



ERASTEEL

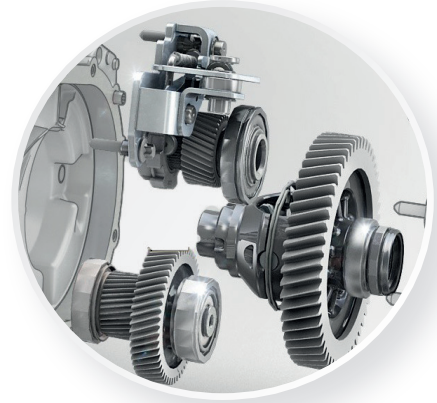
GEAR
SKIVING



A NEW FLEXIBLE WAY OF MACHINING GEARS

Today's gear producers are looking for **higher production speeds, tighter tolerances** and **more flexibility**. Gear skiving has proven to be a well-adapted method to meet these needs. Supported by the latest developments in Powder Metallurgical High-Speed Steels, coatings and more stable numerically controlled machine tools, this method is increasing in usage.

Gear skiving uses a **continuous generating cutting process** to form the involute **gear profile**. The cutting tool and work piece are mounted in **two separate spindles** which are **rotated synchronously**. The axles of the two spindles are crossed at a specific intersection angle, this angle together with the rotary speed of the two spindles is responsible for creating **the cutting speed of the tool**. The tool is then **fed into the work piece**, typically in **multiple passes**, to create the **gear profile**.

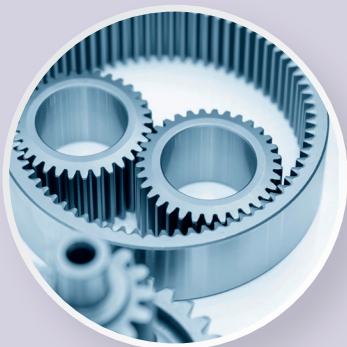


BENEFITS OF GEAR SKIVING

FLEXIBILITY

Unlike some other **gear cutting** methods, gear skiving allows for machining of **both external and internal gears**. The ability to produce internal gears is important with the increasing need for **planetary gear trains**.

The flexibility of gear skiving also comes from the fact that machining of the tooth profile can take place in the same machining center doing other operations such as **turning outer diameter / inner diameter, drilling and tapping holes**, and so on. This limits the required machine tools to produce a single gear, **decreases downtime** and **minimizes errors** introduced during re-fixturing.



PRODUCTIVITY

In the past, shaper cutting has been the obvious choice of shops that have limited machine tools but need to produce both **internal and external gears**. However, staying competitive on **external gears** with shaper cutting is difficult due to the lower productivity.

The productivity of a well-tuned gear skiving process is a good compromise between **flexibility and productivity** since gear skiving allows a **higher productivity than shaper cutting**, with the benefit of being able to **produce both internal and external gears**.



INTERNAL VS. EXTERNAL GEARS

Both external and internal gears can be produced with gear skiving, however the same tool can not be used for both.

Skiving tools cutting internal gears usually require a **higher degree of toughness** as they are subjected to a lot of **re-cutting of chips**. As the work piece is rotating at a high speed, the chips are easily trapped between teeth by **centrifugal forces**. If the chips are not flushed away by **compressed air or cutting fluids**, there is a high risk that the cutter is damaged due to re-cutting of the chips. This is less of a concern with external gears, where abrasive wear or thermal softening are more typical failure mechanisms of the tools.

ERASTEEL'S ASP® OFFER

ASP® is a reference brand in the tooling industry for **gear manufacturing**. It is used for the **most demanding applications** and offers **longer tool life**, **higher productivity** and **easier re-grinding**.

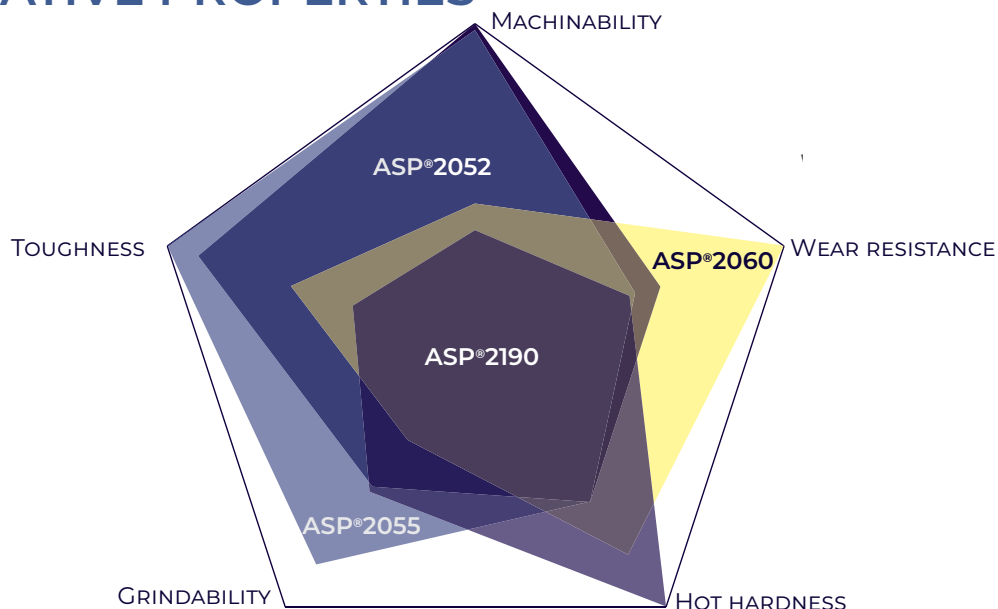
Gear skiving is a very demanding process due to the high speed inducing large amounts of wear, as well as a need for **tough cutting edges**.

