

<<制造工程与技术（上下册）>>

图书基本信息

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内容概要

时代教育·高校双语优秀教材。

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书籍目录

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## 章节摘录

版权页：插图：14.7 DIE MATERIALS AND LUBRICATION Among important aspects of forging ( as well as of other manufacturing processes discussed in Part ) are die materials and lubrication. Die Materials. Most forging operations, particularly for large parts, are carried out at elevated temperatures. General requirements for die materials therefore are ( a ) strength and toughness at elevated temperatures, ( b ) hardenability and ability to harden uniformly, ( c ) resistance to mechanical and thermal shock, and ( d ) wear resistance, particularly resistance to abrasive wear, because of the presence of scale in hot forging. Selection of proper die materials depends on such factors as the die size, the composition and the properties of the workpiece, the complexity of the shape, the forging temperature, the type of forging operation, the cost of the die materials, and the number of forgings required. Heat transfer from the hot workpiece to the dies ( and subsequent distortion of the dies ) is also an important factor. Common die materials are tool and die steels containing chromium, nickel, molybdenum, and vanadium ( see Tables 5.5 and 5.6 ) . Dies are made from die blocks, which themselves are forged from castings and then machined and finished to the desired shape and surface finish. Die failures usually result from a variety of the reasons described in Section 14.10. Die manufacturing methods are also described in that section.

Lubrication. Lubricants greatly influence friction and wear; consequently, they affect the forces required ( Eq.14.1 ) and the flow of the metal in die cavities. They can also act as a thermal barrier between the hot workpiece and the relatively cool dies, slowing the rate of cooling of the workpiece and improving metal flow. Another important role of the lubricant is to serve as a parting agent, that is, one which inhibits the forging from sticking to the dies and helps in its release from the die. A wide variety of lubricants can be used in forging. ( See also Chapter 32. ) For hot forging, graphite, molybdenum disulfide, and sometimes glass are used. For cold forging, mineral oils and soaps are common lubricants, applied after conversion coating of the blanks ( Section 32.12 ) . In hot forging, the lubricant is usually applied directly to the dies; in cold forging, it is applied to the workpiece. The method of application and the uniformity of the lubricant's thickness on the blank are important to product quality.

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