METROLOGY SERVICE

Director
Metrology service Ltd.

Nataliia BOZHKO
March 27th 2026

PROFICIENCY TESTING PT.UA.3.2.2017

VEGETABLE OIL (SAFETY)

PROFICIENCY TESTING REPORT

ROUND 9 MARCH 2026

Report prepared by:	Volodymyr Novikov
Date:	27.03.2026
Contact:	vovan.novikov@gmail.com

Report approved by:	Nataliia Bozhko
Date:	27.03.2026
Contact:	pt.smetrology@gmail.com
Status:	Final

Kyiv-2026

1. TABLE OF CONTENTS

2. SUMMARY

2.1. The purpose of proficiency testing in vegetable oil testing is to demonstrate the laboratory's competence (as described in ISO/IEC 17043:2023[1]) and improve the reliability of test results.

2.2. This proficiency testing involves the use of inter-laboratory comparisons to confirm the performance of individual laboratories' abilities and/or identify areas of improvement. Current PT scheme is registered in the EPTIS database.

2.3. This is the final report on the PT.UA.3.2.2017 Round 9 held in February- March 2026. This report is issued according to ISO/IEC 17043[1] and PT.UA.3.2.2017 Round 8 Programme. The report is issued in two languages – Ukrainian and English. English should be considered as the basic language of the report. Both versions of this report can be found at: http://www.metrologyservice.com.ua

2.4. A total of 24 participants have reported. Their results are presented in the next clauses.

2.5. Technical experts list and/or subcontractors for this round can be provided to the Participant by request.

2.6. Any calculations, formulas, raw and intermediate data used in this round can be provided to the Participant by request, except confidential information about other participants and information that may contain commercial secret.

2.7. If the Participant does not agree with the proficiency testing results or has any comments on the Provider's work, one can submit a complaint or appeal within 10 days. More information on the complaint procedure can be found at https://www.metrologyservice.com.ua/ or by contacting the Provider.

2.8. Provider is accredited by NAAU in accordance with the requirements of ДСТУ EN ISO/IEC 17043:2017. The list of parameters is specified in the scope of accreditation, which can be found on the website https://www.metrologyservice.com.ua/ or obtained upon request from the Provider.

3. GENERAL PROTOCOL FOR PROFECIENCY TESTING

3.1. MANAGEMENT SYSTEM.

3.1.1. The functioning management system of Metrology service Ltd. (further - Provider) complies with ISO/IEC 17043[1] requirements and covers all aspects of proficiency testing (further - PT) for all proficiency tests.

3.2. SAMPLES PREPARATION, HOMOGENITY AND STABILITY

3.2.1. Provider has used Пр.ПК02-2017 procedure and appropriate technical experts and contractors for the samples' selection, production, homogenization and division designs that is proved to be satisfactory for the purposes of PT programme PT.UA.3.2.2017 Round 9. Details of test material preparation and homogenization are not published in the report, though can be provided to the Participant by request. Tests, required to prove (validate) homogeneity and stability of samples were performed by competent contracting laboratories according to [1]. These results with statistics are published in the report.

3.2.2. Participants may contact the Provider to request details of test material selection, preparation, homogenization and division of those test material samples, for which they tested in

PT. Such information can be provided to the Participant in confidence and only if it cannot compromise other Participants and/or is not a commercial secret.

3.3. DISPATCH AND RECEIPT OF SAMPLES

3.3.1. Samples of test material – **sunflower oil - Sample A** and **rapeseed oil - Sample B** were dispatched 16.02.2026 according to schedule of proficiency testing programme PT.UA.3.2.2017 Round 9.

3.3.2. Each produced and identified sample was sealed in a PET bottle.

3.3.3. A total of 25 participants from 5 countries received Sample A and Sample B. Results were accepted from 24 participants.

3.4. FOLLOW-UP SERVICES

3.4.1. If a participant wishes to obtain advice/consultation on any aspect of its performance, one should contact the Provider. Provider can (with agreement with Participant) pass on the Participant's inquiry to a technical expert and/or contracting laboratory.

