

New Technologies in the Cutting Tool Industry

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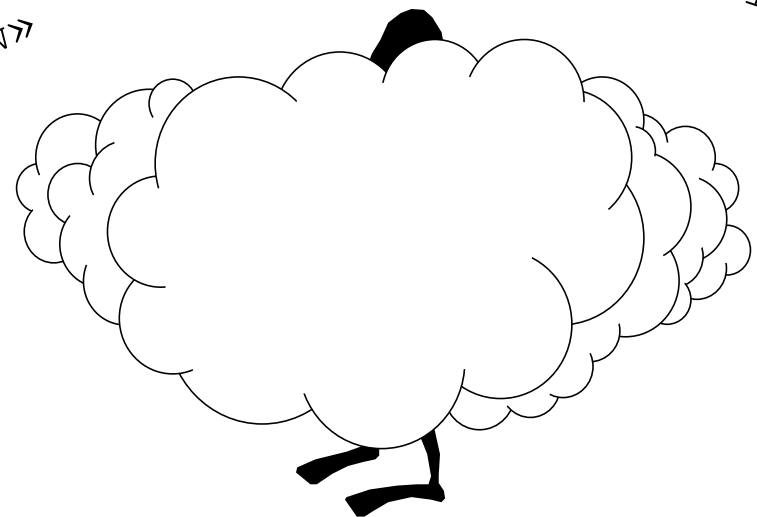
Read in the press

«HSS will diminish dramatically very soon»

«High speed steel tooling could be more economical when speeds are low»

«HSS remains the preferred tool material in many titanium applications today»

«HSS continues to erode»

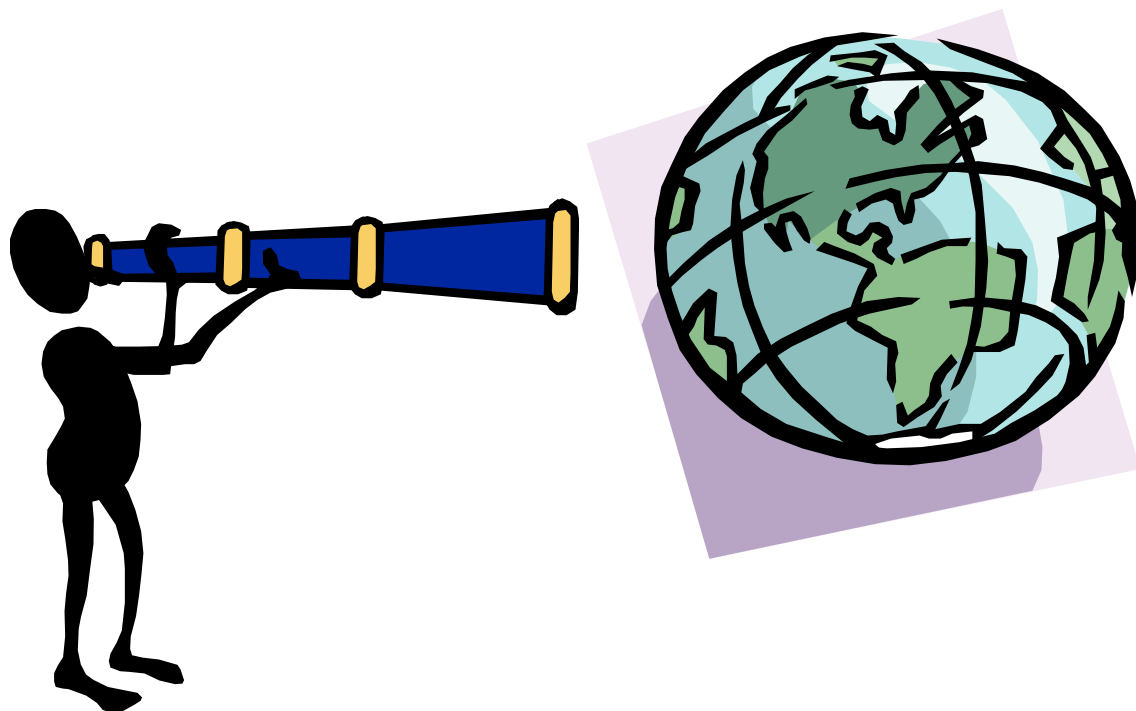


«HSS has the ability to withstand stresses far beyond the tolerances of carbide»

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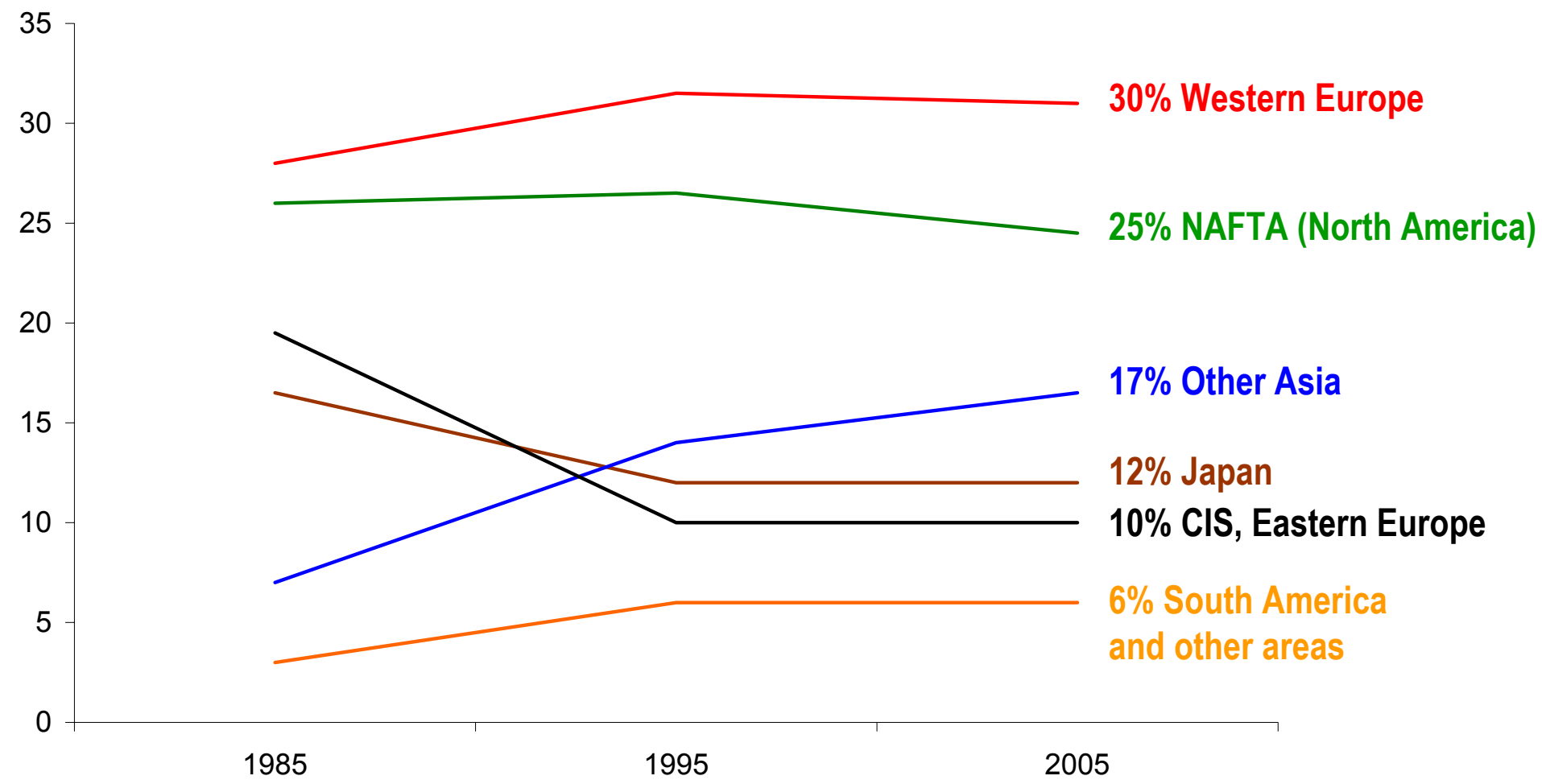
- Facts and figures by area
- Facts and figures by metal cutting technologies
- Facts and figures on new technologies

