



Joint Collaboration DIC Study ORNL/INL

July 2024

Changing the World's Energy Future

Arvin Burnell Cunningham



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GAS-COOLED REACTOR

ADVANCED REACTOR TECHNOLOGIES PROGRAM

July 17, 2024

Joint Collaboration DIC Study ORNL/INL

Arvin Cunningham

Staff Engineer/Scientist



DOE ART GCR Review Meeting

Hybrid Meeting at INL

July 16–18, 2024

Size Study INL Test Matrix

- 288 samples total consisting of 3 fine grain and 3 coarse grain graphite
- Fine grain, 2114, NBG-25, ETU-10
- Coarse Grain, NBG-17, NBG-18, PCEA
- 108, 10mm diameter, with axial lengths of 5mm, 6mm, 7mm, 8mm, 9mm, and 10mm
- 108, 12.7mm diameter, with axial lengths of 6.35mm, 7.62mm, 8.89mm, 10.16mm, 11.43mm, 12.7mm
- 36 samples, 20mm x 10mm 2:1 ratio
- 36 samples, 30mm x 15mm 2:1 ratio

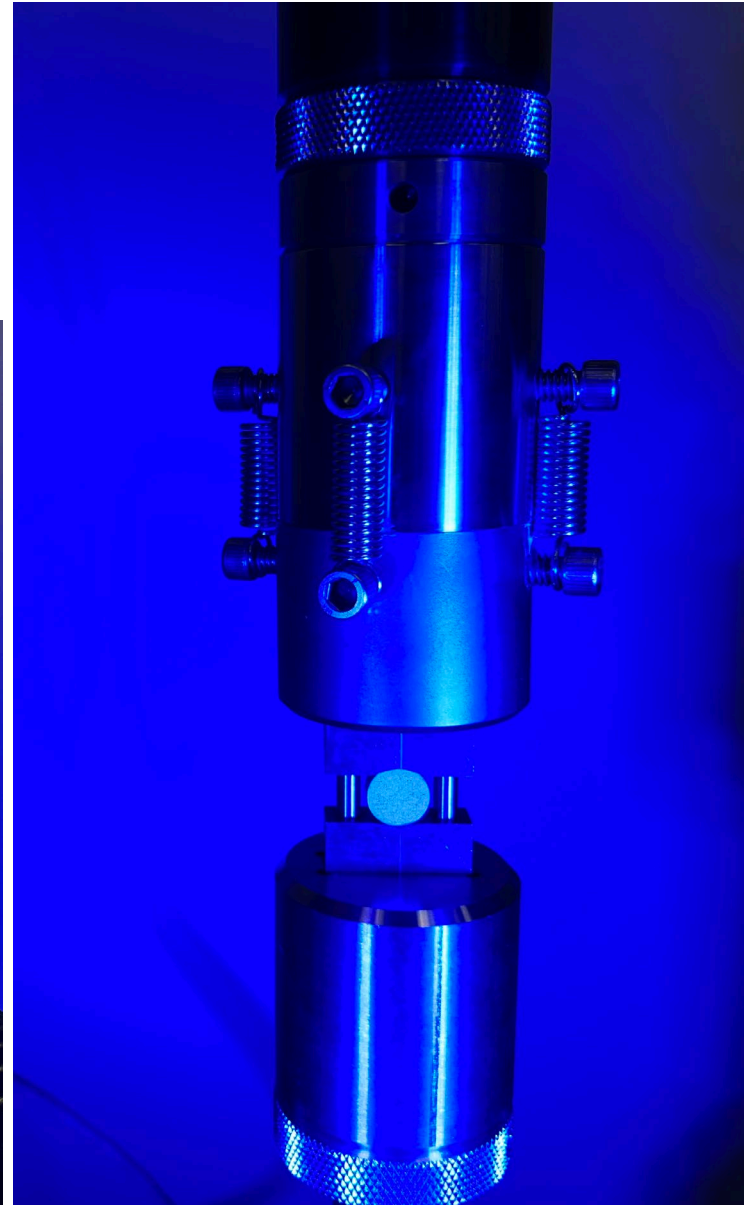
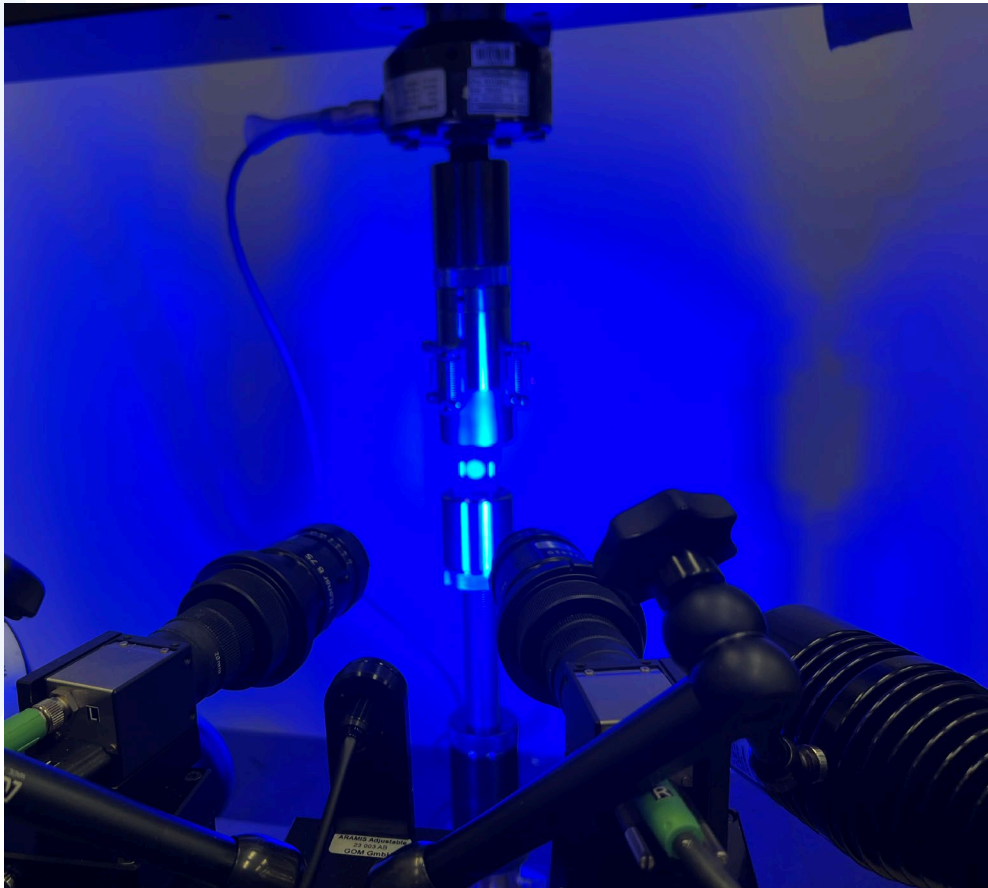


