

Design, material, and manufacturing requirements for prefabricated septic tanks and sewage holding tanks



Currently in preview, click buy full version

Legal Notice for Standards

Canadian Standards Association (CSA) standards are developed through a consensus standards development process approved by the Standards Council of Canada. This process brings together volunteers representing varied viewpoints and interests to achieve consensus and develop a standard. Although CSA administers the process and establishes rules to promote fairness in achieving consensus, it does not independently test, evaluate, or verify the content of standards.

Disclaimer and exclusion of liability

This document is provided without any representations, warranties, or conditions of any kind, express or implied, including, without limitation, implied warranties or conditions concerning this document's fitness for a particular purpose or use, its merchantability, or its non-infringement of any third party's intellectual property rights. CSA does not warrant the accuracy, completeness, or currency of any of the information published in this document. CSA makes no representations or warranties regarding this document's compliance with any applicable statute, rule, or regulation.

IN NO EVENT SHALL CSA, ITS VOLUNTEERS, MEMBERS, SUBSIDIARIES, OR AFFILIATED COMPANIES, OR THEIR EMPLOYEES, DIRECTORS, OR OFFICERS, BE LIABLE FOR ANY DIRECT, INDIRECT, OR INCIDENTAL DAMAGES, INJURY, LOSS, COSTS, OR EXPENSES, HOWSOEVER CAUSED, INCLUDING BUT NOT LIMITED TO SPECIAL OR CONSEQUENTIAL DAMAGES, LOST REVENUE, BUSINESS INTERRUPTION, LOST OR DAMAGED DATA, OR ANY OTHER COMMERCIAL OR ECONOMIC LOSS, WHETHER BASED IN CONTRACT, TORT (INCLUDING NEGLIGENCE), OR ANY OTHER THEORY OF LIABILITY, ARISING OUT OF OR RESULTING FROM ACCESS TO OR POSSESSION OR USE OF THIS DOCUMENT, EVEN IF CSA HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, INJURY, LOSS, COSTS, OR EXPENSES.

In publishing and making this document available, CSA is not undertaking to render professional or other services for or on behalf of any person or entity or to perform any duty owed by any person or entity to another person or entity. The information in this document is directed to those who have the appropriate degree of experience to use and apply its contents, and CSA accepts no responsibility whatsoever arising in any way from any and all use of or reliance on the information contained in this document.

CSA is a private not-for-profit company that publishes voluntary standards and related documents. CSA has no power, nor does it undertake, to enforce compliance with the contents of the standards or other documents it publishes.

Intellectual property rights and ownership

As between CSA and the users of this document (whether it be in printed or electronic form), CSA is the owner, or the authorized licensee, of all works contained herein that are protected by copyright, all trade-marks (except as otherwise noted to the contrary), and all inventions and trade secrets that may be contained in this document, whether or not such inventions and trade secrets are protected by patents and applications for patents. Without limitation, the unauthorized use, modification, copying, or disclosure of this document may violate laws that protect CSA's and/or others' intellectual property and may give rise to a right in CSA and/or others to seek legal redress for such use, modification, copying, or disclosure. To the extent permitted by licence or by law, CSA reserves all intellectual property rights in this document.

Patent rights

Attention is drawn to the possibility that some of the elements of this standard may be the subject of patent rights. CSA shall not be held responsible for identifying any or all such patent rights. Users of this standard are expressly advised that determination of the validity of any such patent rights is entirely their own responsibility.

Authorized use of this document

This document is being provided by CSA for informational and non-commercial use only. The user of this document is authorized to do only the following:

If this document is in electronic form:

- load this document onto a computer for the sole purpose of reviewing it;
- search and browse this document; and
- print this document if it is in PDF format.

Limited copies of this document in print or paper form may be distributed only to persons who are authorized by CSA to have such copies, and only if this Legal Notice appears on each such copy.

In addition, users may not and may not permit others to

- alter this document in any way or remove this Legal Notice from the attached standard;
- sell this document without authorization from CSA; or
- make an electronic copy of this document.