3.4.2. Surplus samples from this round are available for sale as certified reference materials (CRM) with the certified values and uncertainties. Please email Provider for details.

3.5. PERFORMANCE ASSESMENT

3.5.1. Provider expressed Participant's results as traditional z-scores according to [1].

3.5.2. The assigned value for each analyte was calculated as the robust mean of the trial data using Huber H15 method [2] or Algorithm A variation, Annex C.3 [4].

3.5.3 The target standard deviation for each analyte was chosen from either the appropriate form of the Horwitz equation, method trial standard deviation (if stated in the method from inter-laboratory comparisons), standard deviation from the previous trials (PT rounds), or the robust trial standard deviation, after the removal of outliers. The choice was made using current industry practices used in other collaborative trials and proficiency testing schemes.

3.5.4. z-Scores were deemed satisfactory if $|z| \leq 2$. z-Scores were deemed questionable if $2 < |z| \leq 3$ (marked yellow in tables). If $|z| \geq 3$, the results were considered to be unsatisfactory (marked red in tables). The calculations were made according to [1,3,5]. Provider recommends corrective actions if $|z| > 3$ and preventive actions if $2 < |z| \leq 3$.

3.5.5. Only 2,55% (15 results) of all results in this round were considered to be unsatisfactory. 4,33% (18 results) of all results were considered to be unsatisfactory in Round 8.

3.5.6. The results for Sample A for the parameters «Total C18:2 (Sum of cis-isomers),%», «Total C18:2 (Sum of trans-isomers),%» according to the method «ISO 12966-4:2015» and «Relative mass fraction of trans-isomers C18:1, % by sum of the corrected areas of all peaks», «Relative mass fraction of trans-isomers C18:2, % by sum of the corrected areas of all peaks» according to the method «ДСТУ ISO 15304:2007» are considered by the Provider as qualitative, because, according to the homogeneity assessment results, the value less than the detection limit of the method "<0.05%". The results of the participants: «less than the detection limit» or «not detected» were assessed by the Provider as "Satisfactory (S)".

3.5.7. Participant №10 stated the results for Sample A for «Benz(a)anthracene, µg/kg», «Chrysene, µg/kg», «Benzo(b)fluoranthene, µg/kg», «Benzo(a)pyrene, µg/kg», «Sum of PAHs-4, µg/kg» according to «Method developed by the laboratory» method instead of the «ISO

15753:2016/ ДСТУ EN ISO 15753:2019, ISO 22959:2009/ ДСТУ EN ISO 22959:2019», «ISO 15753:2016/ ДСТУ EN ISO 15753:2019 (EN ISO 15753:2016, IDT)» proposed by the Provider. These results were assessed by the Provider and were taken into account when calculating robust mean and robust SD.

3.5.8. Participant №13 stated the results for Sample A for «Benz(a)anthracene, µg/kg», «Chrysene, µg/kg», «Benzo(b)fluoranthene, µg/kg», «Benzo(a)pyrene, µg/kg», «Sum of PAHs-4, µg/kg» according to «Method developed by the laboratory» method instead of the «ISO 15753:2016/ ДСТУ EN ISO 15753:2019, ISO 22959:2009/ ДСТУ EN ISO 22959:2019», «ISO 15753:2016/ ДСТУ EN ISO 15753:2019 (EN ISO 15753:2016, IDT)» proposed by the Provider. And for Sample A for «Benzo(a)pyrene, µg/kg» according to «Метод розроблений лабораторією» method instead of the «ISO 15302:2017» proposed by the Provider. These results were assessed by the Provider and were taken into account when calculating robust mean and robust SD.

