	of water is added through a series of spray bars located over the screening deck.
Factor "F"— Material Weight	Applies for weights other than 100 lbs. per cu. ft. If bulk density of one cubic foot of material weighs ± 100 lbs. cu. ft., Factor "F" = $\frac{\text{lbs. per cu. ft.}}{100}$
Factor "G"— Screen Surface Open Area	Applies when open area of screening surface is less than open area shown in Factor "A" capacity chart. Factor "G" = $\frac{\text{\% open area of screen surface being used}}{\text{\% open area indicated in capacity chart}}$
Factor "H"— Shape of Opening	Applies when rectangular openings are used. Slotted or oblong openings will pass more material per square foot than square openings.
Factor "J"— Efficiency	Applies when objective screening efficiency is less than 95%

SCREEN EFFICIENCY

Screening efficiency is the percent of the undersize in the feed that actually passes the screen surface opening, or:

$$\text{Efficiency} = \frac{\text{\% of undersize in feed which actually passes}}{\text{\% of undersize in feed (should pass)}}$$

It would be most desirable for an operator if every screen attained 100% efficiency. However, it is understood and accepted in the industry that this is impossible. The capacity formula is based on 95% screening efficiency. Normally, 90 to 95% efficiency is an accepted rate in most screening operations. However, even 90% is not always attainable. Considering the many factors that affect material classification, it is a very difficult task to constantly control screening efficiency to an exact percentage. Furthermore, multiple deck screens present separate problems for each deck.

With the many factors that govern efficient screening, it is impractical to expect a numerical factor in the capacity formula will automatically control this. By the very fact that industry accepts that 100% efficiency is impossible, it also recognizes there are screening applications when 90% or even 80% may be impossible, regardless of the amount of available screening area.

The difficult-to-pass "nearsize undersize" is most often a controlling factor in determining the problems you can expect to encounter in attaining a high efficiency. Moisture and peculiar particle shapes will compound the problem.

Keep in mind that material remains on a vibrating screen for only a matter of seconds. Evaluation of the efficiency of the screen is checked by testing sieves for three to five minutes or longer. This seems to be an unfair method of checking a vibrating screen's efficiency but it is an accepted method.

The screen manufacturer will review the application and determine what percent of efficiency can be expected.

The VSMA form "Vibrating Screen Questionnaire" should be used as a guide to record the application data necessary to apply the above formula. When using the formula, a sieve analysis of the material being fed to the screen is the basis to determine the percent of oversize (Factor "B"), undersize (Factor "U") and halfsize (Factor "C") for each separation, A numerical factor corresponding to the actual percent is selected from the charts and placed in its proper location in the formula. After all factors are determined, proceed to calculate the required theoretical area.

Before establishing the size of screen from the screen area calculations only, check that the theoretical bed depth is in accordance with good operating practice.

$$\text{DBD} = \frac{\text{O} \times \text{C}}{5 \times \text{T} \times \text{W}} = \text{Inches of Bed Depth}$$

FACTORS

DBD = Discharge End Bed Depth
O = Oversize in STPH
C = Cubic Feet Per Ton of Material
5 = Constant
T = Rate of Travel (nominal 75 fpm for inclined screen at slope of 18° to 20° with flow rotation and nominal 45 fpm for horizontal screen)
W = Width of Screening Area in Feet

The feed to a vibrating screen consists of a mass of material in different sizes. The oversize will retard passage of the undersize; and this temporary restriction results in a build-up of material on the screen surface. The bed diminishes as the undersize passes the opening. However, the bed of material should never reach a depth where the undersize does not stratify before it discharges off the end of the screen. A rule of thumb is that the bed depth at the discharge end of the screen should not exceed four times the size of the surface opening when separating material weighing 100 lbs. per cu. ft. or three times for material weighing 50 lbs. per cu. ft. This rule should be followed and is practical in most applications. However, it is based on volume only and many times the dimensions of the topsize pieces in the feed to the deck will exceed the calculated bed depth. This is not cause for alarm but it deserves consideration before selecting the screen size.

To select the size of screen, first determine, from the bed depth calculations, the width that will maintain the proper bed depth for efficient screening and then choose the length that, together with the width, provides a minimum total screening area equivalent to that arrived at in the screen area calculations.