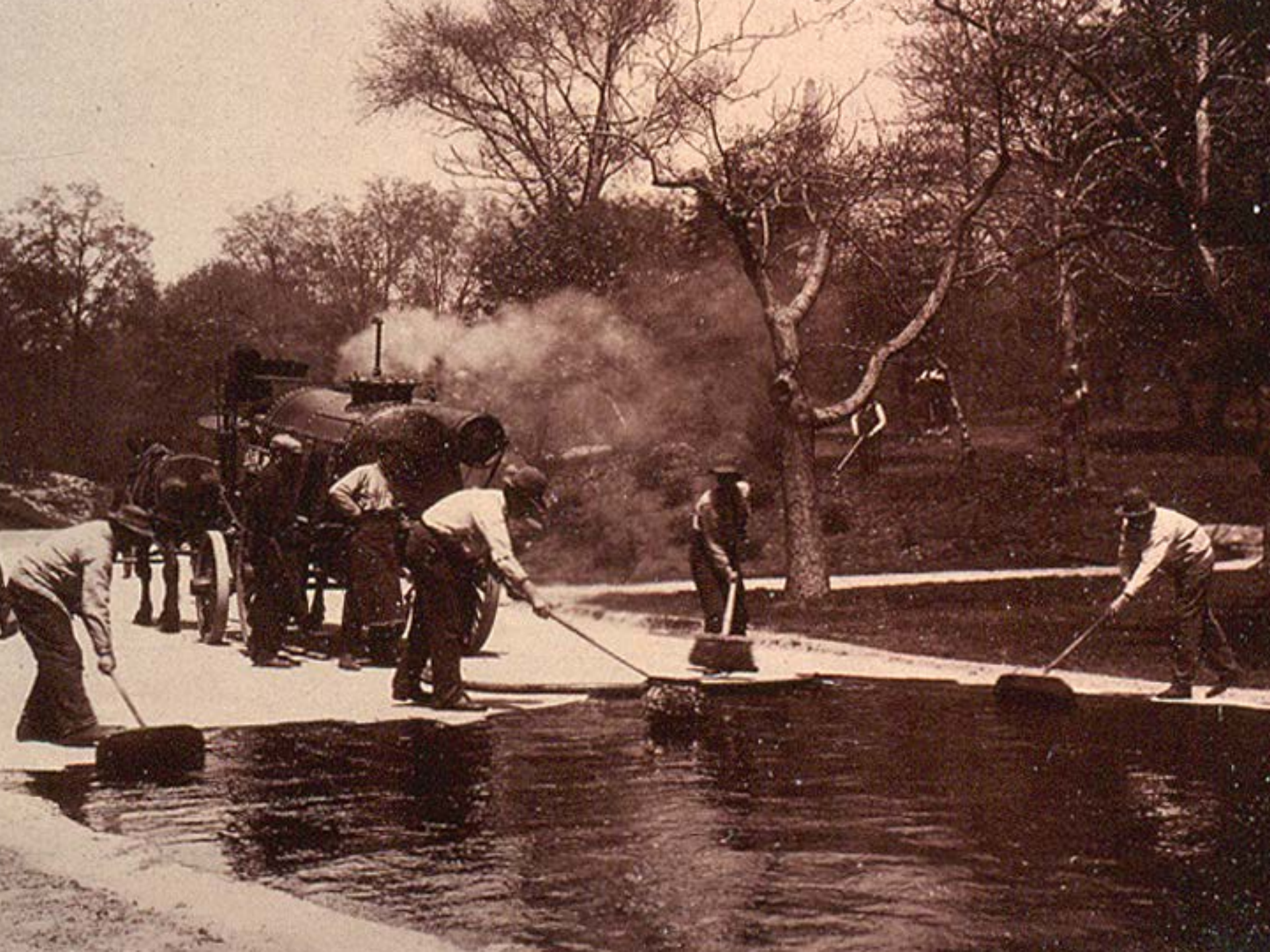
# Pump Meter – Volume



# Spray – Pressure

# BASIC SYSTEM







**Tack**



**6.4  
Oz.**

**.050  
Gal/Sq. Yd.**

**Tack**



**12.8  
Oz.**

**.100  
Gal/Sq. Yd.**

**Sealcoat**



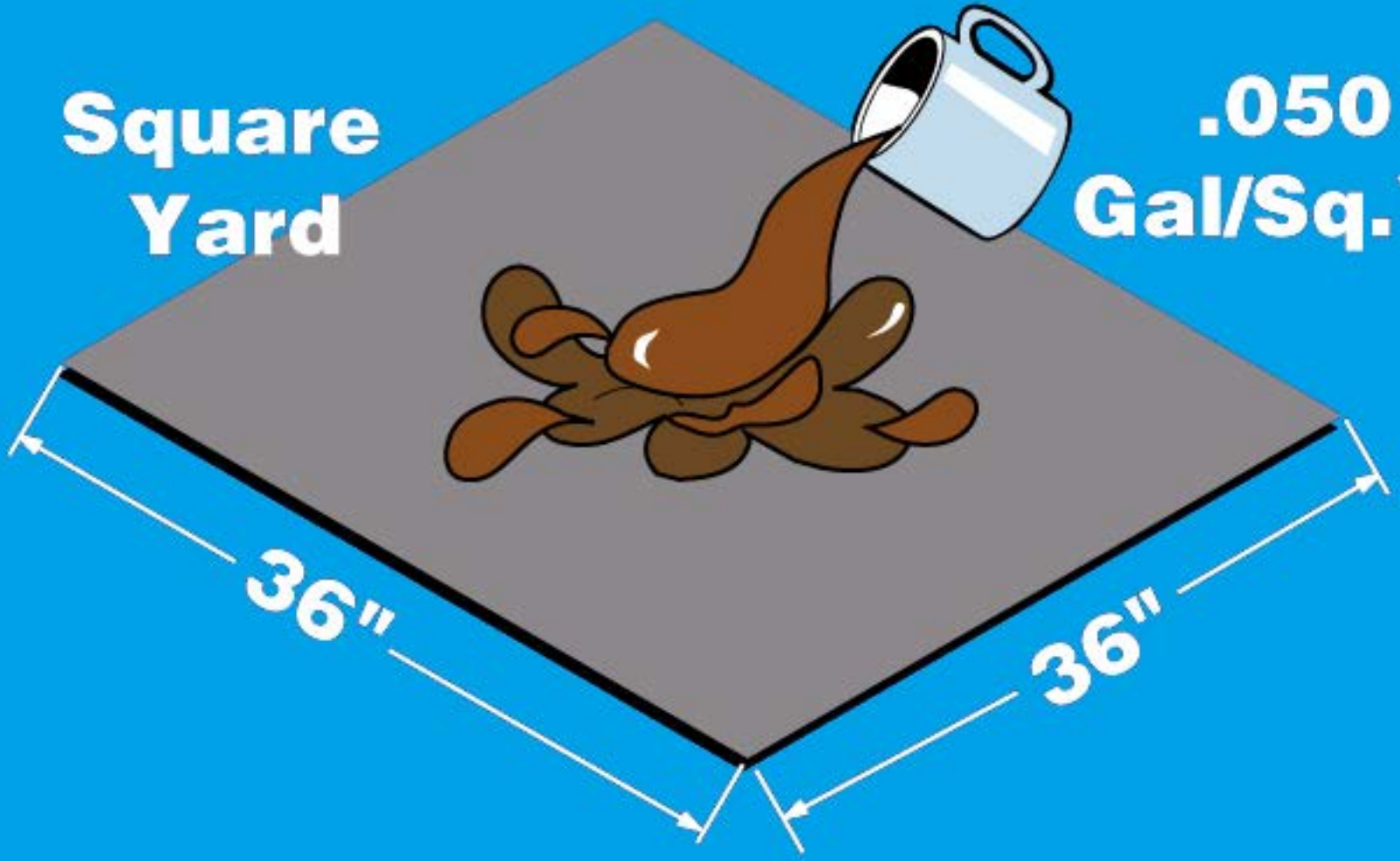
