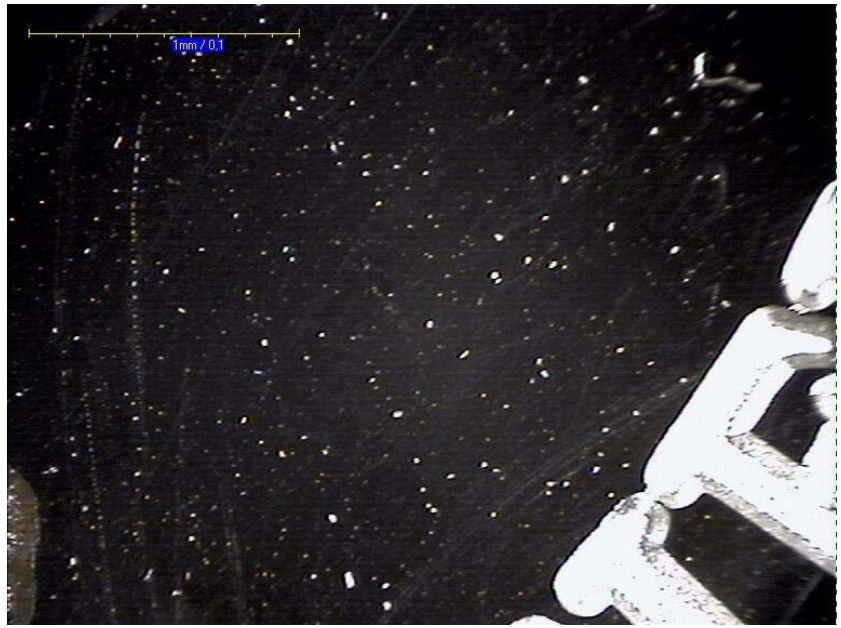
Wear behaviour of the die while coining silver blanks
- part II –

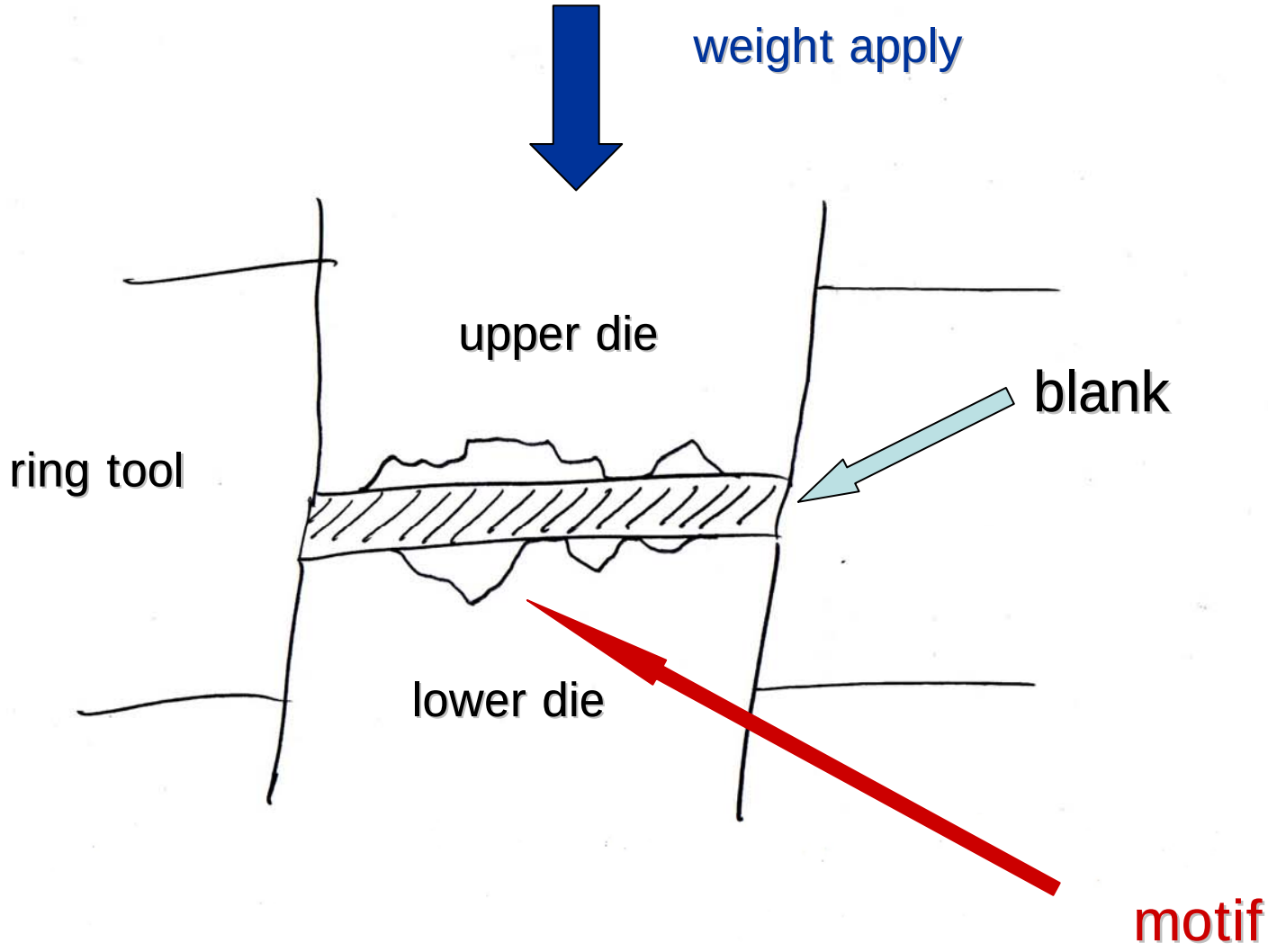
Dr. Gerd Wagner
Reischauer GmbH
Idar-Oberstein, Germany

