

Low Cost Conversion of Coal to Graphene

DE-FE00031999

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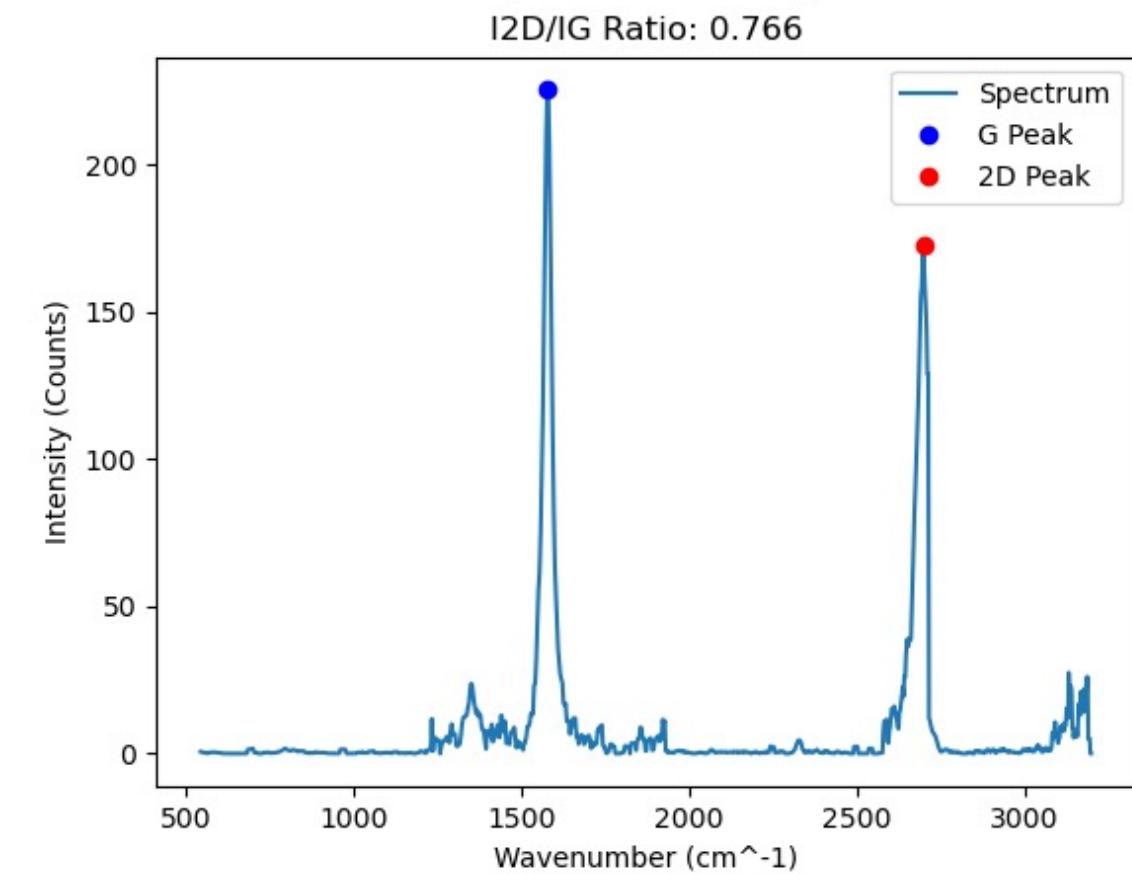
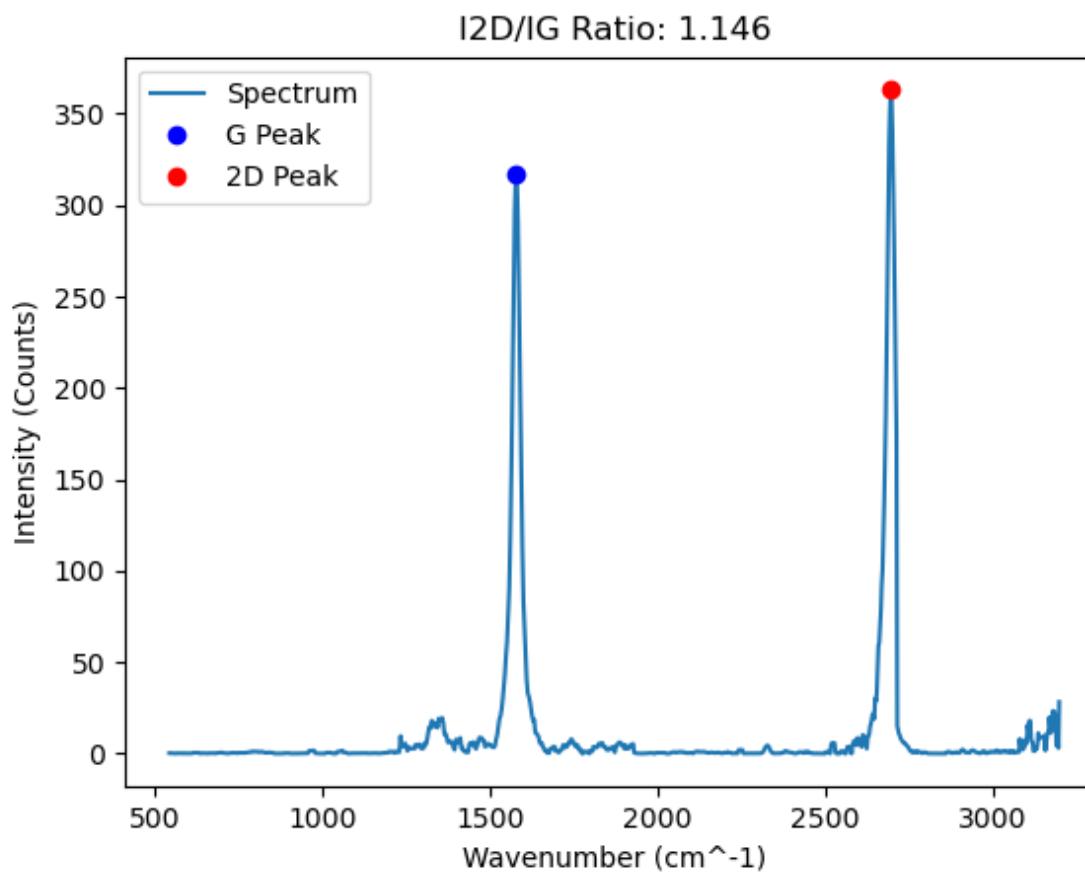
Project Impacts

- Champion coal as a key feedstock for value-added graphene/cement composites
- Customize use of graphene in concrete as the final product for end-customers

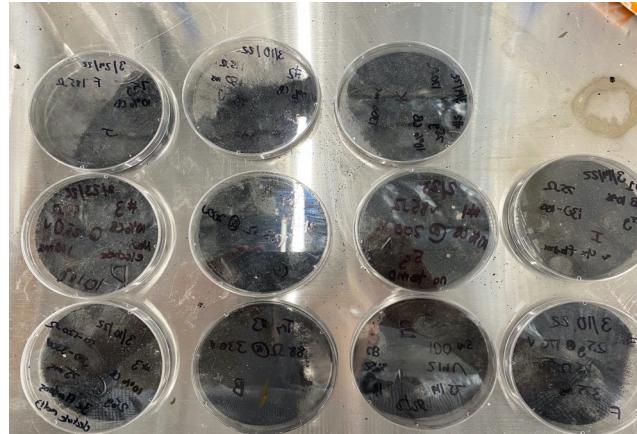
Key Objectives

- Customize various coal types to create low cost graphenes that perform and mix best in concrete (essentially tailoring graphene/cement microstructure)
- Measure various properties of concrete reinforced by graphene.

