SLOVENSKI STANDARD
SIST EN 13121-3:2008+A1:2010/AC:2011

01-november-2011

Nadzemni rezervoarji iz armiranega poliestra - 3. del: Načrtovanje in izdelava - Popravek AC

GRP tanks and vessels for use above ground - Part 3: Design and workmanship

Oberirdische GFK-Tanks und -Behälter - Teil 3: Auslegung und Herstellung

Réservoirs et récipients en PRV pour applications hors sol - Partie 3: Conception et fabrication

Ta slovenski standard je istoveten z: **EN 13121-3:2008+A1:2010/AC:2011**

ICS:

23.020.10	Nepremične posode in rezervoarji	Stationary containers and tanks

SIST EN 13121-3:2008+A1:2010/AC:2011 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

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GRP tanks and vessels for use above ground - Part 3: Design and workmanship

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Oberirdische GFK-Tanks und -Behälter - Teil 3: Auslegung und Herstellung

This corrigendum becomes effective on 4 May 2011 for incorporation in the three official language versions of the EN.

Ce corrigendum prendra effet le 4 mai 2011 pour incorporation dans les trois versions linguistiques officielles de la EN.

Die Berichtigung tritt am 4.Mai 2011 zur Einarbeitung in die drei offiziellen Sprachfassungen der EN in Kraft.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

1. Modification to the Contents
10.6, replace "Flat circular ends" with "Bottoms".

2. Modification to Clause 1, Scope
Paragraph 1, line 2, replace "Thermoplastics" *with* "thermoplastics".

3. Modification to 3.12
Replace "design pressure (ρ_D)" *with* "design pressure (p_D)".

4. Modification to Clause 4, Symbols and abbreviations
Table 1, replace symbol "Θ" *with symbol* "θ".

5. Modification to 5.3, Information to be prepared by the manufacturer
Paragraph 5, line 1, replace "Tables 20 and 21" *with* "Tables 18 and 19".

6. Modification to 6.1, General
Paragraph 3, line 2, replace "(see Table 23)" *with* "(see Table 24)".

7. Modification to 6.2.3, Resin based linings
Paragraph 2, line 2, replace "E_{CR} glass" *with* "ECR glass".

8. Modification to 7.1, General
Paragraph 5, line 3, replace "7.8.2" *with* "7.8.3".

9. Modification to 7.3, Laminate construction
Definitions below Table 3, U_i , replace "reinforcement" *with* "lamina".

10. Modification to 7.3, Laminate construction
Definitions below Table 3, X_i , replace "unit modulus" *with* "unit tensile modulus".

11. Modification to 7.4, Lamina thickness
Equation (1), replace "$t_i = [1/\rho_g+(100-m_g)/(m_g\times\rho_r)]\times10^{-3}$" *with:*
"$t_i = [1/\rho_g+(100-m_g)/(m_g\times\rho_r)]\times10^{3}$".

12. Modification to 7.5, Laminate properties
Line 2, replace "basic laminae properties" *with* "basic lamina properties".

13. Modification to 7.8.4.5, Derivation of partial design factor A_3
Line 2, replace "Equation (6)" *with* "Equations (6a) and (6b)".

14. Modification to 7.8.4.5, Derivation of partial design factor A_3
Rename the first of the two Equations "(6)" *as* "(6a)" *and the second as* "(6b)".

15. Modification to 8.2.3, Limiting strain for laminate ε_L or lamina ε_i
Paragraph 2, line 1, replace "obtained either from Equation (10)" *with* "obtained from Equations (10a) and (10b)".

16. Modification to 8.4, Laminate design
Equation (10), replace "$all \times u_{lam}$ =" *with* "all. U_{lam} =".

17. Modification to 8.4, Laminate design
Equation (10a), replace "$X_{lam} = X_1 \times m_1 \times n_1 + u_2 \times m_2 \times n_2 \ldots\ldots u_i \times m_i \times n_i$" *with:*
"$X_{lam} = X_1 \times m_1 \times n_1 + X_2 \times m_2 \times n_2 \ldots\ldots X_i \times m_i \times n_i$".

18. Modification to 8.4, Laminate design
Replace Equation "(10)" *with* "(10a)" *and* "(10a)" *with* "(10b)".

19. Modification to 8.4, Laminate design
Definition u_i, *replace* "is the allowable tensile unit load carrying capacity of lamina layer l" *with* "is the tensile unit load carrying capacity of lamina layer l".