If you do not agree with any of the terms and conditions contained in this Legal Notice, you may not load or use this document or make any copies of the contents hereof, and if you do make such copies, you are required to destroy them immediately. Use of this document constitutes your acceptance of the terms and conditions of this Legal Notice.

CSA Standards Update Service

B66-10

April 2010

Title: *Design, material, and manufacturing requirements for prefabricated septic tanks and sewage holding tanks*

Pagination: **35 pages** (x preliminary and 25 text), each dated **April 2010**

To register for e-mail notification about any updates to this publication

- go to **www.ShopCSA.ca**
- click on **E-mail Services** under **MY ACCOUNT**
- click on **CSA Standards Update Service**

The **List ID** that you will need to register for updates to this publication is **2420639**.

If you require assistance, please e-mail techsupport@csa.ca or call 416-747-2233.

Visit CSA's policy on privacy at www.csagroup.org/legal to find out how we protect your personal information.

Currently in preview, click buy full version

CSA Standard

B66-10

***Design, material, and manufacturing
requirements for prefabricated septic tanks
and sewage holding tanks***



**CANADIAN STANDARDS
ASSOCIATION**

®Registered trade-mark of Canadian Standards Association

*Published in April 2010 by Canadian Standards Association
A not-for-profit private sector organization
5060 Spectrum Way, Suite 100, Mississauga, Ontario, Canada L4W 5N6
1-800-463-6727 • 416-747-4044*

Visit our Online Store at www.ShopCSA.ca



The Canadian Standards Association (CSA) prints its publications on Rolland Enviro100, which contains 100% recycled post-consumer fibre, is EcoLogo and Processed Chlorine Free certified, and was manufactured using biogas energy.

To purchase CSA Standards and related publications, visit CSA's Online Store at www.ShopCSA.ca or call toll free 1-800-463-6727 or 416-747-4044.

ISBN 978-1-55491-402-9

Technical Editor: Abraham Murra

© Canadian Standards Association — 2010

All rights reserved. No part of this publication may be reproduced in any form whatsoever without the prior permission of the publisher.

Contents

Technical Committee on Decentralized Wastewater Systems vi

Subcommittee on Septic Tanks ix

Preface x

1 Scope 1

2 Reference publications 1

3 Definitions 3

4 General requirements 5

- 4.1 All tanks 5
 - 4.1.1 Materials 5
 - 4.1.2 Quality control 5
 - 4.1.3 Assembly 5
 - 4.1.4 Strength and watertightness 5
 - 4.1.5 Inlet and outlet connectors 6
 - 4.1.6 Metallic fasteners 6
- 4.2 Septic tanks 6
 - 4.2.1 Minimum working capacity 6
 - 4.2.2 Liquid depth 6
 - 4.2.3 Inlet and outlet devices 7
 - 4.2.4 Scum capacity/air space 7
 - 4.2.5 Sewage travel 7
 - 4.2.6 Access openings 7
 - 4.2.7 Other openings 8
 - 4.2.8 Compartmentalization 8
 - 4.2.9 Equivalency test 8
- 4.3 Effluent chambers 8
 - 4.3.1 Outlet device 8
 - 4.3.2 Siphon materials 9
 - 4.3.3 Siphon flush rate and capacity 9
 - 4.3.4 Venting 9
- 4.4 Sewage holding tanks 9
 - 4.4.1 Access and pump-out openings 9
 - 4.4.2 Venting 9
 - 4.4.3 Other openings 9
 - 4.4.4 Alarm system 9
 - 4.4.5 Weatherproofing, ultraviolet radiation protection, and hold-down and support systems 9

5 Steel tanks 10

- 5.1 Corrosion protection 10
- 5.2 Baffles 10
- 5.3 Steel septic tanks 10
- 5.4 Steel sewage holding tanks 10
 - 5.4.1 Underground steel sewage holding tanks 10
 - 5.4.2 Above-ground steel sewage holding tanks 10