**38.4  
Oz.**

**.300  
Gal/Sq. Yd.**

**6.4  
Ounces**

**Square  
Yard**

**.050  
Gal/Sq.Yd.**

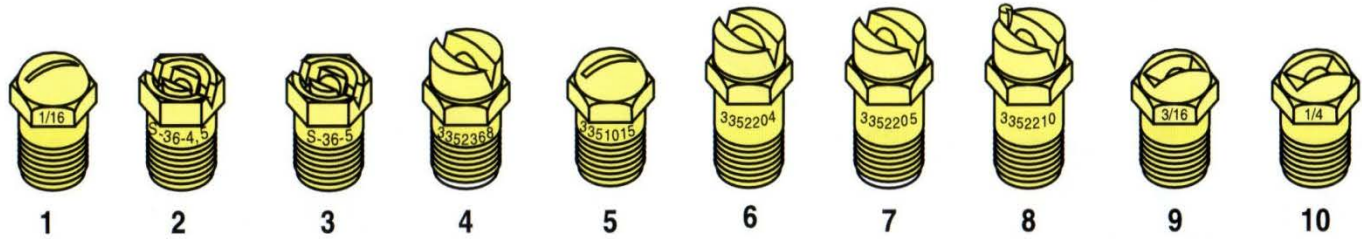


**36"**

**36"**

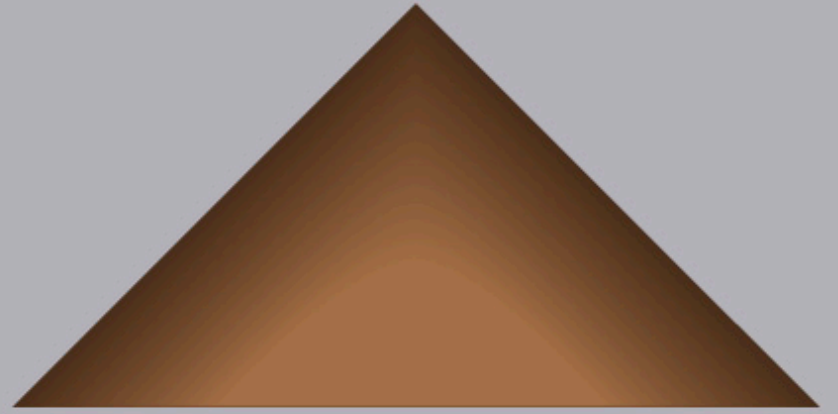
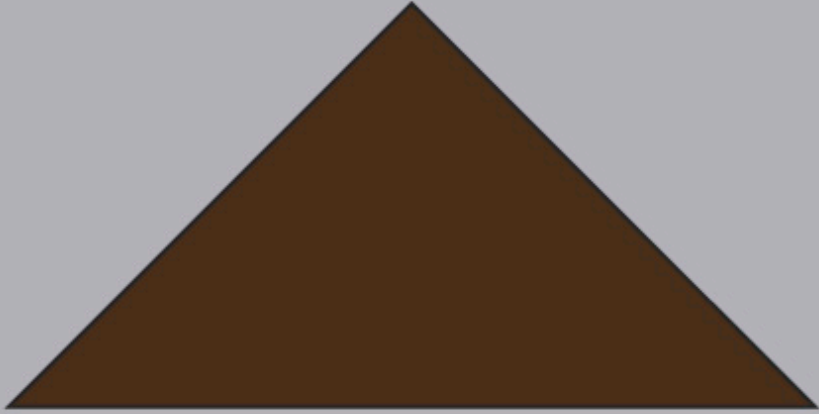


