

ABRASIVE WEAR

Abrasive wear is the loss of material from a surface that results from the motion of a hard material across this surface.

There are several types of abrasive wear. Since the properties required of a wear-resistant material will depend on the type of wear the material has to withstand, a brief mention of these types of wear may be useful.

There are three main types of wear generally considered: gouging abrasion (impact), Figure 18.1; high-stress abrasion (crushing), Figure 18.2; and low-stress abrasion (sliding), Figure 18.3. This classification is made more on the basis of operating stresses than on the actual abrading action.

Gouging abrasion

This is wear that occurs when coarse material tears off sizeable particles from wearing surfaces. This normally involves high imposed stresses and is most often encountered when handling large lumps.

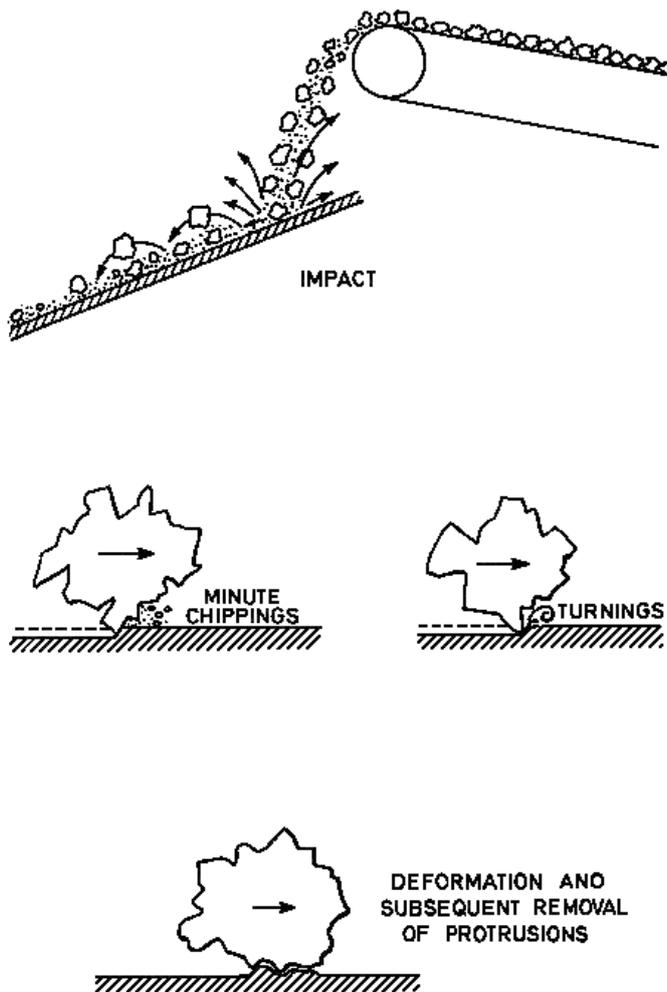


Figure 18.1 Types of gouging abrasion

High-stress abrasion

This is encountered when two working surfaces rub together to crush granular abrasive materials. Gross loads may be low, while localised stresses are high. Moderate metal toughness is required; medium abrasion resistance is attainable.

Rubber now competes with metals as rod and ball mill linings with some success. Main advantages claimed are longer life at a given cost, with no reduction in throughput, lower noise level, reduced driving power consumption, less load on mill bearings and more uniform wear on rods.

Low-stress abrasion

This occurs mainly where an abrasive material slides freely over a surface, such as in chutes, bunkers, hoppers, skip cars, or in erosive conditions. Toughness requirements are low, and the attainable abrasion resistance is high.

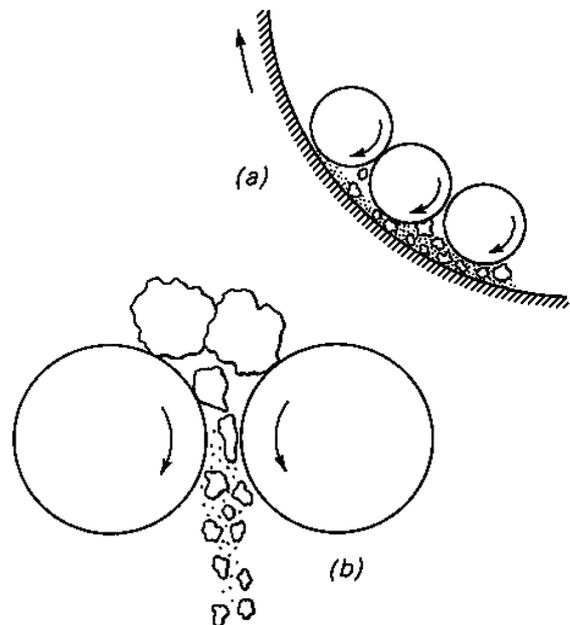


Figure 18.2 Types of high-stress abrasion: (a) rod and ball mills; (b) roll crushing

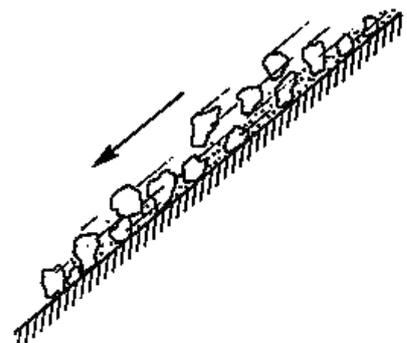


Figure 18.3 Low-stress abrasion