Representative Raman Spectra

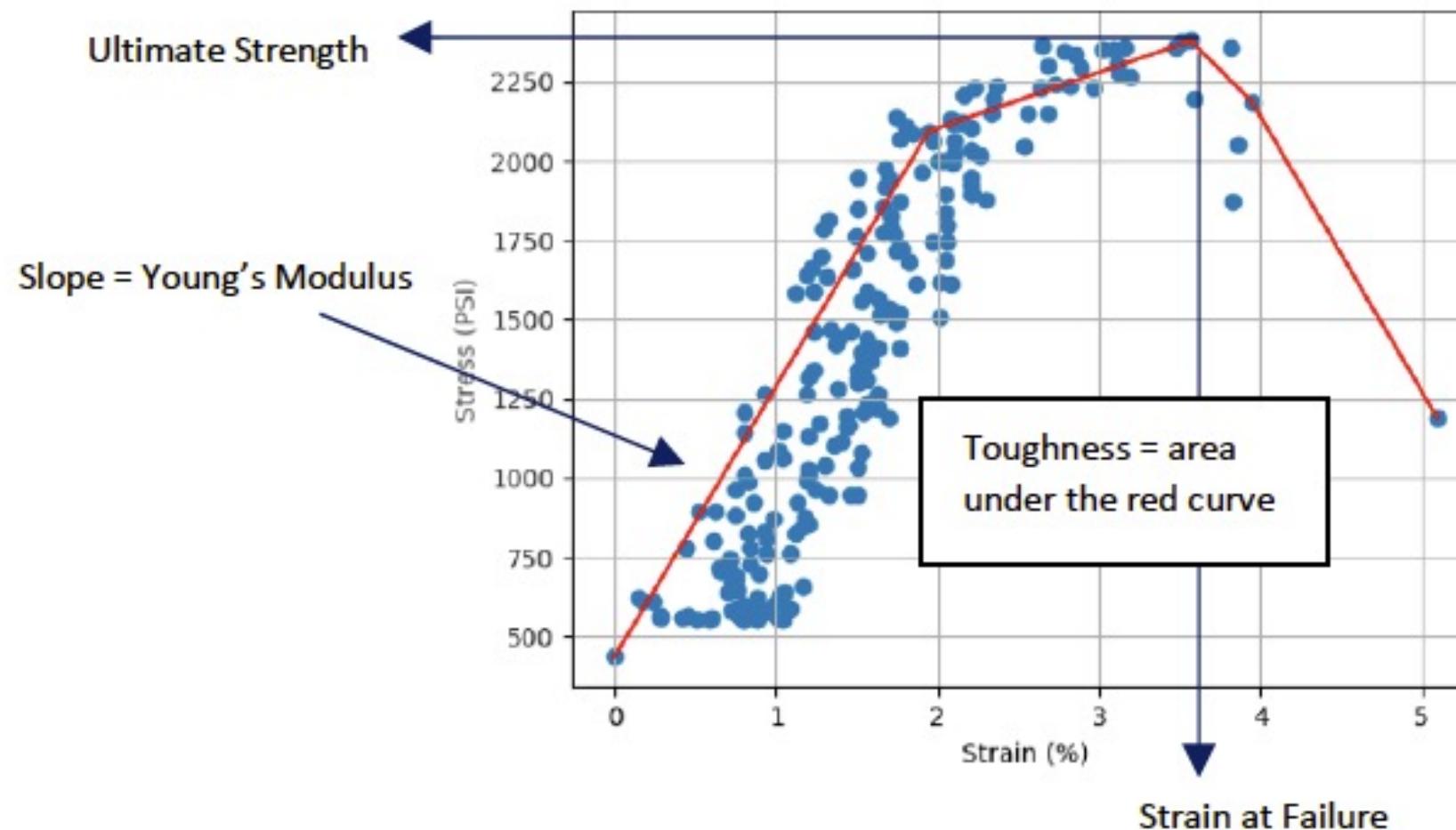


Made numerous cement/graphene samples for 3, 7, 14, 28 day testing

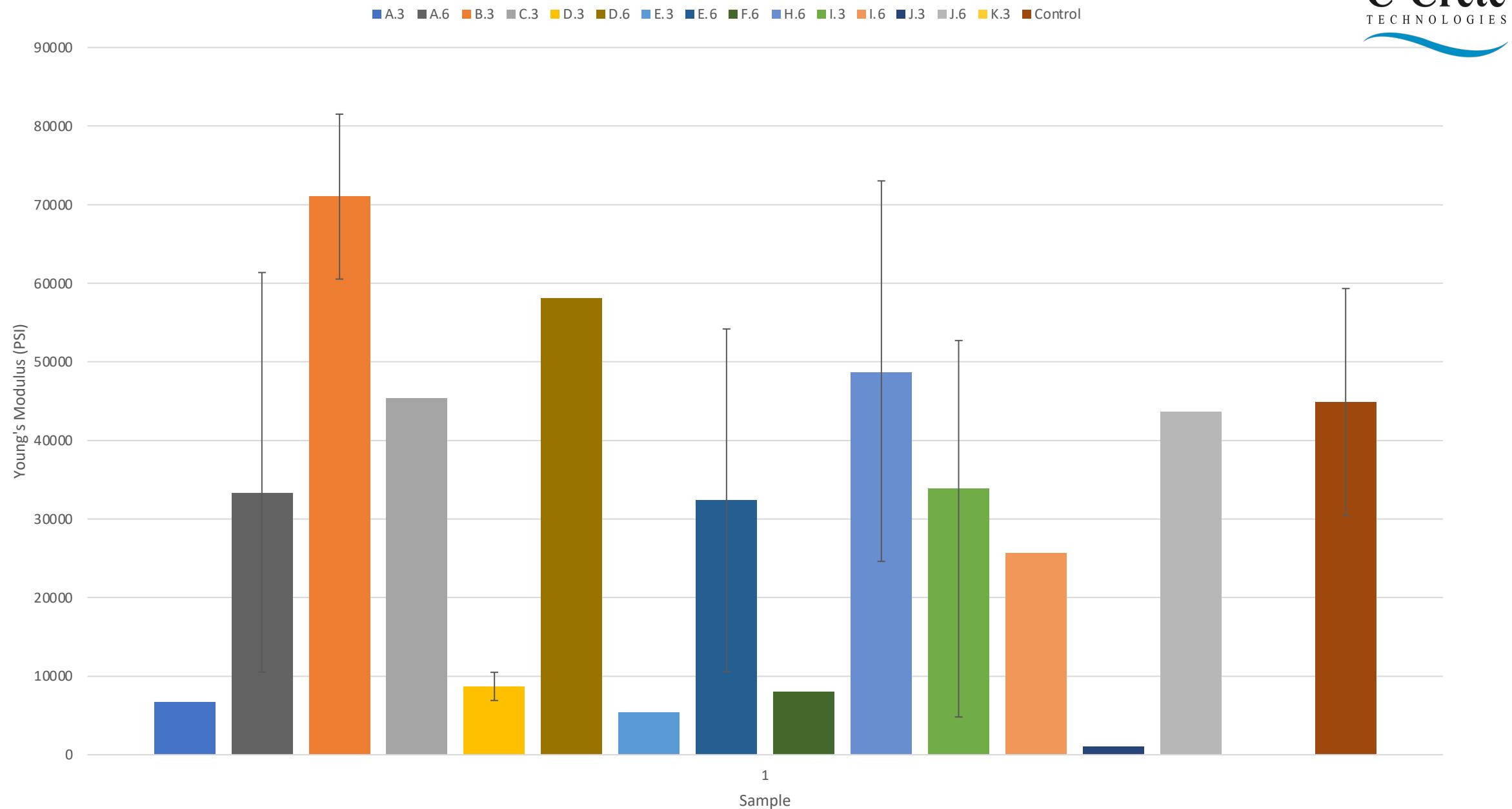