6 Concrete tanks 11

- 6.1 Materials 11
 - 6.1.1 Cements and supplementary cementitious materials 11
 - 6.1.2 Mixing water, aggregates, and admixtures 11
 - 6.1.3 Reinforcement 11
 - 6.1.4 Gasket and sealant material 12
- 6.2 Concrete 13
 - 6.2.1 Strength 13
 - 6.2.2 Air entrainment 13
 - 6.2.3 Water/cementitious material ratio 13
- 6.3 Manufacture 13
 - 6.3.1 Concrete thickness 13
 - 6.3.2 Resistance to cracking 13
 - 6.3.3 Lifting hooks or other lifting devices 13
 - 6.3.4 Concrete access opening covers 13
 - 6.3.5 Joints 13
 - 6.3.6 Quality of work and finish 13

7 Fibreglass-reinforced polyester tanks 13

- 7.1 General 13
- 7.2 Laminate 14
 - 7.2.1 Description 14
 - 7.2.2 Interior chemical-resistant layer 14
 - 7.2.3 Interior anti-wicking layer 14
 - 7.2.4 Structural layer 14
 - 7.2.5 Exterior surface layer 14
 - 7.2.6 Edge treatment 14
 - 7.2.7 Laminate hardness 14
 - 7.2.8 Quality of work and finish 14
- 7.3 Materials 15
 - 7.3.1 Resin 15
 - 7.3.2 Reinforcement 15
- 7.4 Additives 15
 - 7.4.1 Thixotropic additives 15
 - 7.4.2 Colourants 15
 - 7.4.3 Resin extenders 15

8 Polyethylene and polyvinyl chloride tanks 15

- 8.1 Moulded polyethylene tanks 15
 - 8.1.1 Compound 15
 - 8.1.2 Wall thickness 15
- 8.2 Extruded polyethylene and polyvinylchloride tanks 15
 - 8.2.1 Compound 15
 - 8.2.2 Stiffness 16
 - 8.2.3 End wall thickness 16
- 8.3 Quality of work and finish 16

9 Testing (effluent chambers, septic tanks, and sewage holding tanks) 16

- 9.1 Volumes, capacities, rates, and dimensions 16
- 9.2 Strength tests 16
 - 9.2.1 Steel tanks 16
 - 9.2.2 Vacuum test for concrete, extruded polyethylene and polyvinylchloride, and fibreglass-reinforced polyester tanks 16
 - 9.2.3 Moulded polyethylene and polyvinylchloride tanks 17

- 9.3 Chamber divider and partition tests 17
- 9.3.1 Chamber divider test 17
- 9.3.2 Partition (tank divider) test 18
- 9.4 Watertightness test 18
- 9.5 Siphon test 18
- 9.6 Environmental stress crack resistance test 18

10 Markings and instructions 19

- 10.1 Type and location 19
- 10.2 Information 19
- 10.3 Warning 19
- 10.4 Instructions 19

Annexes

- A** (informative) — Typical layouts of septic tanks 21
- B** (normative) — Equivalency testing 24

Figures

- 1** — Cross-section of laminate 20

Technical Committee on Decentralized Wastewater Systems

D. Joy	University of Guelph, Guelph, Ontario	<i>Chair</i>
A. Durnie	Alberta Municipal Affairs, Edmonton, Alberta	<i>Vice-Chair</i>
J. Aitkin	Rankin's Septic Tank Pumping & Environmental Services, Waterdown, Ontario <i>Representing the Ontario Association of Sewage Industry Services</i>	<i>Associate</i>
W. Alsip	Terrex Construction Ltd., Okotoks, Alberta	
D.H. Bachelder	Advanced Drainage Systems Inc., York, Maine, USA	
M.C. Bélanger	Premier Tech Aqua, Rivière-du-Loup, Québec	<i>Associate</i>
R. Benzon	British Columbia Ministry of Healthy Living and Sport, Victoria, British Columbia	<i>Associate</i>
B. Berard	Infiltrator Systems Inc., Lac du Bonnet, Manitoba	
E. Bergsma	Yukon Health and Social Services, Whitehorse, Yukon	
B. Bohn	Watertec Engineering Research and Health Inc., Calgary, Alberta	
J. Bradfield	Anchor Concrete Products Ltd., Kingston, Ontario	<i>Associate</i>
J.H. Doner	Waterloo Biofilter Systems Inc., Rockwood, Ontario	<i>Associate</i>
C. Ferneyhough	Advanced Drainage Systems Inc., Caledon, Ontario	<i>Associate</i>
J.P. Ferrer	Bureau de normalisation du Québec, Québec, Québec	<i>Associate</i>
K. Galloway	Engineering Technologies Canada Ltd., Stratford, Prince Edward Island	

