



Low Thermal Expansion

Contact us at
vespel.dupont.com

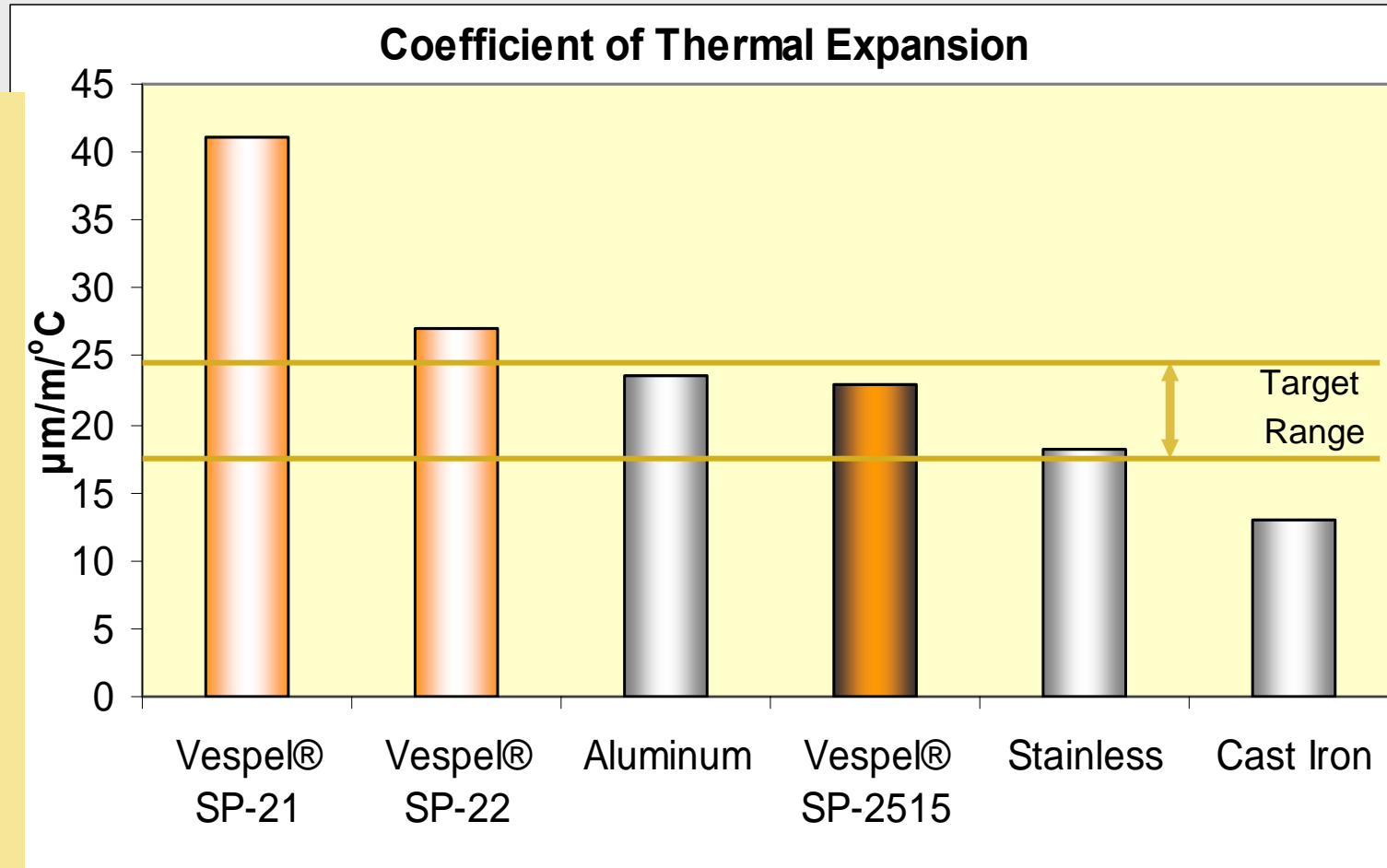
DuPont™ Vespel® - delivering big science part by part. Faster than ever before...



DuPont™ Vespel® SP-2515: Designed to better match the CTE of metals

Vespel® SP-2515 approaches the CTE of commonly used metals.

Allows greater dimensional control over a broader range of temperatures.

