

LABORATORY RESEARCH REPORT

Characterization of NX3 Veneer and Dual-Cure composite

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SPONSOR

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Kerr /Sybron Dental

INVESTIGATOR/CONSULTANT

A handwritten signature in blue ink, reading "Jeffrey Y. Thompson". The signature is written in a cursive style with a long horizontal stroke at the end.

Jeffrey Y. Thompson, PhD
Weston, FL

PROTOCOL

MATERIALS AND METHODS:

Materials:

All materials were supplied by Sybron Dental to the investigator for this investigation.

TABLE 1: List of Proposed Materials (2)

(1) NX3 Veneer	Kerr	Light-cure composite
(2) NX3 Dual-Cure	Kerr	Dual-cure composite

Materials Manipulation:

All materials were manipulated following the stated instructions in individual manufacturers' enclosures in the package. All instructions were recorded in detail for reported results.

Specimen Preparation for Mechanical Testing:

All specimens were prepared by dispersing material into appropriate molds for specific mechanical tests. The number of specimens is reported in the test descriptions below. Specimens were cured, aged for 24hr in deionized/distilled water (37°C), and polished (when appropriate) through 1200 grit SiC abrasive.

Mechanical Testing:

All samples were tested wet at 25°C. Tests were conducted on a MTS universal testing machine operating at 0.5 mm per minute CHS. Test information was recorded using computer software (SINTECH) that allows automatic interpretation of stress-strain curve points or areas.

TABLE 2: Mechanical Tests (Individual test procedures are referenced):

[All tests were run at 25°C (in water when applicable)]

Compressive Strength:

Recommended number of specimens per material: 15

Total number of specimens for test: 30

Reference for Procedure: ISO Standard 9917 (International Standards Organization)

Flexural Strength (3 pt. Bend):

Recommended number of specimens per material: 15

Total number of specimens for test: 30

Reference for Procedure: ISO Standard 4049 (International Standards Organization)

Young's (flexural) Modulus:

Values will be obtained from stress-strain curves for 3-pt. flexural strength specimens.

Recommended number of specimens per material: 15

Total number of specimens for test: 30

Reference for Procedure: ISO Standard 4049 (International Standards Organization)

Diametral Tensile Strength:

Recommended number of specimens per material: 15

Total number of specimens for test: 30

Reference for Procedure: ISO Standard 9917 (International Standards Organization)

Depth of Cure:

Recommended number of specimens per material: 15

Total number of specimens for test: 30

Reference for Procedure: ISO Standard 4049 (International Standards Organization)

Statistical Analysis:

All groups of specimens for specific mechanical property tests were analyzed for means and standard deviations. Groups were compared within tests using ANOVA and post-hoc t-tests ($p \leq 0.05$) by the statistician.