Material Properties Prior to DIC

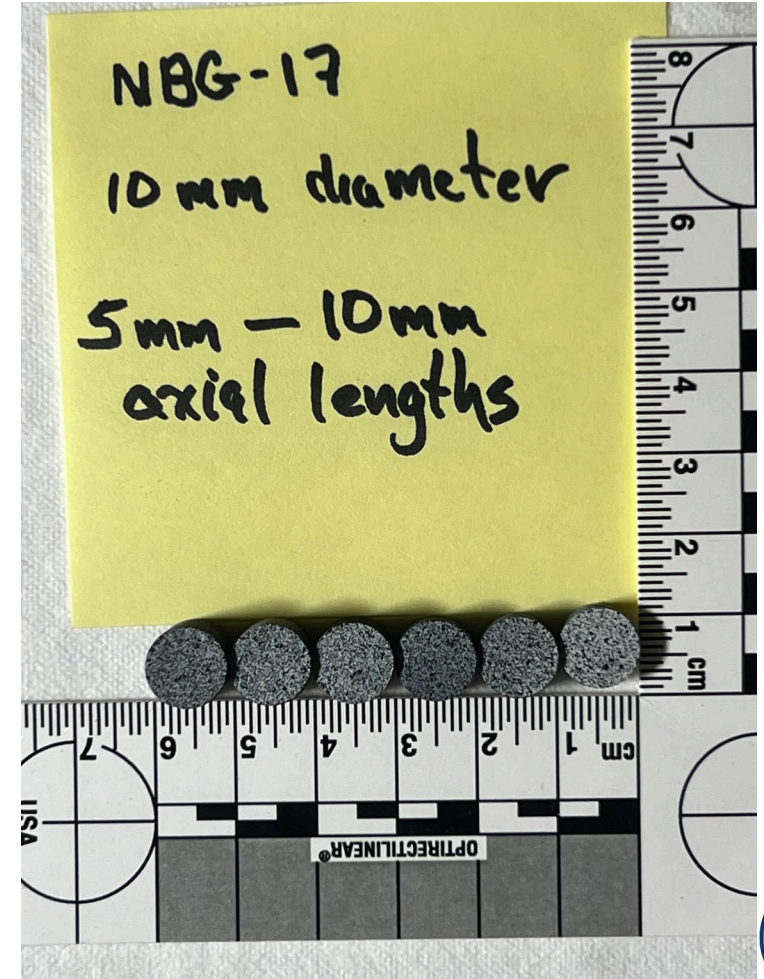
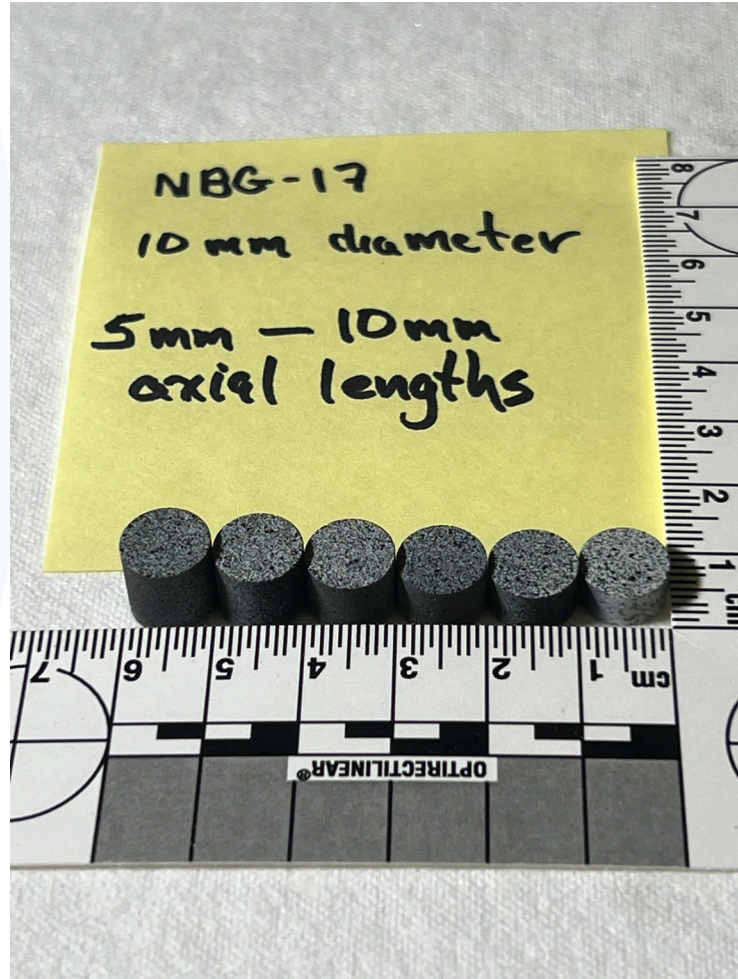
- For each of the samples a modulus measurement was made using ASTM C769
- Density measurements were also performed using ASTM C559
- Materials are measured as received



