SURFACE FINISHES

An OEM Perspective

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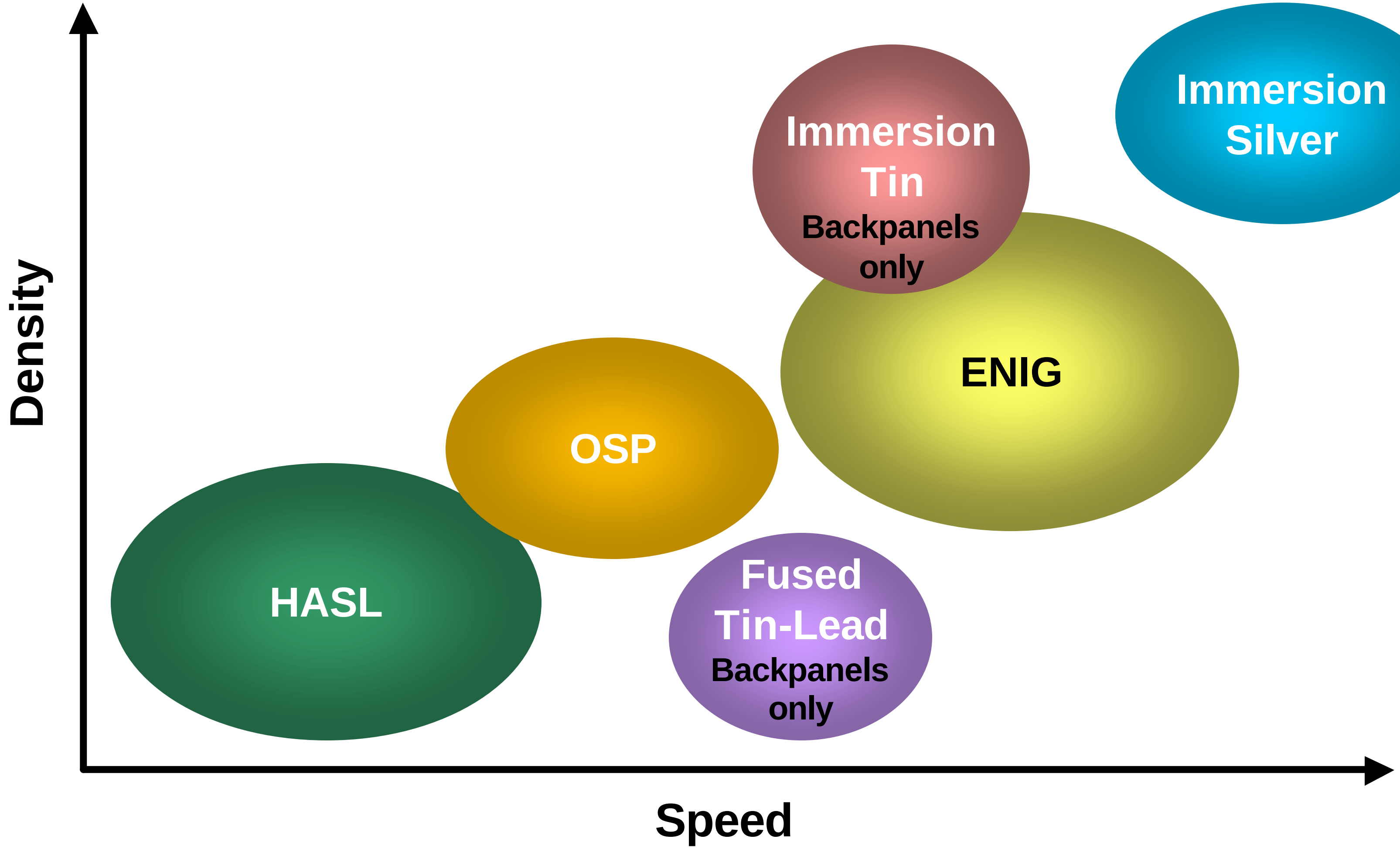
Cisco Approved Surface Finishes