Mechanical Analysis

Typical Stress-strain curve

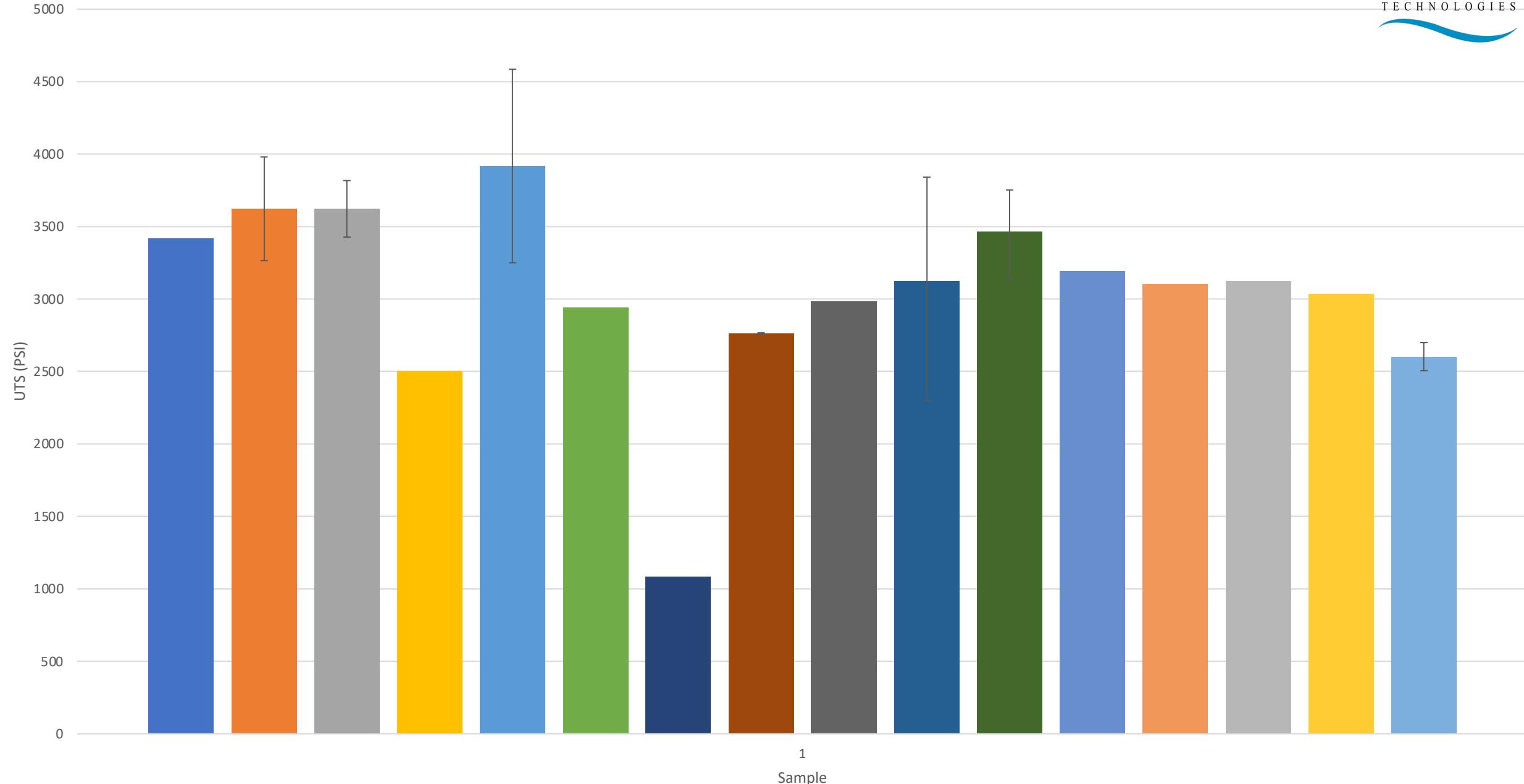


3 Day Cured Graphene Cement Young's Modulus



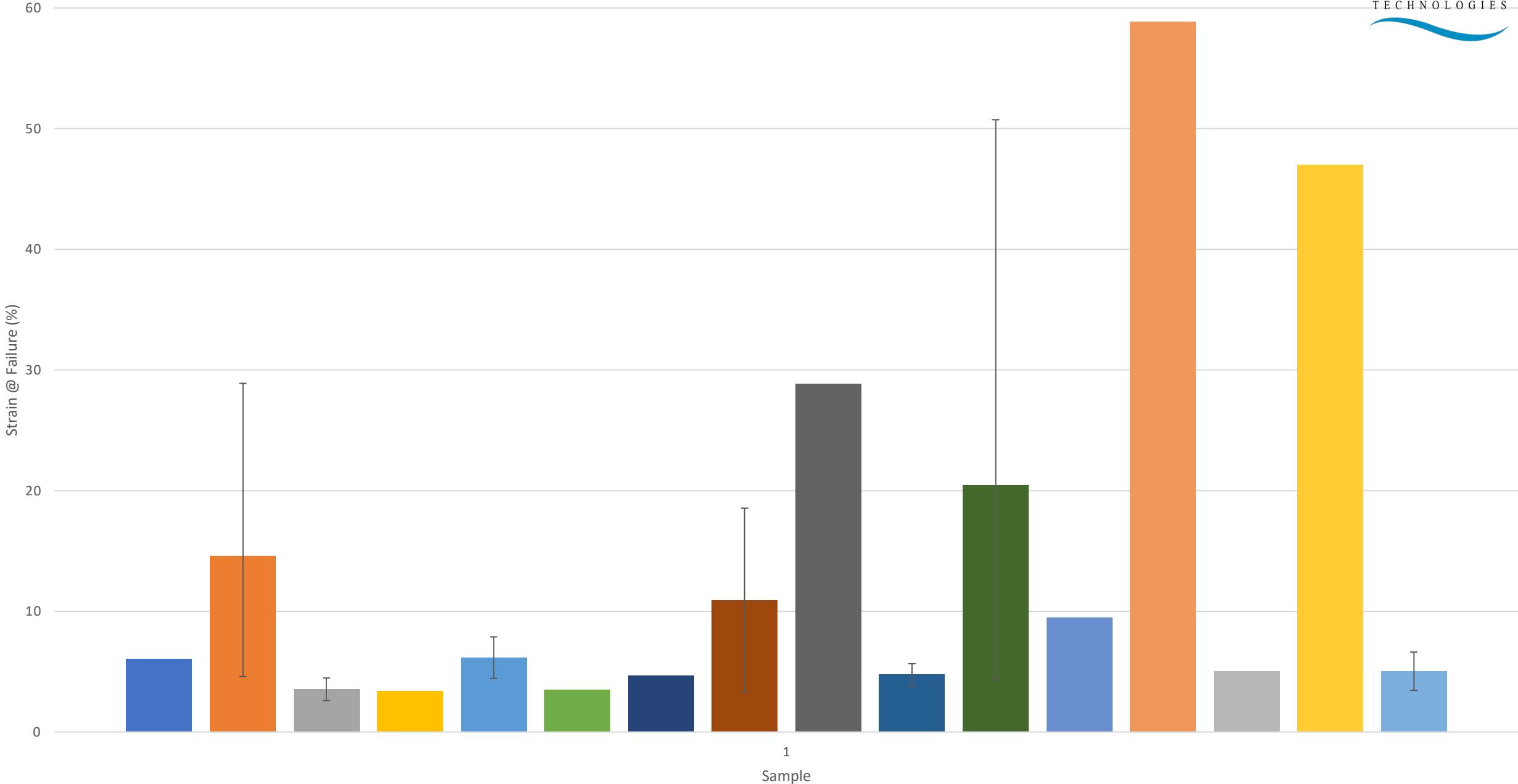
