**Cutting Slip Velocity**

These calculations give the slip velocity of a cutting of a specific size and weight in a given fluid. The annular velocity and the cutting net rise velocity are also calculated.

**Method 1**

Annular velocity (ft/min):

Cuttings slip velocity (ft/min):

Where, Vs = slip velocity (ft/min)  
 PV = plastic viscosity (cps)  
 MW = mud weight (ppg)  
 Dp = diameter of particle (inch)  
 DenP = density of particle (ppg)

Sample Case :

Using the following data, determine the annular velocity (ft/min) the cuttings slip velocity (ft/min) and the cutting net rise velocity (ft/min):

Annular velocity (ft/min):

Cuttings slip velocity (ft/mn):

Cuttings net rise velocity :

Annular velocity = 102 ft/min

Cuttings slip velocity = 41 ft/min \_

Cuttings net rise velocity = 61 ft/min

**Method 2**

1. Determine n:

2. Determine K :

3. Determine annular velocity (ft/min) :

4. Determine viscosity (µ):

5. Slip velocity (Vs)(ft/min):

**Nomenclature :**

n = dimensionless  
K = dimensionless  
Ɵ600 = 600 viscometer dial reading  
Ɵ300 = 300 viscometer dial reading  
Q = circulation rate (gpm)  
Dh = hole diameter, in.  
Dp = pipe or collar OD, in.  
v = annular velocity (ft/min)  
µ = mud viscosity (cps)  
DensP = cutting density (ppg)  
DiaP = cutting diameter, in.

Sample Case : Using the data listed below, determine the annular velocity,

cuttings slip velocity, and the cutting net rise velocity :

DATA : Mud weight = 11.0 ppg  
 Plastic viscosity = l3 cps  
 Yield point = 10 lb/lOO sq ft  
 Diameter of particle = 0.25 in.  
 Density of particle = 22.0 ppg  
 Hole diameter = 12.25 in.  
 Drill pipe OD = 5.0 in.  
 Circulation rate = 520 gpm

1. Determine n :

2. Determine K :

3. Determine annular velocity (ft/min):

4. Determine mud viscosity (cps) :

5. Determine cuttings slip velocity (ft/min):

6. Determine cuttings net rise velocity (ft/min):

Annular velocity = 102 ft/min  
 Cuttings slip velocity = 24.55 ft/min \_  
 Cuttings net rise velocity = 77.45 ft/min