

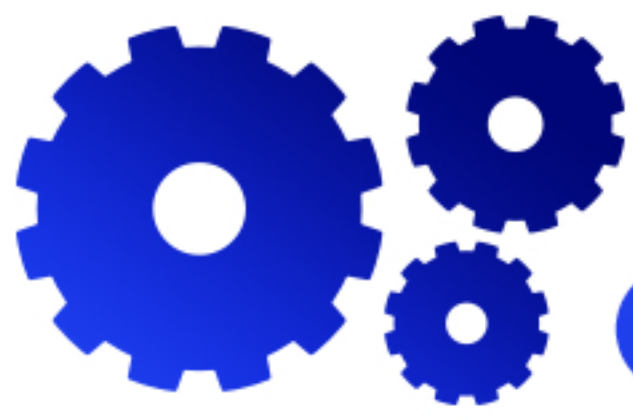


Dr. Castle our expert on Metal Working oils is going to brief you on the process of Gear manufacturing and selection of cutting oils for Gear Hobbing operation.



Gear Manufacturing

Gear manufacturing is a fairly complex metal cutting process and forms an integral part of many industrial products. Gears and Gear drives are one of the key components of all kinds of vehicles, machine tools, aircrafts, and household appliances as well as a broad variety of industrial equipment's. Proper understanding about the various Gear manufacturing processes and controlling parameters is essential in order to meet the growing demands for better productivity and quality of gears.