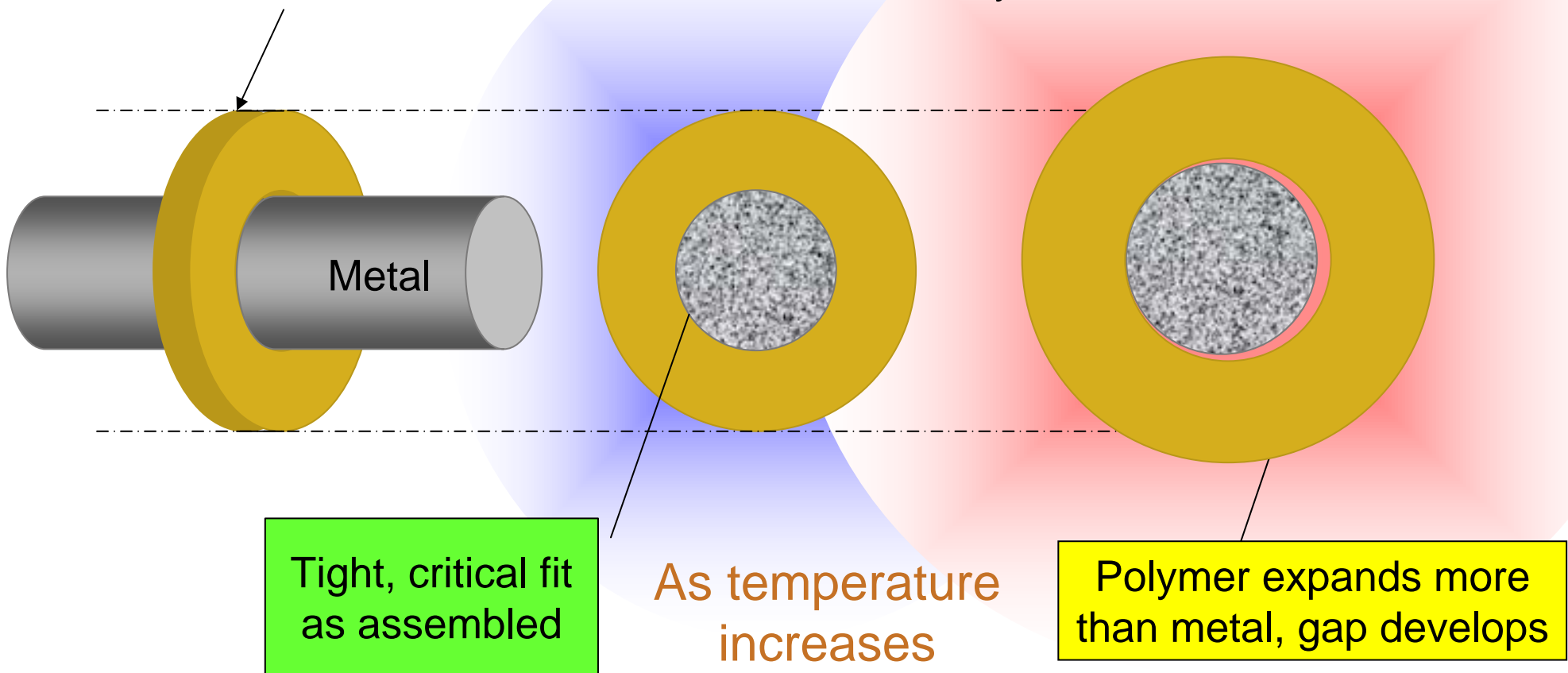


- Relative dimensions stay the same as temperature increases or decreases

Why 'matching' CTE is important

Polymer as outside,
unrestrained bearing
surface

If Polymer CTE > Metal CTE

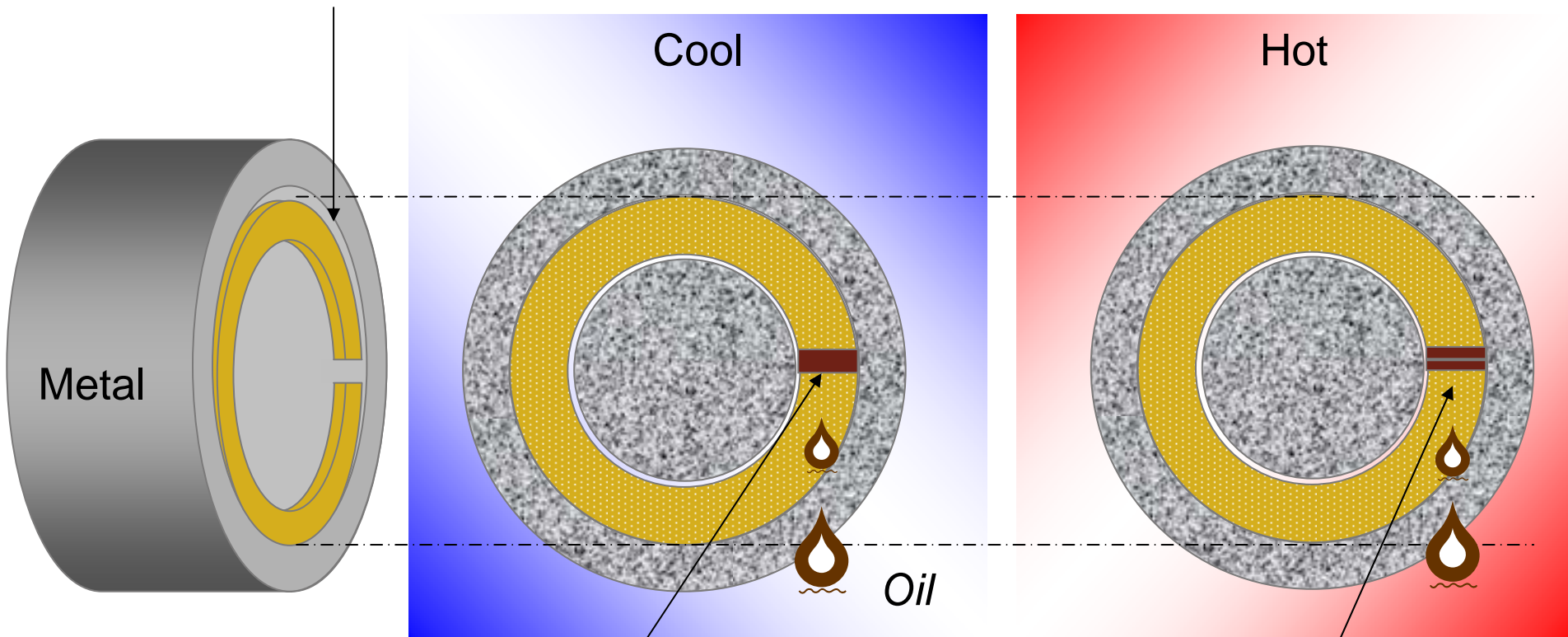


If Polymer CTE = Metal CTE, gap remains constant

Why 'matching' CTE is important for seal rings

Polymer as inside, restrained bearing or sealing surface

If Polymer CTE > Metal CTE



At ambient:
Engineered, precise gap.
Controlled fluid leakage rates.