3 Day Cured Graphene Cement UTS

A.3 A.6 B.3 C.3 D.3 D.6 E.3 E.6 F.6 H.6 I.3 I.6 J.3 J.6 K.3 Control



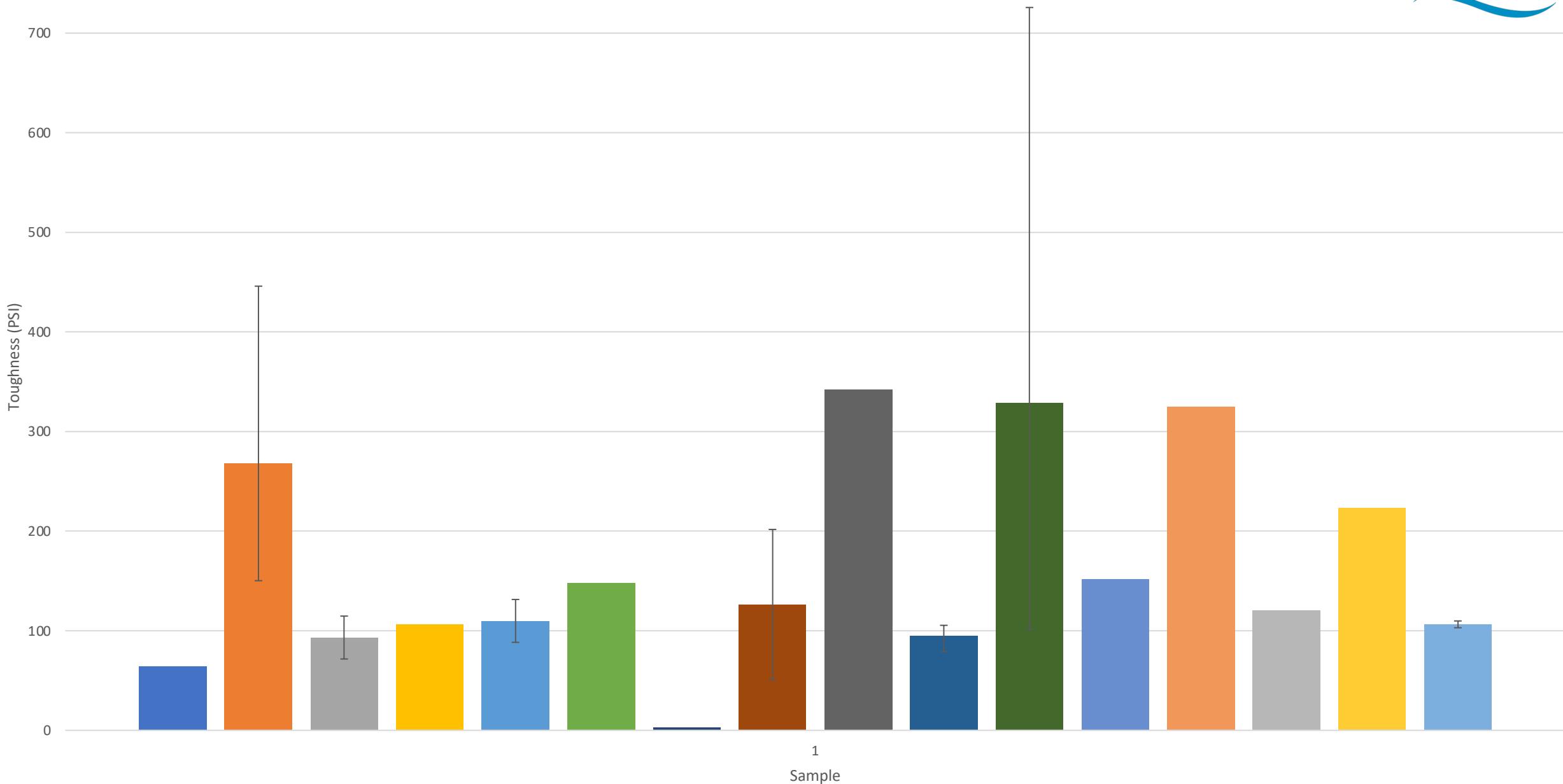
3 Day Cured Graphene Cement Strain @ Failure