wear behaviour of the die

macroscopically



microscopically



wear:= property of the „system“

test procedure used in part I

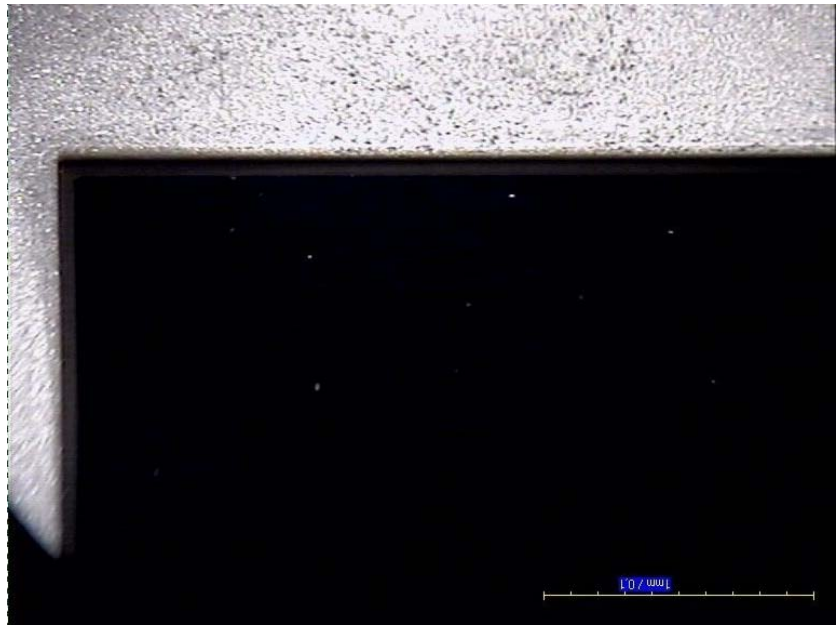
- upper and lower die
- mechanical press
- weight 180 to
- Ag999-blanks
- 50 strokes

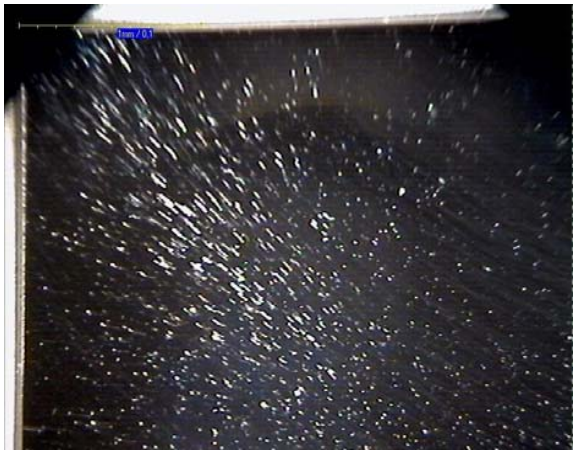
assessment of microscopical wear attack by

