

## New OPSS.PROV 1640 – Material specification for Glass Fibre Reinforced Polymer (GFRP) Reinforcement for Concrete

Comments received by TCP			
Comment ID	Organization	Comment	Response
<b>391</b>	<b>Individual</b>	<p>Table 1 The test name for water absorption seems gone.</p> <p>With the removal of the performance requirement for anchor heads, what is the official reference to validate their conformity? They are covered in CSA S807, but a lot of what is found in Tables 1, 2 and 3 are also actually the specifications from S807. It may thus be an opportunity to simplify the tables by generalising the reference to S807 where the requirements are identical to MTO's.</p>	<p>The water absorption test requirements in the body of the specification and Table 1 are the same as SSP 999S02, October 2021. The test name in Table 1 has been consistent since the June 2017 publication.</p> <p>Pullout capacity of anchor headed bars was removed from Table 1 as a Quality Control test to reduce the number of tests required by MTO to be conducted by the manufacturer. The capacity is established through qualification testing for listing on the DSM and may be verified in construction contracts through Quality Assurance testing.</p> <p>OPSS 950 quality assurance testing referenced Table 1 which missed pullout capacity of anchor headed bars. Pullout capacity has been added as an additional possible QA test in 950.08.02 Testing:</p> <p>“Pullout capacity of anchor headed bars shall be tested by embedment in concrete block. The test may be conducted with high early strength concrete after the concrete reaches 30 MPa strength. The specified limits for anchor headed bars is 100 kN for 15 mm diameter bar with a maximum slip of 0.5 mm.”</p>

Comments received by email			
Number	Organization	Comment	Response
1	CMTE	<p>Section: 1640.02: References</p> <p>Current Text: OPSS 950 Glass Fibre Reinforced Polymer (GFRP) Reinforcement for Concrete</p> <p>Comment: I recommend changing the title to reflect the current title of the OPSS 950 as follows: OPSS 950: Construction Specification For Glass Fibre Reinforced Polymer (GFRP) Reinforcement For Concrete- November 2023</p>	<p>The current text follows OPS writing convention. See <i>OPS User Guide</i>, January 2023 for more information.</p>
2	CMTE	<p>Section: 1640.02: References</p> <p>Current Text: ASTM</p> <p>Comment: Please update the ASTM published dates as follows:</p> <ul style="list-style-type: none"> <li>1- ASTM 570-22</li> <li>2- D3418-21</li> <li>3- D7205/D7205M-21</li> </ul>	<p>The publication dates have been updated.</p>
3	CMTE	<p>Section: 1640.05 Materials</p> <p>Current Text: Binding material for the bars shall be composed of thermoset vinyl ester resin matrix.</p> <p>Comment: Classification based on durability as per CSA S807-19 Section 8.4.1 includes both vinyl ester or epoxy. I understand that most of the current approved suppliers are using vinyl ester</p>	<p>The text has been updated to include epoxy.</p> <p>"Binding material for the bars shall be composed of thermoset vinyl ester or epoxy resin matrix that is homogeneous throughout the cross-section of the bar."</p>

		but future suppliers may use Epoxy which is also approved as D1.	
<b>4</b>	<b>CMTE</b>	<p>Section: 1640.07.01: Manufacture</p> <p>Current Text: The standard fabricating tolerances.</p> <p>Comment: I think a reference to Table 1 of OPSS 950 should also be added as part of this statement.</p>	<p>Reference to Table 1 of OPSS 950 has not been added. Table 1 is for the tolerances for concrete cover and placing accuracy; these constitute the physical placement of the finished reinforcement in the structure.</p> <p>The fabricating tolerances referenced in 1640.07.01 are for the dimensional tolerances of fabricated bar, e.g., bar length, bending, spiral diameter and spacing, etc.</p>
<b>5</b>	<b>CMTE</b>	<p>Section: 1640.07.06: Determination of Properties</p> <p>Current Text:</p> <p>Comment: I noticed that the properties required for the QC for each subsequent subplot only consider physical properties. I suggest that the tension test should also be included.</p>	<p>The reduction in testing is in accordance with CSA S807-19 [4.2.2.1]. The change was made to SSP 999S02, October 2021 and there has not been an observed adverse change in quality of bars.</p> <p>If quality assurance testing shows tensile strength of bars to be an issue, the requirement for tensile testing in subsequent sublots will be revisited.</p>
<b>6</b>	<b>CMTE</b>	<p>Section: 1640.08: Quality Assurance</p> <p>Current Text:</p> <p>Comment: MTO referenced Appendix D for the QA projects between 2021-2021. I strongly suggest combining any additional requirement specified by Appendix D into OPSS 1640. This way there will be no future confusion or reference to multiple documents.</p>	<p>The additional instruction on sampling and testing for Quality Assurance laboratory agreements is not specific to the fabrication and installation of GFRP reinforcing bar.</p> <p>It may be ideal for the lab to be able to reference one document, but the MTO does not want to include the type of information in the additional instruction on sampling and testing appendix as a contractual requirement in construction contracts.</p>
<b>7</b>	<b>CMTE</b>	<p>Section: Table 1</p> <p>Current Text: Water Absorption</p>	<p>This is the requirement of CSA S807-19.</p> <p>"Table 8, Water absorption:  <math>\leq 0.25\%</math> for D1 bars and grids of size 15 mm and larger and grids; and <math>&lt; 0.30\%</math> for D1 bars of size 13 mm and smaller."</p>

		<p>Comment: I noticed that the limit for 24-hour immersion depends on the bar size. Is there a reason for that? I do not think the limit should be increased since all suppliers are aware of the tighter limit of 0.25%. A larger limit means allowing more moisture in the bar which is not favourable in colder environments. Note that CSA S807-19 does not provide different specified limits based on the bar size.</p>	
<p><b>8</b></p>	<p><b>MTO QA</b></p>	<p>The resin polymer type should be provided with the supplier submission.</p>	<p>The base polymer types are restricted by CSA S807 and are controlled by application submissions of a product to the DSM list #9.65.90. Changing or mixing of polymer type is not permitted as it constitutes a different product from the DSM application.</p> <p>The specific resins being used for each product are already known.</p>