

volume making the wash less effective. If instead the wash is dispersed across the cake surface evenly, for example by atomisation, it is possible to establish a relatively flat wash front as the wash enters the cake. During the passage of the wash through the cake this wash front becomes more ragged and the boundary between mother liquor and wash becomes more diffuse as passage through the larger pores is faster than through the smaller ones. Thus to be reasonably effective the wash volume should exceed the mother liquor volume held up in the voids in the cake at the start of the wash. This is illustrated in Figure 13.5.

13.4.2 Deliquored Cake Washing

When a filter cake is deliquored the large pours are drained as illustrated in Figure 13.4. This is usually accompanied either by cake cracking or by cake shrinkage which often opens up a pathway between the filter vessel walls and the sides of the cake. The extent of cracking or shrinkage depends on the crystal size distribution, the crystal habit and the physical dimensions of the cake. In general cake cracking becomes more severe as the particle size becomes smaller and the cake becomes larger. The tendency for cake shrinkage is often associated with elongated, especially needle like particles which tend to form a three dimensional mat which rather than cracking shrinks from the walls of the filter body. Driving a wash solvent rapidly through a deliquored cake is accompanied by the risk that most of the wash solvent passes through the cracks and is not particularly effective in displacing the mother liquor from the un-cracked regions of the cake. Rather than forcing the wash through the cake in this situation it is preferable to maximise the wash efficiency by increasing the contact time – sometimes termed soak washing.

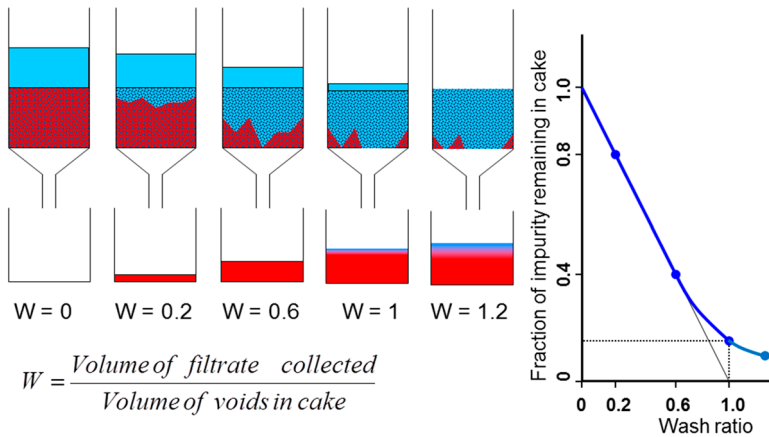


Figure 13.5 Role of wash solvent in displacing mother liquors, figure shows the effect of using 1.2 cake void volumes of wash solvent.