

# Simplifying the Purification Process

# What is the purpose of purification?

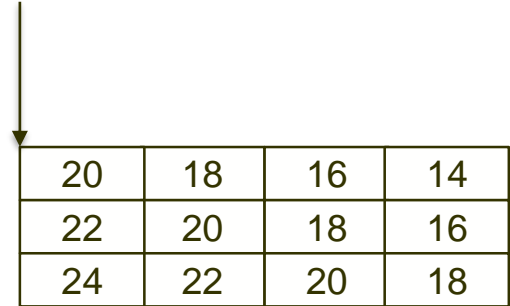
To make a separation based on the size of the particle and how it reacts in an air current.

# Typical Clothing for a purifier

-To flow a purifier (install clothing), understand the granulation range which is determined from the sifter source. Typically 2 screen sizes are added to determine to coarsest screen in the purifier. This will get you started. However one must check the unit after the mill is running and balanced to get the results one desires.

- All of this is dependent on Air
  - The finer the clothing the less air required
  - The coarser the clothing the more air require
  - Dependent on the granulation

18SS / 36SS - 1BK



20	18	16	14
22	20	18	16
24	22	20	18

# Standard Purification Process for modern flows

- Coarse Purification from 1BK and 2BK, most surface area
- Fine Purification from 1BK and 2BK, 2/3 to half of coarse
- 3BK Purifier
- Sizing's Purifier
- Farina\*

## 5000 Cwt mill

- 2 ea Coarse Purifier
- 1 ea Fine Purifier
- 1 ea 3BK purifier
- 1 ea Siz Purifier

# ADM Buffalo

## 22,500 Cwt Mill

12 1/2BK Coarse purifiers, 8 P1 & 4 P4 (18ss-36ss)

12 1/2BK Fine purifiers, 8 P2 & 4 P5 (36ss-62ss)

4 Extra Fine Purifiers from 1/2BK, 4 P3 (62ss-80ss)

5 3BK Coarse Purifiers, 5 P6 (36ss-62ss)

4 3BK Fine Purifiers, 4 P7 (62ss-80ss)

2 Germ Purifiers, 2 P10 (32ss+ sizings)

4 Sizing's Purifiers, 4 P11 (32ss-66ss)

2 2<sup>nd</sup> Sizing's Purifiers, 2 P12 (40ss-80ss)

1 Farina Purifier, 1 P13 (cut P1,P4,P2)

2 1M Purifiers, 2 P9 (80ss+ 1M)

48 Total Purifiers

# Assumptions

**Anything finer than a 66SS is better to be sifted than purified**

**Most samples from these purifiers yielded ash results less than 0.400, so what good is purifying stock this good already?**

# Head end coarse and fine purifiers

-8 P1's have a nice load a little lighter than most flows. Since I have 8 sections of 1BK sifters it is an easy split 18SS/36SS

-4 P4's no change is needed. 2BK 20SS/36SS

-8 P2's load is very light from 1BK, 36SS/62SS from 1BK

-4 P5's load is good for the stock 36SS/62SS from 2BK

-P3's were eliminated and dropped directly onto 1MM rolls, granulation is 62SS/84SS from both 1/2BK, stock has oven ash of 0.401

Eliminating P5 and combining with P2 will kill 30 HP with minimal spouting changes necessary.

Will also eliminate a negative lift. As P2's are gravity fed instead of lifted

# 3BK Purifiers

**-5 P6's have very light load  
36SS/62SS 3BKC, 32SS/50SS  
3BKF**

**-4 P7's are very light  
62SS/80SS 3BKC, 50SS/70SS  
3BKF and oven ash of 0.421**

**5-P6's when I have 4 P5's? half the  
stock is on 3BK as opposed to 2BK  
these can be reduced to 3 and will not  
even make a difference killing 15 hp**

**Working with both 3BKC and 3BKF  
sifters P7's will drop right onto 1M  
rolls thus eliminating 30HP and a lift**



# Sizing's Purifiers

**-4 P11's load is very light**

**-Current flow is 36SS/66SS**

**These could be gravity fed into 2 purifiers thus eliminating 15HP and a .5 HP splitter.**

# Germ Purifiers

**-2 P10's**

**-Scalp of 30SS from 1SIZ  
sifters**

**Ran to 3BKF lifts and thus end up on  
4BKF/Germ Clasifiers**

**Would eliminate 15HP and a 3 dedicated  
lifts to take the thrus to 1T/Germ**

# 1M Purifier

2-P9's

Scalp 80ss from 1M sifters

**Initially installed to reclaim  
some Germ.**

**Reclaim some 2M material  
with out rolls**

## 2<sup>rd</sup> Sizing's Purifier

2 – P12's

40SS-88SS

**Why? Purify to 2M/Q? air remains off because the purifier scalps to 1T.**

**This is nothing more than an extension of the sifter.**

**Killing this would remove 15HP**

# Electrical savings

30 HP from P5's

30 HP from P7's

15 HP from P6

15 HP from P10

15 HP from P12

30HP from P3

15HP from P9

0.5 HP from splitter

150.5HP saved from purifier motors alone  
(\$28,899)

## Possible savings

7 dedicated lifts

Sifters better utilized

Fan's and filters shut off (3 purifier filters total)

# What it looks like when finished

**48 purifiers**

**12 1/2BK Coarse purifiers, 8 P1 & 4 P4**

**12 1/2BK Fine purifiers, 8 P2 & 4 P5**

**4 Extra Fine Purifiers from 1/2BK, 4 P3**

**5 3BK Coarse Purifiers, 5 P6**

**4 3BK Fine Purifiers, 4 P7**

**2 Germ Purifiers, 2 P10**

**4 Sizing's Purifiers, 4 P11**

**2 2<sup>nd</sup> Sizing's Purifiers, 2 P12**

**1 Farina Purifier, 1 P13**

**2 1<sup>st</sup> Midds Purifiers, 2 P9**

**26 Purifiers**

**12 1/2BK Coarse purifiers**

**8 1/2BK Fine Purifiers**

**3 3BK Purifiers**

**2 Sizing's Purifiers**

**1 Farina Purifier**

# Proving the theory 2 ways

From the operations manual  $\frac{1}{2}$  a purifier can handle 0.4 – 1.4 metric tons per hour depending on the product

## example

Using weigh offs I find that the average load to P6 splitter is 2.7 tons per hour across 5 halves, is .54 tons per machine or 0.9 tons for 3 machines

# Using granulations

The mill grinds 11,000 lbs of wheat per hour.

Granulation is as follows

For 1BK

60% on top of the 18ss

20% on top of a 32SS

10% on top of the 62SS

7% to redust / 1M

3% flour

For 2BK

46% on top of 18SS

15% on top of 32SS

15% on top of 62SS

14% to redust / 1M

10% Flour

**For 1BK**

**1 tons per hour to Coarse purifier**

**0.5 tons per hour to fine purifier**

**For 2<sup>nd</sup> break**

**0.45 tons per hour to coarse purifier**

**0.45 tons per hour to fine purifier**