# SPRAY BAR NOZZLES

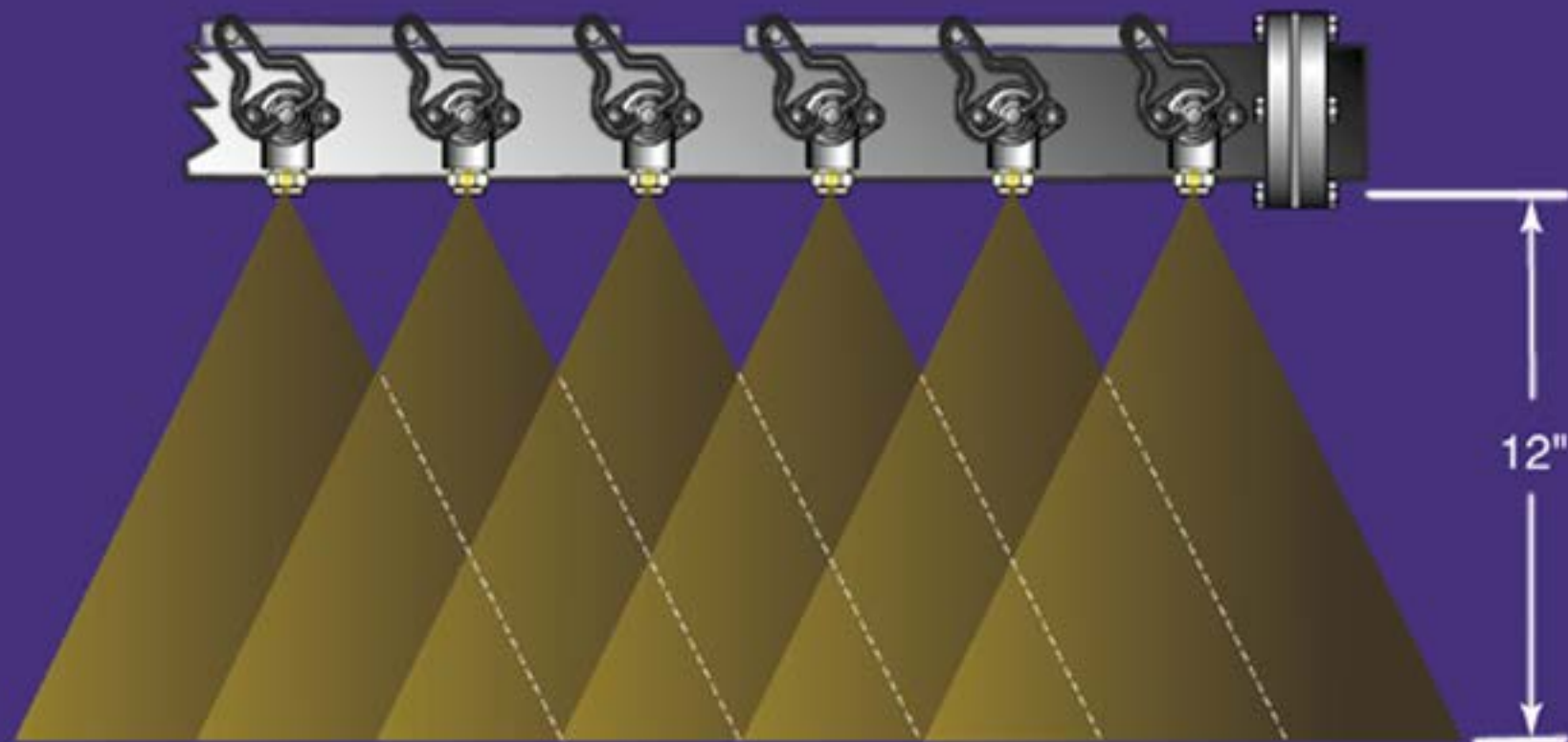


3351013 3351008 3351009 3352368 3351015 3352204 3352205 3352210 3351014 3351010

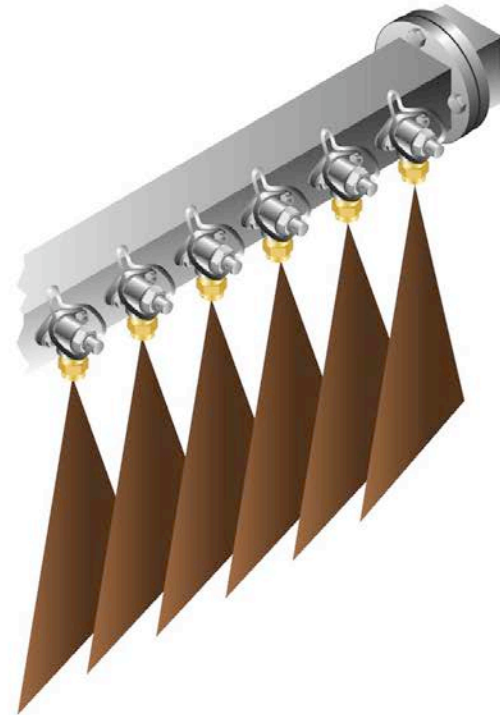
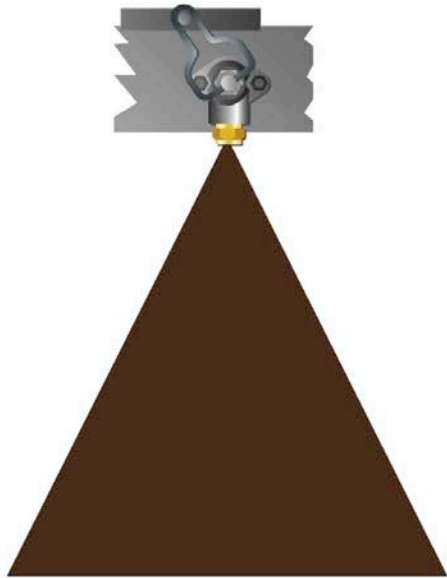
Ref.	Part No.	Description	Application Per Square Yard	Application (Metric) Liters Per Square Meter	Flow Gallons Per Minute Per Foot
1	3351013	1/16" Coin Slot	.05 - .20	.19 - .75	3.0 to 4.5
2	3351008	S36-4 V Slot	.10 - .35	.38 - 1.30	4.0 to 7.5
3	3351009	S36-5 V Slot	.18 - .45		7.0 to 10.0
4	3352368	Multi-Material V Slot	.15 - .40	.57 - 1.50	6.0 to 9.0
5	3351015	3/32" Coin Slot	.15 - .40	.57 - 1.50	6.0 to 9.0
6	3352204	Multi-Material V Slot	.35 - .95	1.30 - 3.60	12.0 to 21.0
7	3352205	Multi-Material V Slot	.20 - .55	.75 - 2.08	7.5 to 12.0
8	3352210	End Nozzle (3352205)	.20 - .55	.75 - 2.08	7.5 to 12.0
9	3351014	3/16" Coin Slot	.35 - .95	1.30 - 3.60	12.0 to 21.0
10	3351010	1/4" Coin Slot	.40 - 1.10	1.50 - 4.16	15.0 to 24.0