Facts and figures by area



Tool consumption by area (in %)

■ A world tool consumption of \$11 billion in 2003

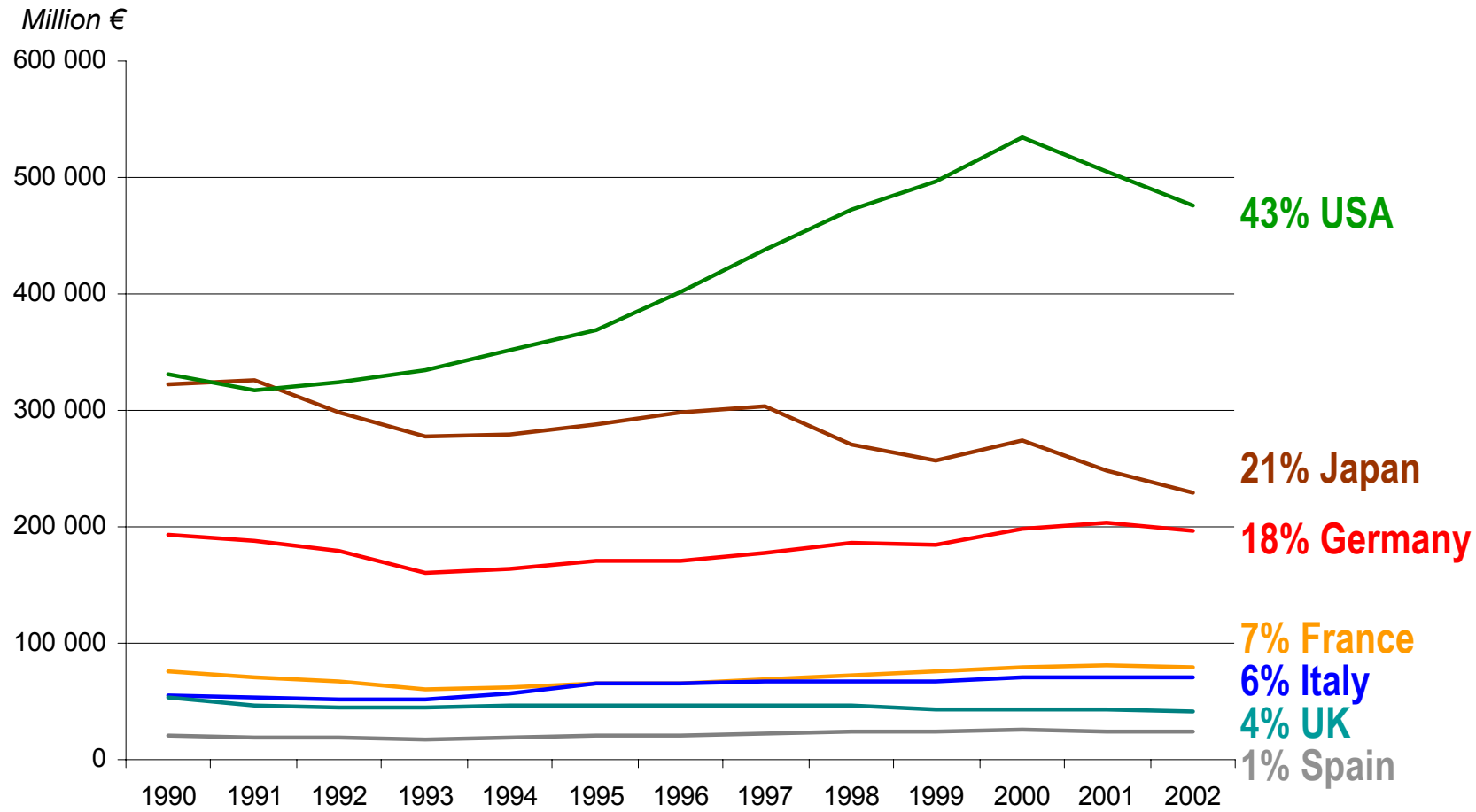


Note: saws not included

Source: HSS FORUM

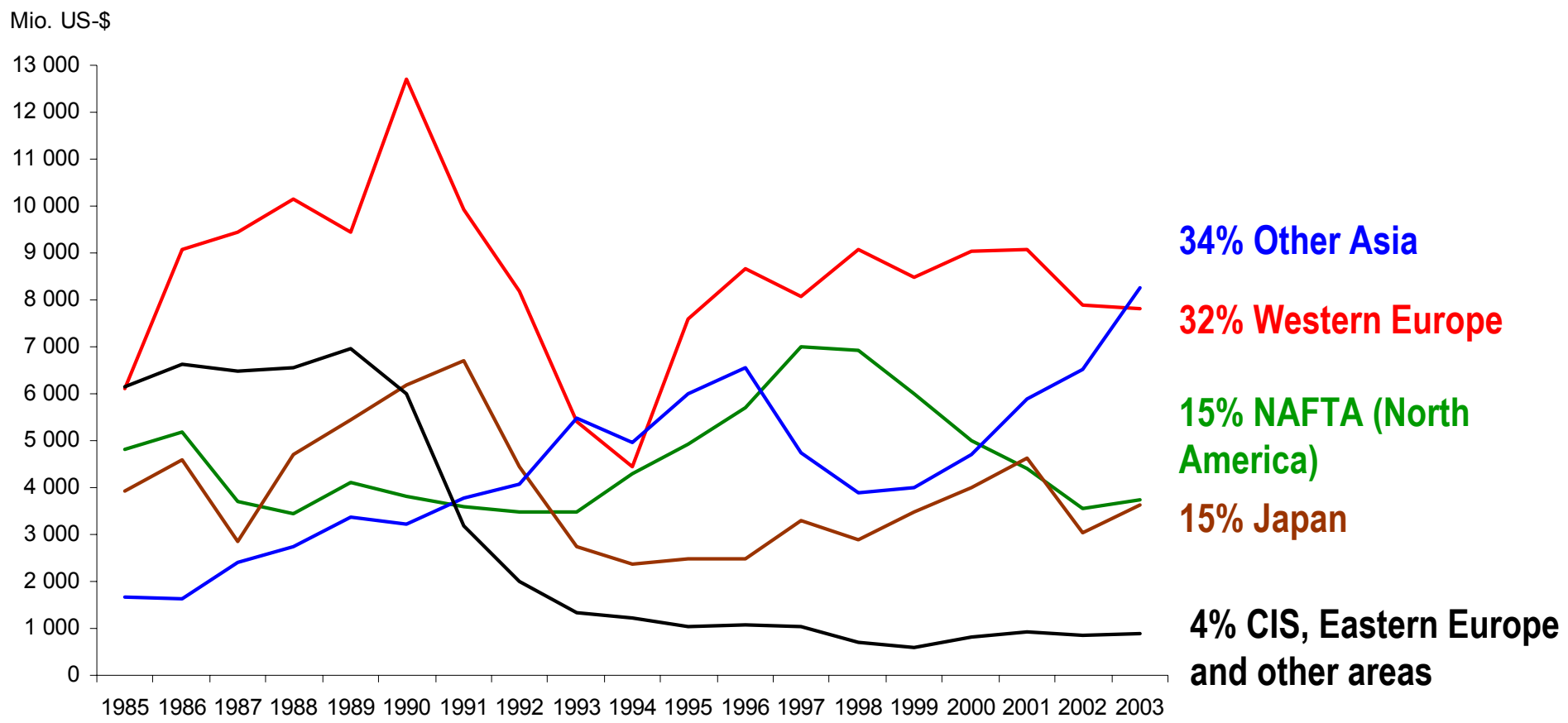
Mechanical industry by area (in %)