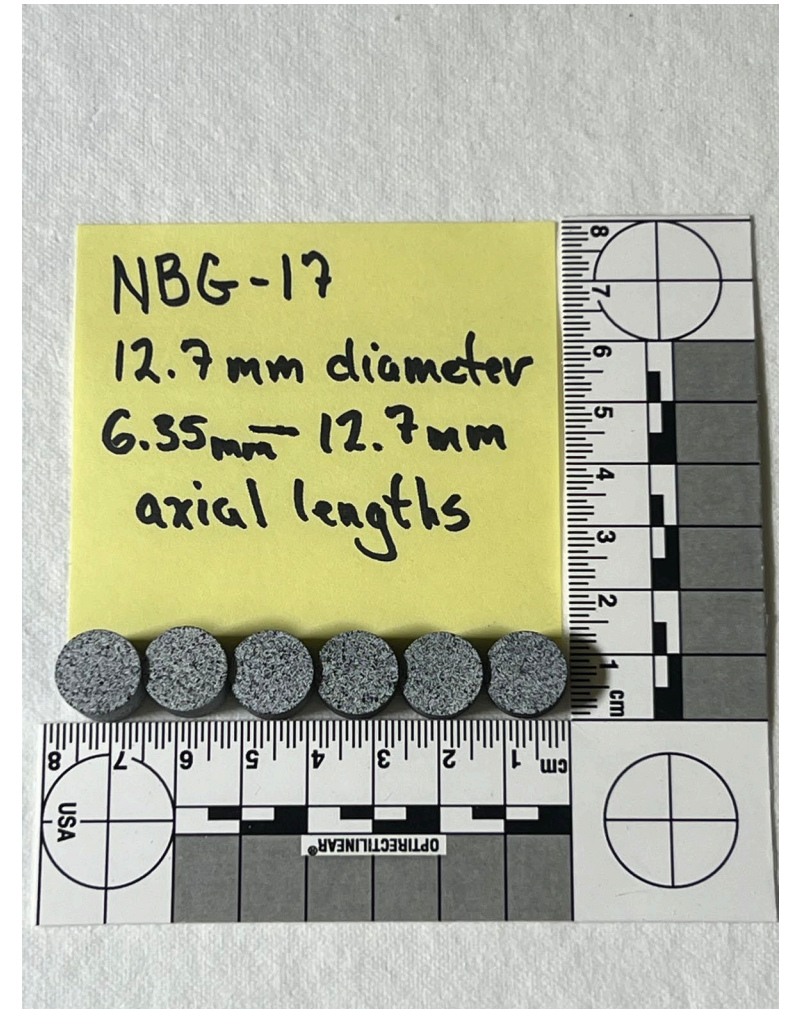
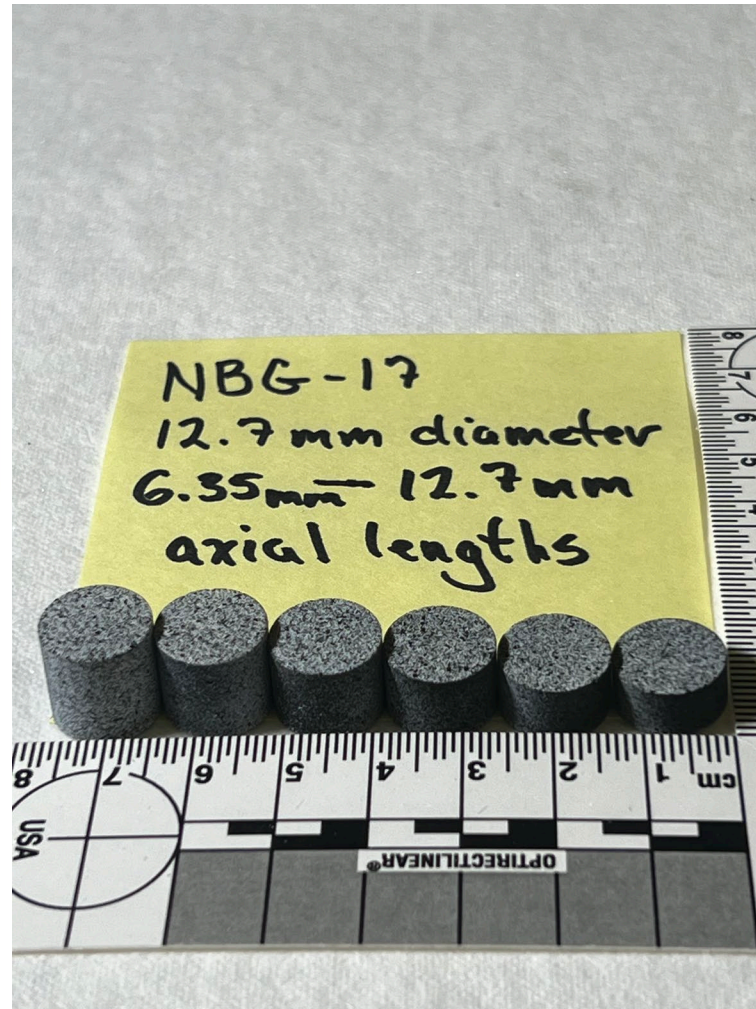
Typical DIC set up