RESULTS

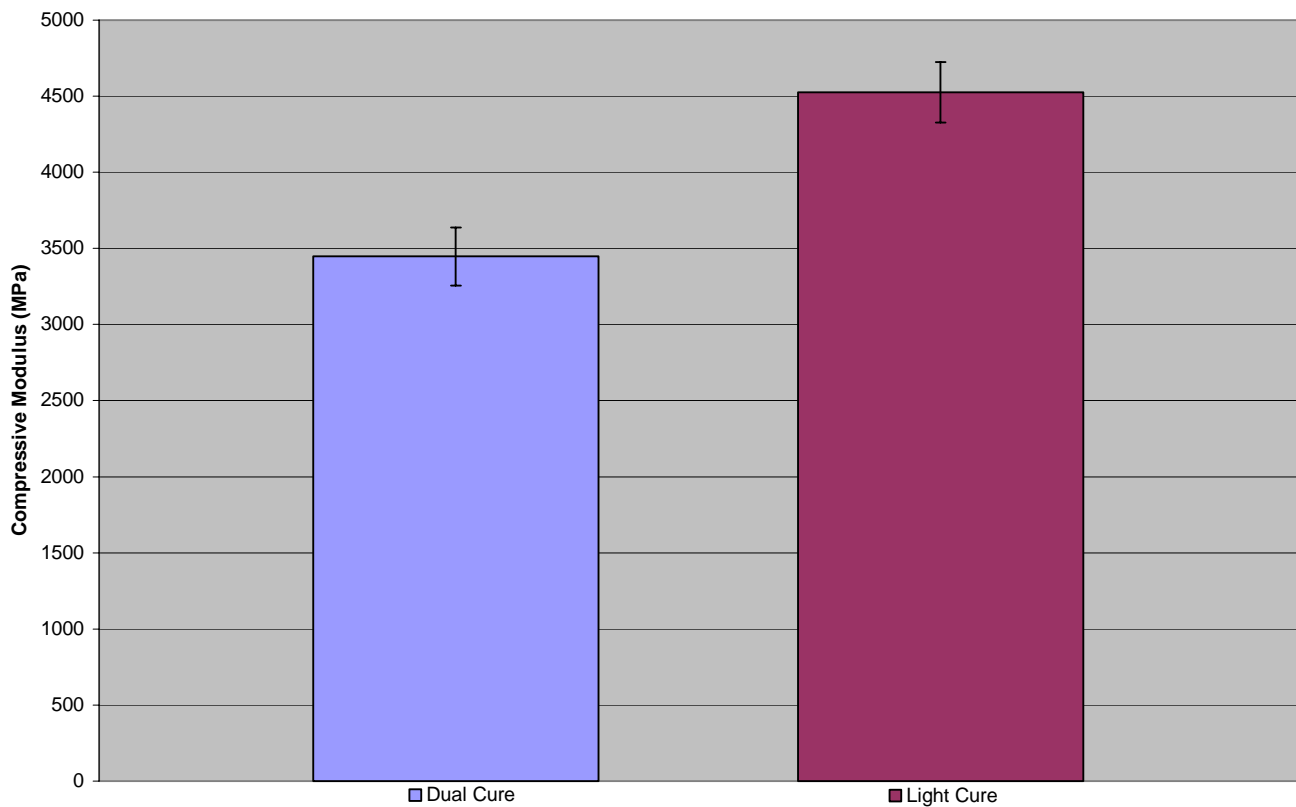
Summary table of test results:

Material	Compressive Modulus (GPa)	Compressive Strength (MPa)	Flexural Modulus (GPa)	Flexural Strength (MPa)	Diametral Tensile Strength (MPa)	Depth of Cure (mm)
Kerr <i>NX3 Veneer</i>	4.5 ± 0.2 ^a	310 ± 37 ^b	6.4 ± 1.3 ^a	135 ± 17 ^a	59 ± 9 ^a	3.38 ± 0.16
Kerr <i>NX3 Dual-Cure</i>	3.5 ± 0.2 ^b	340 ± 38 ^a	4.9 ± 0.6 ^b	122 ± 19 ^a	56 ± 11 ^a	---