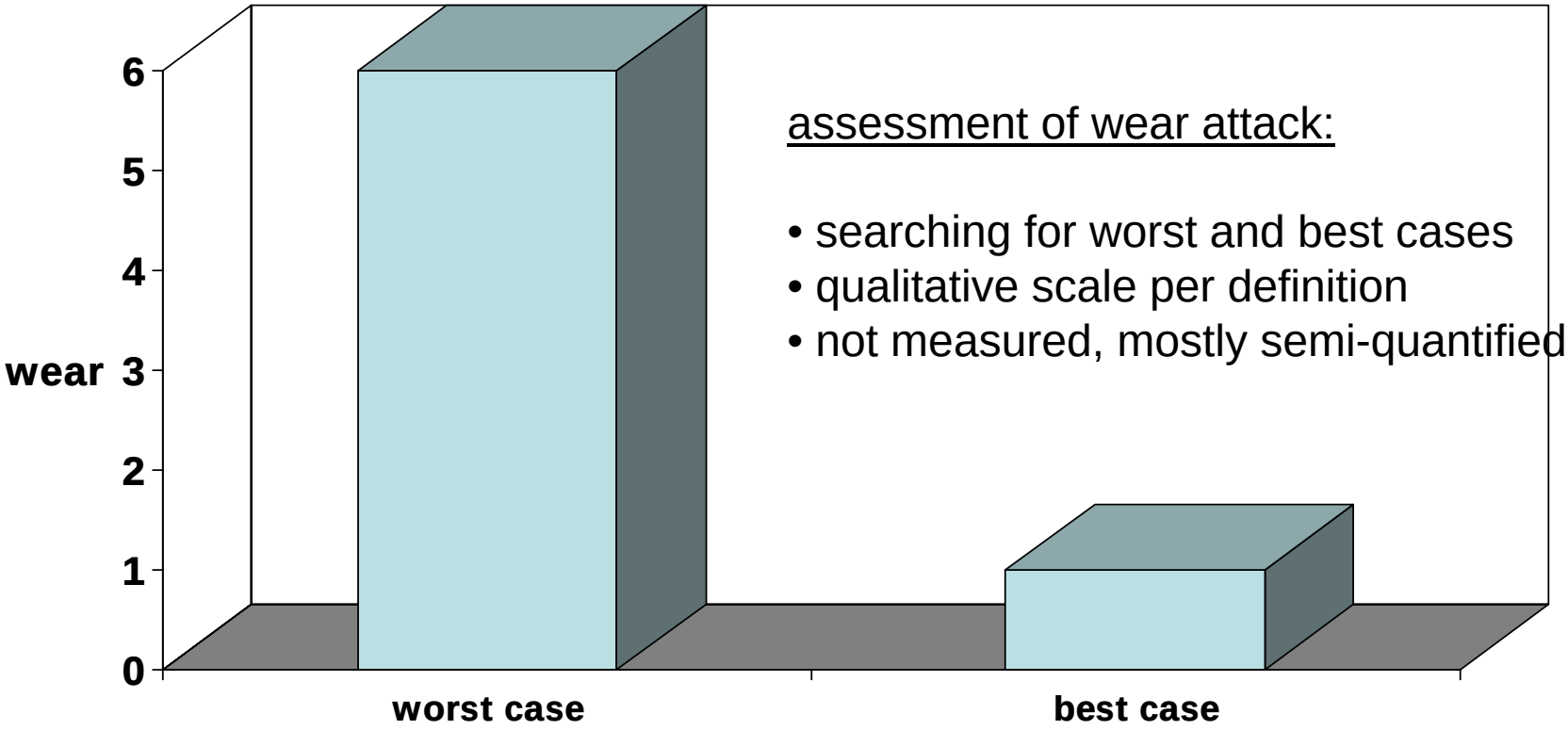
→ visual inspection

and

→ comparison



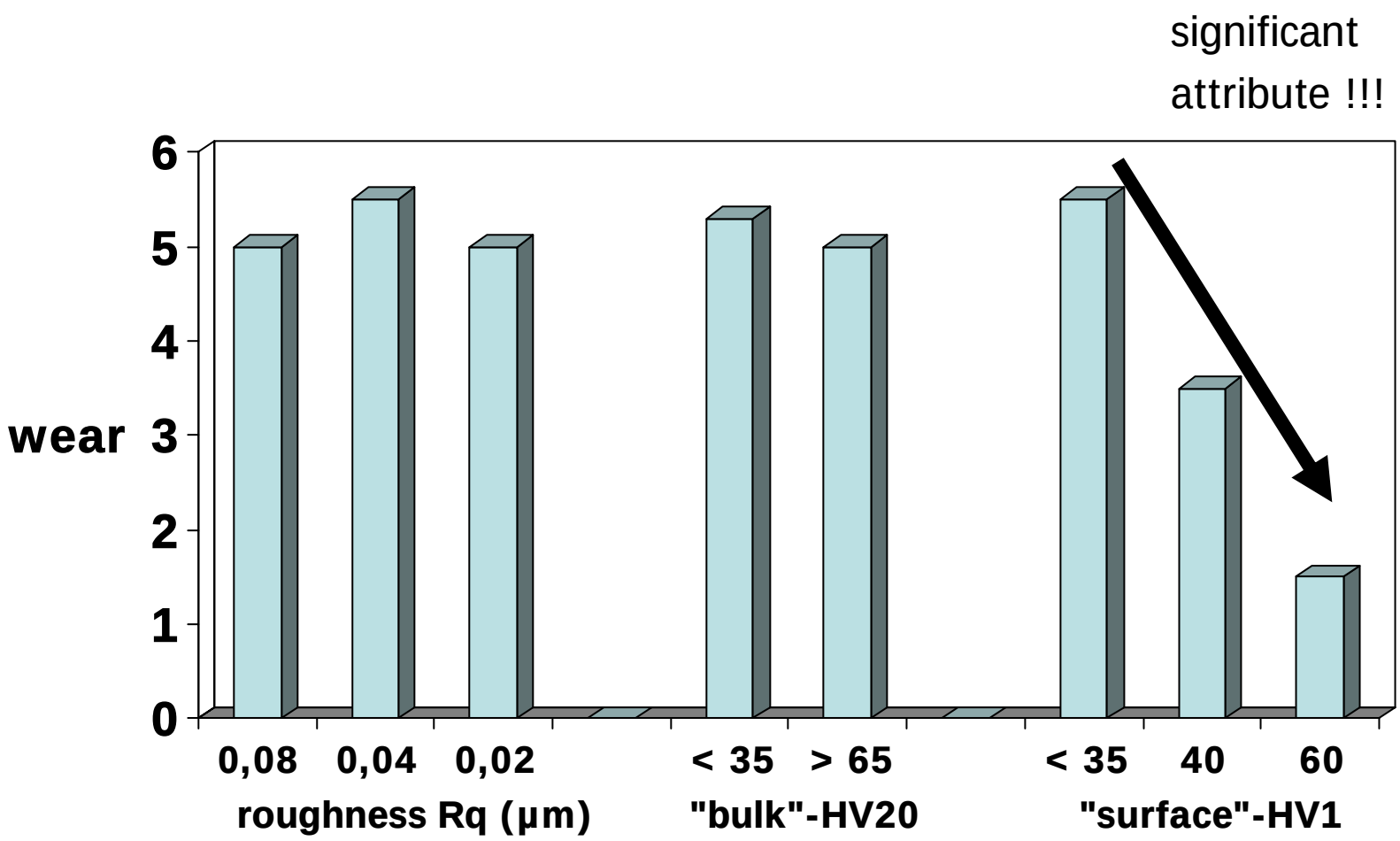




assessment of wear attack:

- searching for worst and best cases
- qualitative scale per definition
- not measured, mostly semi-quantified !

results of part I: Ag999



part I:

weak points of research

- wear attack not measured
- detection of un-differentiated defects (1 and 2 dim)
- focus on Ag999

part I:

weak points of research

- wear attack not measured
- detection of un-differentiated defects (1 and 2 dim)
- focus on Ag999

part II:

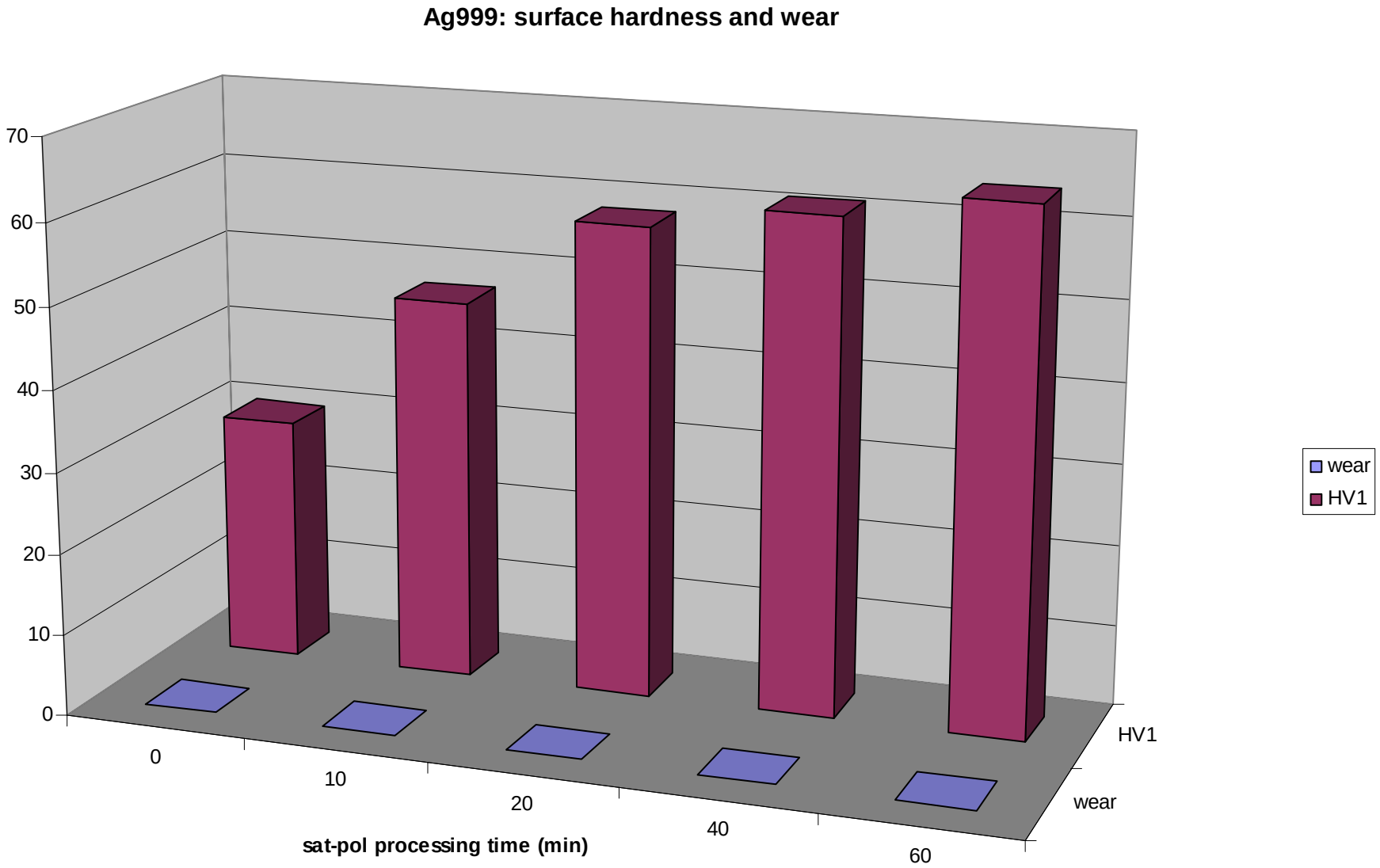
aims of …

- measuring the wear attack by „multiple-square“- method
- focus on 1dim point defects
- Ag999 and Ag925
- interaction: sat-pol <-> surface hardness <-> wear attack