- A market of €1115 billion in 2002 in Europe, USA and Japan



Machine tool consumption by area (in %)

- A world consumption* of \$25 billion in 2003 (metal forming not included)
- Significant growth in other Asia and and strong decline in North America

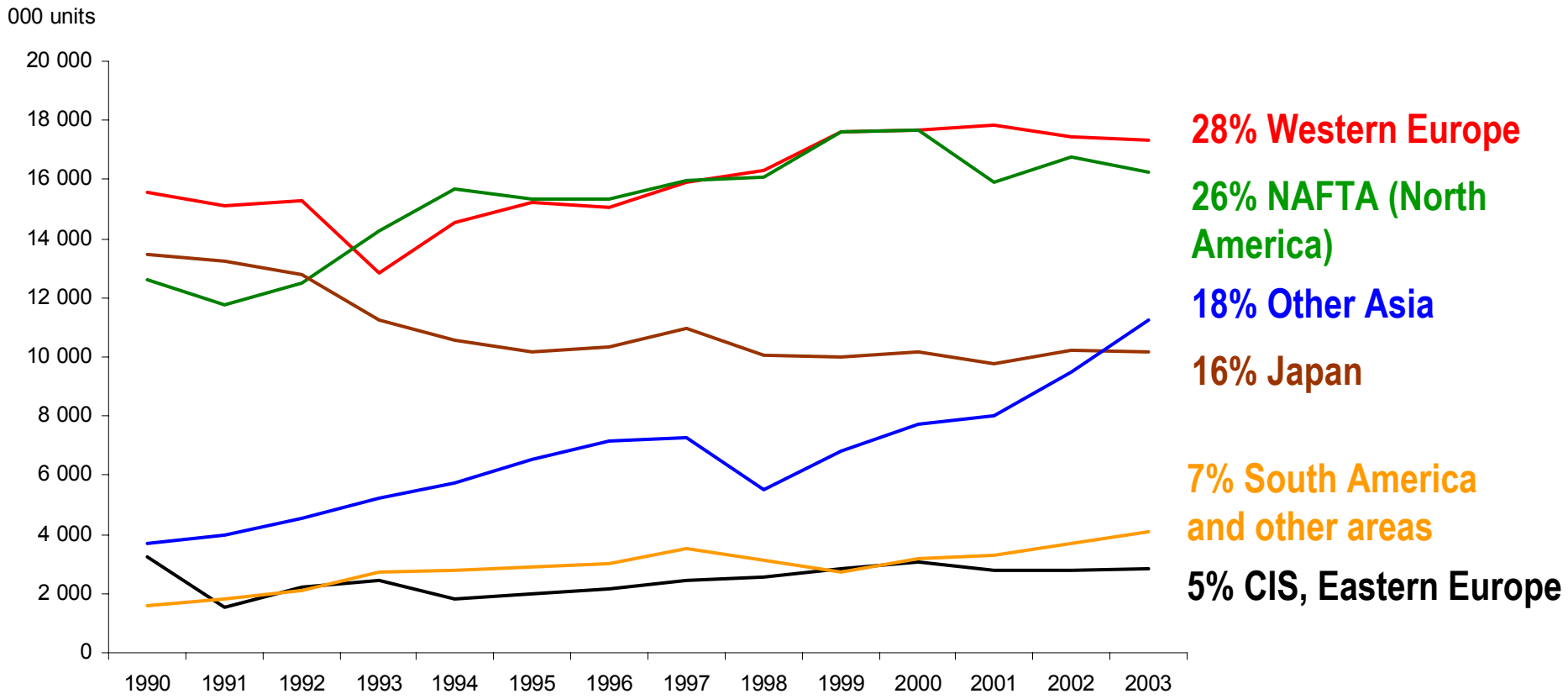


* Machine tools for metal removal only (metal forming machines are not included)

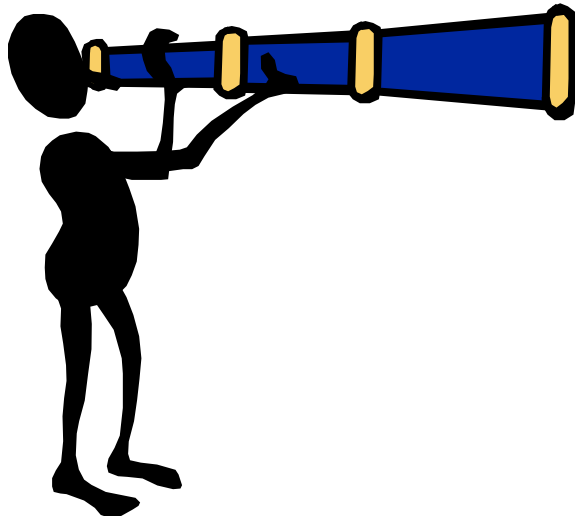
Source: American Machinist and subsequent publisher

Automotive production by area (in %)

- A total production of 62 million vehicles in 2003
- Development of Asian vehicles production