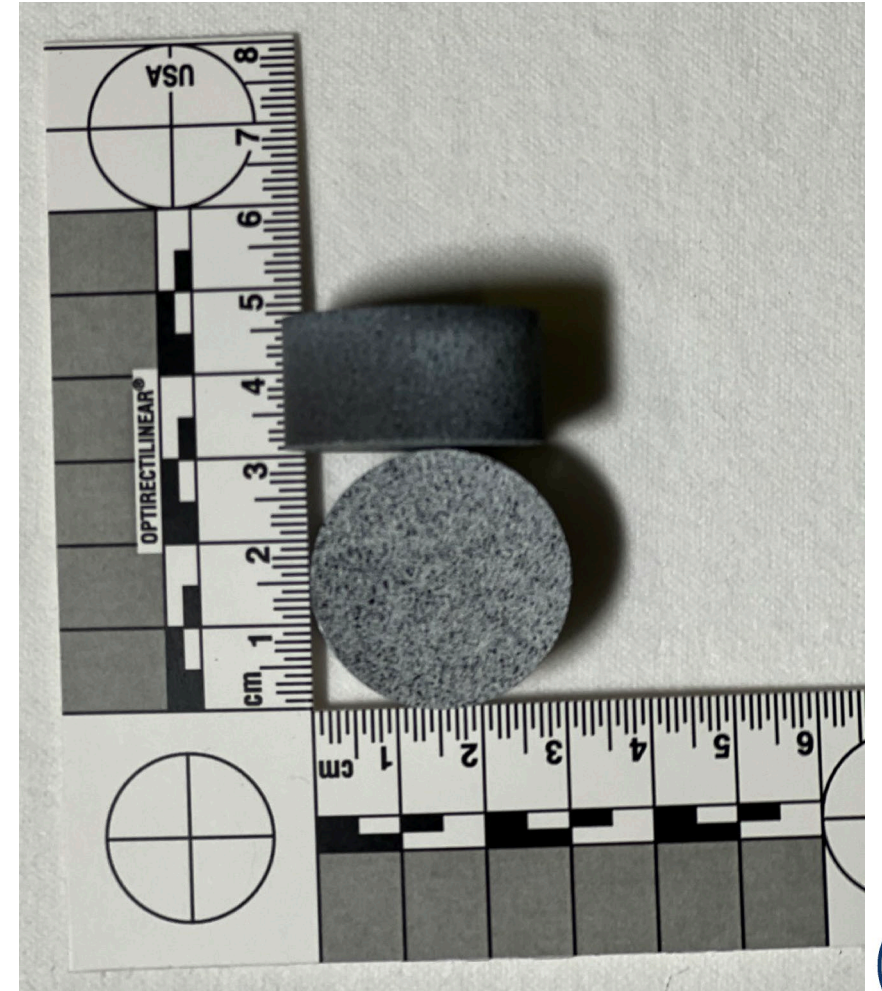
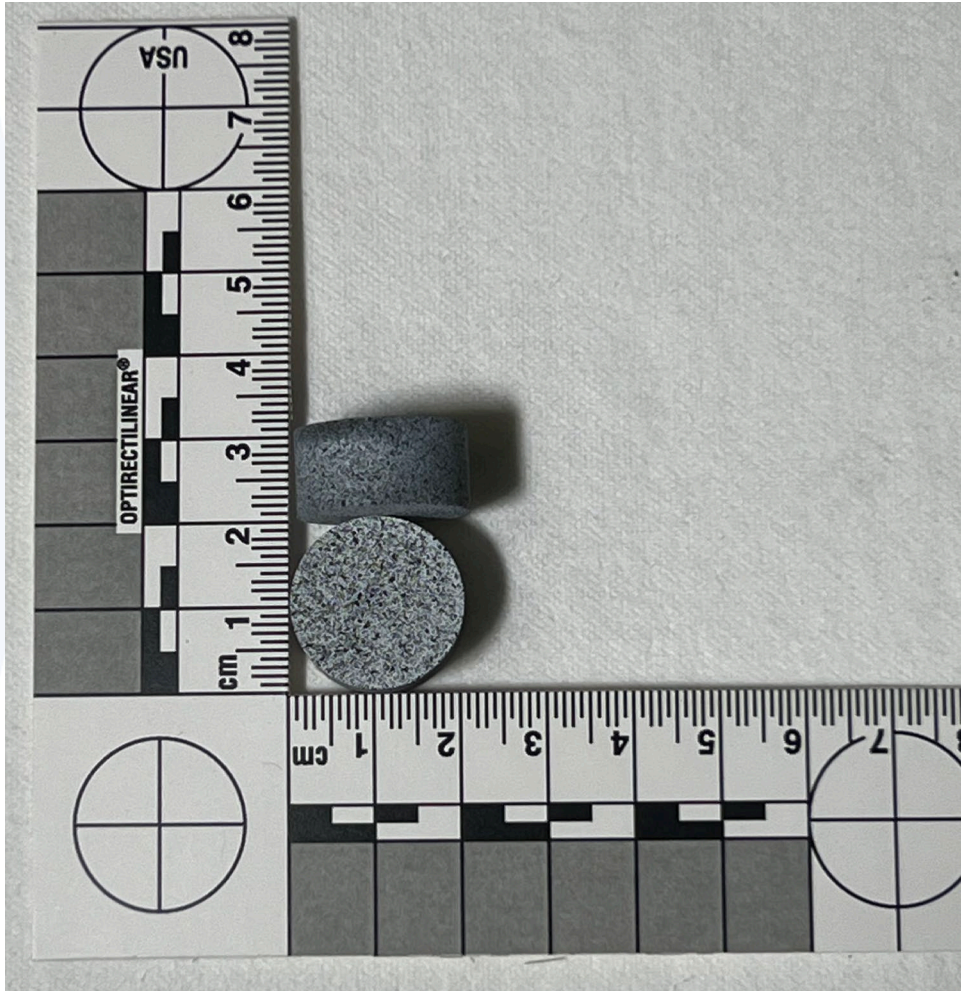
Sample set 10mm