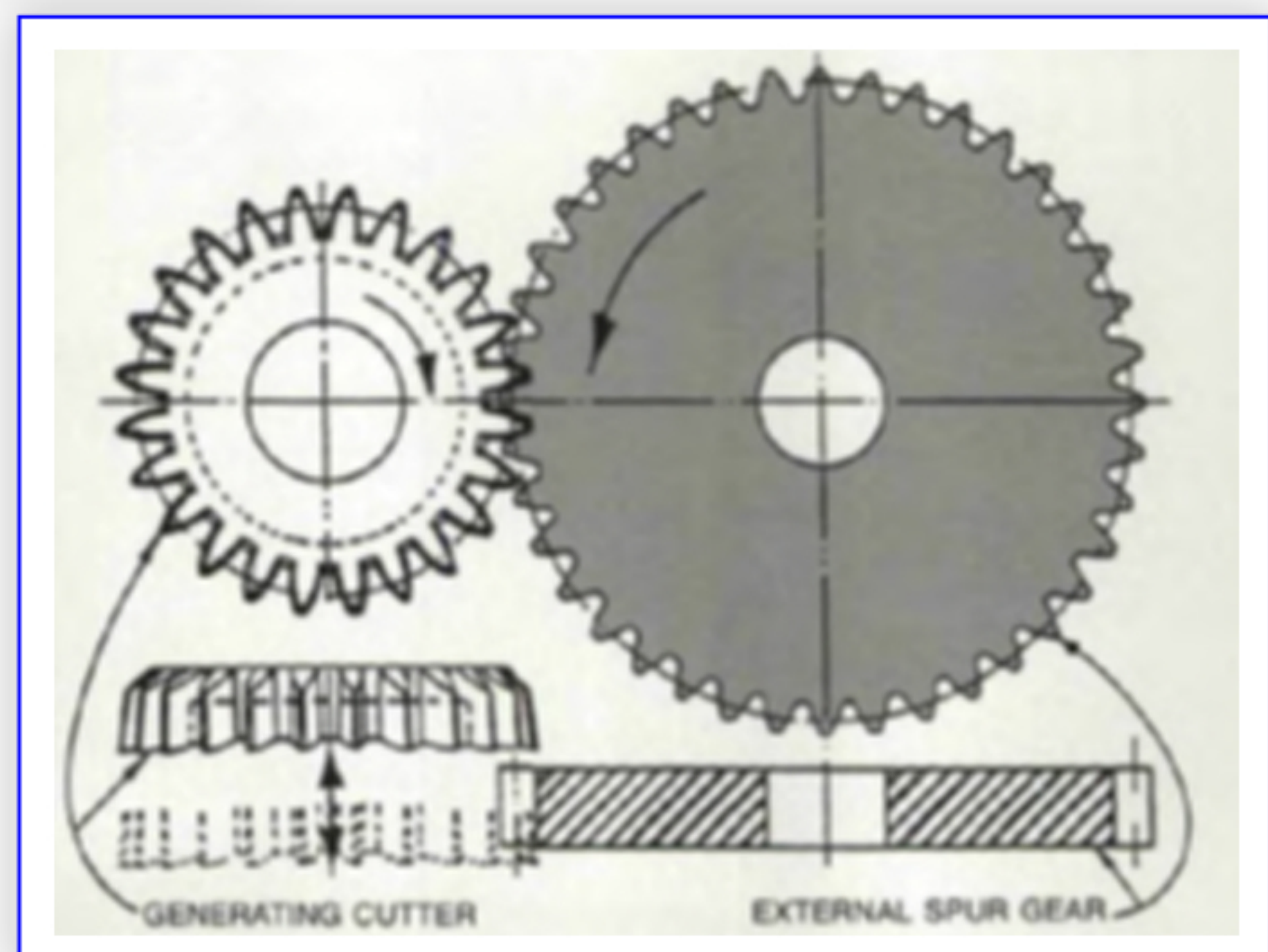
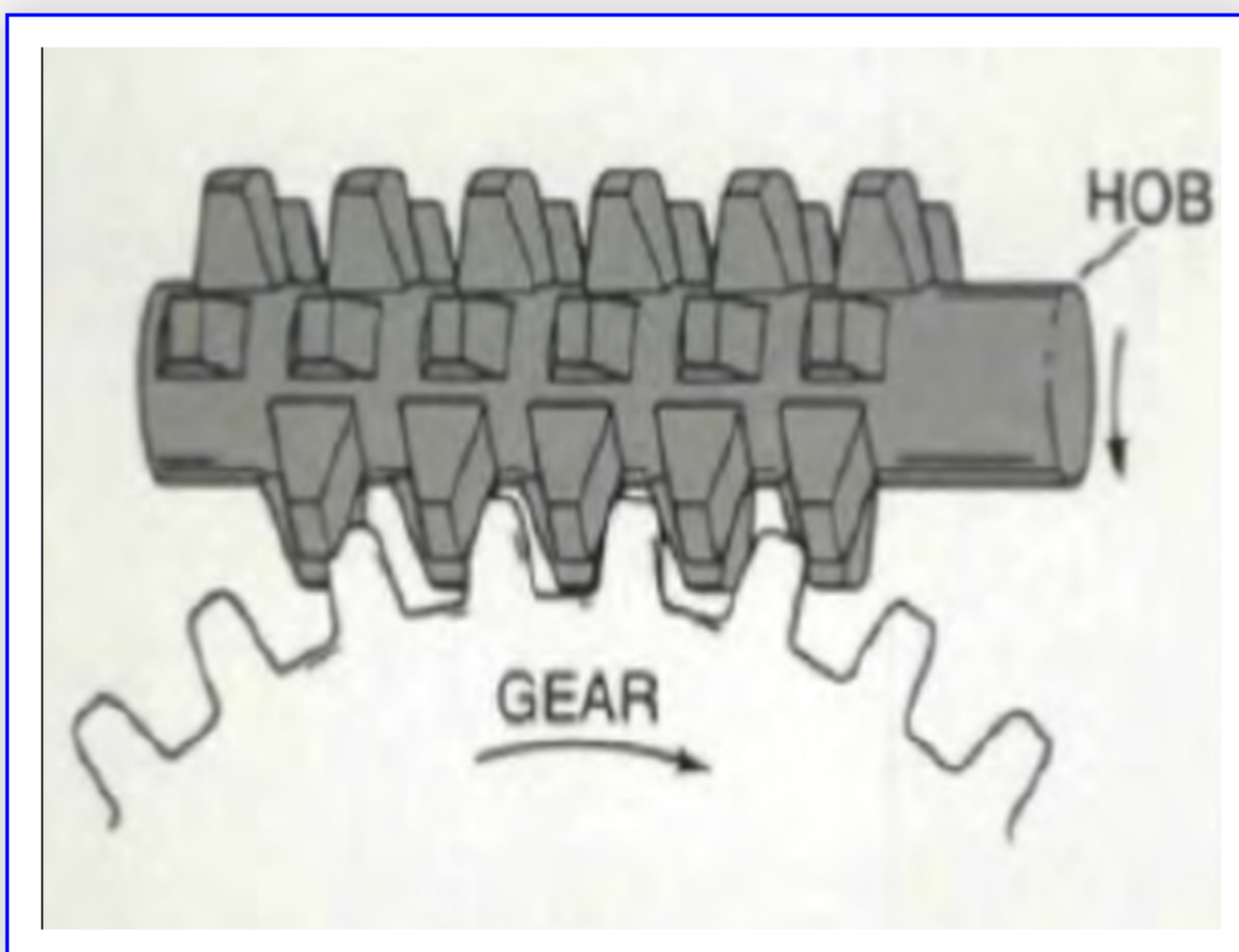


Gear manufacturing process

There are a number of processes related to gear manufacturing.