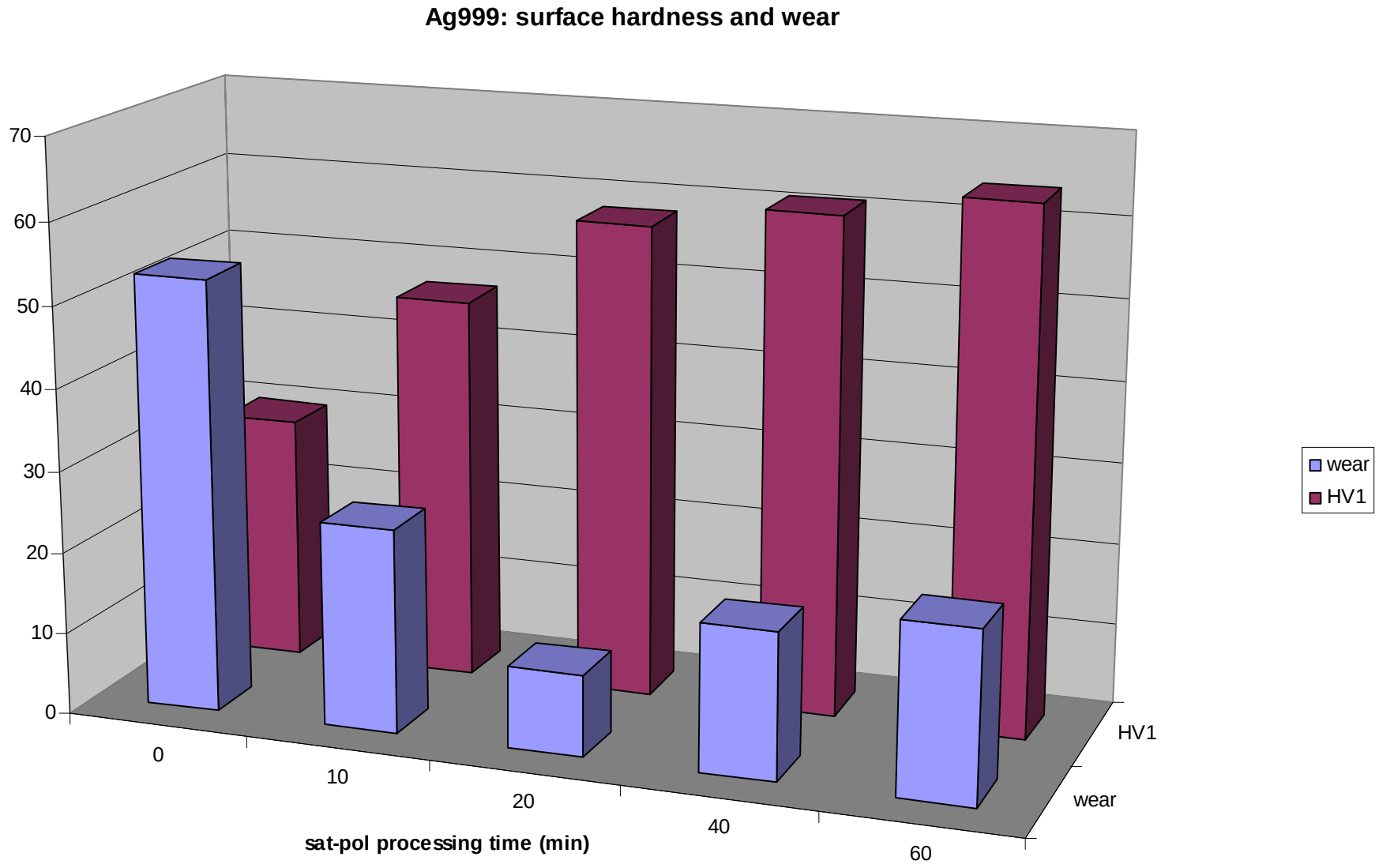
procedure of part II: „multiple-square“-method