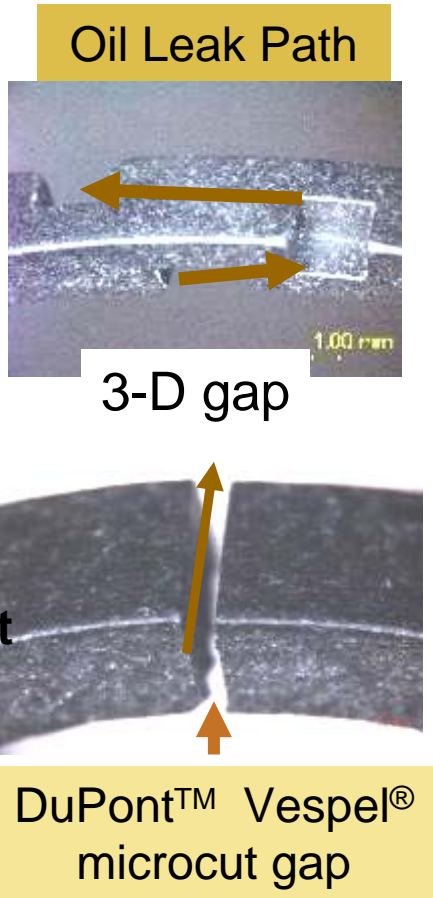
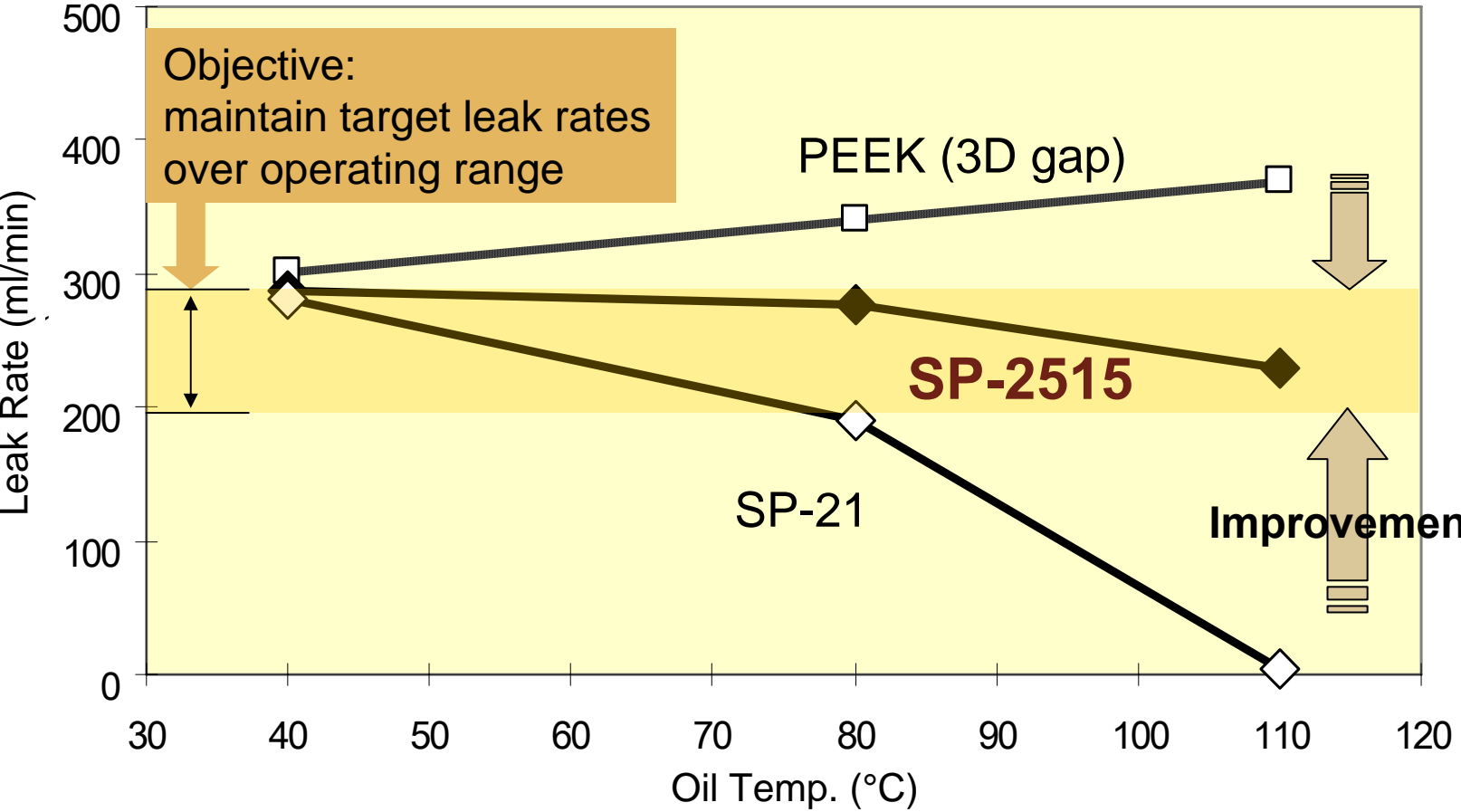
As
temperature
increases

Polymer expands more
than metal. Gap closes.
Fluid flow reduces.

If Polymer CTE = Metal CTE, gap remains constant → resulting in more consistent fluid flow over broader temperature range.

Confirmation of DuPont™ Vespel® SP-2515 performance in seal rings (transmission shaft and ring test results)

Lower Thermal Expansion → Less Gap Size Change →
Stable Leak Rate over broad temperature range



Objective: maintain target leak rates over operating range

Test condition: (in automatic transmission)
 Ring OD: 42mm Pressure: 1.0MPa Speed: 1,000rpm Oil: ATF D-III

Opportunities for Innovation

Low Coefficient of Thermal Expansion:

- In seal rings, low and consistent leakage can help allow for smaller, more efficient oil pumps.
- In thrust washers, consistent performance over a broad temperature range can help reduce the chance of vibration or seizure.

Where else can you put low coefficient of friction and DuPont™ Vespel® solutions to work for you?

Talk to us About ...	For ...
Fuel efficiency / emissions Performance	Variable valve timing & lift EGR technologies Turbochargers
New propulsion (hybrids)	New transmission designs (6,7,8 speed; CVT; dual clutch; electric/hybrid)
Increasing use of electronic controls	Actuators, DC drives, stability systems, electric pumps (fuel, oil, etc.)

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Faster than ever before.....**