Expectations for Surface Finishes

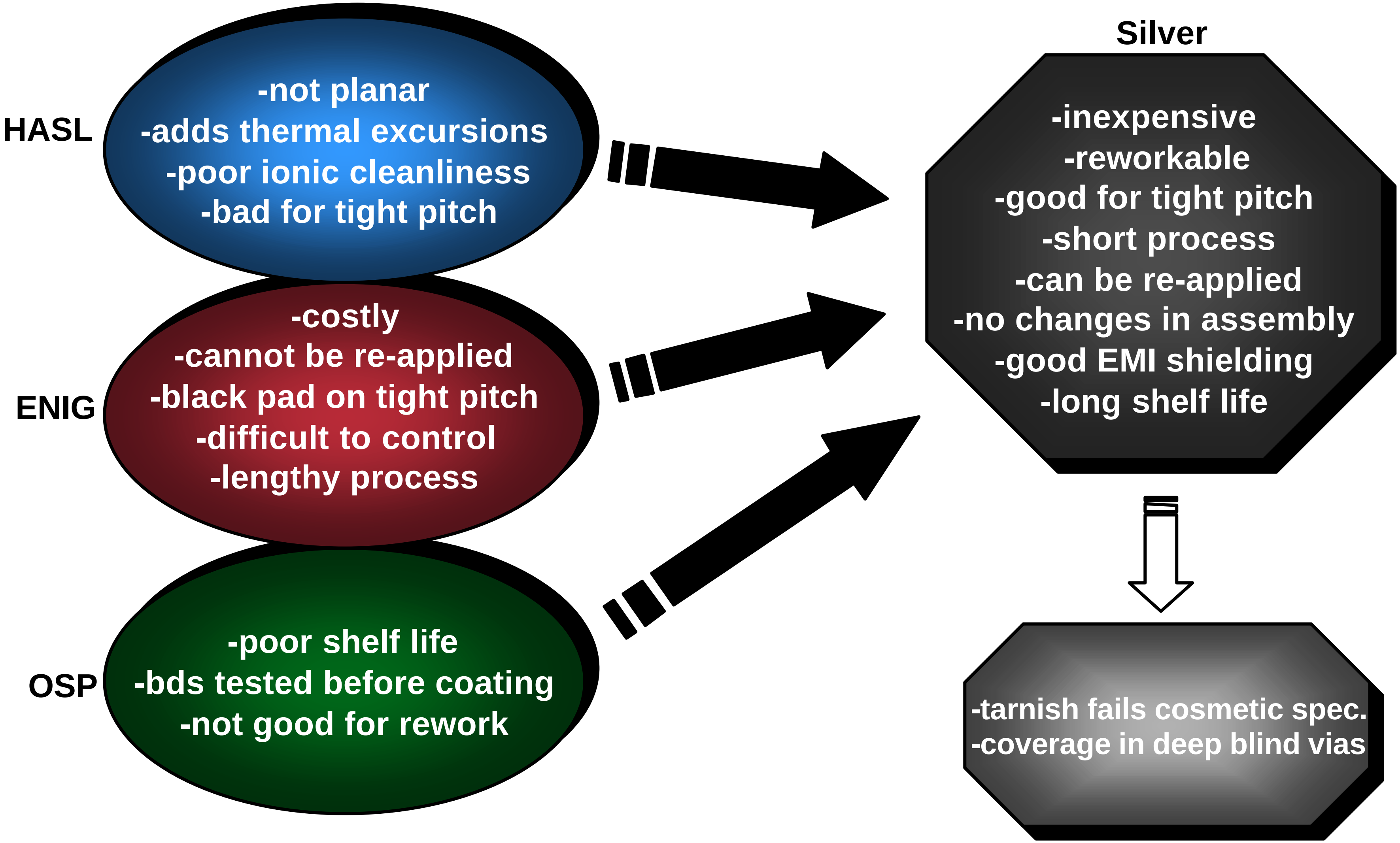
Internal

- signal integrity
- high speed signals
- EMI shielding
- RF capable
- high joint strength
- contact resistance

External

- cost, cost, cost
- shelf life
- can be re-applied
- wetting/solderability
- good for 5 yr. EOL

The Rise of Silver



HASL

-not planar
-adds thermal excursions
-poor ionic cleanliness
-bad for tight pitch

ENIG

-costly
-cannot be re-applied
-black pad on tight pitch
-difficult to control
-lengthy process

OSP

-poor shelf life
-bds tested before coating
-not good for rework

Silver

-inexpensive
-reworkable
-good for tight pitch
-short process
-can be re-applied
-no changes in assembly
-good EMI shielding
-long shelf life