B. Gorczyca	University of Manitoba, Winnipeg, Manitoba <i>Consumer Representative</i>	
R. Guinn	Barrie, Ontario <i>Consumer Representative</i>	<i>Associate</i>
M. Harkin	Pinnacle Environmental Technologies Inc., Edmonton, Alberta	<i>Associate</i>
D. Johnson	Newfoundland and Labrador Department of Health and Community Services, St. John's, Newfoundland and Labrador	<i>Associate</i>
C.D. Jowett	Waterloo Biofilter Systems Inc., Rockwood, Ontario	
G. Kachanowski	University of Alberta, Edmonton, Alberta	<i>Associate</i>
D. Krauss	Infiltrator Systems Inc., North Bay, Ontario	<i>Associate</i>
R. Lacasse	Premier Tech Aqua, Rivière-du-Loup, Québec	
L. Laidman	L-Zone Environmental Inc., Binbrook, Ontario	
R. Lay	Enermodal Engineering Limited, Kitchener, Ontario	
I. Leblanc	Assembly of First Nations, Ottawa, Ontario	<i>Associate</i>
L. Leskiw	Paragon Soil and Environmental Consulting Inc., Edmonton, Alberta	
M. MacCormack	Stantec Consulting Ltd., Kitchener, Ontario	<i>Associate</i>
D.G. Martin	Golder Associates Ltd., Kanata, Ontario	<i>Associate</i>
V. Pileggi	Ontario Ministry of the Environment, Toronto, Ontario	
J. Rowse	British Columbia Onsite Sewage Association, Victoria, British Columbia	
M. Schmalz	Alberta Wilbert Sales Ltd., Edmonton, Alberta	
C. Seeley	Saskatchewan Health, Regina, Saskatchewan	

P. Seto	Environment Canada, Burlington, Ontario	
A. Sharaf	Ontario Ministry of Municipal Affairs and Housing, Toronto, Ontario	<i>Associate</i>
D. Smiley	Manitoba Conservation, Winnipeg, Manitoba	
C. Soroczan	Canada Mortgage and Housing Corporation, Ottawa, Ontario	<i>Associate</i>
J. Steeves	Indian and Northern Affairs Canada, Gatineau, Québec	
G.K. Taracha	Health Canada, Ottawa, Ontario	
K. White	New Brunswick Department of Health, Fredericton, New Brunswick	<i>Associate</i>
T. Wilson	Langley, British Columbia	
A.I. Murra	Canadian Standards Association, Mississauga, Ontario	<i>Project Manager</i>

Subcommittee on Septic Tanks

B. Bohn	Watertech Engineering Research and Health Inc., Calgary, Alberta	<i>Chair</i>
E. Beaudry	Tanks-A-Lot Ltd., Edmonton, Alberta	
J. Bradfield	Anchor Concrete Products Ltd., Kingston, Ontario	
J.H. Doner	Waterloo Biofilter Systems Inc., Rockwood, Ontario	
A. Durnie	Alberta Municipal Affairs, Edmonton, Alberta	
G. Fulcher	Fulchers, Douglas, Ontario	
K. Habib	CSA International, Edmonton, Alberta	
L. Laidman	L-Zone Environmental Inc., Binbrook, Ontario	
D. Lentz	Infiltrator Systems Inc., Old Saybrook, Connecticut, USA	
V. Pileggi	Ontario Ministry of the Environment, Toronto, Ontario	
A.I. Murra	Canadian Standards Association, Mississauga, Ontario	<i>Project Manager</i>

Preface

This is the seventh edition of CSA B66, *Design, material, and manufacturing requirements for prefabricated septic tanks and sewage holding tanks*. It supersedes the previous editions, published in 2005 under the same title, and published in 2000, 1990, 1985, 1979, and 1975 under the title *Prefabricated Septic Tanks and Sewage Holding Tanks*.

