University of Waterloo
BUILDING A TALENT TRUST

Faculty of Engineering **Chemical Engineering**

University of Waterloo
200 University Avenue West
Waterloo, Ontario, Canada
N2L 3G1

519-888-4567
Fax: 519-746-4979

May 20, 2014

Mr. Robin Pixner
Stellchem Inc.
Breslau. ON
Canada

Dear Mr. Pixner:

Thank you for allowing the University of Waterloo, Chemical Engineering Department to evaluate various structural and strength tests on Stellchem's polymer Rhino Wood Repair (RWR). The test results shown below are exceptional for the structural intent of the product.

Performed testing includes the following ASTM procedures using ADMET Expert 2 testing equipment:

i) Tensile Strength (ASTM D-3500)
ii) Flexural Strength (ASTM D-3043)
iii) Hardness (ASTM D-143)

A summary of the testing results and comparison to reference material is given below:

i) Tensile Strength (TS) predicts how the material will react under force. It determines ultimate tensile strength of material.
   - The RWR putty was found to be 74% stronger than Pine and 18% stronger than Maple
   - (Average RWR TS = 18459 psi, Pine[1] TS = 10600 psi, Maple[1] TS = 15700 psi).

ii) Flexural Strength (FS) is a mechanical test method that determines unified bending loads to define structural integrity of material.
   - The RWR putty was found to be 25 times stronger than Pine and 7 times stronger than Maple
   - (Average RWR FS = 851 MPa, Pine[1] FS = 32 MPa, Maple[1] FS = 109 MPa).

iii) Hardness (H) testing is a physical test method that directly relates to the resistance of specimen identification.
   - The RWR putty was found to be 5.24% harder than Pine while maple was found to be 54.4% harder than the RWR putty.
   - (Average RWR H = 442 lbs, Pine[1] H = 420 lbs, Maple[1] H = 970 lbs).

[1]Mechanical Properties of Wood, Chapter 4, David W. Green, Jerrold E. Winandy, and David E. Kretschmann, 2010

Stellchem's polymer, Rhino Wood Repair putty, proved to be superior in strength to softwoods and hardwoods under force. RWR putty is 25 times stronger in load strength than Pine and 7 times stronger in load strength than Maple. Hardness of RWR was found to be slightly greater than Pine. The mechanical properties of RWR make it versatile and easy to use for the contractor/renovator. The superior strength and unique hardness makes it very easy to use. Although, RWR is structurally stronger than many softwoods and hardwoods, its balance of strength and hardness makes it easy to sand, paint, stain, nail, screw, cut and saw.

Yours very truly,

Ali Elkamel, Professor, P.Eng.
Email: aelkamel@uwaterloo.ca
Phone: (519) 888-4567 ext. 37157

UNIVERSITY OF Waterloo 50 1957/2007 the spirit of 'why not?'