3.5.9. For Sample A for «Total C18:1 (Sum of trans-isomers), %» according to the method «ДСТУ ISO 15304:2007»: Participant №13 stated the result as «0,046»; Participant №20 stated the result as «0,038»; Participant №25 stated the result as «0,050». Due to the chosen PT target standard deviation and the homogeneity assessment, these results were assessed by the Provider as «Satisfactory (S)».

3.5.10. For Sample A for « Relative mass fraction of trans-isomers C18:1, % by sum of the corrected areas of all peaks» according to the method «ISO 12966-4:2015»: Participant №13 stated the result as «0,046»; Participant №20 stated the result as «0,038». Due to the chosen PT target standard deviation and the homogeneity assessment, these results were assessed by the Provider as «Satisfactory (S)».

3.5.11. For Sample A for «Total C18:1 (Sum of trans-isomers), %» according to the method «ISO 12966-4:2015» Participant №21 stated the result as «0,07».

for «Total C18:1 (Sum of trans-isomers), %» according to the method «ISO 12966-4:2015» Participant №21 stated the result as «0,07».

for «Total C18:2 (Sum of trans-isomers), %» according to the method «ISO 12966-4:2015» Participant №3 stated the result as «0,070», Participant №13 stated the result as «0,069», Participant №20 stated the result as «0,058».

for «Relative mass fraction of trans-isomers C18:2, % by sum of the corrected areas of all peaks» according to the method «ДСТУ ISO 15304:2007» Participant №13 stated the result as «0,069», Participant №20 stated the result as «0,058», Participant №25 stated the result as «0,057». Due to the chosen PT target standard deviation and the homogeneity assessment, these results were not assessed by the Provider.

3.5.12. For Sample B for «Erucic acid C22:1, %» according to the method «ДСТУ ISO 5508:2001» Participant №7 stated the result as «<0,084». Taking into account the robust mean and chosen PT target standard deviation (from the results of interlaboratory comparisons published in the method) this result was assessed by the Provider as «Satisfactory (S)».

3.5.13. For Sample B for «Total C18:2 (Sum of trans-isomers), %» according to the method «ISO 12966-4:2015» Participant №17 stated the result as «<0,05». Taking into account the robust mean and chosen PT target standard deviation (from the results of interlaboratory comparisons published in the method) this result was not assessed by the Provider.

4. HOMOGENITY AND STABILITY ASSESMENT

4.1. Qualitative methods.

4.1.1. Samples were assessed for homogeneity and stability after blending and packing by selecting five samples (Sample A) of material at random from all those produced. Three of these samples (Sample A) were tested in duplicate under repeatability conditions as only 32 samples were produced according to [6]. Two samples (Sample A) for stability tests were stored in appropriate conditions for the period of preparation and test submission for this round. They were also tested in duplicate.

4.1.2. Homogeneity and stability were deemed satisfactory only if 100% of results are identical with intended results, i.e. with “Satisfactory (S)” result.

4.1.3. Homogeneity and stability for ISO 12966-4:2015, Total C18:1 (Sum of trans-isomers), %»

Sample N	Total C18:1 (Sum of trans-isomers), %	Test result	«Satisfactory (S)» / Not satisfactory
1	Less than LOQ	<0,05* %	«Satisfactory (S)»
2	Less than LOQ	<0,05* %	«Satisfactory (S)»
3	Less than LOQ	<0,05* %	«Satisfactory (S)»
4	Less than LOQ	<0,05* %	«Satisfactory (S)»
5	Less than LOQ	<0,05* %	«Satisfactory (S)»

* limit of Quantification

Homogeneity and stability confirmed by 100% of satisfactory results.

4.1.4. Homogeneity and stability for ISO 12966-4:2015, Total C18:2 (Sum of trans-isomers), %»

Sample N	Total C18:2 (Sum of trans-isomers), %	Test result	«Satisfactory (S)» / Not satisfactory
1	Less than LOQ	<0,05* %	«Satisfactory (S)»
2	Less than LOQ	<0,05* %	«Satisfactory (S)»
3	Less than LOQ	<0,05* %	«Satisfactory (S)»
4	Less than LOQ	<0,05* %	«Satisfactory (S)»
5	Less than LOQ	<0,05* %	«Satisfactory (S)»

* limit of Quantification

Homogeneity and stability confirmed by 100% of satisfactory results.