Major changes in this edition include

- (a) revised requirements for alternative reinforcement for concrete tanks, environmental stress crack resistance testing, and inlet and outlet connections;
- (b) new requirements for alternative tanks; and
- (c) a new performance test for determining equivalency of new tank designs ([Annex B](#)).

This Standard is considered suitable for use for conformity assessment within the stated scope of the Standard.

This Standard was prepared by the Subcommittee on Septic Tanks, under the jurisdiction of the Technical Committee on Decentralized Wastewater Systems and the Strategic Steering Committee on Water Management Products, Materials, and Systems, and has been formally approved by the Technical Committee.

April 2010

Notes:

- (1) Use of the singular does not exclude the plural (and vice versa) when the sense allows.
- (2) Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.
- (3) This publication was developed by consensus, which is defined by CSA Policy governing standardization — Code of good practice for standardization as “substantial agreement. Consensus implies much more than a simple majority, but not necessarily unanimity”. It is consistent with this definition that a member may be included in the Technical Committee list and yet not be in full agreement with all clauses of this publication.
- (4) CSA Standards are subject to periodic review, and suggestions for their improvement will be referred to the appropriate committee.
- (5) All enquiries regarding this Standard, including requests for interpretation, should be addressed to Canadian Standards Association, 5060 Spectrum Way, Suite 100, Mississauga, Ontario, Canada L4W 5N6.
 - Requests for interpretation should
 - (a) define the problem, making reference to the specific clause, and, where appropriate, include an illustrative sketch;
 - (b) provide an explanation of circumstances surrounding the actual field condition; and
 - (c) be phrased where possible to permit a specific “yes” or “no” answer.

Committee interpretations are processed in accordance with the CSA Directives and guidelines governing standardization and are published in CSA's periodical Info Update, which is available on the CSA Web site at www.csa.ca.

B66-10

Design, material, and manufacturing requirements for prefabricated septic tanks and sewage holding tanks

1 Scope

1.1

This Standard specifies minimum design and material requirements as well as manufacturing practices and markings for prefabricated septic tanks, sewage holding tanks, and effluent chambers made of steel, concrete, fibreglass-reinforced plastic, polyvinylchloride (PVC), or polyethylene (PE) that are designed to handle sewage or sewage effluent.

1.2

This Standard does not purport to address all of the safety concerns associated with its use. It is the responsibility of the user of this Standard to establish appropriate safety and health practices and to determine the applicability of any regulatory limitations before use.

1.3

This Standard does not apply to sewage holding tanks used in recreational vehicles, which are covered in CAN/CSA-B45.6.

1.4

In CSA Standards, “shall” is used to express a requirement, i.e., a provision that the user is obliged to satisfy in order to comply with the standard; “should” is used to express a recommendation or that which is advised but not required; “may” is used to express an option or that which is permissible within the limits of the standard; and “can” is used to express possibility or capability. Notes accompanying clauses do not include requirements or alternative requirements; the purpose of a note accompanying a clause is to separate from the text explanatory or informative material. Notes to tables and figures are considered part of the table or figure and may be written as requirements. Annexes are designated normative (mandatory) or informative (non-mandatory) to define their application.

2 Reference publications

This Standard refers to the following publications, and where such reference is made, it shall be to the edition listed below, including all amendments published thereto.

CSA (Canadian Standards Association)

A23.1-09/A23.2-09

Concrete materials and methods of concrete construction/Test methods and standard practices for concrete

A3000-08

Cementitious materials compendium