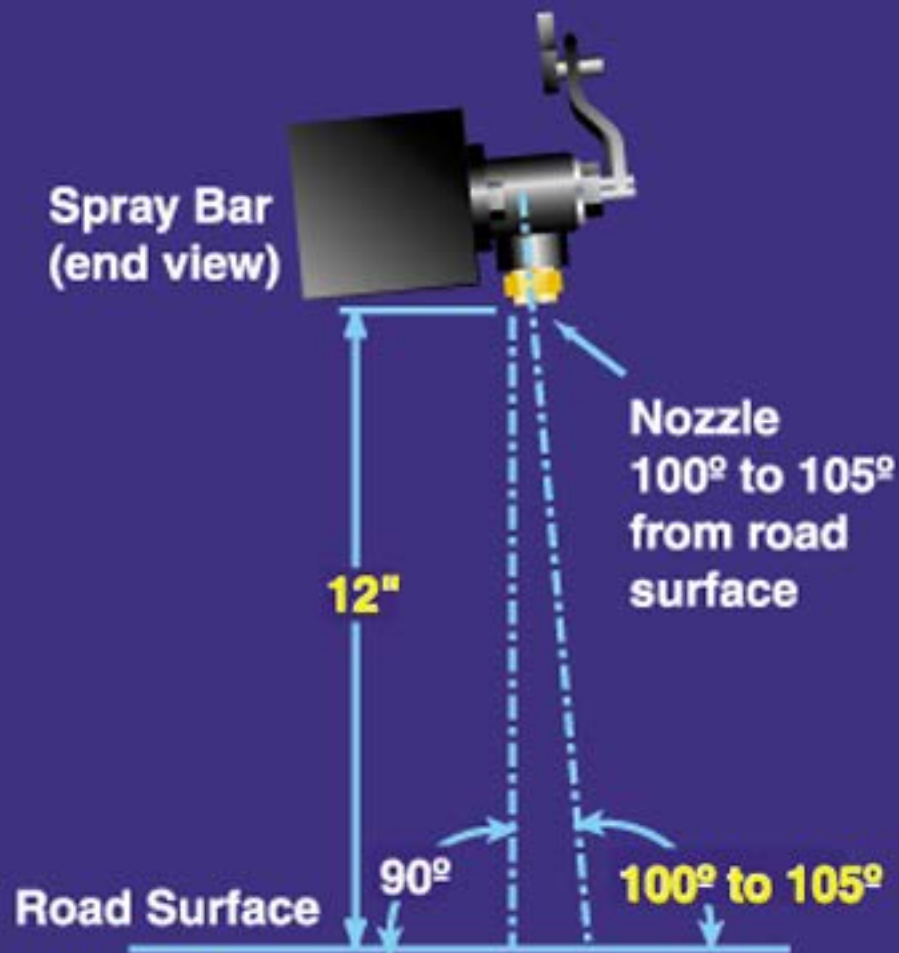
# Triple Lap Coverage



# Flat Fan

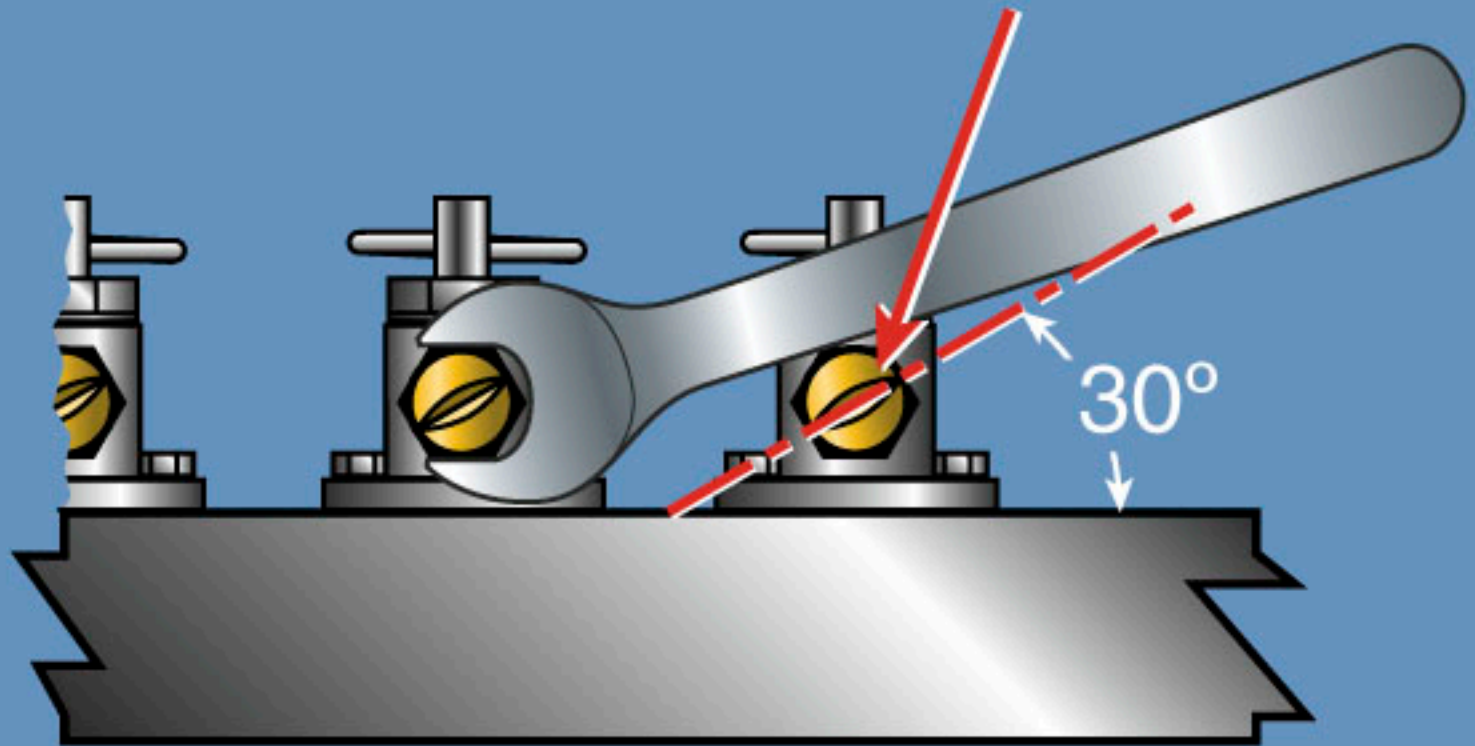


# Nozzle Height



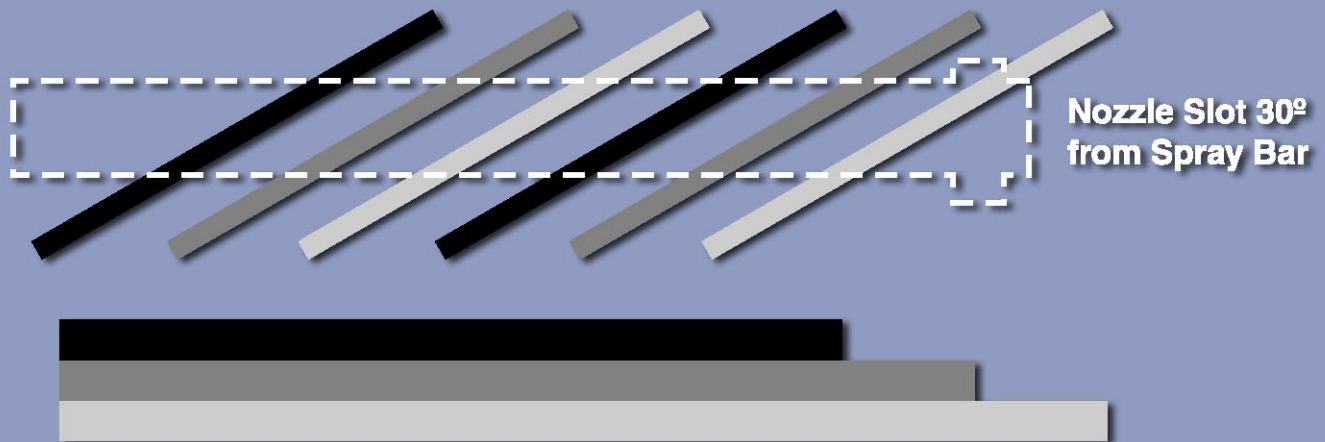
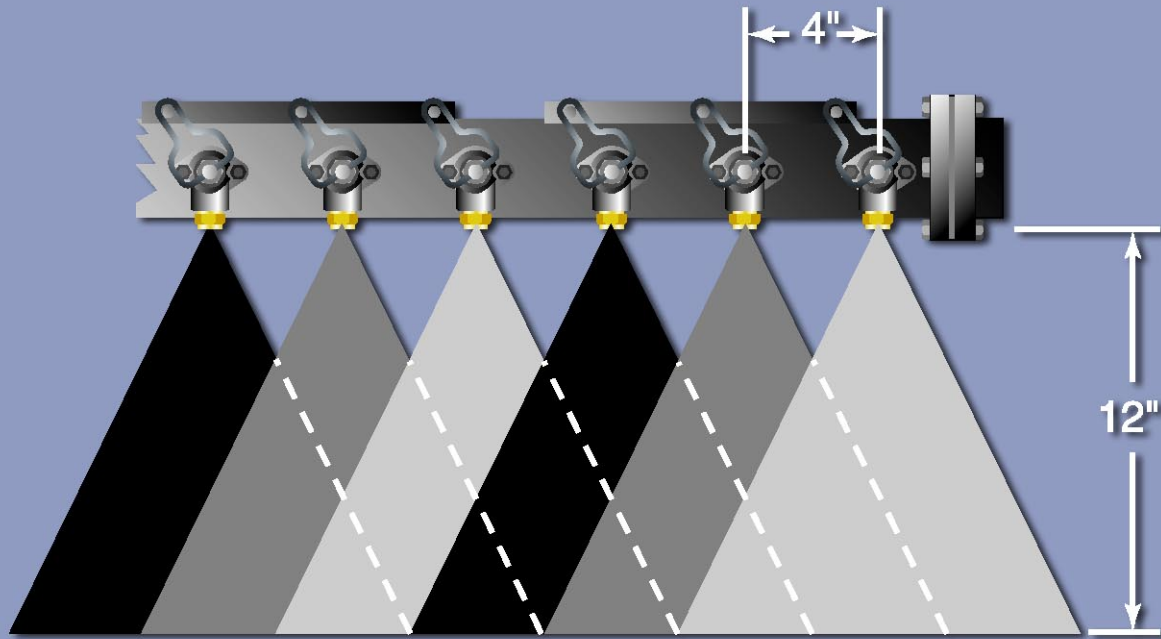