20. Modification to 8.4, Laminate design
Definition X_{lam} *replace* "N/mm per kg/m^2" *with* "N/mm".

21. Modification to 9.2.2, Wind
Add "NOTE Reference can be made to EN 1991-1-4.".

22. Modification to 9.2.7, Personnel loading
Add "Snow and access loads shall not be considered to act together." *as last paragraph.*

23. Modification to 9.4.2, Pressure
Paragraph 1, line 1, replace pressure "ρ_D" *with pressure* "p_D".

24. Modification to 9.4.2, Pressure
Last paragraph, line 1, replace "ρ_D" *with* "p_D".

25. Modification to 9.4.2, Pressure
Last paragraph, delete the text "Snow and access loads shall not be considered to act together.".

26. Modification to 10.1, Symbols and units
Delete "d_r mm diameter of neutral axis of stiffener ring".

27. Modification to 10.1, Symbols and units
Delete symbols not used in the standard:
"t_{ck} mm thickness cylinder knuckle area";
"t_{over} mm thickness overlapping laminate";
"t_{Shell} mm thickness shell at branch position".

28. Modification to 10.1, Symbols and units
Add symbol "t mm thickness of shell".

29. Modification to 10.1 Symbols and units
Unit for PS, *replace* "N/mm" *with* "N/mm^2".

30. Modification to 10.2.2, Combined axial loading
Equation (13), replace "$q_{x,m}$ =" with "$q_{x,M}$ =".

31. Modification to 10.2.2, Combined axial loading
Equation (15), replace "$q_{x,c} = q_{x,M} + q_xW + q_{x,p}$" with "$q_{x,c} = q_{x,M} + q_{xW} + q_{x,p}$".

32. Modification to 10.2.2, Combined axial loading
First line on page 34, after Equation (15), replace "where q_x^W is the" *with* "where $q_{x,W}$ is the".

33. Modification to 10.2.2, Combined axial loading
Equation (16), replace "$q_{x,c} = q_{x,M} + q_{x,}^{W} - q_{x,p}$" *with* "$q_{x,c} = q_{x,M} + q_{xW} - q_{x,p}$".

34. Modification to 10.2.2, Combined axial loading
Equation (17), replace "$q_{x,c} = q_{x,p} + q_{x,M} + qx_{,W}$" *with* "$q_{x,c} = q_{x,p} + q_{x,M} + q_{x,W}$".

35. Modification to 10.2.2, Combined axial loading
Last but one paragraph, line 1, replace "Equation (10)" *with* "Equation (10a)".

36. Modification to 10.3.2, Critical axial buckling load
Last paragraph, replace "the equation for k for such sections is given by" *with* "k for such sections is given by Equations (19) and (20)".

37. Modification to 10.3.2, Critical axial buckling load
Add definition "t is the wall at the cut-out".

***38. Modification to* 10.3.2, Critical axial buckling load**
Add reference to 10.6.3.3.5 Cut-outs in a skirt.

39. Modification to 10.3.3, Critical circumferential buckling pressure
Equations (21) and (22), $E_{\varphi b}$ should be $E_{\phi b}$.

40. Modification to 10.3.5, Critical buckling pressure for cylindrical
Equation (24), $E_{\varphi b}$ should be $E_{\phi b}$.

41. Modification to 10.3.5, Critical buckling pressure for cylindrical
Replace Equation "(24)" *with* "(24a)" *and* "(24a)" *with* "(24b)".

42. Modification to 10.3.5, Critical buckling pressure for cylindrical
b), delete the text "for example see Figure 8".

43. Modification to 10.4.1, General requirements
First paragraph, replace "10.4" *with* "Figure 4a) and 4b)".

44. Modification to 10.4.1, General requirements
Paragraph 2, line 1, replace "Thermoplastics" *with* "thermoplastics".

45. Modification to 10.4.1, General requirements
Paragraph 2, line 2 replace "R" *with* "r".

46. Modification to 10.4.1, General requirements
Figure 4a), replace the knuckle radius "R" *with* "r".

47. Modification to 10.4.1, General requirements
Figure 4a), replace the half apex angle "ϕ" *with* "Φ".

48. Modification to 10.4.1, General requirements
Text below Figure 4a), replace "Thermoplastics" *with* "thermoplastics".