A.3 A.6 B.3 C.3 D.3 D.6 E.3 E.6 F.6 H.6 I.3 I.6 J.3 J.6 K.3 Control

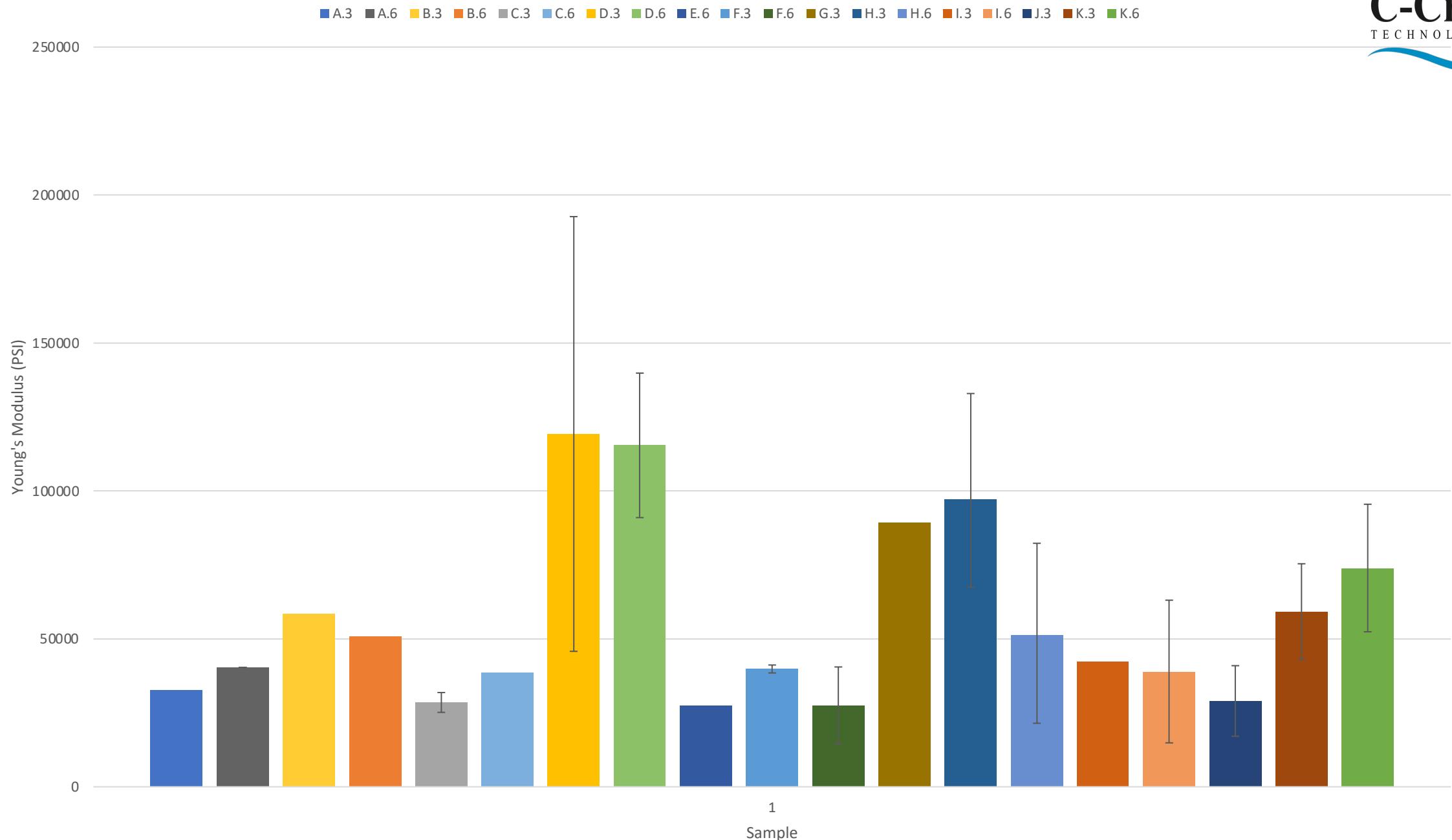


3 Day Cured Graphene Cement Toughness

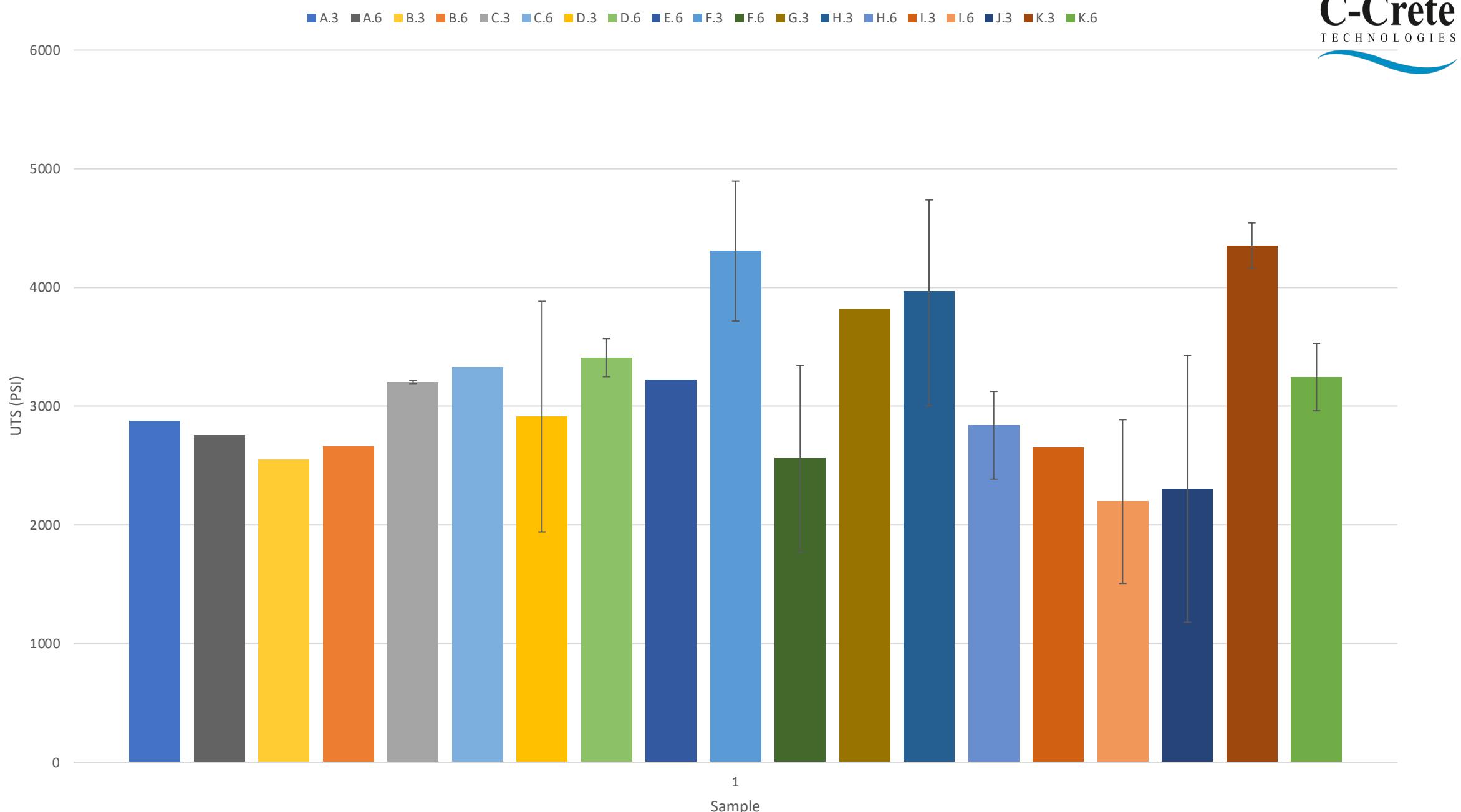
A.3 A.6 B.3 C.3 D.3 D.6 E.3 E.6 F.6 H.6 I.3 I.6 J.3 J.6 K.3 Control