# Nozzle Slot 30° from Spray Bar

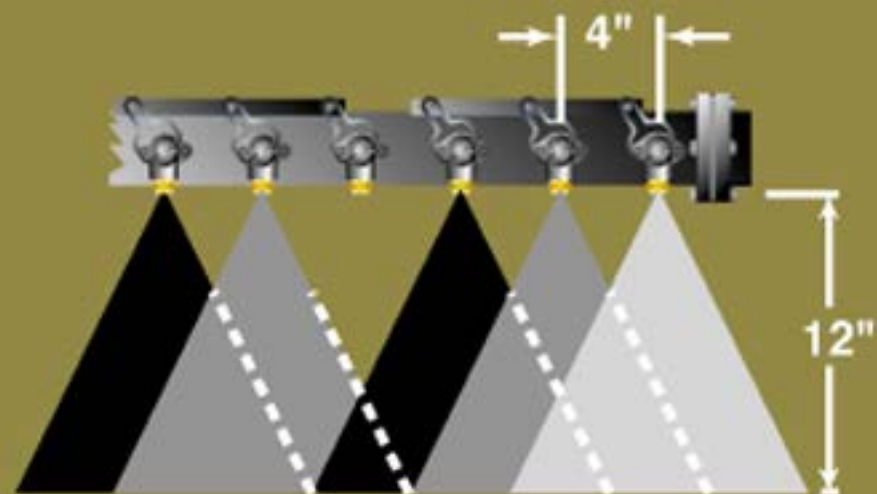


**Spray Bar (bottom view)**





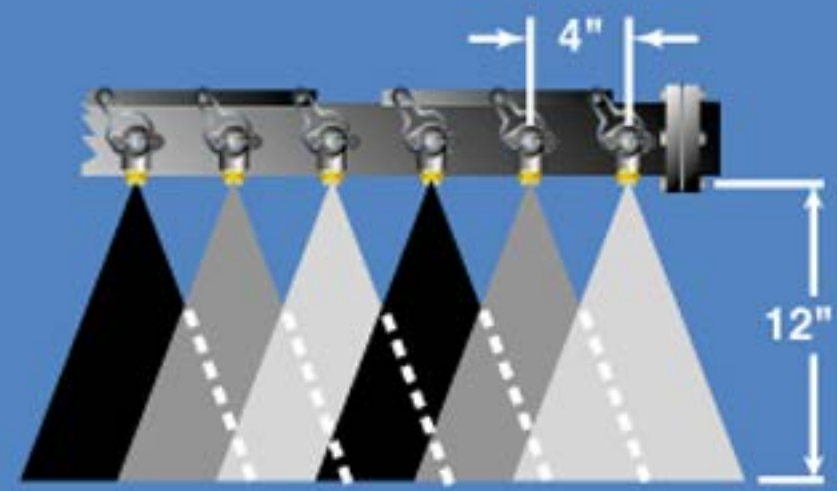
# Plugged Nozzle



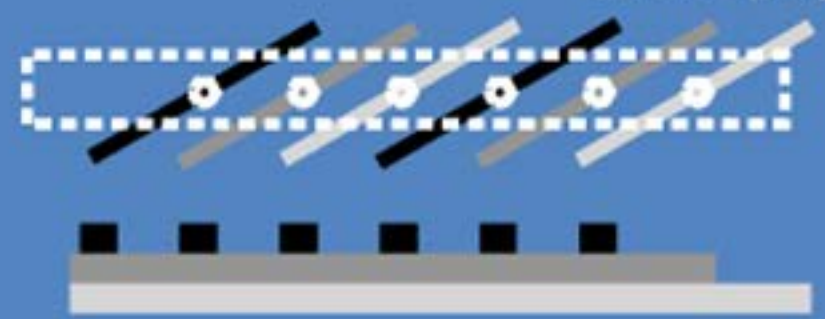
Nozzle Slot 30°  
From Spray Bar

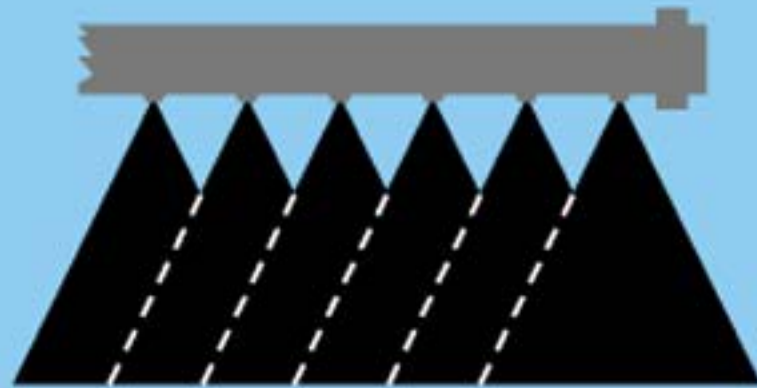


# Low Pressure



Nozzle Slot 30°  
From Spray Bar

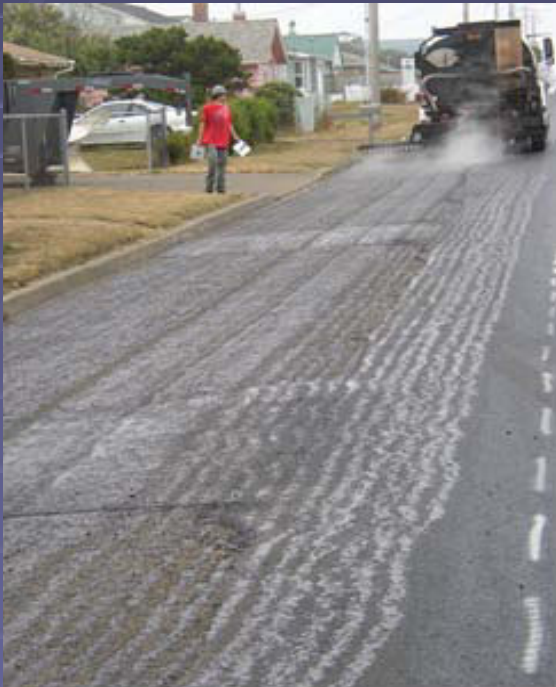




# Construction Issues

## Uniformity of the Tack Coat Application

Non-uniform Application



Proper Application



INCORRECT

NOZZLES?

CAN I STILL

WORK?