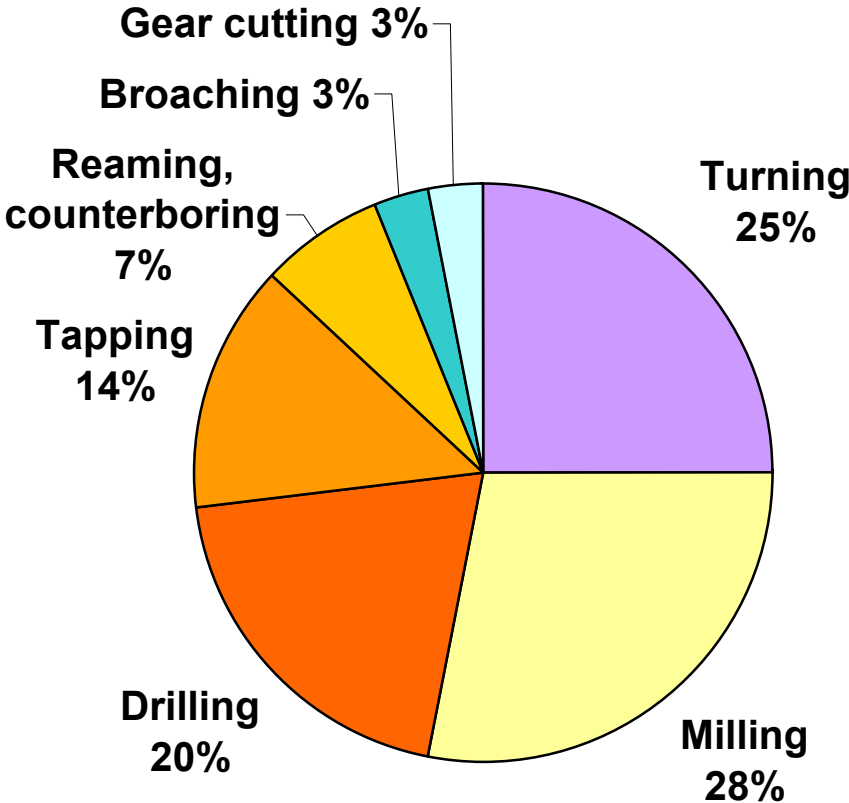


Facts and figures by metal cutting technologies



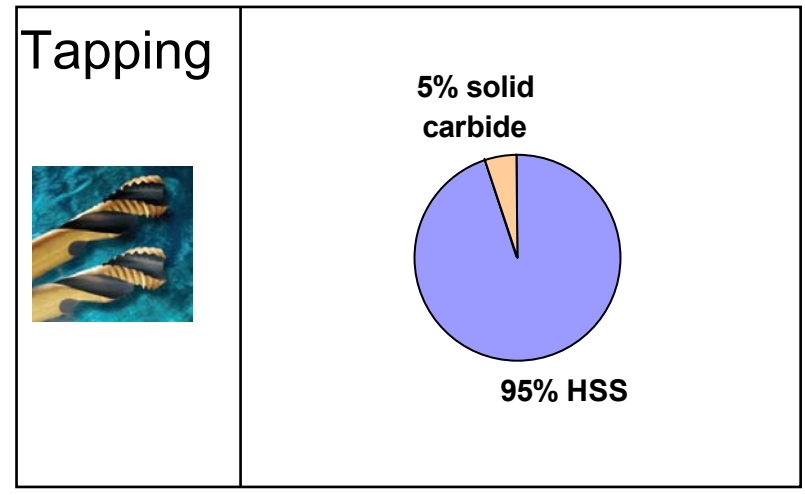
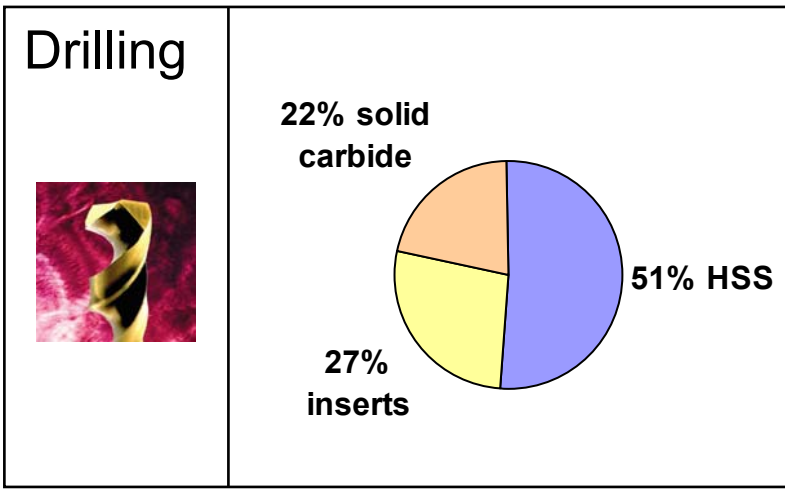
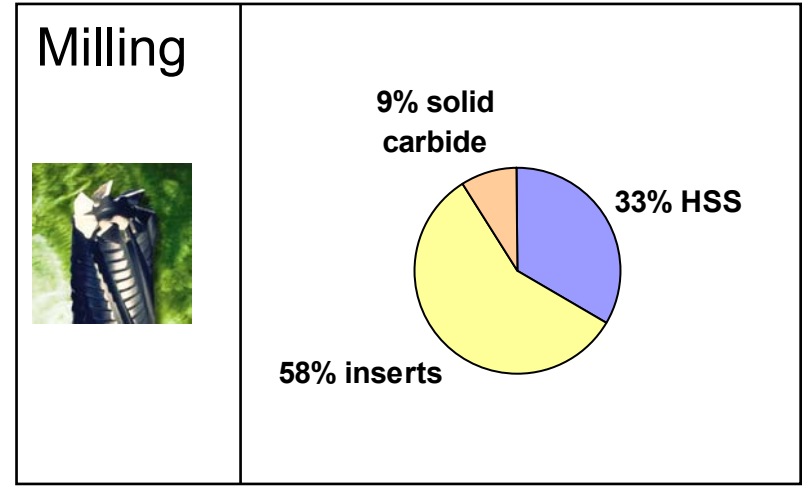
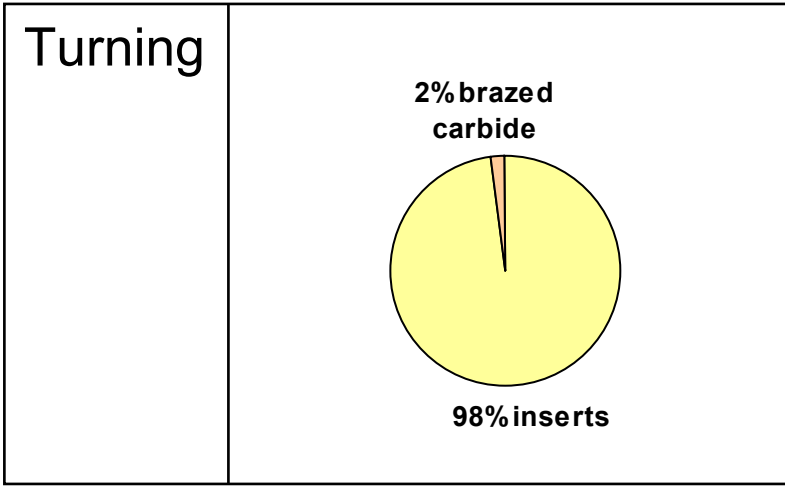
World metal cutting tool market in 2003

A world tool consumption of \$11 billion in 2003



* Sawing (not included above) is estimated to represent a similar volume as tapping