4.2. Quantitative methods.

4.2.1. Samples were assessed for homogeneity and stability after blending and packing by selecting five samples (Sample A and Sample B) of material at random from all those produced. Three of these samples (Sample A and Sample B) were tested in duplicate under repeatability conditions as only 32 samples were produced according to [6]. Two samples (Sample A and Sample B) for stability tests were stored in appropriate conditions for the period of preparation and test submission for this round. They were also tested in duplicate.

4.2.2. Statistical analysis of the resulting data for homogeneity and stability was carried out using the industry standard Cochran’s ‘C’ test and analytical variance test for ‘sufficient homogeneity’ according to [3] or Annex B.2[4].

4.2.3 Produced samples were found to be sufficiently homogeneous and stable for every analyte according to programme, except for those that can be considered equivalent or homogeneity can be assumed from other analyte homogeneity.

4.2.4. Sample A ДСТУ ISO 5508:2001 Palmitic acid C16:0, %

Palmitic acid C16:0, %			ДСТУ ISO 5508:2001							
Дослідження гомогенності/Homogenity test										
Аналіз викидів за тестом Кохрана(С -тест)/Cohran's C test for outliers						Аналіз на 'достатню однорідність'/Test for 'sufficient homogenity'				
Номер зразку/ Sample number	Результат/ Result A	Результат/ Result B	Average	SD²		Номер зразку /Sample number	Результат/ Result A	Результат/ Result B	SUM	Difference²
1	7,510	7,520	7,515	0,0000	0,00	1	7,51	7,52	15,03	0,0001
2	7,530	7,540	7,535	0,0000	0,00	2	7,53	7,54	15,07	0,0001
3	7,530	7,540	7,535	0,0000	0,00	3	7,53	7,54	15,07	0,0001
4	7,550	7,540	7,545	0,0000	0,00	4	7,55	7,54	15,09	0,0001
5	7,530	7,540	7,535	0,0000	0,00	5	7,53	7,54	15,07	0,0001
										0,0005
Mean	7,533		Worst pair	0,0000		Mean	7,533			
Max	7,55		SUM of SD²	0,0002		Max	7,55			
Min	7,51		C	0,2000		Min	7,51			
			Ccr, 5%	0,8413						
			Ccr, 1%	0,9279		Analytical variance S²an	0,0000	SD	0,0116	
			Conclusion			Sanal	0,0071	RSDR	0,1539	
			5%	PASS		Ssums	0,0005			
			1%	PASS		MSb	0,0002			
					Between sample variance S²sam		0,0001			
Remarks										
1. Cohran's C test is described in ISO 5727-2 and ISO 13528:2022										
2. Test for 'sufficient homogenity' is performed according to Annex B ISO 13528:2022										

Source of σp value to use		
Use(write '1')	Source	σp
	C>13.8%, HORWITZ	0,2745
1	120ppb<C<13.8%, HORWITZ	0,2223
	C<120 ppb	1,6573
MASS NEGATIVE POWER FOR HORWITZ EQUATION(%=2, ppb=9,ppm=6)		2
	SD	0,0110
	Trial SD	0,2230
	Target SD chosen	0,2223
	σ²all	0,0044
	Replicates	5
	F1	2,3719
	F2	2,0961
	Critical value	0,0107
	Between sample variance S²sam	0,0001
	Sufficient homogenity test	PASS

