



**PENNMET
2000**®

SUPERIOR
STAINLESS

Penn Stainless Products offers a unique product for the machining industry – PennMet 2000 – in stainless steel round bars (*1/4" through 7"*). Our proprietary grades of stainless steel machining bars in 304/L and 316/L are melted to a uniquely controlled chemistry to produce optimal machining characteristics: faster cutting speeds, reduced tool wear, and lower cost parts.



PENN STAINLESS PRODUCTS, INC.

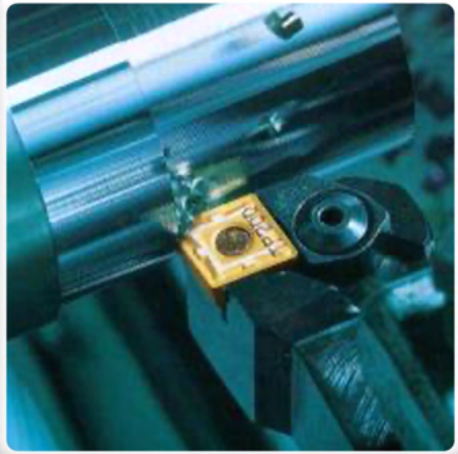


PENNMET 2000 Superior Stainless

- **Improved Machinability**
- **Consistent Performance from Lot to Lot**
- **Improved Surface Finish**
- **Increased Feeds and Speeds**
- **Superior Chip Control**
- **Longer Tool Life**