← **600 FPM**



**.05 G/Y<sup>2</sup>**

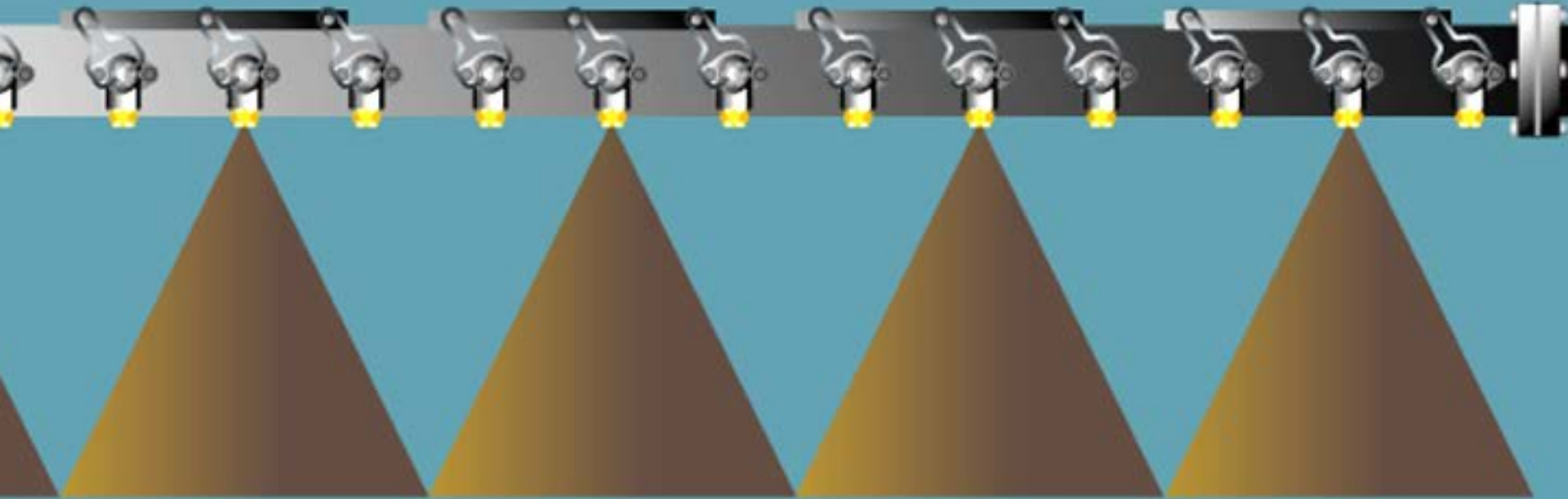
← **300 FPM**



**.05 G/Y<sup>2</sup>**



# 1 NOZZLE PER FOOT

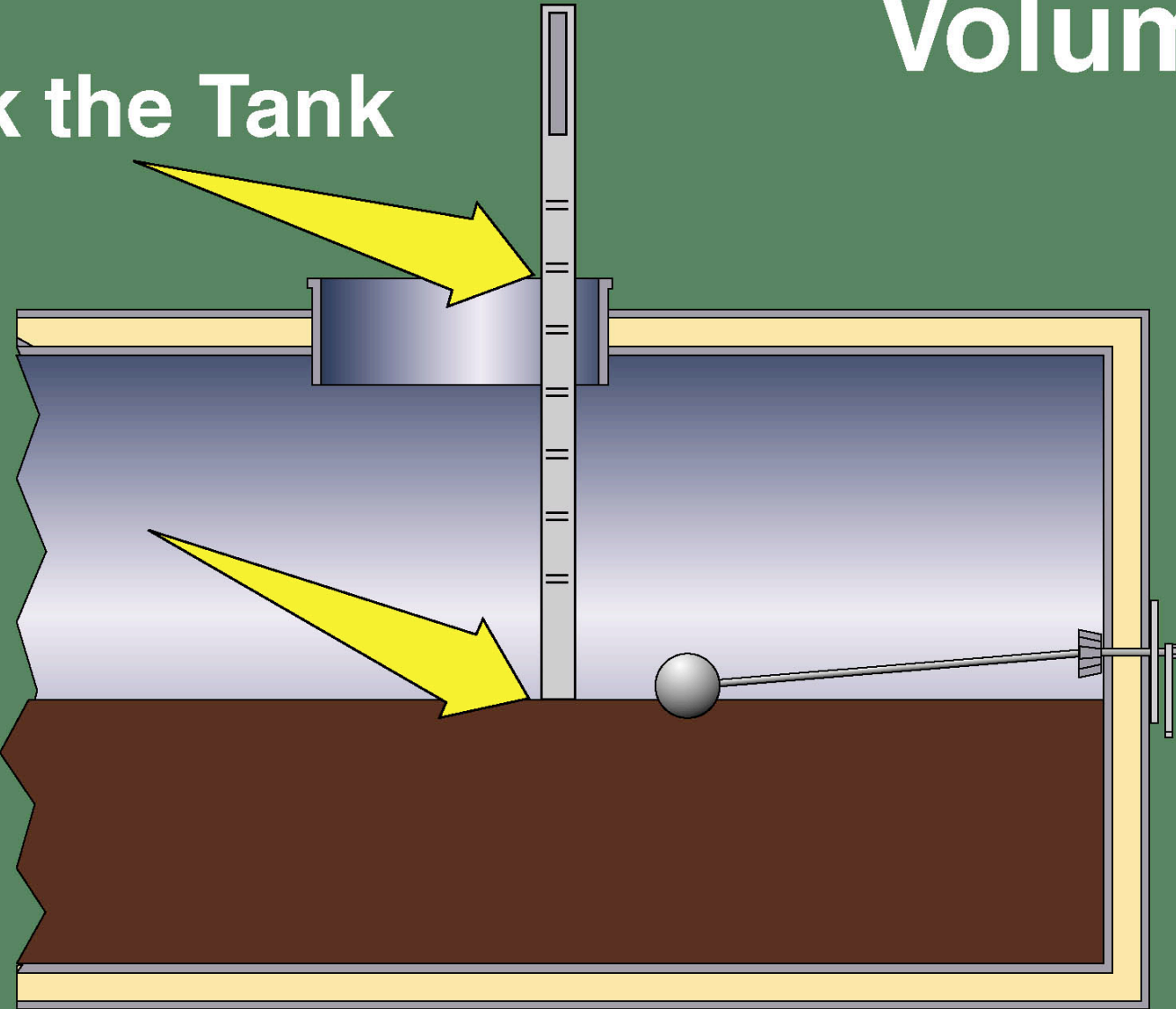




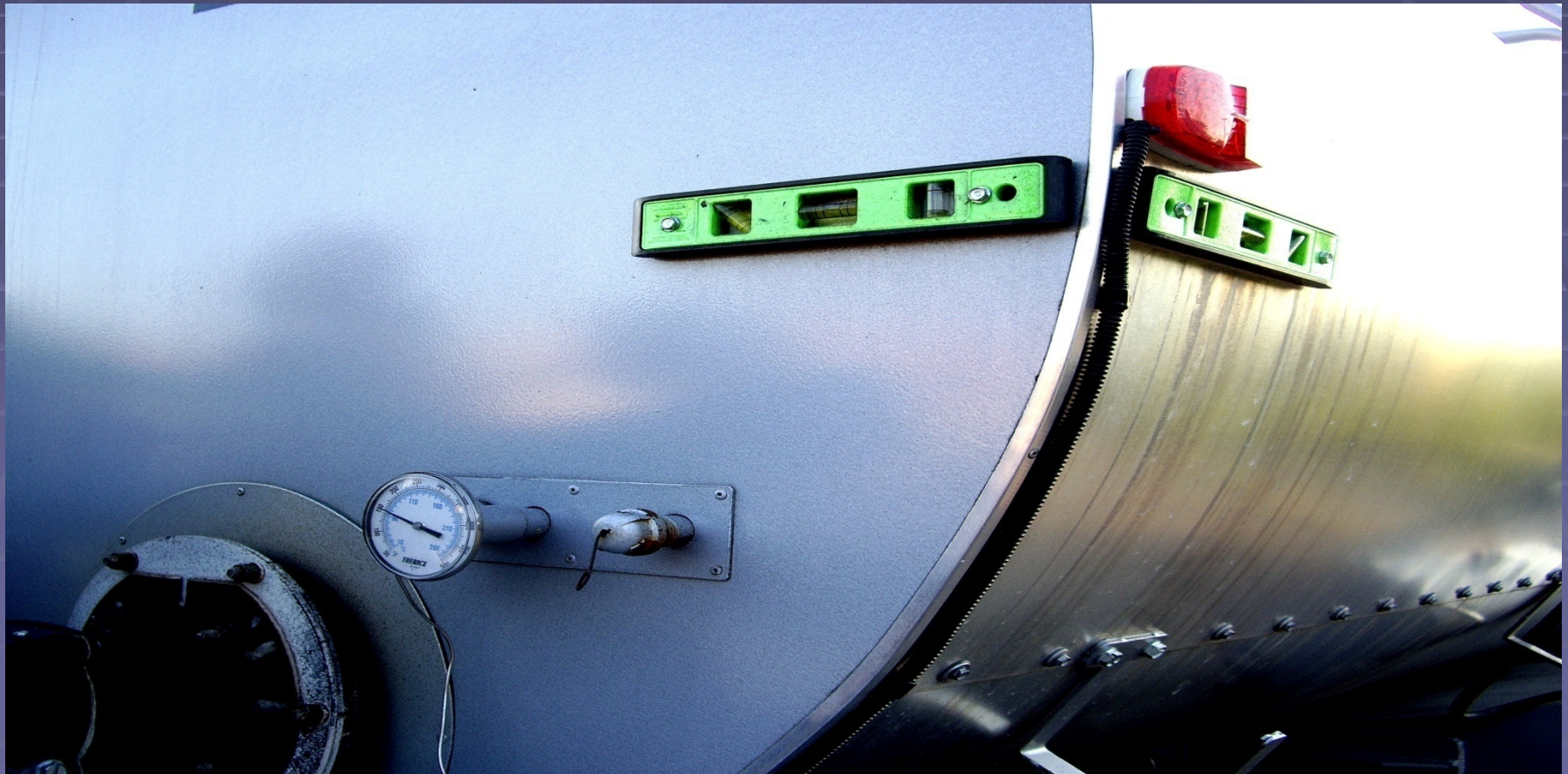
LETS CHECK  
THE RESULT!