4.3. Data for all analytes

Sample A

	ISO 9832:2002/ ДСТУ ISO 9832:2004	ISO/TS 23647:2010	ISO 12228-1:2014	ISO 12228-1:2014	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001
	Residual technical hexane content, mg/kg	Wax content, mg/kg	Total sterols content, mg/kg	Cholesterol content, % by sum of all peak areas of sterols	Palmitic acid C16:0, %	Stearic acid C18:0, %	Total C18:1 (Sum of isomers), %	Total C18:2 (Sum of isomers), %	Total C18:3 (Sum of cis-isomers), %
Homogenity and stability (Гомогенність та стабільність)									
Cohran's 'C' test (С-тест "Кохрана")									
Crtitical value (5%,5pairs)=0,8412	0,5538	0,8065	0,5257	0,7619	0,2000	0,5000	0,2000	0,2000	0,8000
Mean Result	116,5000	78,1000	2953,8000	2,8150	7,5330	3,7040	27,9250	59,9530	0,1710
Conclusion (Висновок)	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Analytical variance test (тест аналітичної дисперсії)									
S^2anal	6,5000	3,1000	662,2000	0,0002	0,0000	0,0001	0,0000	0,0000	0,0000
Sanal	2,5495	1,7607	25,7332	0,0145	0,0071	0,0089	0,0071	0,0071	0,0071
S^2sample	4,5000	87,1250	226,2250	0,0042	0,0001	0,0004	0,0036	0,0005	0,0000
σ_p	9,1070	26,7000	141,9446	0,1370	0,2223	0,1217	0,5284	0,7743	0,0089
σ_p source	Horwitz	Method Tr SD	Horwitz	Trial SD	Horwitz	Horwitz	Horwitz	Horwitz	Horwitz
σ^2all	7,4643	64,1601	1813,3430	0,0017	0,0044	0,0013	0,0251	0,0540	0,0000
Critical value	31,3294	158,6813	5689,1536	0,0044	0,0107	0,0033	0,0597	0,1281	0,0001
Conclusion (Висновок)	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS

	ISO 15753:2016/ ДСТУ EN ISO 15753:2019, ISO 22959:2009/ ДСТУ EN ISO 22959:2019	ISO 15753:2016/ ДСТУ EN ISO 15753:2019, ISO 22959:2009/ ДСТУ EN ISO 22959:2019	ISO 15753:2016/ ДСТУ EN ISO 15753:2019, ISO 22959:2009/ ДСТУ EN ISO 22959:2019	ISO 15753:2016/ ДСТУ EN ISO 15753:2019, ISO 22959:2009/ ДСТУ EN ISO 22959:2019	ISO 15302:2017
	Benz(a)anthracene, µg/kg	Chrysene, µg/kg	Benzo(b)fluoranthene, µg/kg	Benzo(a)pyrene, µg/kg	Benzo(a)pyrene, µg/kg
Homogenity and stability (Гомогенність та стабільність)					
Cohran's 'C' test (С-тест "Кохрана")					
Crtitical value (5%,5pairs)=0,8412	0,4737	0,8182	0,8000	0,5000	0,5689
Mean Result	4,6300	5,0900	4,3900	3,5000	3,3980
Conclusion (Висновок)	PASS	PASS	PASS	PASS	PASS
Analytical variance test (тест аналітичної дисперсії)					
S^2anal	0,0190	0,0110	0,0050	0,0080	0,0045
Sanal	0,1378	0,1049	0,0707	0,0894	0,0671
S^2sample	0,0362	0,0888	0,0205	0,0310	0,0064
σ_p	1,0186	1,1198	0,9658	0,7700	0,7476
σ_p source	Horwitz	Horwitz	Horwitz	Horwitz	Horwitz
σ^2all	0,0934	0,1129	0,0839	0,0534	0,0503
Critical value	0,2613	0,2907	0,2096	0,1433	0,1287
Conclusion (Висновок)	PASS	PASS	PASS	PASS	PASS