Gear manufacturing can involve several applications to create splines or the teeth of a gear. Gear hobbing is the most common method for modern gear manufacturing while gear shaping still finds some use.

Gear hobbing is a multipoint machining process in which gear teeth are progressively generated by a series of cuts with a cutting tool known as hob. Both the hob and the workpiece revolve constantly as the hob is fed across the face width of the gear blank.



Types of Gears



Spur Gears



Helical Gears



Rack and Pinion



Bevel Gears



Miter Gears



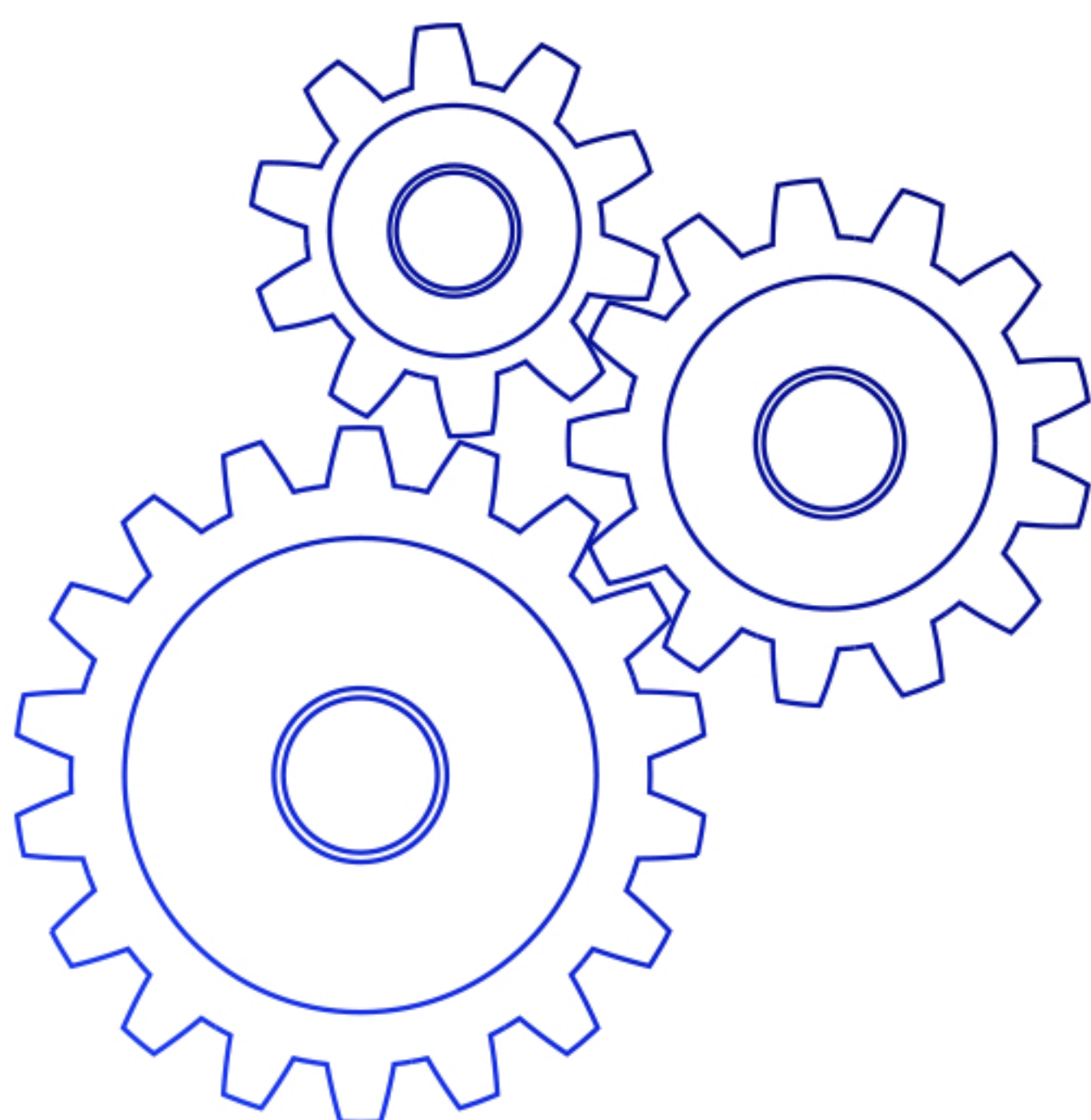
Worm and Worm Gear



Screw Gears



Internal Gears



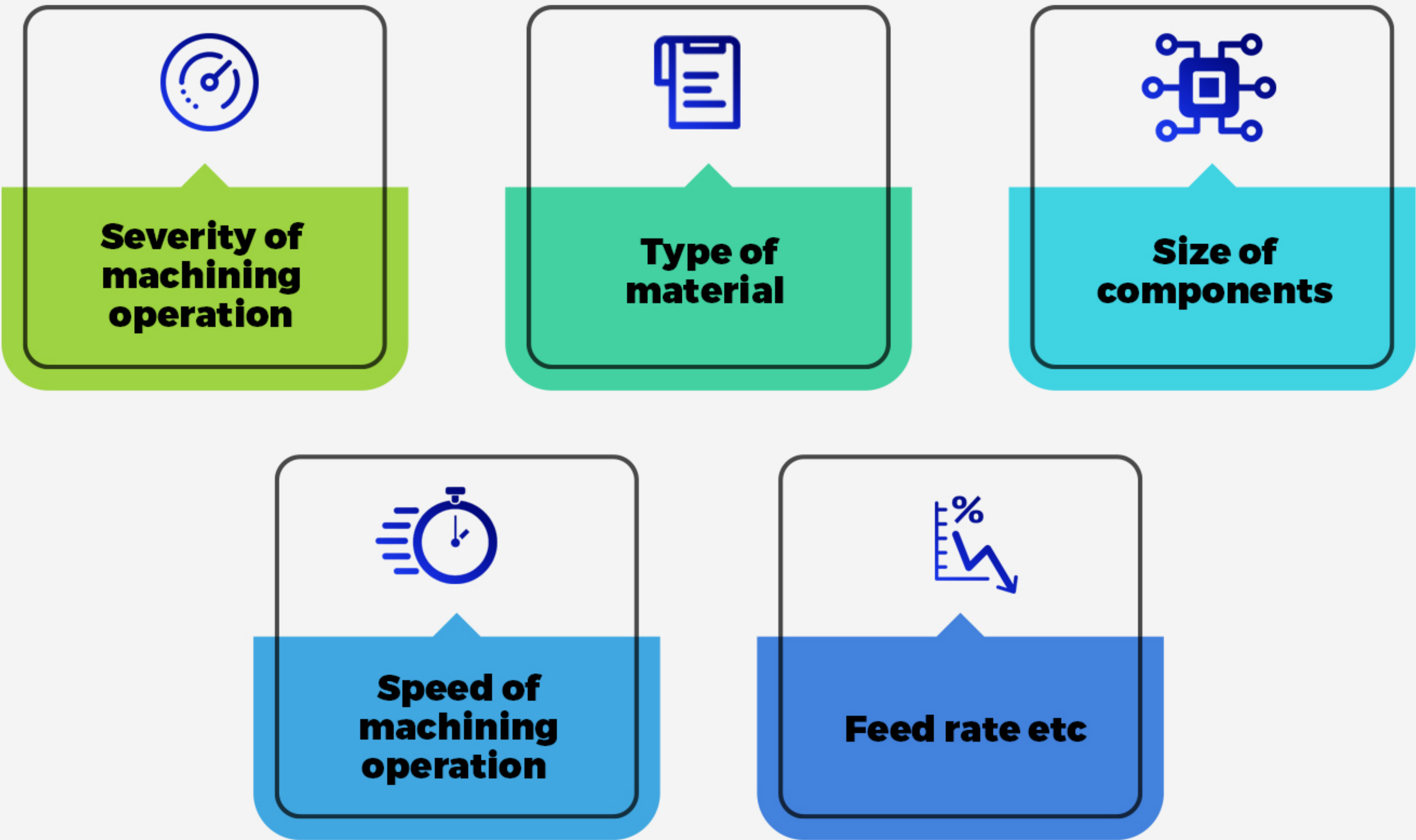
Selection of cutting fluid for Gear Hobbing

Factors influencing Gear Hobbing process.

