

ADVANCED MATERIALS

-A Perspective from Industry-

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Disclaimer: The opinions expressed are those of the presenter and do not necessarily reflect those of the Chemours Company.



Advanced Materials

- A descriptor for materials with improved properties over those existing or commonly used. They can be:

Light-Weight Alloys

Unique & Novel Nanomaterials

Common Materials in New Applications

Shape-Memory Materials

Active Coatings

Safer-by-Design Substances

Materials from Advanced Processing

Smart Materials

Atomically-Precise Materials

Stimuli Responsive Materials

Active Materials

Self-healing Materials

Material Structure Enhanced Materials

A wide range of substances... Almost Endless Possibilities...

'Advanced Materials' are not defined by size

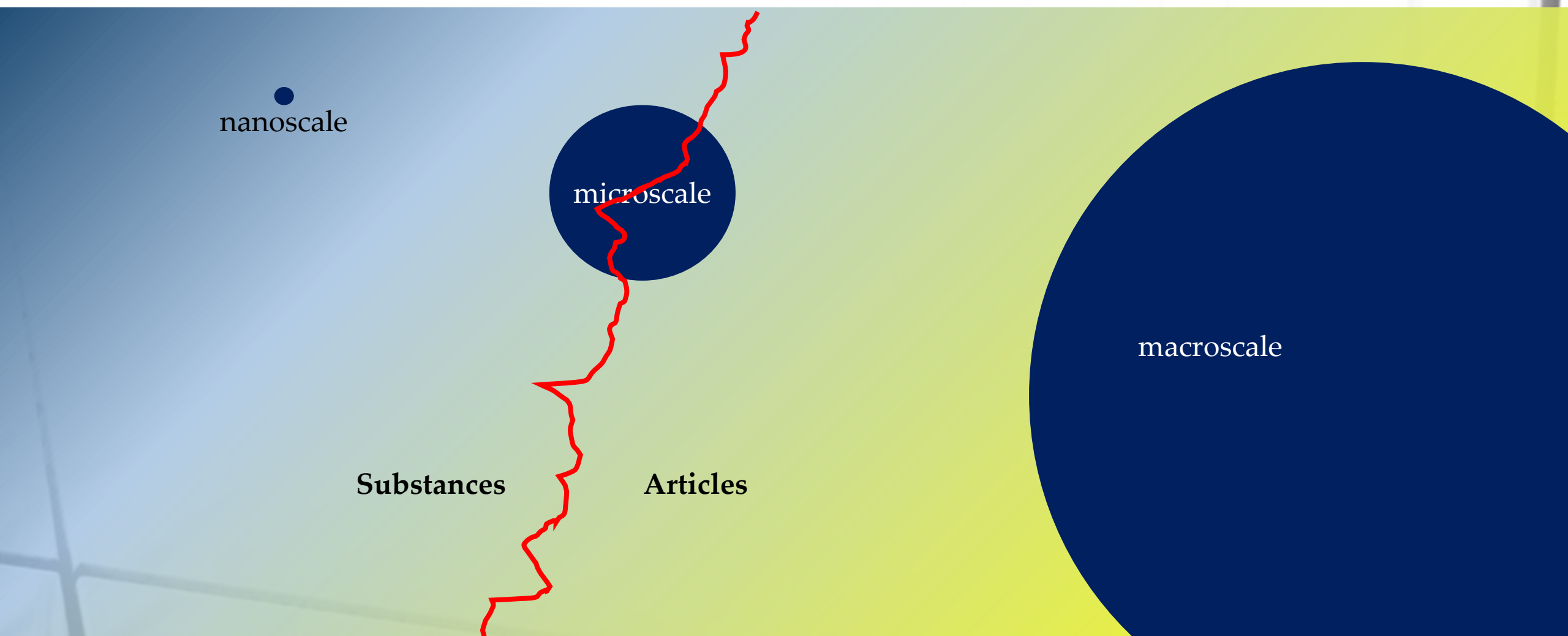
nanoscale

microscale

macroscale

Substances

Articles



'Advanced Materials' change with time...

PAST



Steel

PRESENT



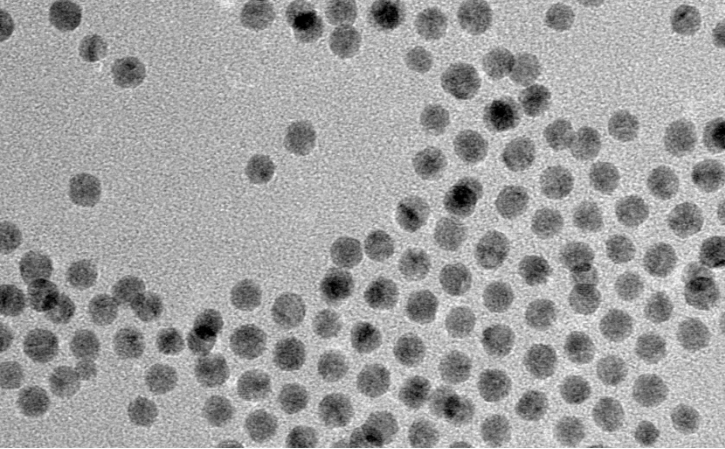
e.g., Graphene Composites

FUTURE



??????

What was 'advanced' is no longer 'advanced' ...



'Advanced Materials' are subject to interpretation

Microelectronics

Common Use,
Benchmark Performance,
Not 'Advanced'

Paints & Coatings

New Use,
In kind Performance,
Not 'Advanced'

Construction

New Use,
Enhanced Performance,
'Advanced'

Improvements in performance depend on a given application and perspective....



All nanomaterials are not 'Advanced Materials'

(But it depends on frame of reference and time...)

Not all 'Advanced Materials' are 'different'

(But it depends on frame of reference and time...)

→ General need for clarity and an opportunity for standards development

Some Challenges & Opportunities

- **How do you “standardize” a moving target (e.g., evolving technologies)?**
 - Relates to “unique and novel” discussions in early nanotechnology standardization...
 - Do we identify “normal” instead? (where needed)
 - How do we use this to encourage safe, sustainable innovation?
- **Efforts in this area will require broader outreach across communities and “normalization” of concepts and terminology.**
 - Nanotechnology committees may be ideal starting points but broader participation and cooperation will be necessary
 - Strong overlap with the “meat and potatoes” of various industries and other standardization interests – how do you avoid conflicting scopes? How do you synergistically augment activities?
 - Narrowing down to what is important and meaningful will be critical. → Learnings from nanotechnology.