49. Modification to 10.4.3.1, Circumferential unit loading in cone
Equation (25), replace "$q\Phi = p_D \times D_k/(2\cos\Phi)$" *with* "$q_\Phi = p_D \times D_k/(2\cos\Phi)$".

50. Modification to 10.4.3.1, Circumferential unit loading in cone
Last paragraph, replace Equation "(10)" *with Equation* "(10a)".

51. Modification to 10.4.3.2, Axial unit load in cone to knuckle junction
Paragraph above Table 7, replace "Equation (10)" *with* "Equation (10a)".

52. Modification to 10.4.3.2, Axial unit load in cone to knuckle junction
Table 7, title, replace the concentration factor "Kc1" *with* "K_{c1}".

53. Modification to 10.4.3.2, Axial unit load in cone to knuckle junction
Paragraph above Table 8, replace Equation "(10)" *with Equation* "(10a)".

54. Modification to 10.4.3.2, Axial unit load in cone to knuckle junction
Table 8, replace "t_c/D" *with* "t_k/D".

55. Modification to 10.4.3.2, Axial unit load in cone to knuckle junction
Last paragraph, replace "Equation (10)" *with* "Equation (10a)".

56. Modification to 10.4.4.1, Strength requirement
Paragraph 1, line 1, replace "Equation (26)" *with* "Equation (25)".

57. Modification to 10.4.4.1, Strength requirement
Paragraph 1, line 2, replace "Equation (10)" *with* "Equation (10a)".

58. Modification to 10.4.4.1, Strength requirement
Paragraph 1, line 2, replace "Equation (26) to (28)" *with* "Equation (25) to (27)".

59. Modification to 10.4.4.2.2, Critical radial buckling pressure p_c
Equation (29), replace "$E_{\varphi b}$" with "$E_{\phi b}$" and "Ex" *with* "E_x".

60. Modification to 10.4.4.2.2, Critical radial buckling pressure p_c
Equation (30), replace "$E_{\varphi b}$" *with* "$E_{\phi b}$".

61. Modification to 10.4.4.2.3, Axial compressive load
Equation (31), replace "$E_{\varphi b}$" *with* "$E_{\phi b}$".

62. Modification to 10.4.4.2.4, Combined axial and radial compressive
Equation (34), replace "$(q_x \times F/u_c)^{1,25}+(p_D \times F/p_c)^{1,25} \le F$" *with* "$(q_x \times F/u_c)^{1,25}+(p_D \times F/p_c)^{1,25} \le 1$".

63. Modification to 10.4.5.1, Covers subjected to internal pressure
Paragraph 1, line 2, replace "For covers outside these parameters the covers" *with* "If $\Phi > 75°$ the covers".

64. Modification to 10.4.5.1, Covers subjected to internal pressure
Equation (35), replace "$q_x = \alpha_b \times p_D \times 1/\sin\phi \times \cos\phi \times (D/t_k)^{1+B_b} \times t_k$" *with* "$q_x = \alpha_b \times p_D \times 1/\sin\phi \times \cos\phi \times (D/t_k)^{1+\beta b} \times t_k$".

65. Modification to 10.4.5.1, Covers subjected to internal pressure
Equation (36a), replace "α_b = 51,6×$(r/D)^2$+7,6×(r/D)+0,13" *with* "α_b = -64×$(r/D)^2$+7,6×(r/D)+ 0,13".

66. Modification to 10.4.5.1, Covers subjected to internal pressure
Equation (36b), replace "β_b = 51,6× (r/D)1,6-8,18×(r/D)+0,52" *with* "β_b = 51,6× $(r/D)^2$-8,18× (r/D)+0,52".

67. Modification to 10.4.5.1, Covers subjected to internal pressure
Last paragraph, replace "Equation (10)" *with* "Equation (10a)".

68. Modification to 10.4.5.2, Covers subjected to external pressure
Paragraph 1, line 1, replace "Equation (37)" *with* "Equation (37a)".

69. Modification to 10.4.5.2 Covers subjected to external pressure
Equation (37), replace "Eb" with "E_b".

70. Modification to 10.4.5.2, Covers subjected to external pressure
Replace Equations "(37)" *and* "(37a)" *with* "(37a)" *and* "(37b)".