Sample B

	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001
	Palmitic acid C16:0, %	Palmitoleic acid C16:1, %	Stearic acid C18:0, %	Total C18:1 (Sum of cis-isomers), %	Total C18:2 (Sum of cis-isomers), %	Total C18:3 (Sum of cis-isomers), %	Arachidic acid C20:0, %
Homogenity and stability (Гомогенність та стабільність)							
Cohran's 'C' test (С-тест "Кохрана")							
Crtitical value (5%,5pairs)=0,8412	0,2000	0,2500	0,2000	0,2000	0,2000	0,2000	0,4444
Mean Result	4,6910	0,1920	1,8770	64,7110	18,2990	7,8290	0,5490
Conclusion (Висновок)	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Analytical variance test (тест аналітичної дисперсії)							
S^2anal	0,00005	0,00004	0,00005	0,00005	0,0001	0,00005	0,0001
Sanal	0,0071	0,0063	0,0071	0,0071	0,0071	0,0071	0,0095
S^2sample	0,0001	0,0001	0,0000	0,0116	0,0024	0,0012	0,0000
σ_p	0,1487	0,0098	0,0683	0,8044	0,4278	0,2297	0,0240
σ_p source	Horwitz	Horwitz	Horwitz	Horwitz	Horwitz	Horwitz	Horwitz
σ^2all	0,0020	0,00001	0,0004	0,0582	0,0165	0,0048	0,0001
Critical value	0,0048	0,00010	0,0011	0,1382	0,0392	0,0114	0,0003
Conclusion (Висновок)	PASS	PASS	PASS	PASS	PASS	PASS	PASS

	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 15304:2007	ДСТУ ISO 15304:2007
	Gadoleic acid C20:1, %	Behenic acid C22:0, %	Erucic acid C22:1, %	Relative mass fraction of trans-isomers C18:1, % by sum of the corrected areas of all peaks	Relative mass fraction of trans-isomers C18:2, % by sum of the corrected areas of all peaks
Homogenity and stability (Гомогенність та стабільність)					
Cohran's 'C' test (С-тест "Кохрана")					
Crtitical value (5%,5pairs)=0,8412	0,3333	0,2500	N/A	0,2500	0,3333
Mean Result	1,1630	0,3140	0,1000	1,2080	0,2030
Conclusion (Висновок)	PASS	PASS	N/A	PASS	PASS
Analytical variance test (тест аналітичної дисперсії)					
S^2anal	0,00003	0,00004	0,0000	0,00004	0,00003
Sanal	0,0055	0,0063	0,0000	0,0063	0,0055
S^2sample	0,0000	0,0000	0,0000	0,0001	0,0002
σ_p	0,0455	0,0150	0,0057	0,0470	0,0950
σ_p source	Horwitz	Horwitz	Horwitz	Horwitz	Trial SD
σ^2all	0,00019	0,00002	0,000003	0,0002	0,0008
Critical value	0,00050	0,00013	0,000007	0,0006	0,0020
Conclusion (Висновок)	PASS	PASS	PASS	PASS	PASS

5. DATA SUMMARY

Sample A

Method	ISO 9832:2002/ДСТУ ISO 9832:2004	ISO/TS 23647:2010	ДСТУ 4602:2006, п. 6	ISO 12228-1:2014	ISO 12228-1:2014	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015
	Residual technical hexane content, mg/kg	Wax content, mg/kg	Wax content, µg/g	Total sterols content, mg/kg	Cholesterol content, % by sum of all peak areas of sterols	Palmitic acid C16:0, %	Stearic acid C18:0, %	Total C18:1 (Sum of cis-isomers), %	Total C18:1 (Sum of trans-isomers), %	Total C18:2 (Sum of cis-isomers), %
No of Results	18	9	3	7	7	15	15	14	8	14
No of Results |z|>3 or NS	0	0	0	0	0	0	0	0	0	0
No of Results |z|>3, % or NS,%	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Mean	107,072	99,856	120,000	3484,393	2,640	7,573	3,707	27,486		59,161
Min	58,550	73,000	92,000	2992,000	2,450	7,350	3,600	26,320		58,380
Max	155,170	130,600	142,000	3864,300	2,800	8,130	3,880	27,940		59,960
SD	24,648	22,151	25,534	272,935	0,137	0,179	0,069	0,498		0,452
Median	113,155	93,600	126,000	3538,150	2,610	7,530	3,710	27,685		59,170
Robust mean (assigned value)	108,434	99,856	120,000	3506,890	2,640	7,538	3,701	27,613		59,149
Robust SD	18,486	22,151	25,534	196,816	0,137	0,065	0,051	0,252		0,384
SD from method (Tr.SD)	22,100	26,700	N/A	317,700	0,979	0,283	0,090	0,770		1,370
SD from Horwitz eq.	8,568	7,989	9,339	164,226	0,091	0,222	0,122	0,525		0,769
Target SD	22,100	26,700	25,534	317,700	0,137	0,283	0,090	0,770		1,370
Source of target SD of PT	Method Tr SD	Method Tr SD	Trial SD	Method Tr SD	Trial SD	Method Tr SD	Method Tr SD	Method Tr SD		Method Tr SD