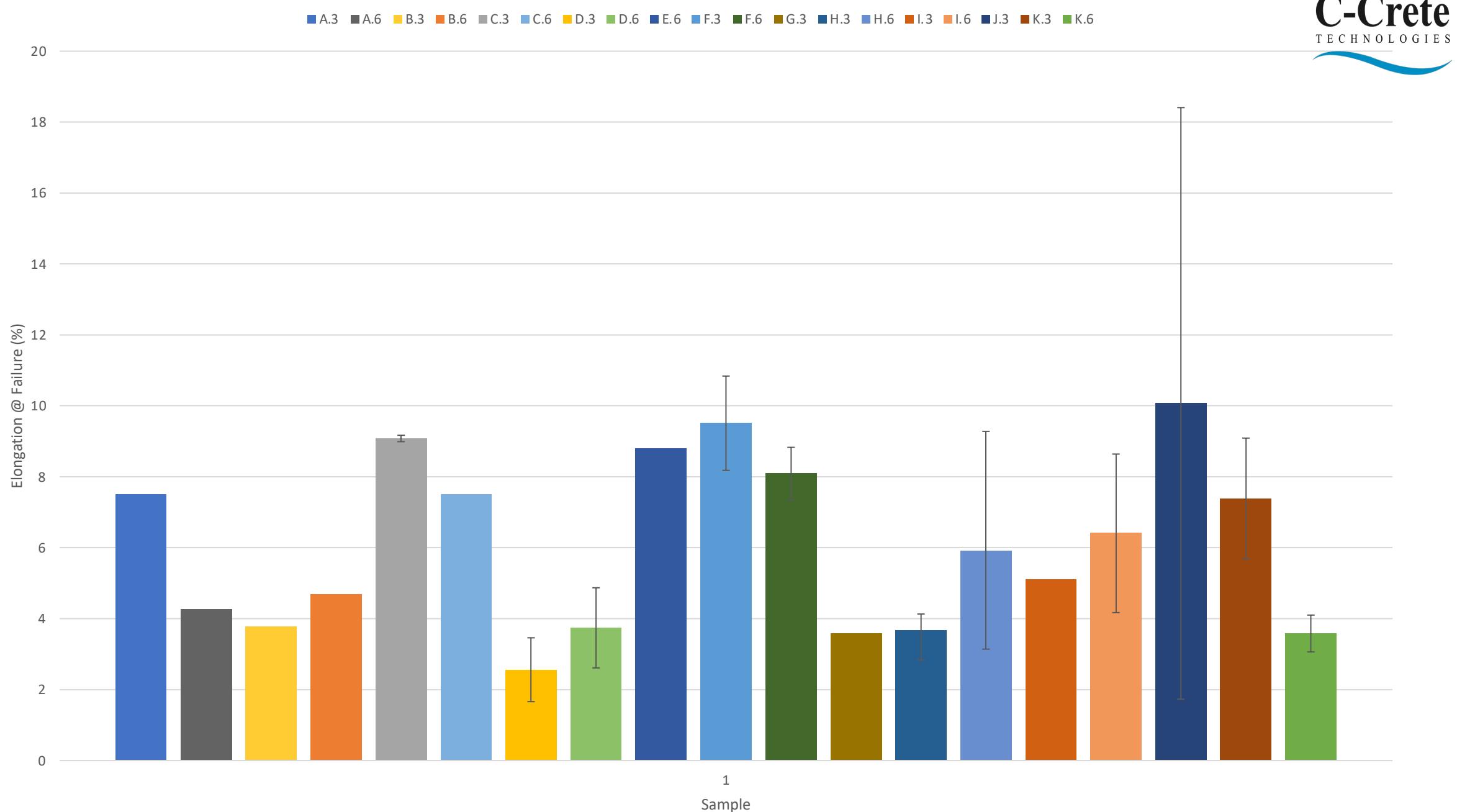
14 Day Cured Graphene Cement Young's Modulus



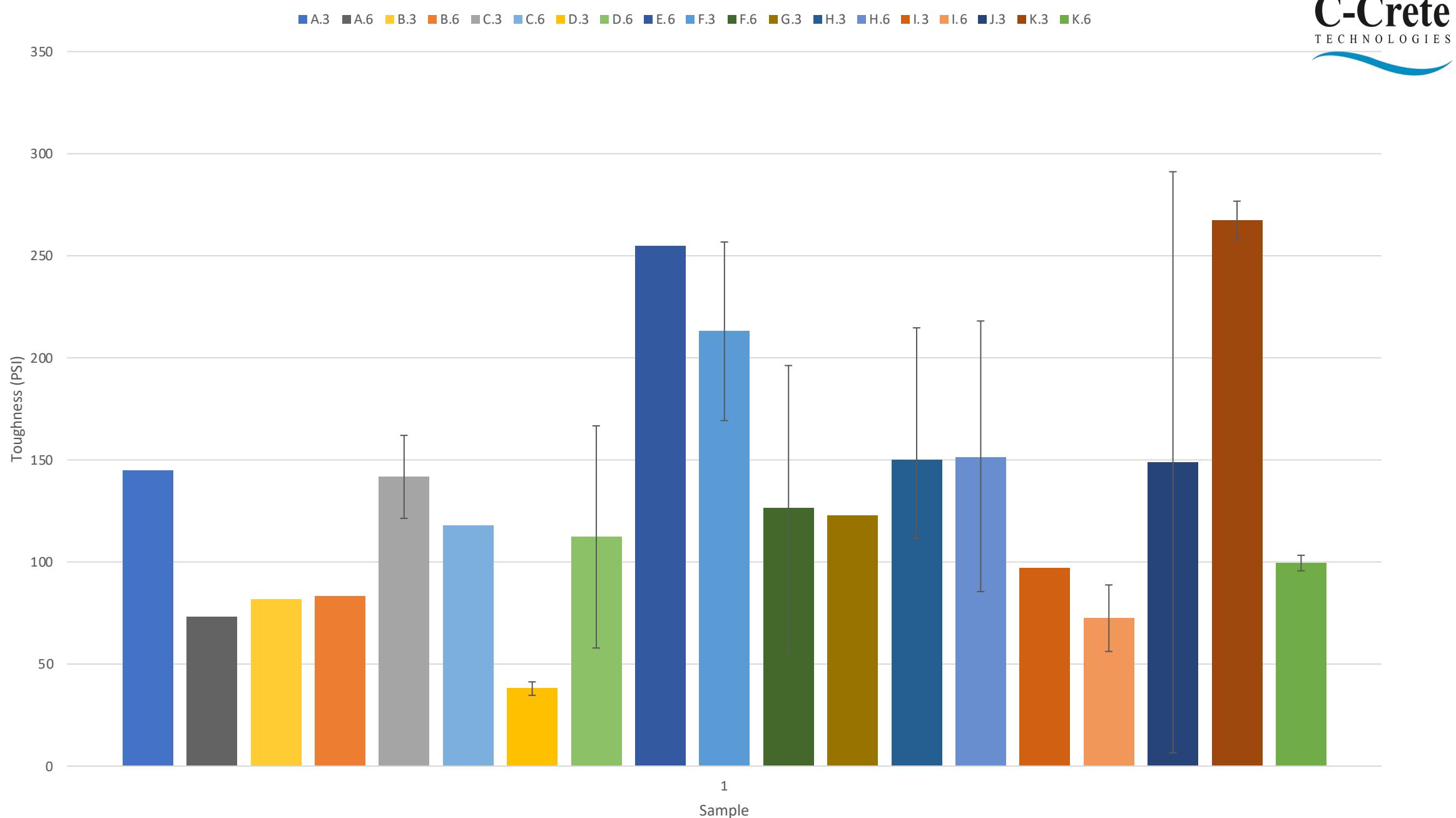
14 Day Cured Graphene Cement Ultimate Tensile Strength