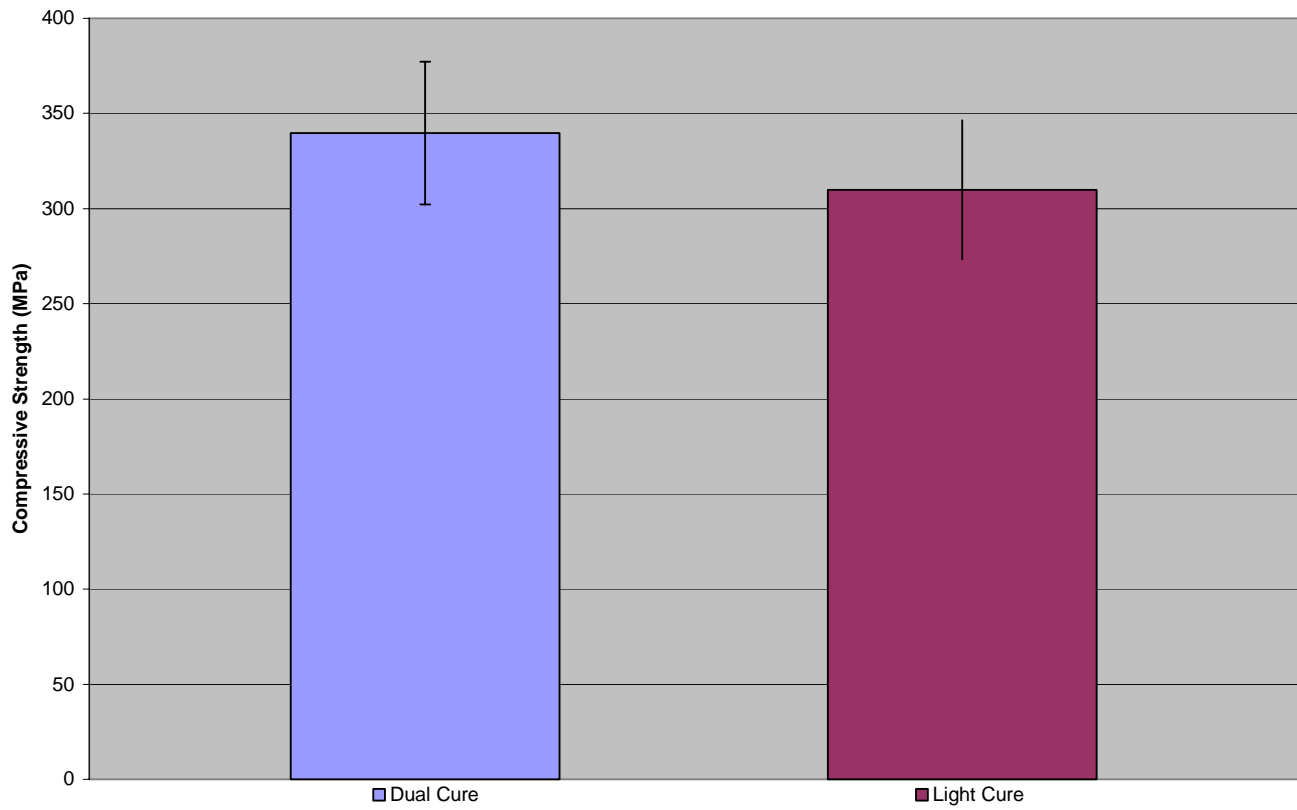
*Superscript letters (a, b) represent statistically equivalent means for each property measured.

Graphical representation of test results:

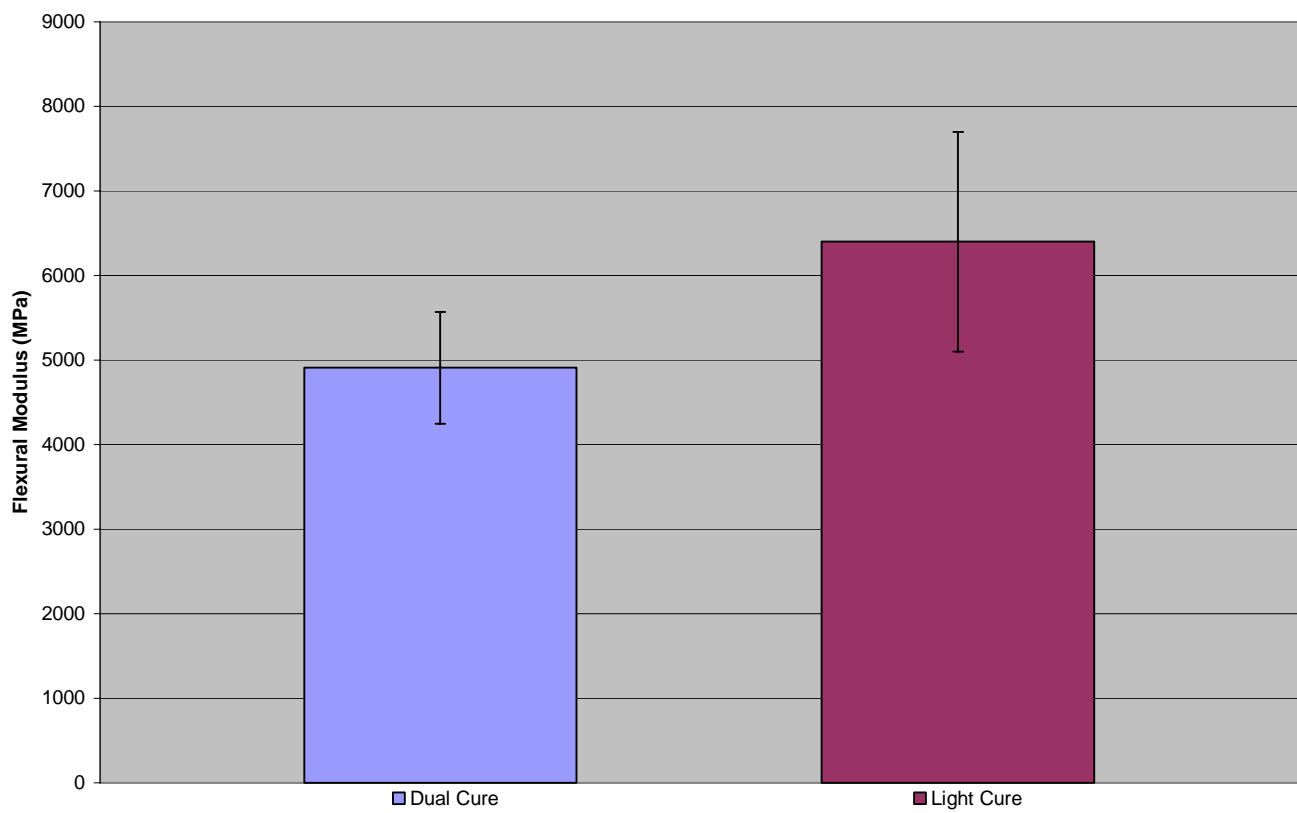
Compressive Modulus - Kerr NX3



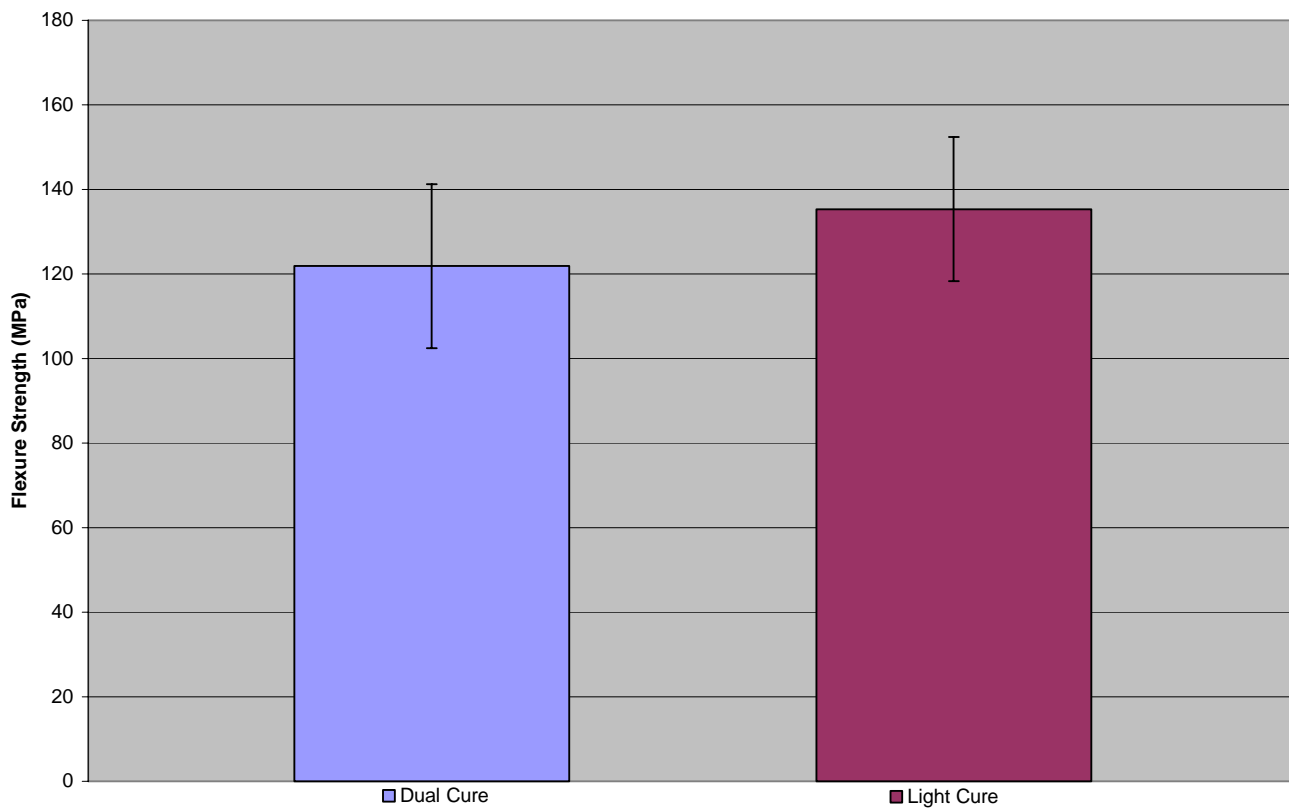
Compressive Strength - Kerr NX3



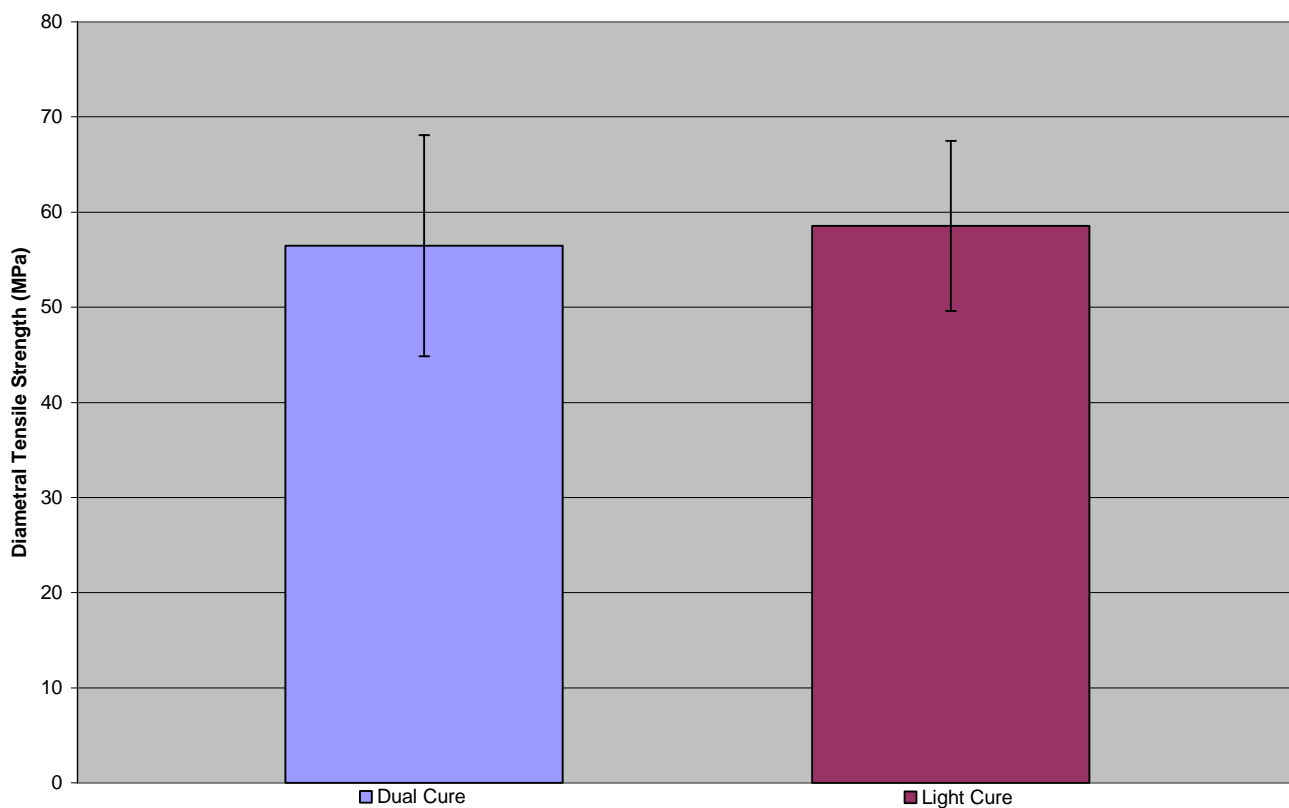
Flexural Modulus - Kerr NX3



3-Pt Flexure Strength - Kerr NX3



Diametral Tensile Strength - Kerr NX3



Summary:

Both materials tested behaved similarly, and are adequate in terms of laboratory property evaluation for the intended clinical applications. Handling properties were similar and no problems fabricating specimens were experienced.