3
2
1
A
B
C
15 NOV 2006

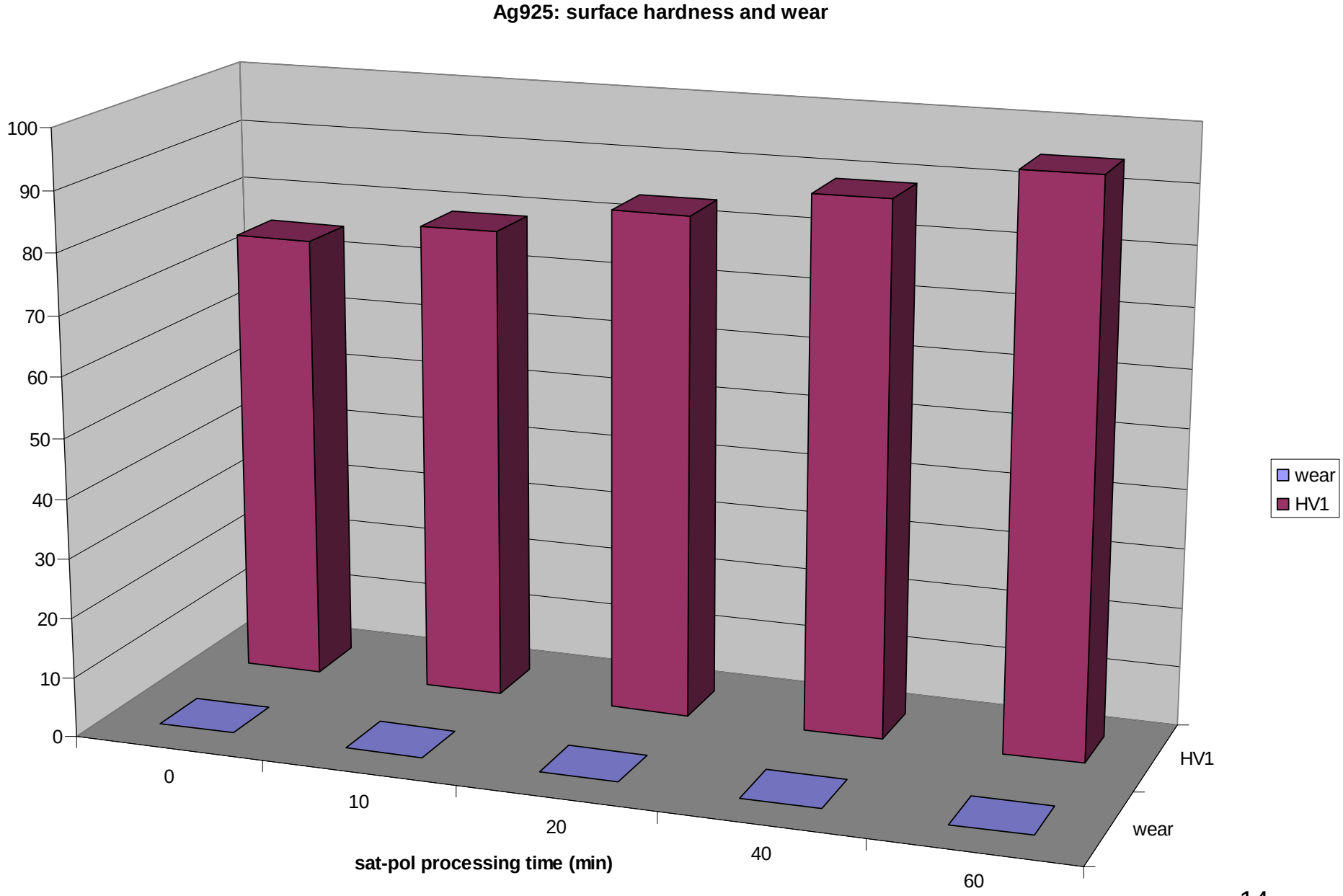

„wear attack“ :
counted point defects per square
A



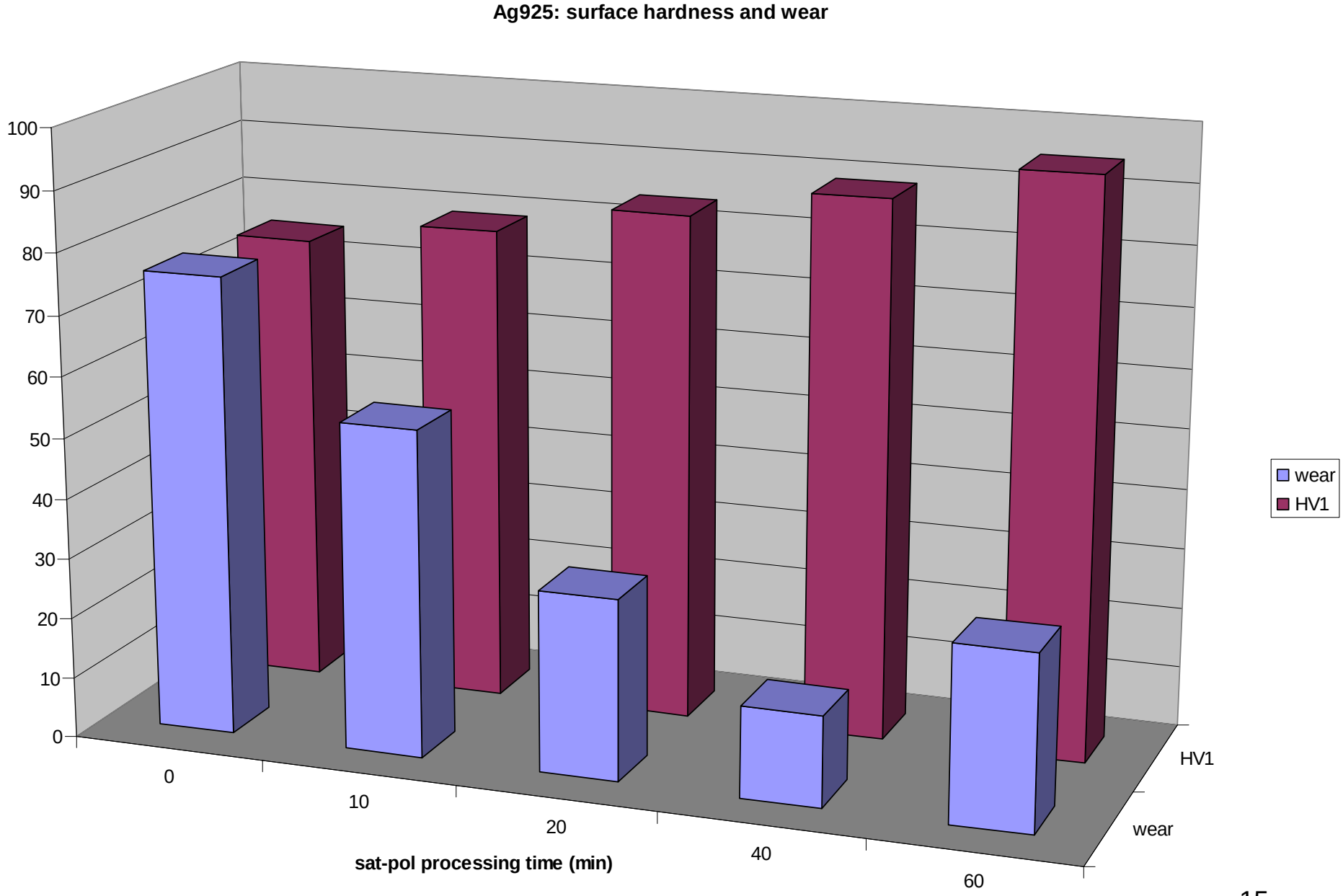
results of part II: Ag999



results of part II: Ag999



results of part II: Ag925



results of part II: Ag925

Ag999/925-blanks and wear of the die

• the wear of the die can be reduced by increasing the surface hardness of the blanks

• the wear attack can be reduced for 80 %

• the centrifugal polishing of the blanks with satellites is an appropriate method to harden the surface

• the "best" processing times are:

→ 20 minutes for Ag999
→ 40 minutes for Ag925

centrifugal polishing with satellites

the centrifugal polishing with satellites creates 2 effects:

1. "polishing": it lowers the roughness of the surface.

2. "hardening": it hardens the near surface layer, but it doesn‘t affect the bulk material. That means, it is the only method to create a blank with a profile in hardness.

The bulk-material remains soft, which is needed for a sufficient plastic deformation. Whereas the hard surface favours the non-appearance of point defects in the shiny area of the coins (quality improves) and the the wear attack of the dies is significantly reduced (up to 80 %).

„multiple-square"-method

It is an appropriate method to control the quality of the blank material.

The quality can be measured and quantified.

… visit us – booth … !