Tool materials in 2003 in different metal cutting technologies

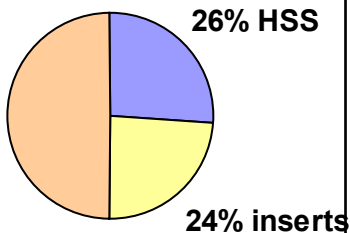


Tool materials in 2003 in different metal cutting technologies

Reaming
Counter-
boring



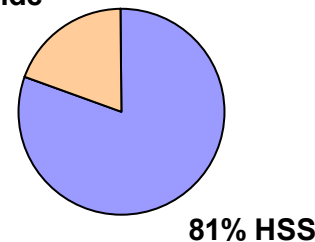
50% solid and
brazed carbide



Gear
cutting



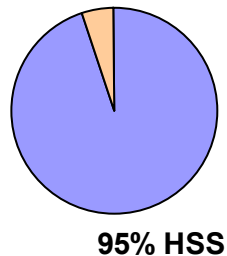
19% solid
carbide



Sawing



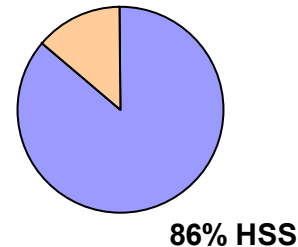
5% brazed
carbide tips



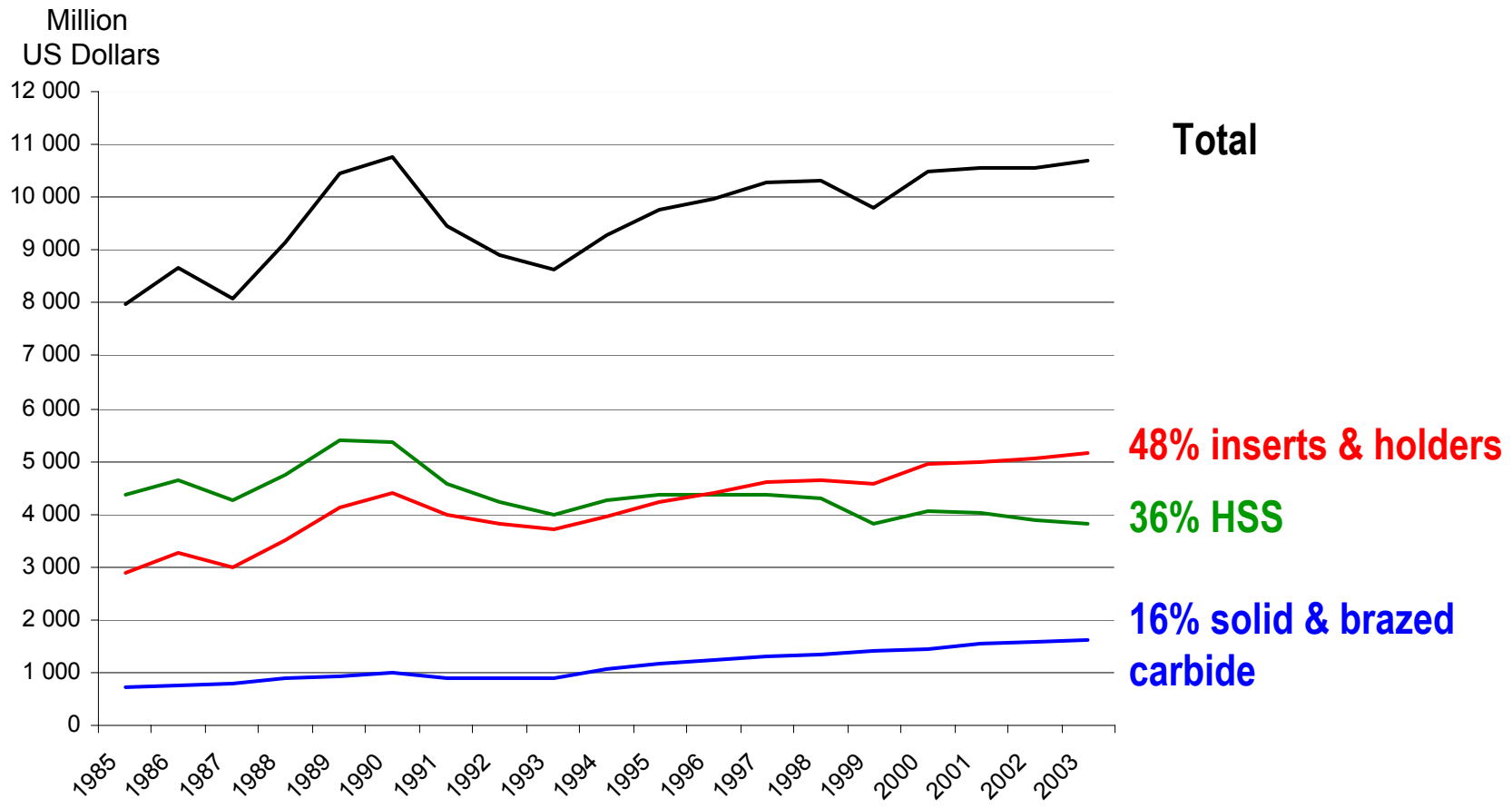
Broaching



14%
carbide

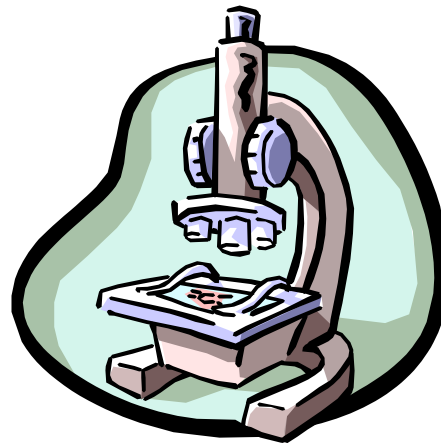


Evolution by tool material