# Volume

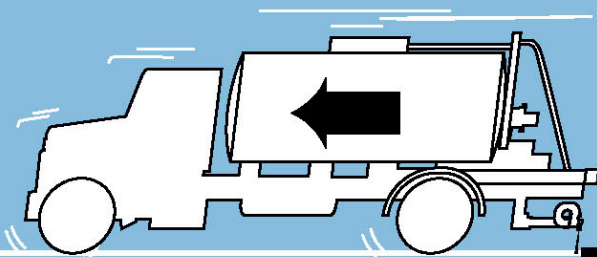
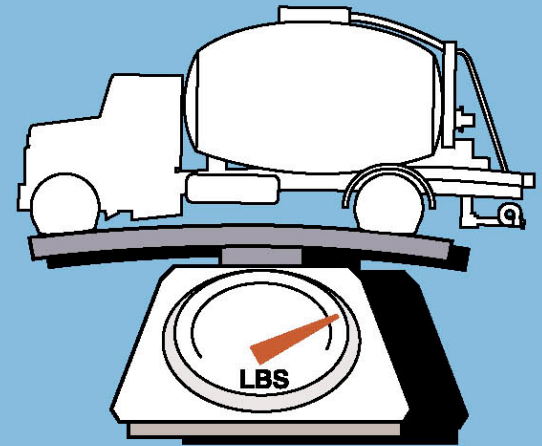
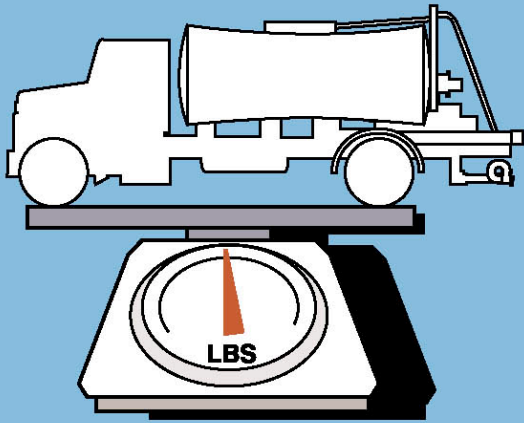
Stick the Tank



Before checking your volume by sticking the tank , make sure Distributor is level



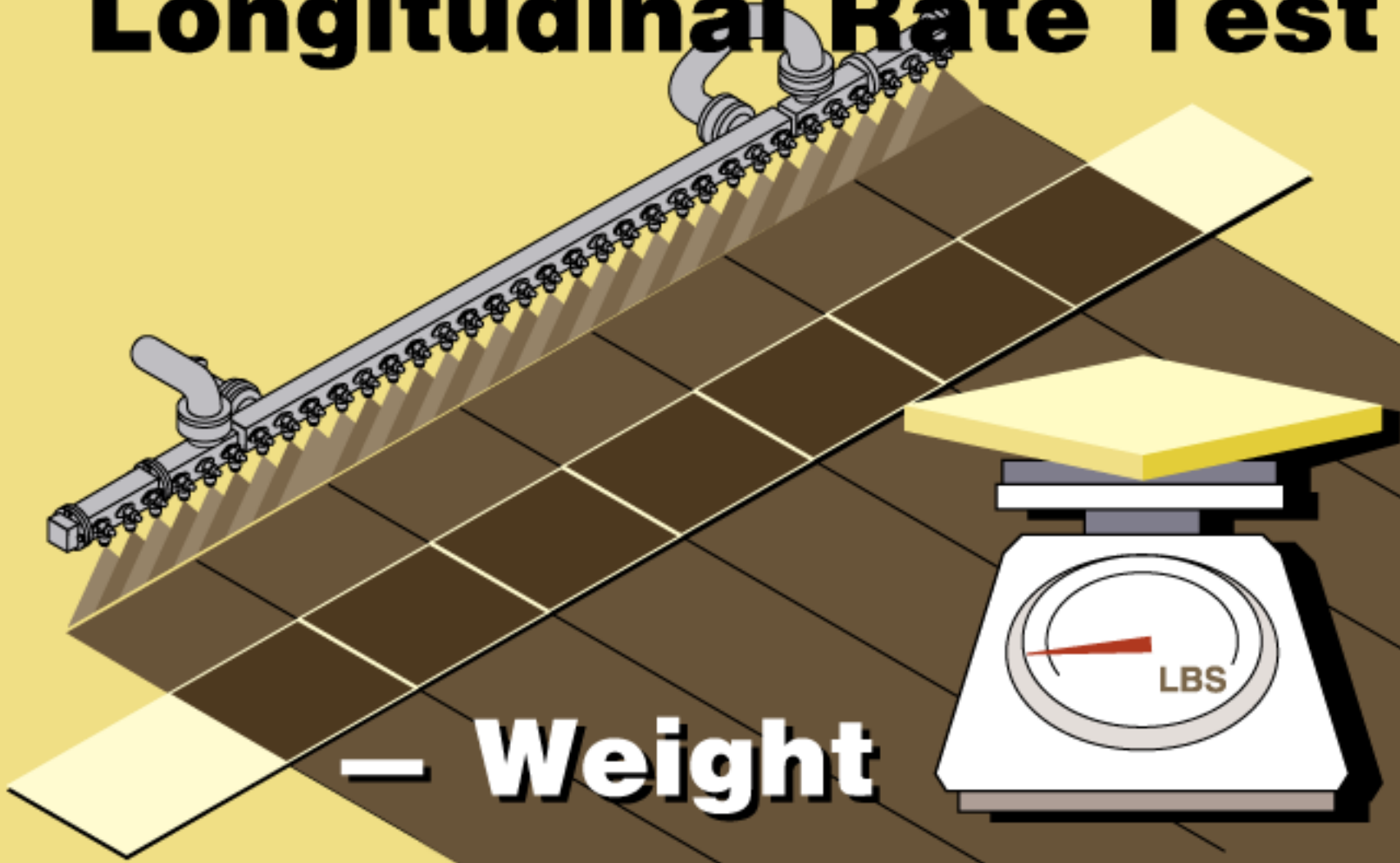
# Weight



(g/y)