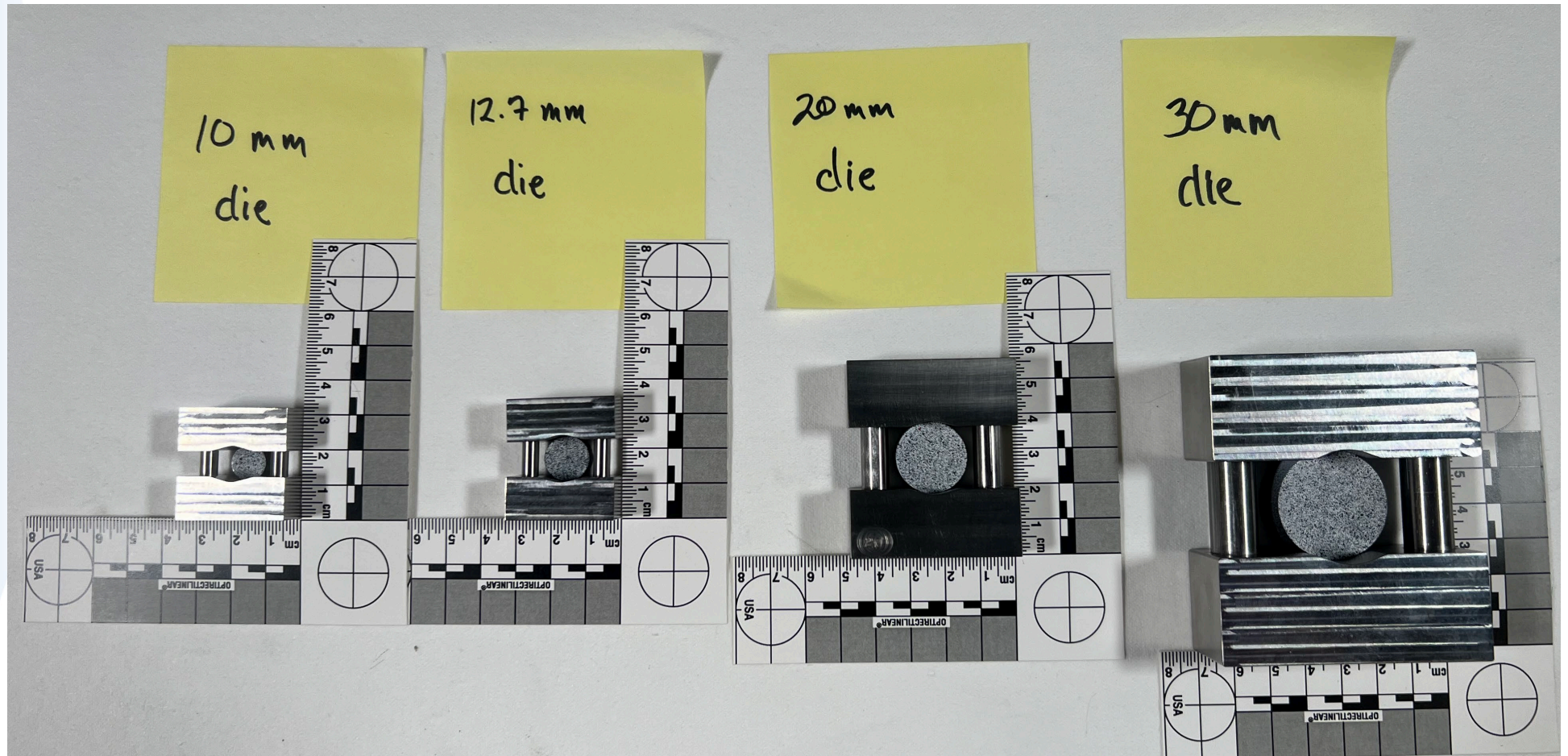
Sample set 12.7mm

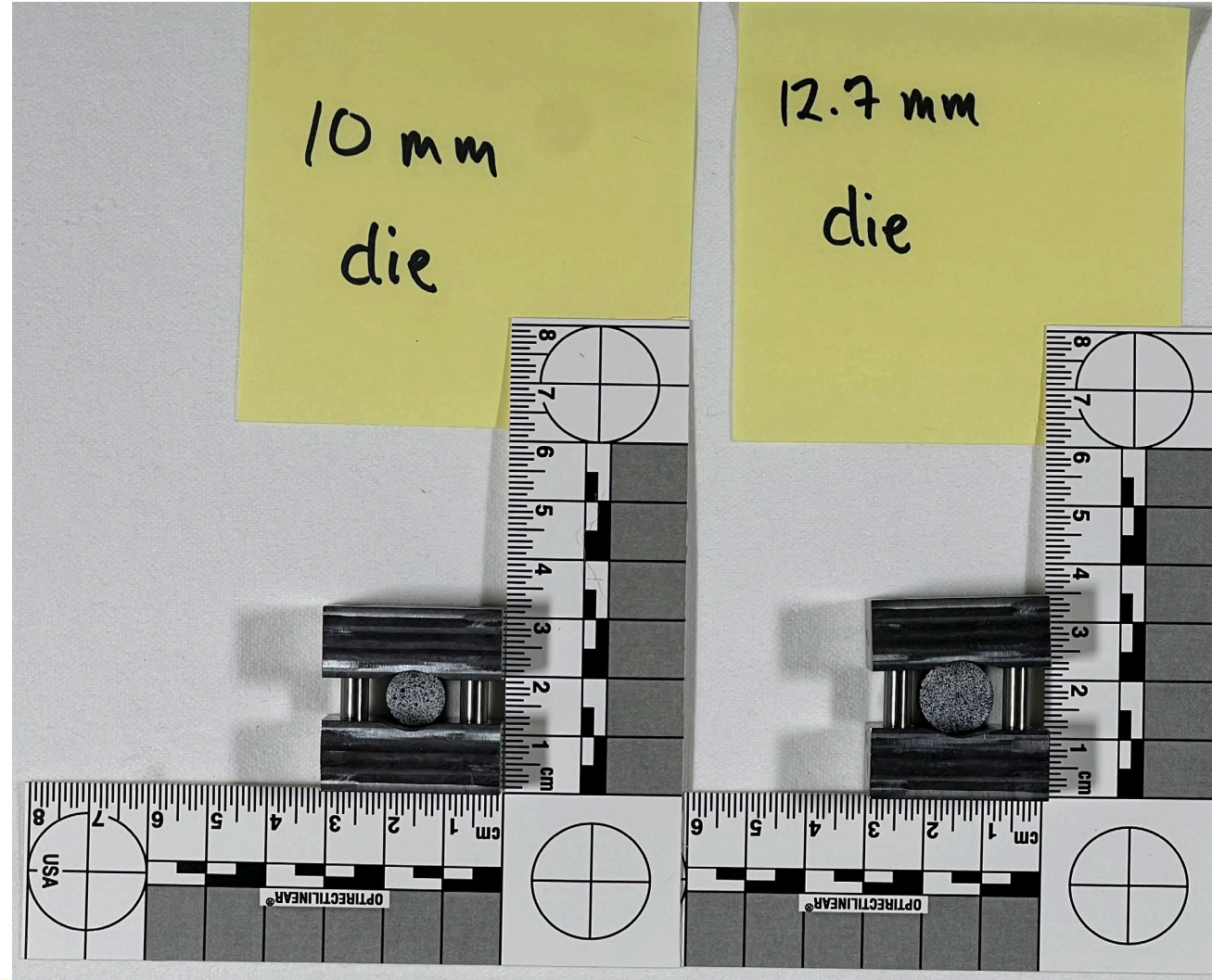