-tarnish fails cosmetic spec.
-coverage in deep blind vias

The Rise of Tin

Fused Sn-Pb

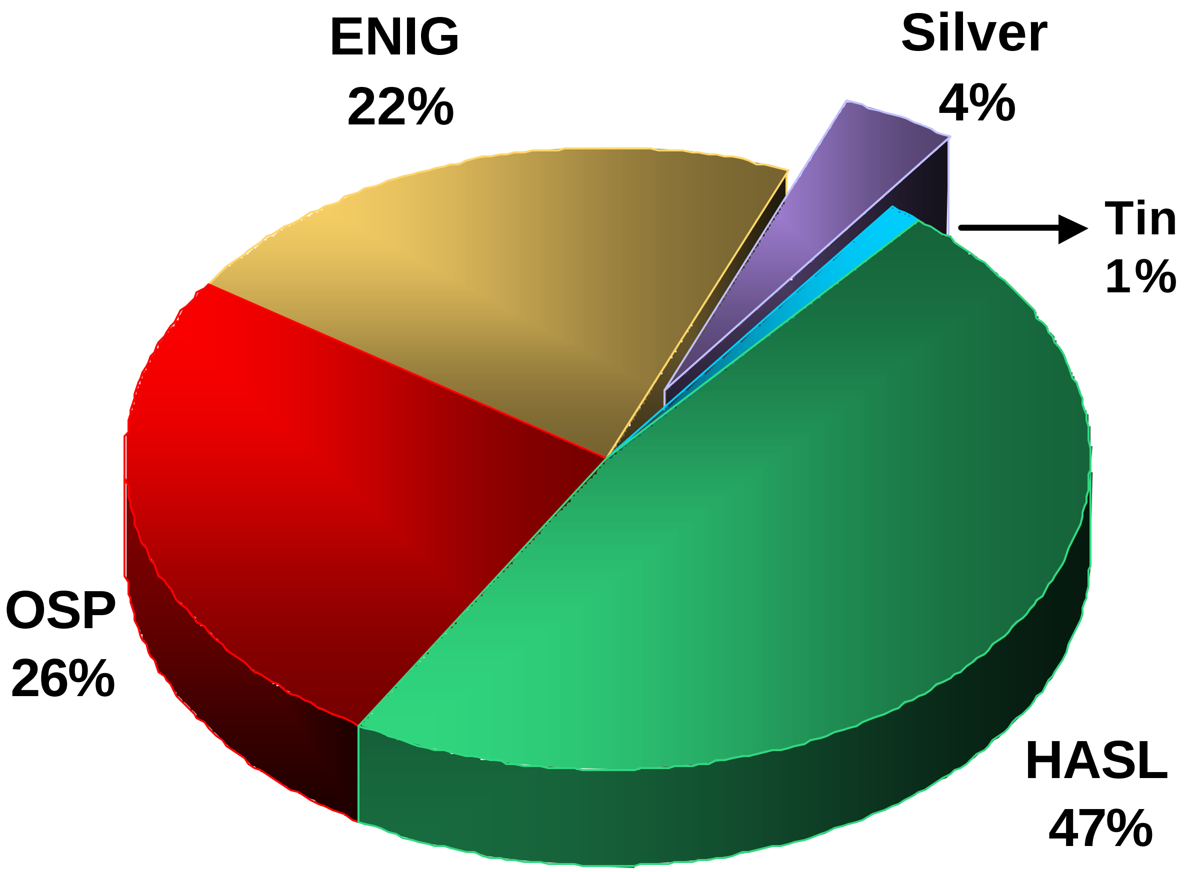
- -slumping issues
- -reduces hole size
- -poor for active backplanes
- -adds thermal excursions
- -poor soldermask adhesion
- -contains lead

Immersion Tin

- -inexpensive
- -won’t reduce hole size
- -no thermal excursions
- -good ionic cleanliness
- -good shelf life
- -contains no lead

-are room temp.
tin whiskers an issue?

Silver Volumes 2002



Silver volume mid-2000 = 0%

Guidelines & Specifications

Guidelines-

- **no ENIG on £ 1.0 mm BGA pitch and/or £ 20 mil QFP Pitch**
- HASL only for ≥ 1.27 mm BGA pitch
- immersion silver is reserved for line cards/daughter cards
- immersion tin is reserved for backpanels.

Specifications-

Surface Finish	Thickness	Thickness 2	Other	Shelf Life
HASL	**.0015” on solderable lands**		**63%Sn / 37%Pb**	**6 mos.**
OSP	**0.2-.06 µm**		**benzimidazoles only**	**6 mos.**
ENIG	**120-250 µin nickel**	**3-8 µin gold**	**EN P content 6-11%**	**I yr.**
I-Ag	**5-25 µin**		**no exposed copper**	**I yr.**
I-Sn	**25-60 µin**		**pure tin reading (XRF minus SERA)**	**I yr.**

Future Considerations

- silver on backpanels
- tin for line cards / daughter cards
- gold on copper

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