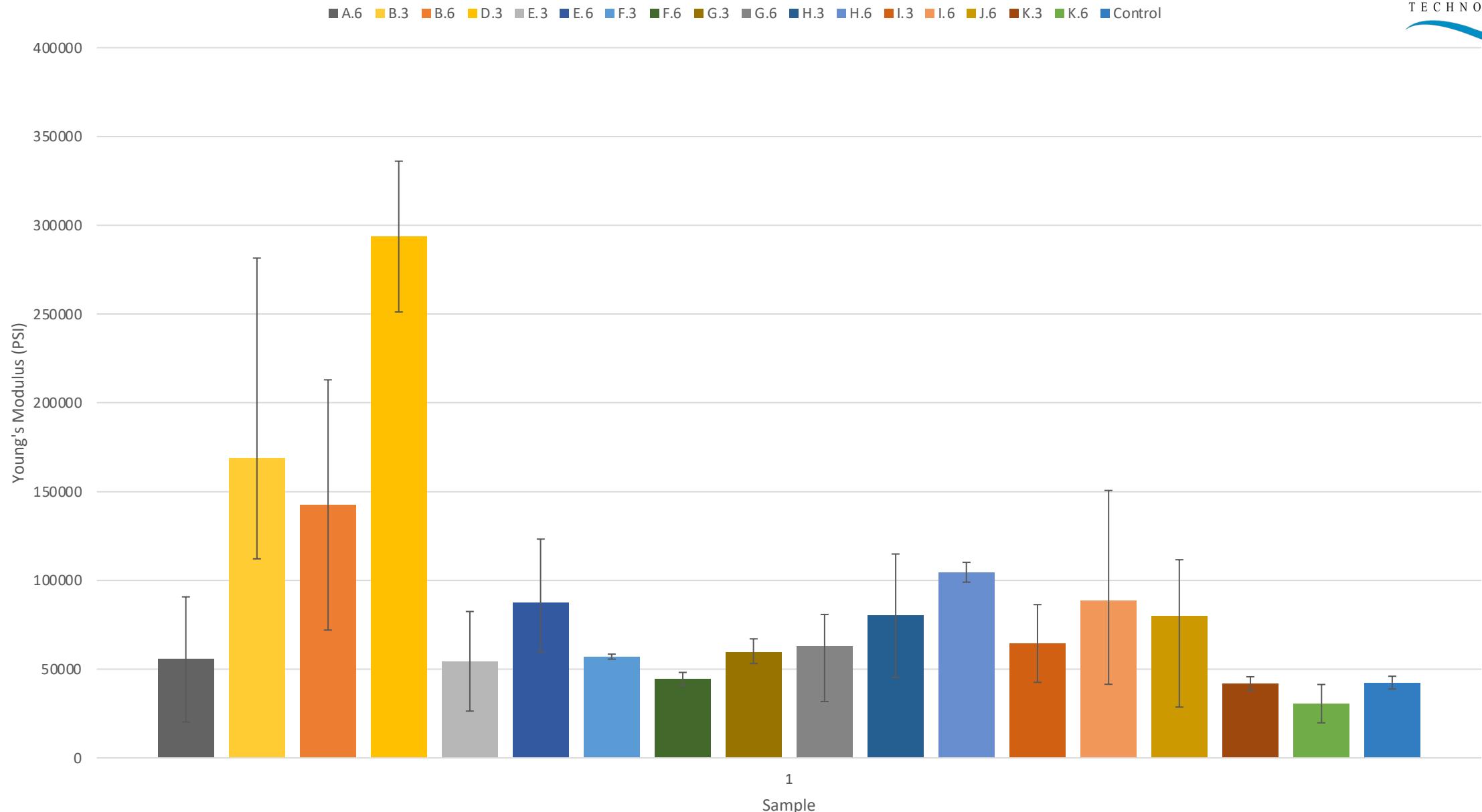
14 Day Cured Graphene Cement Elongation at Failure