71. Modification to 10.5.1, General requirements
Figure 8, replace the depth of end "l" *with* "h_i".

72. Modification to 10.5.2, Dished ends subject to internal pressure
Paragraph below Equation (38), replace Equation "(41)" *with* "(38)".

73. Modification to 10.5.2, Dished ends subject to internal pressure
Paragraph above Table 9, replace "Equation (10)" *with* "Equation (10a)".

74. Modification to 10.5.2, Dished ends subject to internal pressure
Table 9, replace h_i/D = 0,25, t/D = "0,01" *with* h_i/D = 0,25, t/D = "0,005".

75. Modification to 10.6, Flat circular ends
Replace in the title "Flat circular ends" *with* "Bottoms".

76. Modification to 10.6.1.2 Dished ends subject to internal pressure
Paragraph above Equation (49), replace "Equation (10)" *with* "Equation (10a)".

77. Modification to 10.6.1.3
Equation (50), replace "q_{x1} =" *with* "q_{xk1} =".

78. Modification to 10.6.1.3
Equation (51), replace "q_{x1} =" *with* "q_{xk1} =".

79. Modification to 10.6.1.3
Equation (54), replace "q_{kx} =" *with* "q_{xk} =".

80. Modification to 10.6.1.3
Paragraph below Equation (54), replace "Equation (10)" *with* "Equation (10a)".

81. Modification to 10.6.2, Vessels with flat bases subjected to pressure
Note, replace "see 12.5.3" *with* "see 12.5".

82. Modification to 10.6.3.3.1, General
Figure 12a), replace "$t_z = t + t_{o2}$" *with* "$t_z = t + t_o$".

83. Modification to 10.6.3.3.1, General
Figure 12c), replace "$\geq (D * t_{Bk})^{½}$ " *with* "$\geq (D \times t_{bk})^{½}$ ".

84. Modification to 10.6.3.3.2, Unit load for lower part of cylinder region 1
Equation (57), replace "α_φ" *with* "α_ϕ".

85. Modification to 10.6.3.3.2, Unit load for lower part of cylinder region 1
Paragraph above Equation (58), replace "Equation (10)" *with* "Equation (10a)".

86. Modification to 10.6.3.3.2, Unit load for lower part of cylinder region 1
Equation (58), replace "$\pm qx,_{\Delta T}/A_5$" *with* "$\pm q_{x,\Delta T}/A_5$".

87. Modification to 10.6.3.3.3, Unit load for lower part of skirt, region 2
Equation (59), replace "$q_{x,Sku,p} = 6 \times C \times p \times D$" with "$q_{x,Sku,p} = 6 \times C \times p_D \times D$".

88. Modification to 10.6.3.3.3, Unit load for lower part of skirt, region 2
Equation (60), replace "α_φ" *with* "α_ϕ".

89. Modification to 10.6.3.3.3, Unit load for lower part of skirt, region 2
Paragraph above Equation (61), replace "Equation (10)" *with* "Equation (10a)".

90. Modification to 10.6.3.3.3, Unit load for lower part of skirt, region 2
Equation (61), replace "$q_{x,skup} \pm q_{x,sku,\Delta T}/A_5$ with "$q_{x,Sku,p} \pm q_{x,Sku,\Delta T}/A_5$".

91. Modification to 10.6.3.3.3, Unit load for lower part of skirt, region 2
Equation (62), replace "$L_{csku} \geq (D \times t_{sku})^{½}$ " *with* "$L_{c,Sku} \geq (D \times t_{Sku})^{½}$ ".

92. Modification to 10.6.3.3.3, Unit load for lower part of skirt, region 2
Last paragraph, line 1, replace "Equation (10)" *with* "Equation (10a)".

93. Modification to 10.6.3.3.3, Unit load for lower part of skirt, region 2
Last paragraph, line 2, replace "$u_c/q_{x,sk} \geq F$" *with* "$u_c/q_{x,Sk} \geq F$".

94. Modification to 10.6.3.3.3, Unit load for lower part of skirt, region 2
Last paragraph, line 3, replace "Table 6or" *with* "Table 6 or".

95. Modification to 10.6.3.3.4, The unit load in the knuckle region, region 3
Paragraph 1, line 1, replace "knuckle $q_{k,}$" *with* "knuckle $q_{k,p}$".

96. Modification to 10.6.3.3.4, The unit load in the knuckle region, region 3
Paragraph 1, line 2, replace "dome ends" *with* "dished ends".