← # (Feet) →

# Longitudinal Rate Test



— Weight

# Calibration

- Distributor









# WHAT ARE WAYS TO CHECK YOUR DISTRIBUTOR CALIBRATION?

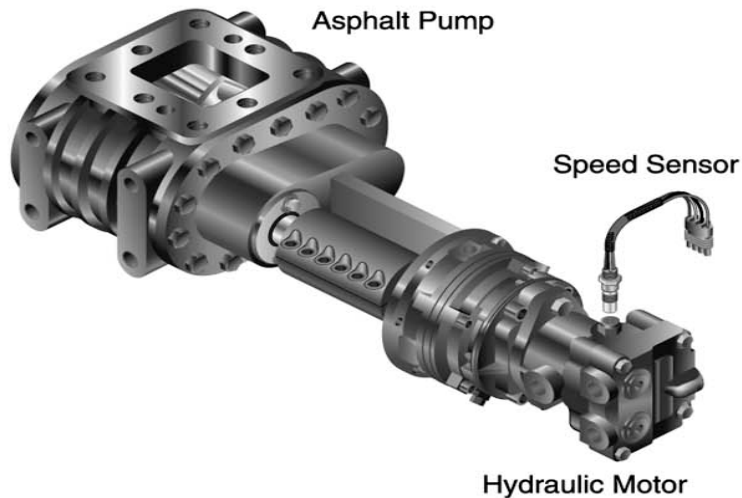


# PUMP AND RADAR

34

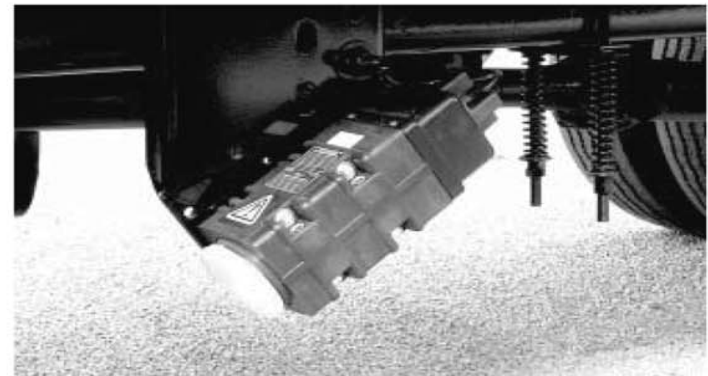
## Metering and Control System continued

### Magnetic Pump Speed Sensing



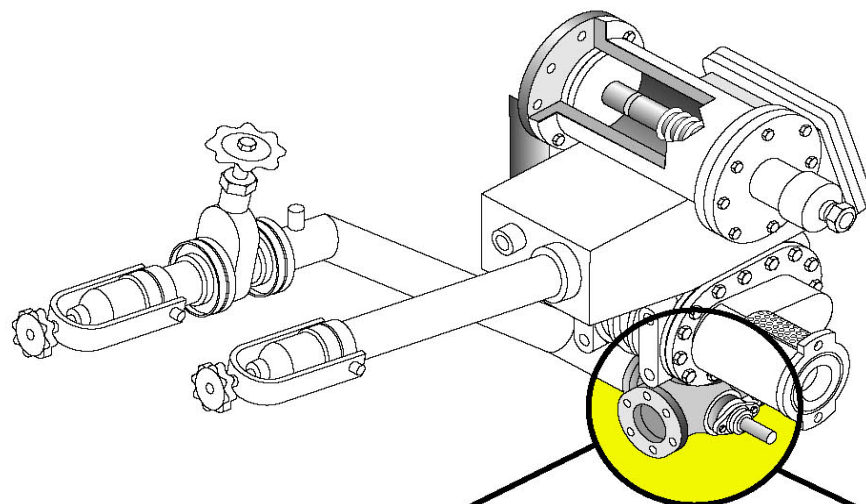
- Speed sensor pick-up counts the revolutions of the asphalt pump.
- Speed sensor is internal to the hydraulic motor.
- Pump output is displayed on an analog gage or sent directly to computer.
- Pump output is measured with Gallons Per Minute (GPM)

### Radar Ground Speed Sensing

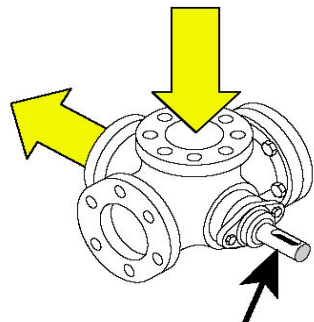


- Radar Speed sensing is **standard equipment**.
- Vehicle speed displayed on analog gauge or sent to computer.
- Precise measurement of ground speed and distance.
- No moving parts to wear out, less maintenance, and less chance of damage.
- Ground speed is measured in Feet Per Minute (FPM).

# CONTROL VALVE TIMING

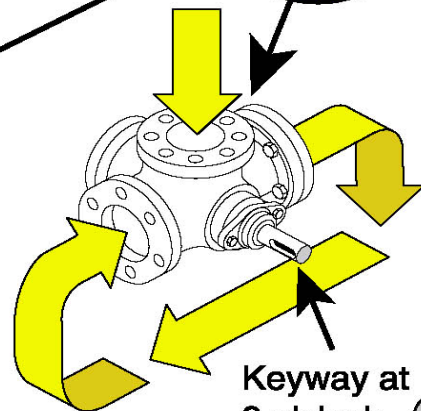


**Control Valve**



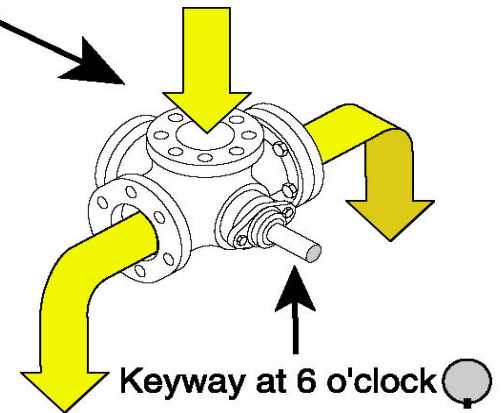
Keyway at 12 o'clock

**Circulate In Tank**



Keyway at 9 o'clock

**Circulate In Bar**



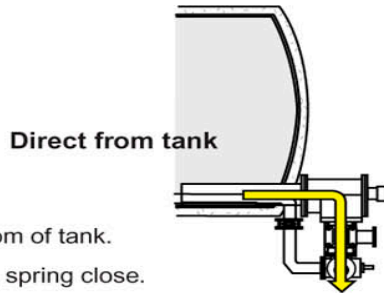
Keyway at 6 o'clock

**Spray**

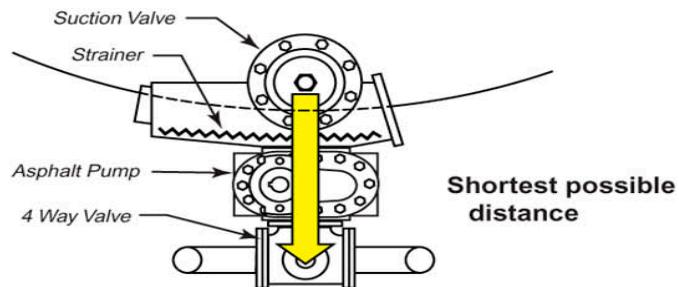
# STRAINER

## Circulating System continued

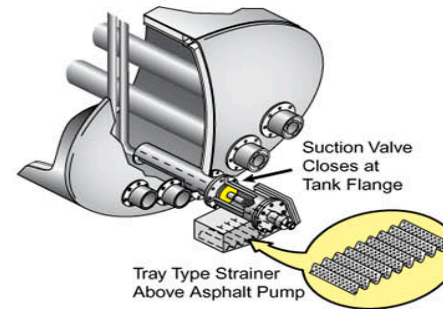
### Tank Suction Valve



- Located at bottom of tank.
- Air control open, spring close.
- No sump to trap liquid asphalt in the tank.
- Disc valve closes at tank flange. Always in contact with hot asphalt.
- No external line between valve and tank to freeze up with cold asphalt.

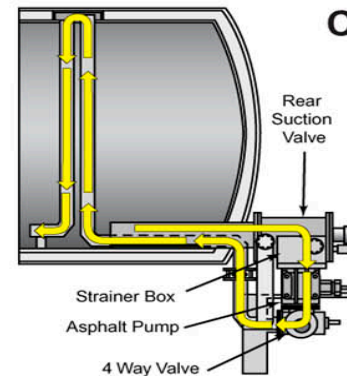


### Strainer



- Strainers, one tray type between tank and asphalt pump and between fill line and asphalt pump.
- All liquid asphalt goes through a strainer before it gets to the asphalt pump.

### Circulating In Tank













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**SEE YA- ALL LATER**