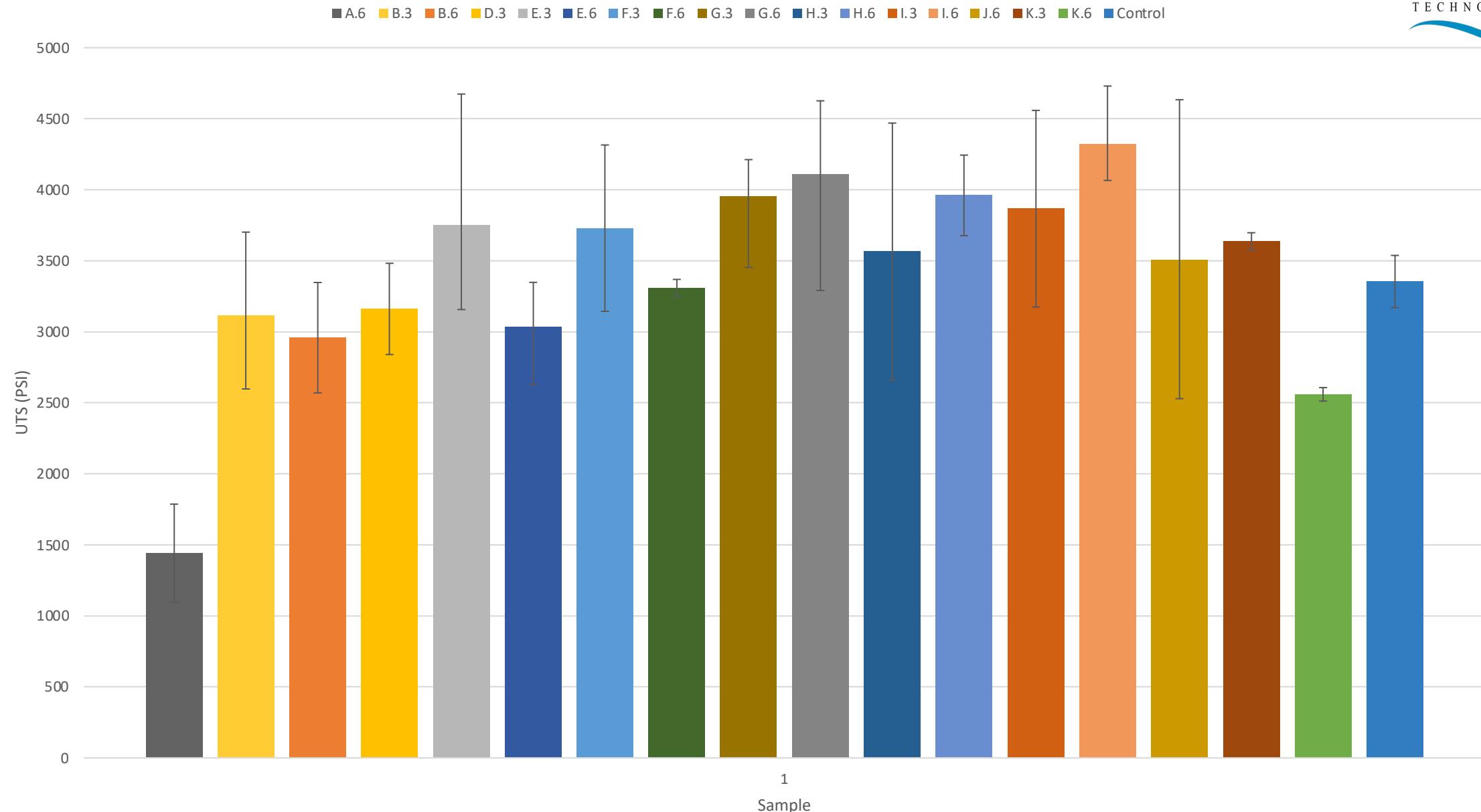
14 Day Cured Graphene Cement Toughness



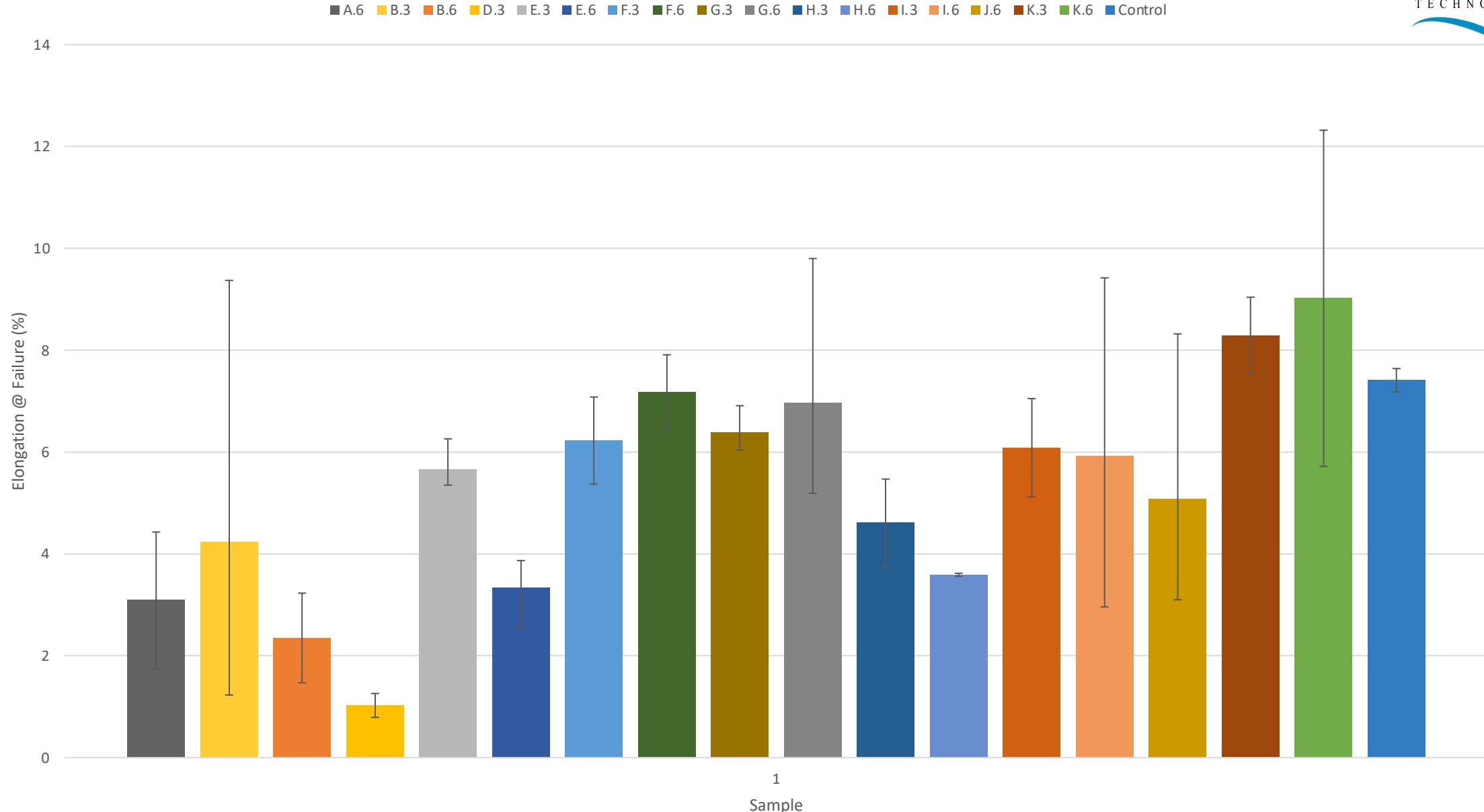
28 Day Cured Graphene Cement Young's Modulus



28 Day Cured Graphene Cement Ultimate Tensile Strength

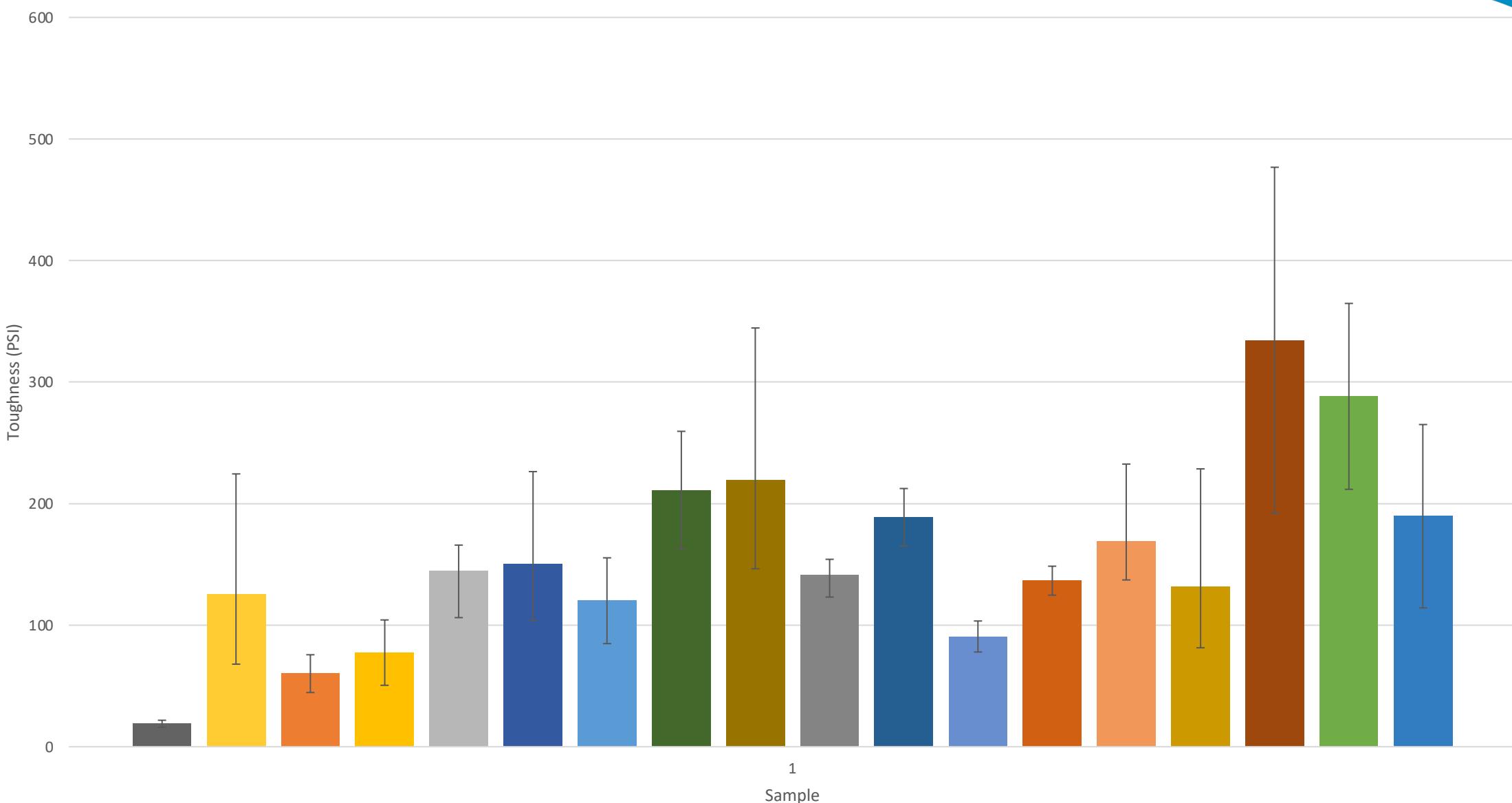


28 Day Cured Graphene Cement Elongation @ Failure



28 Day Cured Graphene Cement Toughness

C-Crete
TECHNOLOGIES



Acknowledgments

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