The cutting tool used for tooth generation is called hob, which is very expensive and ensuring the extended tool life to increase the productivity and better quality gear is very essential requirement.

In the age of economic war of survival it has become essential to consider and evaluate new cutting fluids which can offer better tool life and improve productivity and lowering overall cost

While deciding the type of cutting oil to choose between water miscible (Soluble types) or neat type for various applications one must consider following factors:-

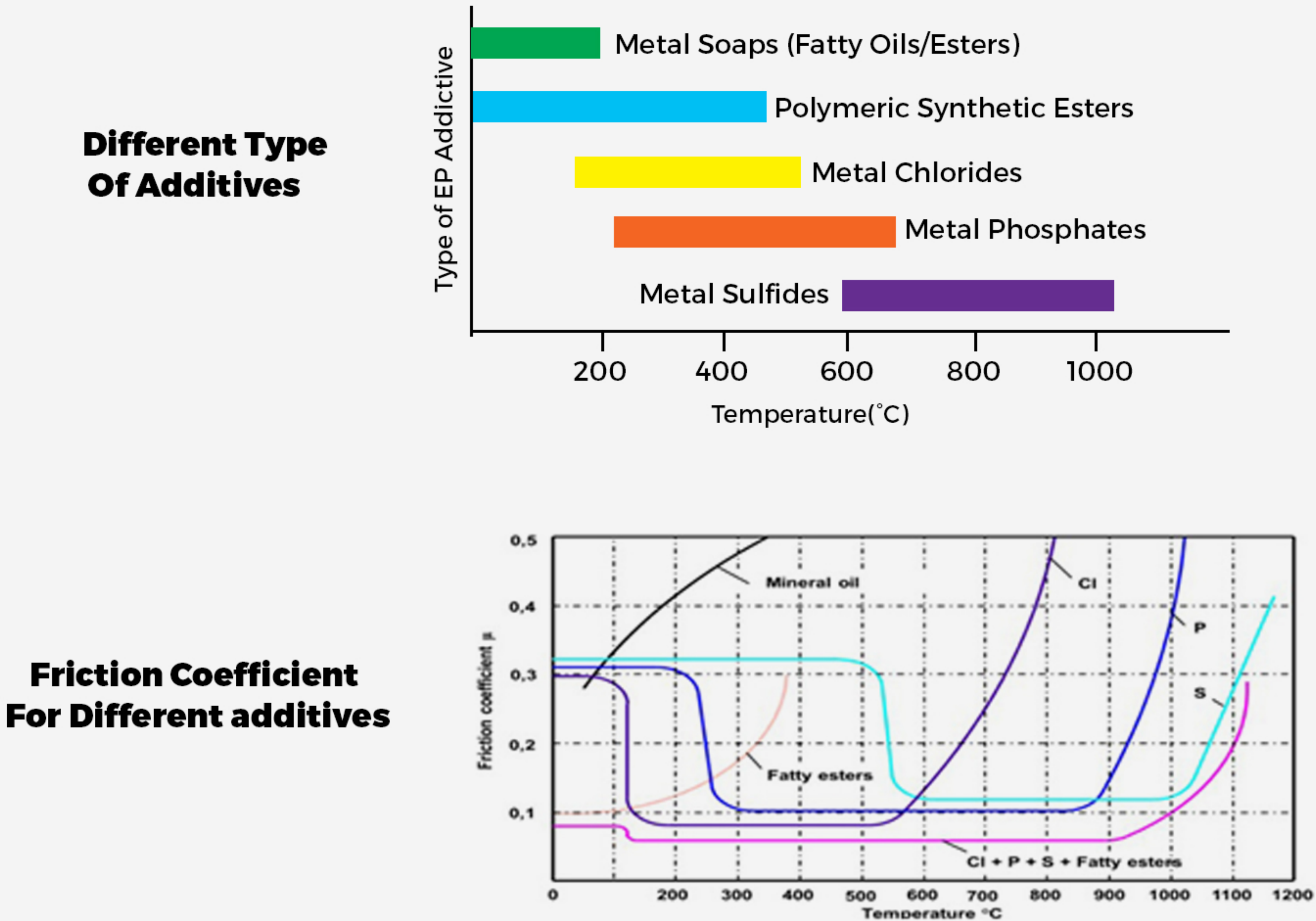


In summary, as a general guideline it is accepted that low speed and heavy cuts involving considerable force are best served by neat oils with selective EP additives however light cut and high speed operation calls for efficient cooling and hence soluble type oils are selected.