Machining Operations



Turning



Milling



Drilling



**Threading –
Tapping and
single point**

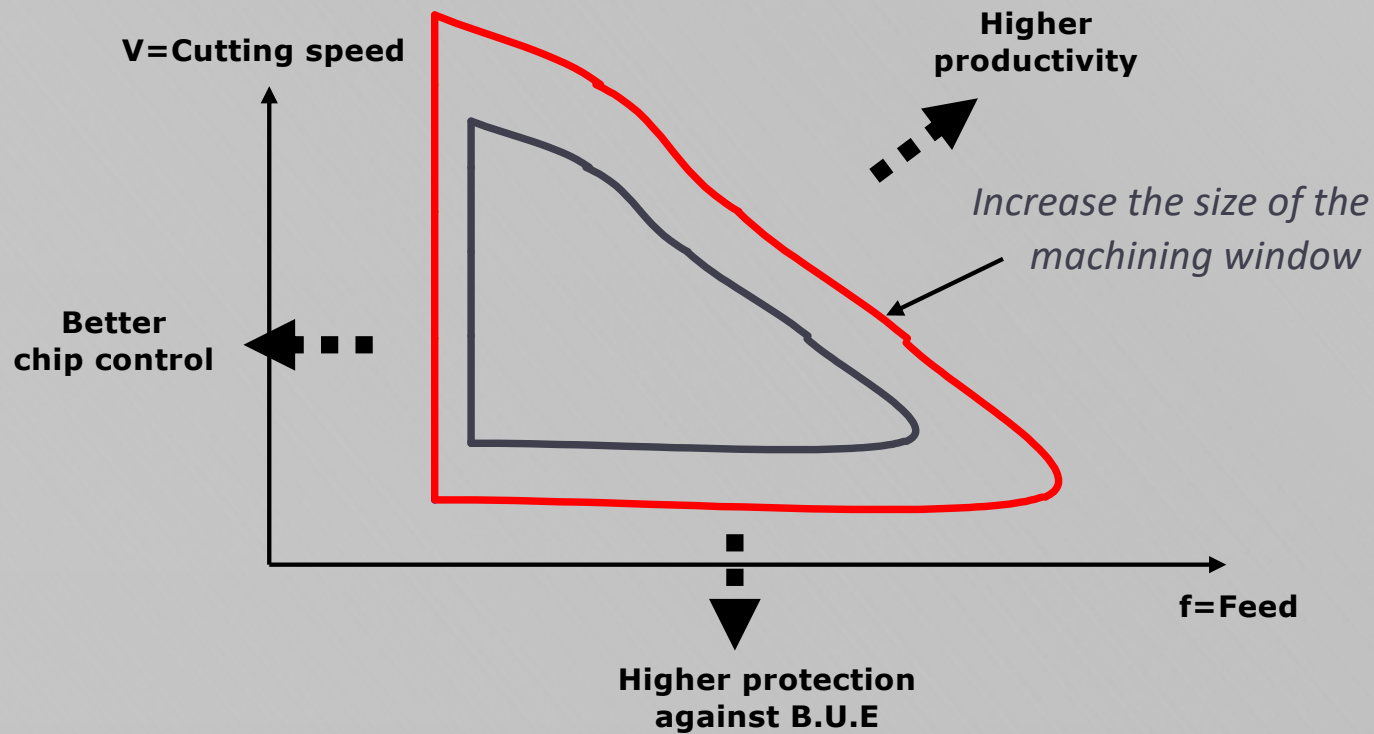
**Forming – HSS
and carbide**

Sawing

Parting off



Improved Machinability





PennMet 2000

A SPECIAL PROCESS FOR A SPECIAL STEEL QUALITY

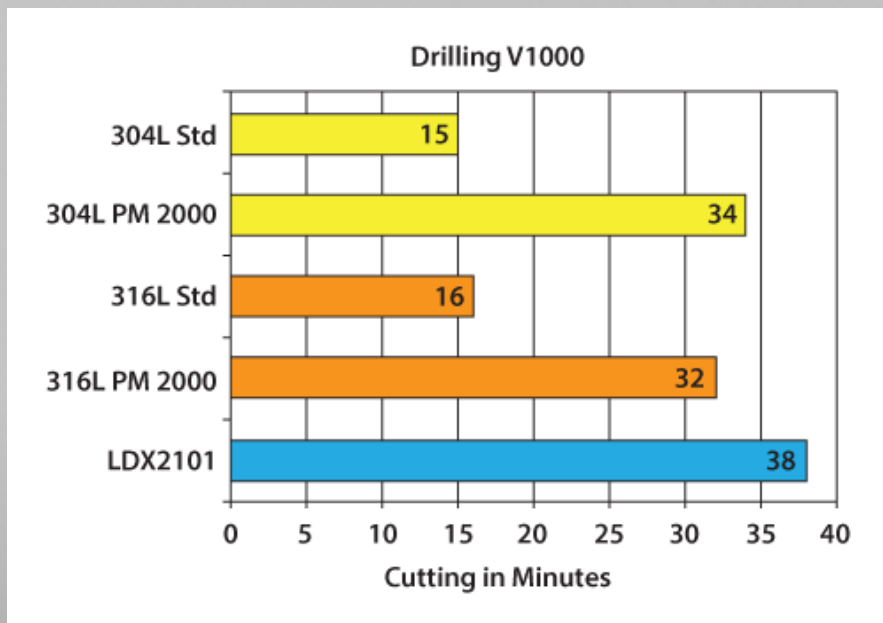
- Process applied austenitic stainless steel bar resulting in optimal machinability.
- Meets all standard specifications requirements of ASTM & ASME for applicable grades.



PennMet 2000

A SPECIAL PROCESS FOR A SPECIAL STEEL QUALITY

- Ladle metallurgy to control **composition, amount, size, shape and distribution of nonmetallic inclusions.**
- Can machine at higher speeds and feeds – increase size of machining window.



V1000 – Machining test showing cutting speed that gives a tool lifetime of 1000mm drilled length.



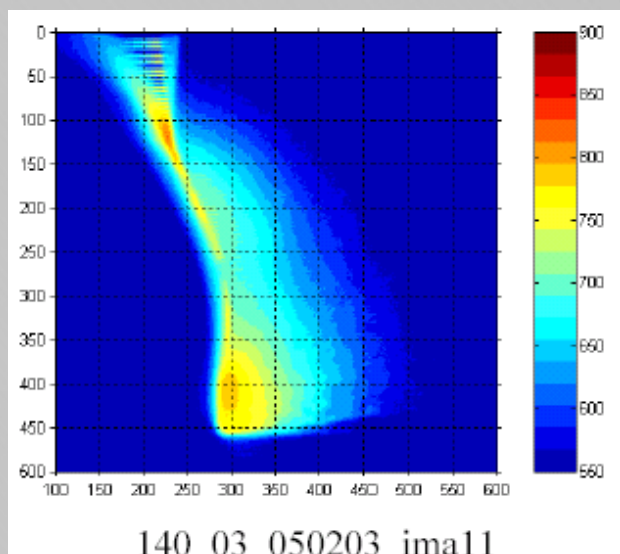


PennMet Treatment

- Deoxidation during standard stainless steel melting results in comparatively large Al_2O_3 inclusions.
- Typically more than 1,000,000 inclusions/lb.
- These inclusions are very hard. For reference carbide tools are coated with Al_2O_3 for wear resistance.
- PennMet treatment improves the composition, size, shape and distribution of these inclusions.