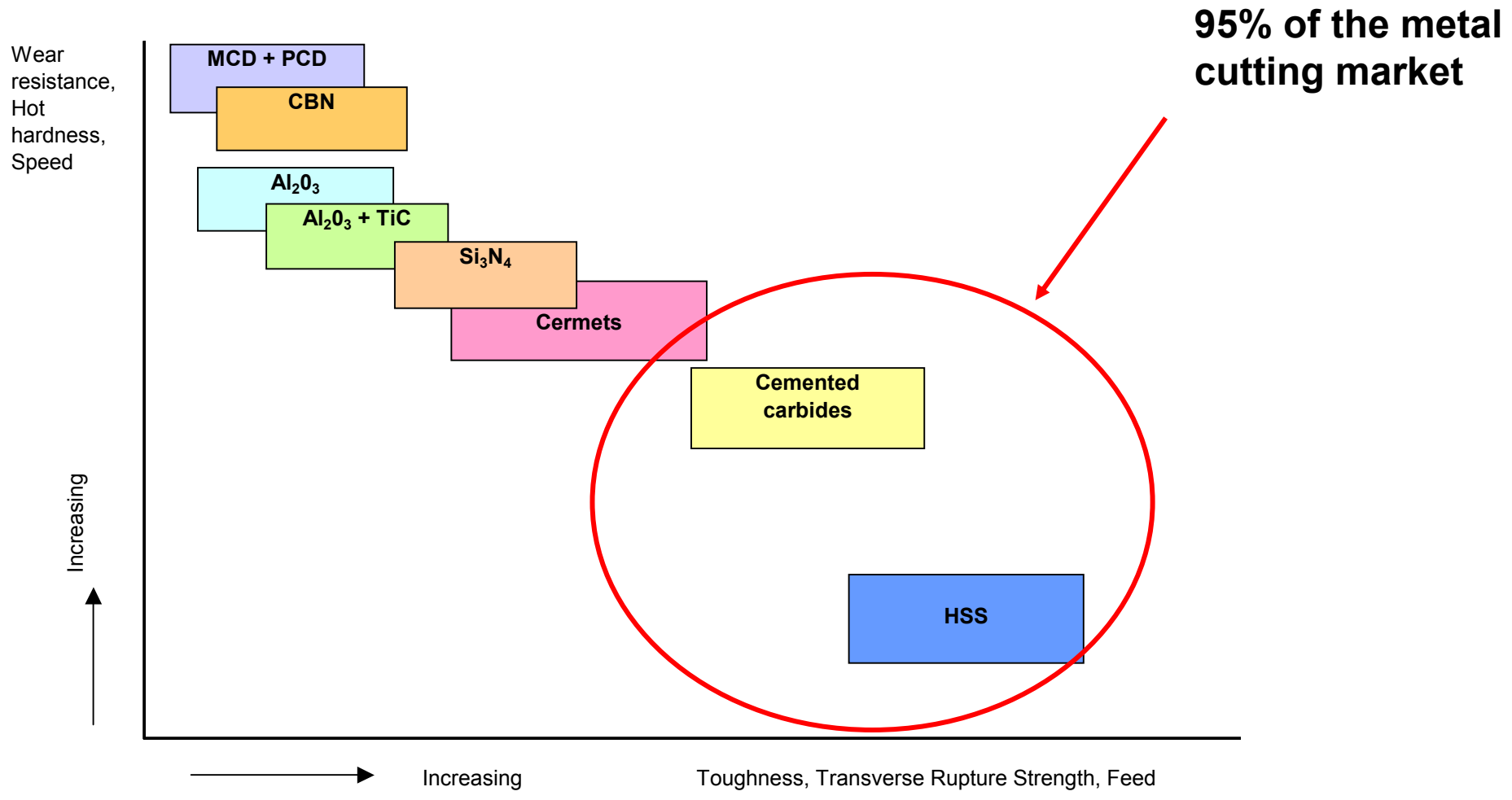


Note: saws not included

Facts and figures on new technologies

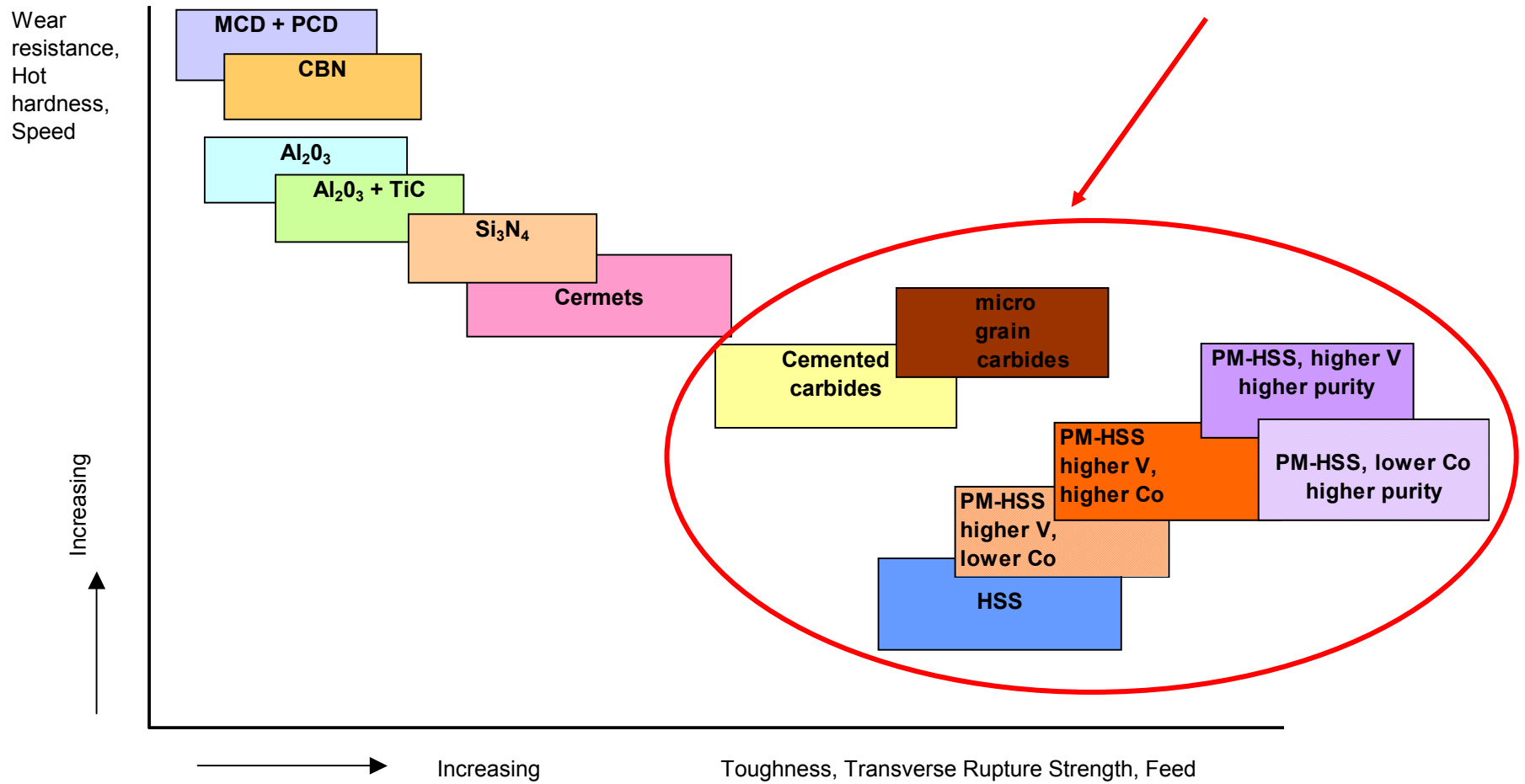


Tool materials – the traditional view

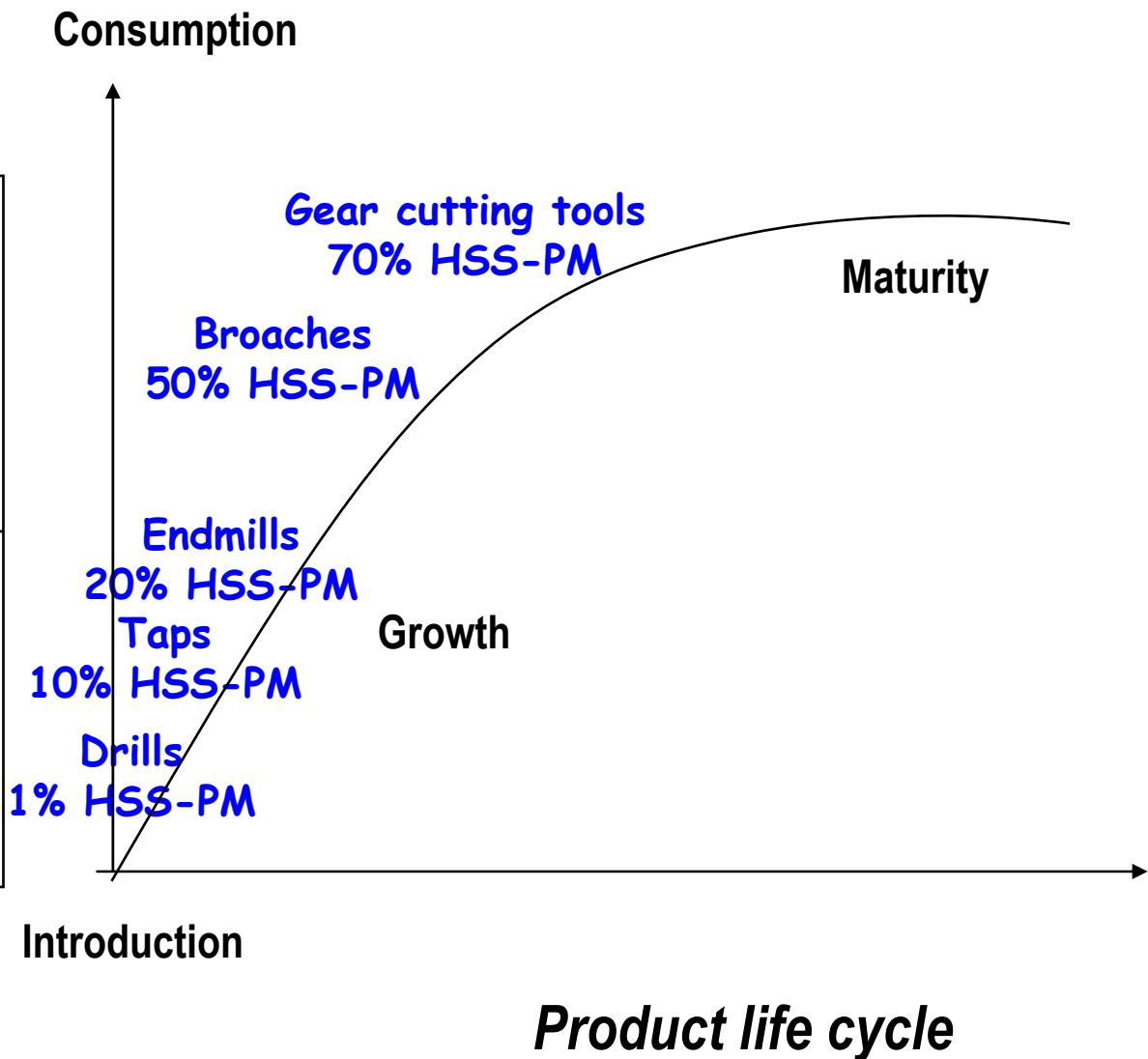
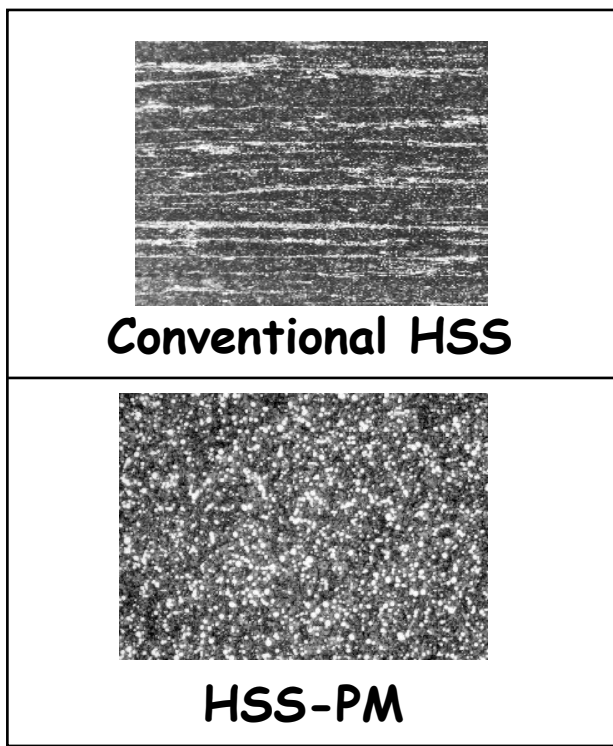