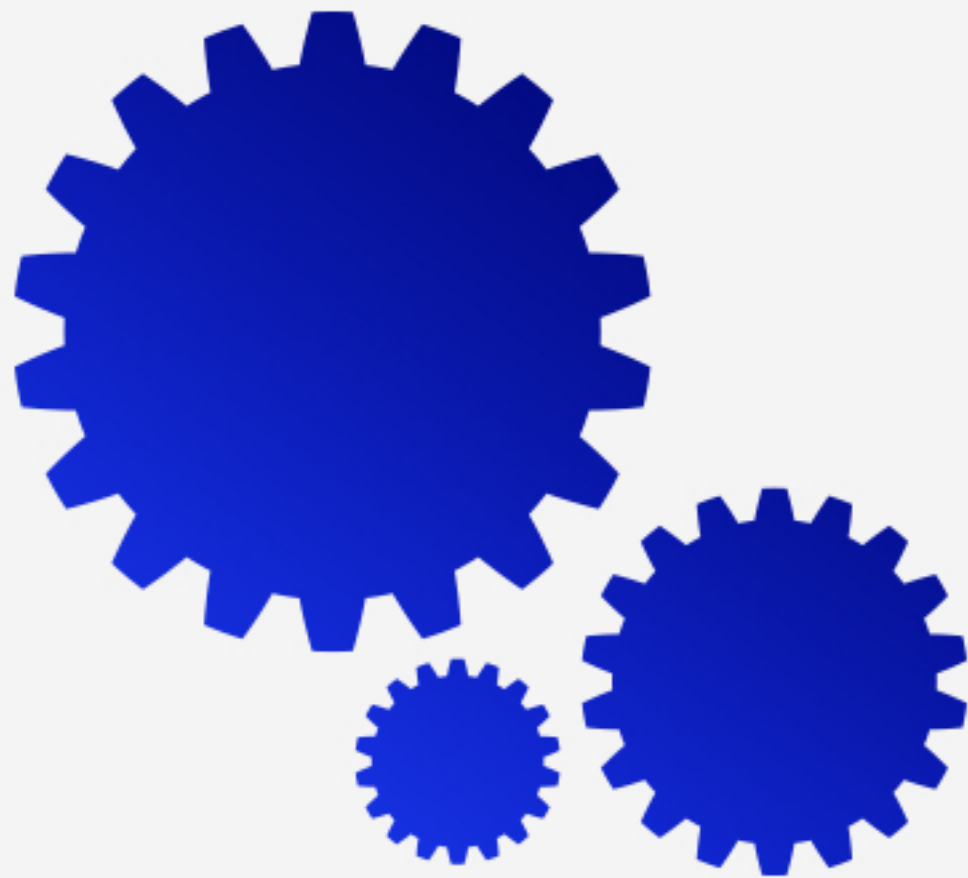
For Gear Hobbing which is considered as severe operation where depth of cut or metal removal is relatively large and operating speed is comparatively slow wherein more lubrication rather than cooling is required, as a general guidelines following table helps in selecting suitable coolant as per the machining operation.

Module	Viscosity Range	Type of Base oil
Bigger Gears > M8	Above 35 Cst	Ester Based
Medium to Bigger Diameter Gears - M4 to M 8type	30 Cst	Ester Based / Mineral Base
Smaller Gears - <M1 to M3	15 -20 cst	GTL / Ester blended / Mineral Base

Most of the gears are of MS and HSS material which are more difficult to machine. Hence to achieve desired tool life and good surface finish and higher productivity neat oil with high level of sulphurised and /or chlorinated EP additive type cutting oils are recommended with the different viscosity levels. Different additive and operating temperatures are highlighted below.



advisable to offer a Dual Purpose oil .i.e cutting oil cum Hydraulic oil to avoid cross contamination and reduce the oil consumption.



Dr. Castle Solution on Gear Machining

HARDCASTLE PETROFER PVT LTD can be a partner in providing you the most appropriate solution of hobbing oil depending upon the application severity.



- Ester Base oil Products - Isocut E Series
- Low & High Viscous - Mineral oil with EP additives: HICUT N VG Series HICUT DP Series



- GTL Based products : Isocut LG Series
- Multipurpose oil - Machining & Circulating fluids : Megacut Series

For more details on product selection you may please contact our Technical Sales team to guide and recommend you the right product.