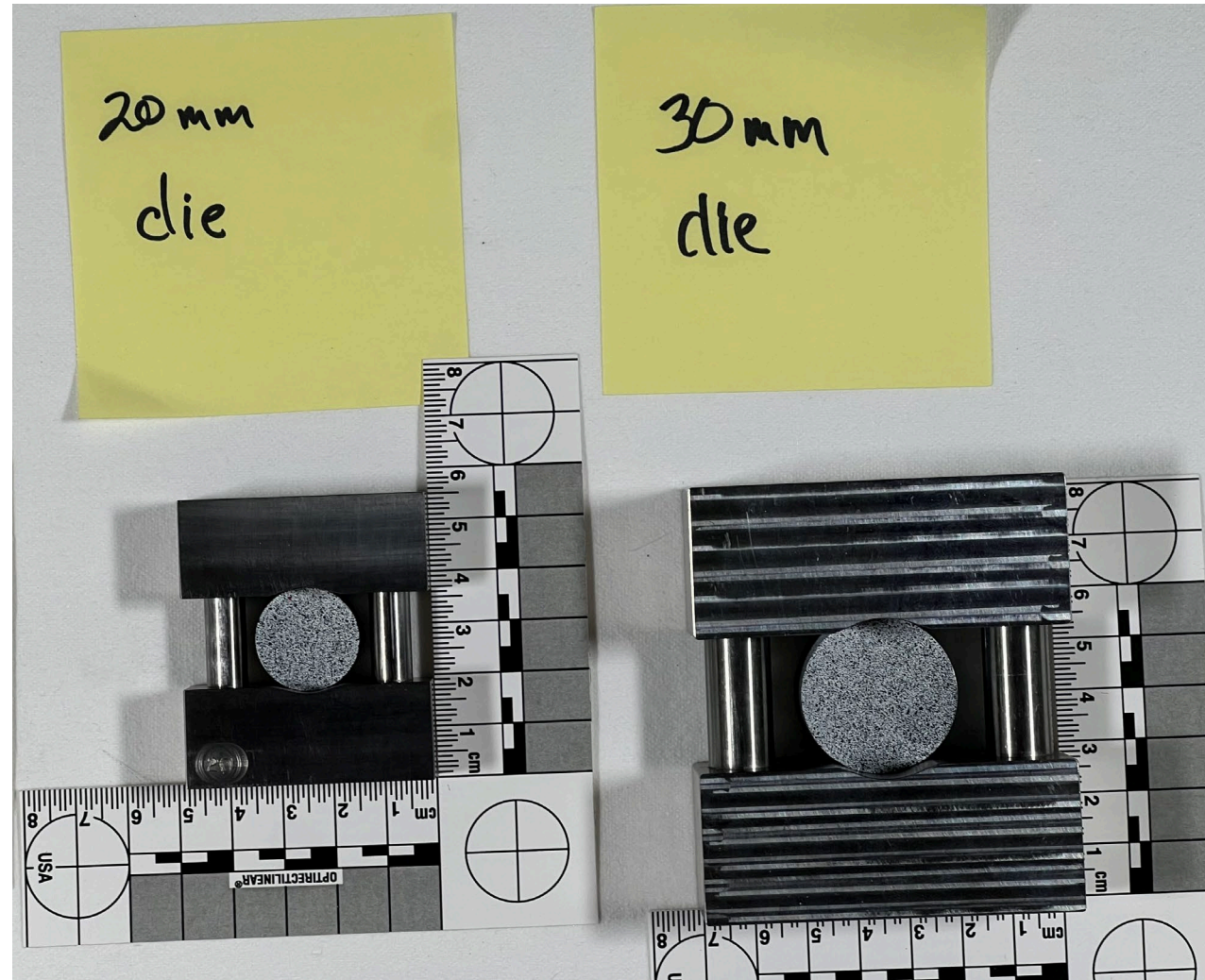
Sample set(s) 20mm, 30mm



Die sets









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