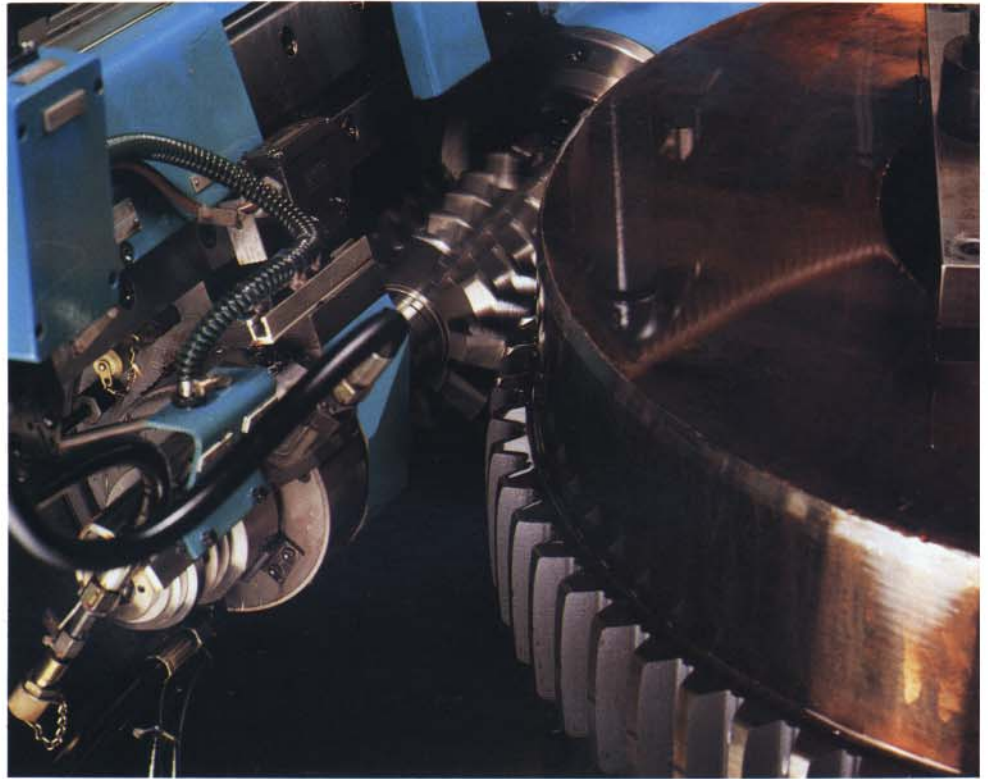


## ***Gear Cutting Technologies***

**Hobbing** is the most common method of cutting gear teeth. This process utilizes a series of rotating cutters arranged in a spiral around an arbor to generate teeth in a gear blank. Both spur and helical gears can be generated by hobbing, as can herringbone gearing, if the apex groove is large enough to accommodate cutting clearances.



**Shaping** generates gear teeth with either a pinion or rack shaped cutter, removing stock from the face of the gear blank in a reciprocating action, while the blank slowly indexes. Spur, helical, herringbone and internal gear teeth are generated on machine tools manufactured by Fellows, Sykes and Maag, among others.

**Milling.** Using milling cutters in the shape of the space between gear teeth, metal is milled from a blank to form the finished gear. Spur, helical and herringbone gear teeth are often formed by milling operations.

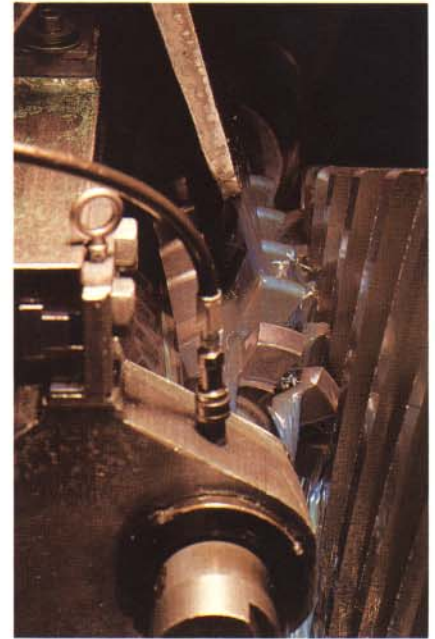


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**Generation Grinding.** Generating external gear teeth with grinding wheels is essentially a finishing process, functionally equivalent to hobbing. Grinding removes distortion due to heat treatment and can significantly increase a gear's quality level and quiet running. This process is performed on equipment which simulates the gear's rolling action against its mate.



**Form Grinding** is another method of improving geometric accuracy of a previously machined and heat treated gear. Form grinding uses a single grinding wheel, contoured to the shape of the desired space between teeth to reduce distortion which occurs during heat treatment. Form grinding is operationally equivalent to milling, and can be performed on both spur and helical external gears.

**Skive Hobbing** is a process of finish hobbing high hardness gearing using carbide tipped cutters to achieve quality levels similar to those of generation grinding. Spur and helical gears can be finished by skive hobbing, as can herringbone gearing if the apex groove is large enough to accommodate cutting clearances.



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