May 2011

V-ROD PULTRALL TECHNOLOGY NEWSLETTER

Pultrall is proud to add to their product offering the ALL NEW

DOWELS

Load transferring devices with an increased life expectancy

Concrete pavement is nothing new, all over North America there are an increasing number of roadways that benefit from the use of concrete paving.

State Departments and Ministries of Transportation are always looking for innovative materials to prolong the life of these important infrastructures.

Corrosion of the steel dowels, as friction wears off the epoxy coating, will cause them to expand and lock up the joint and/or deteriorate, resulting in cracking and failure of the concrete at the joints.

Construction of King's Highway (401) in Toronto, ON (1956)

Photo courtesy of the Ministry of Transportation of Ontario.

Dowels on steel basket before concrete layout, Turgeon and al. (2009)

Pultrall has therefore developed a full line of GFRP dowels based on their renowned V-ROD technology, a concrete reinforcement rebar made of fibreglass and a thermoset vinylester resin matrix.

The dowels properties are outlined in the below table.

Dowel Diameter (mm / inches)	Cross sectional Area (mm² / inches²)	Transverse Shear Strength (MPa / Psi) ACI 440.3R-04, method B4	Flexural Strength (MPa / Psi) ASTM D4476-03	Short Beam Shear (MPa / Psi) ASTM D4476-02	Modulus of Elasticity (GPa / Psi) ASTM D4476-03
25.4 / 1.000	506.7 / 0.785	167 / 24221	1320 / 1.91 x10^5	53 / 7686	54 / 7.83 x10^6
28.6 / 1.125	642.4 / 0.996	193 / 27992	1210 / 1.75 x10^5	59 / 8557	53 / 7.68 x10^6
31.8 / 1.250	794.2 / 1.231	160 / 23206	1165 / 1.68 x10^5	60 / 8702	52 / 7.54 x10^6
34.9 / 1.375	956.6 / 1.483	184 / 26686	1210 / 1.75 x10^5	61 / 8847	50 / 7.25 x10^6
38.1 / 1.500	1140.1 / 1.767	173 / 25091	1075 / 1.55 x10^5	53 / 7686	51 / 7.39 x10^6
41.3 / 1.625	1339.7 / 2.076	196 / 28427	1015 / 1.47 x10^5	58 / 8412	50 / 7.25 x10^6
44.5 / 1.750	1555.3 / 2.411	181 / 26251	1040 / 1.50 x10^5	60 / 8702	49 / 7.10 x10^6

The above values are provided as indicative only and should not be used for design purposes. Please refer to your local representative for the guaranteed design values.

Pultrall's dowels have been tested according to AASHTO's cyclic loading test specifications, providing values of up to 50% Load Transfer Efficiency (LTE) after over 2 000 000 load cycles at 130kN. Steel dowels made it up to 45% under the same conditions.

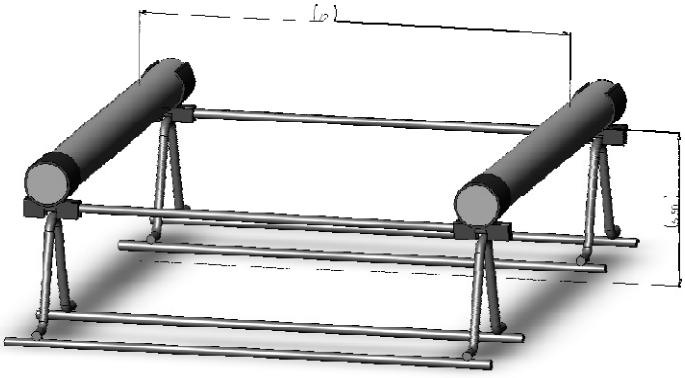
There is a wide array of applications for concrete pavement and for Pultrall Dowels.

- **Highways**
- **City streets and roads**
- **Airport runways**

Photos courtesy of Portland Cement Association.

"Accelerated aging tests have proven the perfect long term integrity of the […] dowels that present a stability of ***more than 90%*** *over an extrapolated* ***200 years*** *service life."*

Prof. B. Benmokrane,
Civil Engineering Dept, Sherbrooke U.
Canada Research Chair in Advanced Composite Materials for Civil Structures
February 2011



With the introduction of these new dowels, Pultrall has also initiated the development of a new generation of baskets that will make the use of these smooth round rods a breeze.

The holding devices will be made of plastic and the bases of steel, as for the standard equipment in use nowadays. With this great addition, Putrall will then be able to provide a complete solution for all your concrete pavement reinforcing needs.

For more information on this product, please contact your local distributor of Pultrall's products.