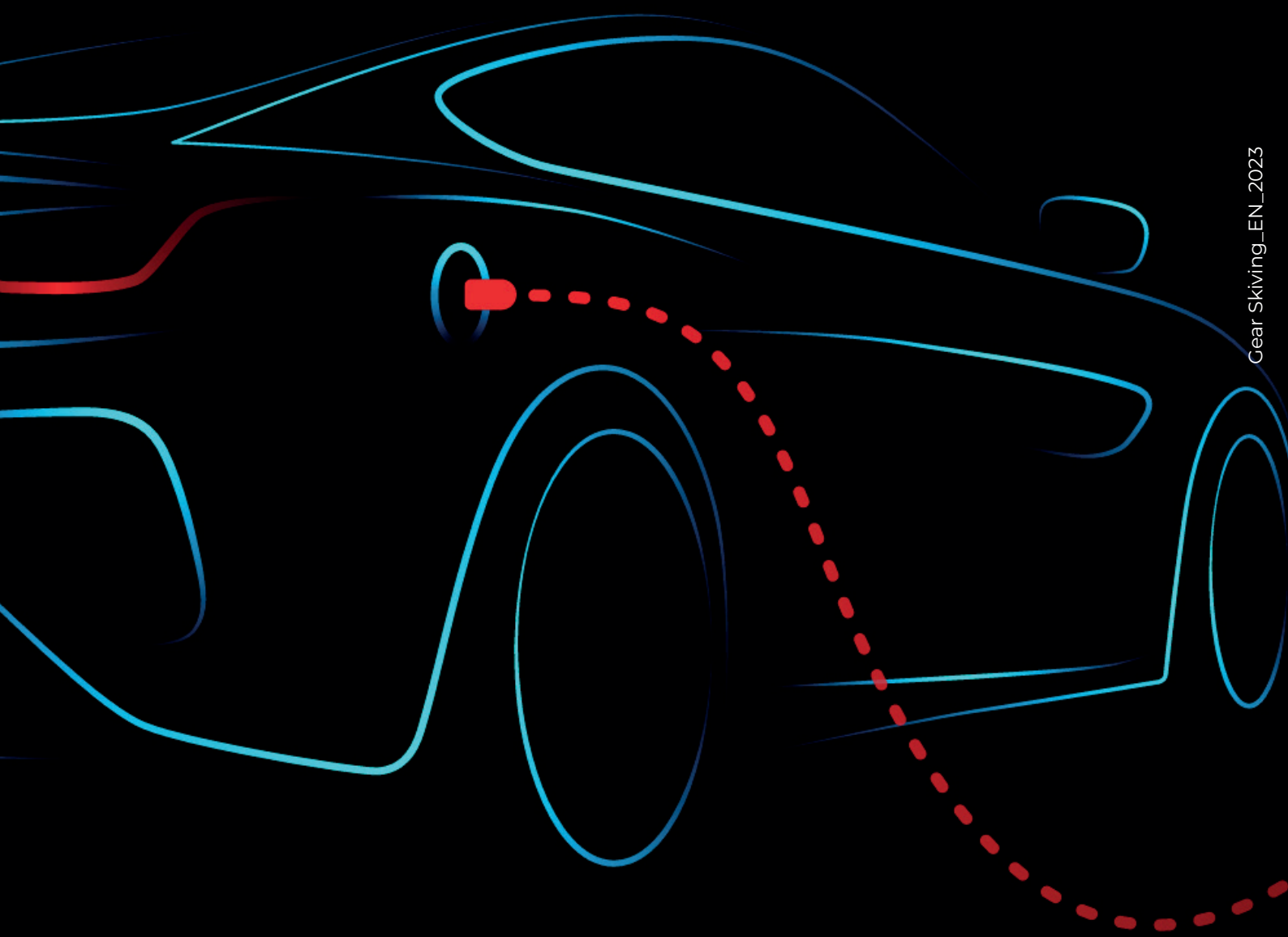
Due to these needs Erasteel offers the following grades:



| GRADES | CHARACTERISTICS |
|----------|--|
| ASP®2052 | Baseline choice for demanding gear cutting applications |
| ASP®2055 | High toughness and performance grade for gear skiving internal gears Reduced carbide size for easier tool production and re-grinding |
| ASP®2060 | Maximum wear resistance and excellent hot hardness for prolonged tool life |
| ASP®2190 | Special grade developed for gear cutting applications to maximize hot hardness Allows for extremely high cutting speeds without softening |

COMPARATIVE PROPERTIES





Gear Skiving_EN_2023

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