

ICC-ES Evaluation Report

ESR-4923

Reissued June 2024


This report also contains:

- CBC Supplement

Subject to renewal June 2025

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<p>DIVISION: 03 00 00— CONCRETE</p> <p>Section: 03 20 00— Concrete Reinforcing</p> <p>Section: 03 21 00— Reinforcement Bars</p>	<p>REPORT HOLDER:</p> <p>PULTRALL, INC.</p>	<p>EVALUATION SUBJECT:</p> <p>V-ROD™ Poly GLASS FIBER REINFORCED POLYMER (GFRP) BARS AS SHRINKAGE AND TEMPERATURE REINFORCEMENT</p>	
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1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2021 [International Building Code® \(IBC\)](#)
- 2021 [International Residential Code \(IRC\)](#)

Properties evaluated:

- Crack Control
- Physical

2.0 USES

The V-ROD™ Poly Glass Fiber Reinforced Polymer (GFRP) bar is used as an alternative to the shrinkage and temperature reinforcement specified in Section 24.4 of ACI 318-19 for plain concrete footings and for plain concrete slabs (as defined by ACI 360) supported directly on the ground.

The V-ROD™ Poly Glass Fiber Reinforced Polymer (GFRP) bar is also used as an alternative to horizontal temperature and shrinkage reinforcement in structural plain concrete walls covered in IBC Section 1901.2 of the 2021 IBC, IRC Sections R404.1.3 and R608.1, and ACI 332-20 Sections 9.2.1 and 9.2.7, excluding walls where vertical reinforcement is required.

3.0 DESCRIPTION

The V-ROD™ Poly Glass Fiber Reinforced Polymer (GFRP) bar is solid and has a circular cross section composed of glass fibers embedded in a resin matrix. Available bar sizes and properties are provided in [Table 1](#) of this report.

4.0 INSTALLATION

The V-ROD™ Poly Glass Fiber Reinforced Polymer (GFRP) bars must be installed in accordance with this report, applicable provisions in ACI 440.5-08, and Pultrall's Handling and Safety Instructions (Installation).

5.0 CONDITIONS OF USE:

The V-ROD™ Poly Glass Fiber Reinforced Polymer (GFRP) bars described in this report comply with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 Installation of FRP bars used as temperature and shrinkage reinforcement for plain concrete footings, plain concrete slabs, and as horizontal reinforcement in plain concrete walls where vertical reinforcement is not required, must be in accordance with this evaluation report, and the report holder's Installation Manual. In case of conflict, this report governs.
- 5.2 V-ROD™ Poly Glass Fiber Reinforced Polymer (GFRP) bar designations of No. 3 and No. 4, as shown in [Table 1](#) of this report, with a maximum spacing of 12 inches (300 mm) can be used as an alternative to conventional temperature and shrinkage reinforcement with maximum steel bar designations of No. 3 and No. 4 and minimum spacing of 12 inches (300 mm). Alternate spacings for V-ROD™ Poly FRP bar greater than 12 inches (300 mm) have not been evaluated and may be considered by a registered design professional to the satisfaction of the code official for each project.
- 5.3 Complete construction documents, including plans showing compliance with the evaluation report, must be submitted to the code official for each project at the time of permit application. The construction documents must be prepared and sealed by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.
- 5.4 V-ROD™ Poly Glass Fiber Reinforced Polymer (GFRP) bars must be stored and protected during storage in accordance with the guidelines given in ACI 440.5-08.
- 5.5 Special inspection as required by Table 1705.3 of the IBC for steel-reinforced concrete construction is also applicable to FRP bars construction under this report.
- 5.6 Use of FRP bars does not eliminate the requirement for joints specified in Section 14.3.4 of ACI 318 (IBC and IRC).
- 5.7 V-ROD™ Poly Glass Fiber Reinforced Polymer (GFRP) bars are manufactured under a quality control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

Data in accordance with the [ICC-ES Acceptance Criteria for Fiber-reinforced Polymer \(FRP\) Bars and Meshes for Internal Reinforcement of Non-structural Concrete Members \(AC521\)](#), dated October 2020 (Editorially revised May 2021), including fiber mass content, moisture absorption, shrinkage crack resistance, and quality control documentation.

7.0 IDENTIFICATION

- 7.1 The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-4923) along with the name, registered trademark, or registered logo of the report holder must be included in the product label.
- 7.2 In addition, The V-ROD™ Poly Glass Fiber Reinforced Polymer (GFRP) bars are identified by packaging labeled with the company name (Pultrall, Inc.) and contact information, product name, bar size, and lot number.
- 7.3 The report holder's contact information is the following:

PULTRALL, INC.
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QUEBEC G05 3G0
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TABLE 1—V-ROD™ POLY GLASS FIBER REINFORCED (GFRP) BAR DIMENSIONS AND PROPERTIES

BAR DESIGNATION NUMBER	NOMINAL DIAMETER (in)	NOMINAL CROSS SECTIONAL AREA (in ²)	GUARANTEED ULTIMATE TENSILE FORCE (kip)	MEAN TENSILE MODULUS OF ELASTICITY (ksi)	MEAN ULTIMATE TENSILE STRAIN (%)
M10 (No. 3)	$\frac{3}{8}$	0.110	14.3	7,200	2.3
M12 (No. 4)	$\frac{1}{2}$	0.187	27.6	7,300	2.1

For SI: 1 inch = 25.4 mm, 1 kip = 4.45kN, 1 psi = 6.89 kPa, 1 ksi = 6.89 MPa

DIVISION: 03 00 00—CONCRETE
Section: 03 20 00—Concrete Reinforcing
Section: 03 21 00—Reinforcement Bars

REPORT HOLDER:

PULTRALL, INC.

EVALUATION SUBJECT:

V-ROD™ Poly GLASS FIBER REINFORCED POLYMER (GFRP) BARS AS SHRINKAGE AND TEMPERATURE REINFORCEMENT

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that V-ROD™ Poly Glass Fiber Reinforced Polymer (GFRP) bars, described in ICC-ES evaluation report ESR-4923, have also been evaluated for compliance with the codes noted below.

Applicable code edition(s):

- 2022 California Building Code (CBC)

For evaluation of applicable Chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) AKA: California Department of Health Care Access and Information (HCAI) and the Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

- 2022 California Residential Code (CRC)

2.0 CONCLUSIONS

2.1 CBC:

The V-ROD™ Poly Glass Fiber Reinforced Polymer (GFRP) bars, described in Sections 2.0 through 7.0 of the evaluation report ESR-4923, comply with CBC Chapter 19, provided the design and installation are in accordance with the 2021 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 16 and 17, as applicable.

2.1.1 OSHPD:

The applicable OSHPD Sections and Chapters of the CBC are beyond the scope of this supplement.

2.1.2 DSA:

The applicable DSA Sections and Chapters of the CBC are beyond the scope of this supplement.

2.2 CRC:

The V-ROD™ Poly Glass Fiber Reinforced Polymer (GFRP) bars, described in Sections 2.0 through 7.0 of the evaluation report ESR-4923, comply with CRC Chapters 4 and 6, provided the design and installation are in accordance with the 2021 *International Residential Code*® (IRC) provisions noted in the evaluation report and the additional requirements of CRC Chapter 3, as applicable.

This supplement expires concurrently with the evaluation report, reissued June 2024.