Tool materials – today's view

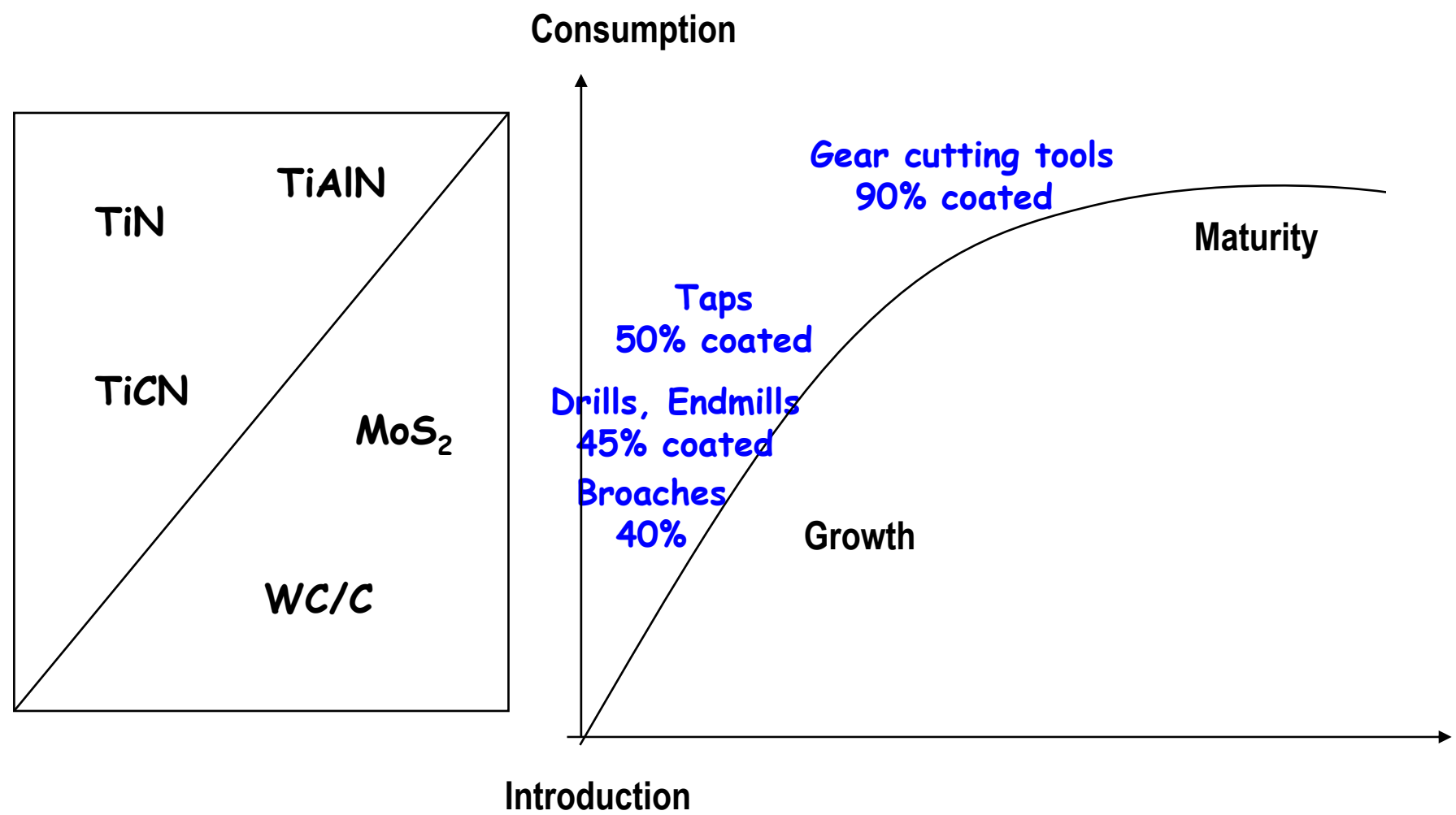
Material developments



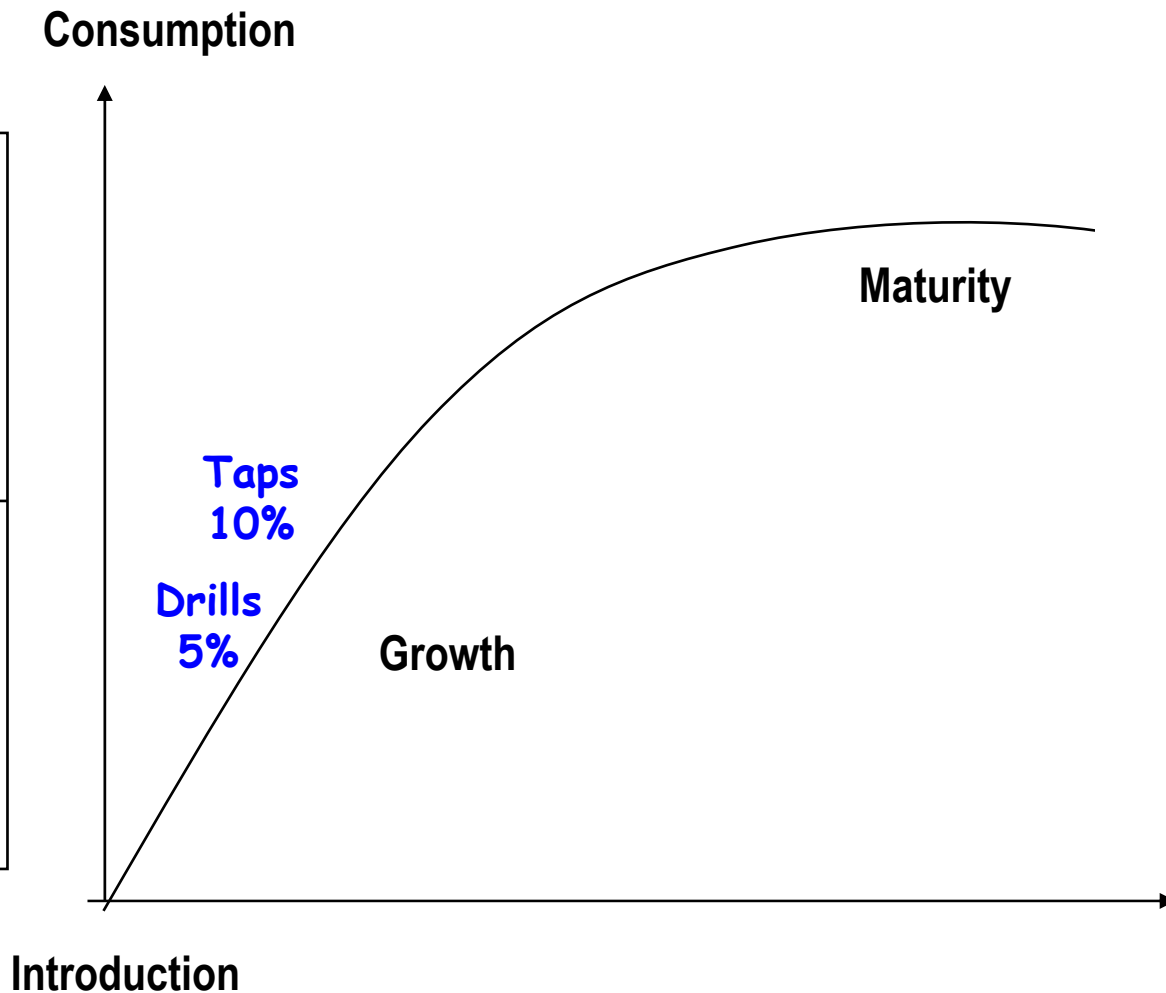
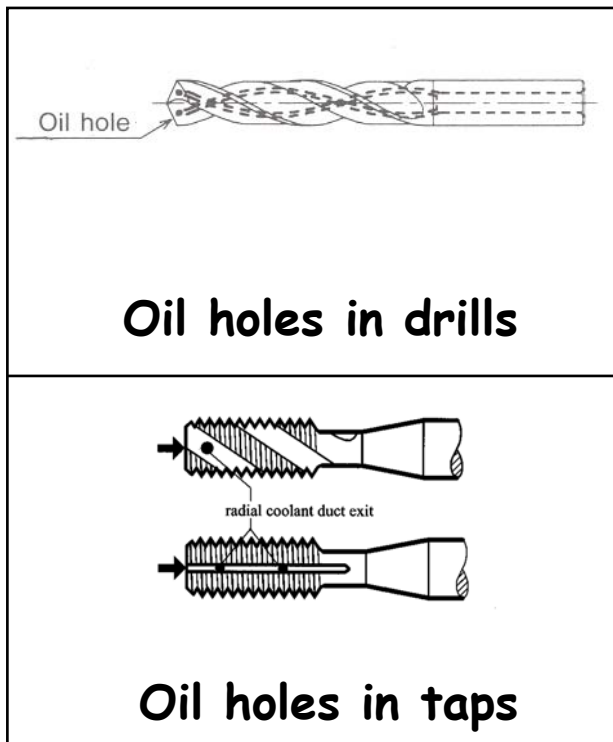
HSS-PM technology in HSS metal cutting tools



PVD coatings in HSS metal cutting tools



Oil-hole technology in HSS metal cutting tools



Product life cycle

Conclusion

- There are today many efforts from tool manufacturers to « bridge the gap » between carbides and HSS in the direction of the ideal cutting material, at different levels:
 - HSS-PM
 - Coatings
 - New geometries

- Interesting evolutions are expected in the field of metal cutting for improved:
 - Tool performance
 - Tool reliability and safety
 - Tool life
 - And machining costs.

Last word: The HSS Smart Guide

- The latest publication of the HSS FORUM
- Comments from readers:

« Ein hilfreiches tool für mich» Mr Pilz, **Austria**

« This is the best HSS guide I ever read» Mr Chen, **Singapore**

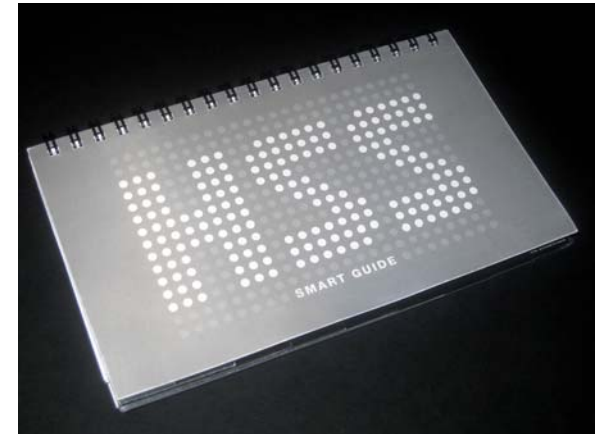
« Your HSS Smart Guide was really useful for us» Mr Tham, **Malaysia**

« We congratulate on the excellent publication, which is very useful to practicing engineers» Mr Sriram, **India**

« The information contained in that book is very easy to understand and it really helps me» Mr Puspasari, **Indonesia**

« There are very useful information for us in this guide» Mr Monka, **Slovak Republic**

« Wir finden diese Lektüre außerordentlich interessant und gut gelungen» Mr Lemke, **Germany**



⇒ **Soon available in German, French, Italian and Spanish**