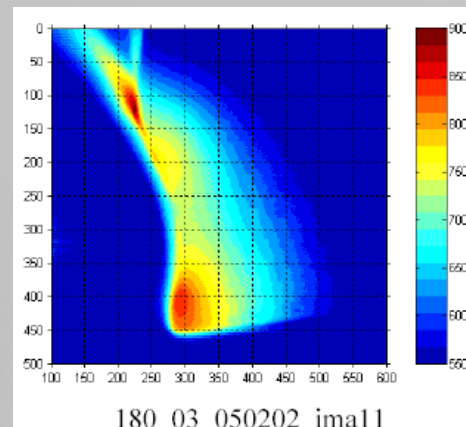
Benefit of PennMet at Higher Speeds



Speed 460ft/min, feed .01181In

Increase speed

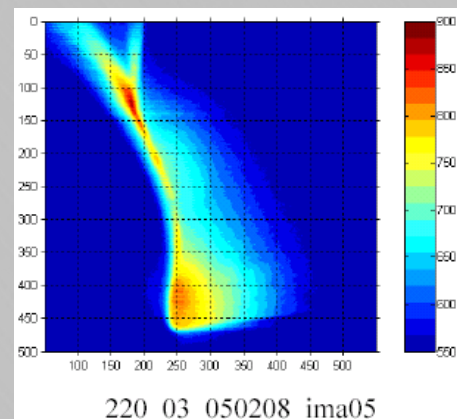
Higher Tool Temp.



Speed 590ft/min, feed .01181In

More speed:

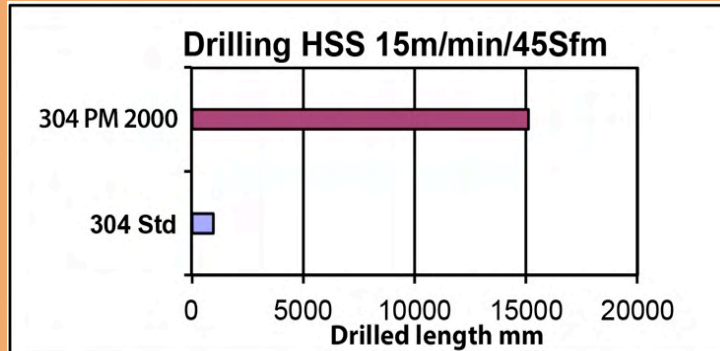
PennMet oxides are activated;
Tool temperature is lower



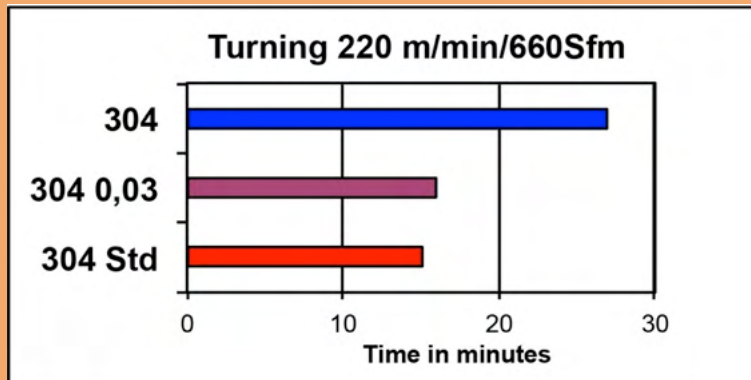
Speed 720ft/min, feed .01181In



Results of PennMet 304 vs Standard 304



PennMet works for drilling



0.030% Sulfur content helps but...

Pre-treatment is more important





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