Method	ISO 12966-4:2015	ISO 12966-4:2015	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 15304:2007
	Total C18:2 (Sum of trans-isomers), %	Total C18:3 (Sum of cis-isomers), %	Palmitic acid C16:0, %	Stearic acid C18:0, %	Total C18:1 (Sum of isomers), %	Total C18:2 (Sum of isomers), %	Total C18:3 (Sum of cis-isomers), %	Relative mass fraction of trans-isomers C18:1, % by sum of the corrected areas of all peaks
No of Results	7	13	15	15	14	14	12	7
No of Results |z|>3 or NS	0	1	0	0	0	0	0	0
No of Results |z|>3, % or NS,%	0,000	7,692	0,000	0,000	0,000	0,000	0,000	0,000
Mean		0,190	7,562	3,599	27,666	59,100	0,156	
Min		0,110	7,450	2,966	26,730	57,090	0,090	
Max		0,540	7,780	3,770	28,960	60,250	0,236	
SD		0,107	0,088	0,190	0,485	0,767	0,040	
Median		0,160	7,540	3,640	27,605	59,210	0,160	
Robust mean (assigned value)		0,163	7,554	3,642	27,636	59,172	0,156	
Robust SD		0,012	0,070	0,060	0,241	0,494	0,031	
SD from method (Tr.SD)		0,030	0,378	0,250	1,382	1,500	0,250	
SD from Horwitz eq.		0,009	0,223	0,120	0,526	0,769	0,008	
Target SD		0,030	0,223	0,250	1,382	1,500	0,250	
Source of target SD of PT		Method Tr SD	Horwitz	Method Tr SD	Method Tr SD	Method Tr SD	Method Tr SD	

Method	ДСТУ ISO 15304:2007	ISO 15753:2016/ ДСТУ EN ISO 15753:2019, ISO 22959:2009/ ДСТУ EN ISO 22959:2019	ISO 15753:2016/ДСТУ EN ISO 15753:2019, ISO 22959:2009/ ДСТУ EN ISO 22959:2019	ISO 15753:2016/ ДСТУ EN ISO 15753:2019, ISO 22959:2009/ ДСТУ EN ISO 22959:2019	ISO 15753:2016/ ДСТУ EN ISO 15753:2019, ISO 22959:2009/ ДСТУ EN ISO 22959:2019	ISO 15753:2016/ ДСТУ EN ISO 15753:2019 (EN ISO 15753:2016, IDT)	ISO 15302:2017
	Relative mass fraction of trans-isomers C18:2, % by sum of the corrected areas of all peaks	Benz(a)anthracene, µg/kg	Chrysene, µg/kg	Benzo(b)fluoranthene, µg/kg	Benzo(a)pyrene, µg/kg	Sum of PAHs-4, µg/kg	Benzo(a)pyrene, µg/kg
No of Results	4	15	15	15	15	14	8
No of Results |z|>3 or NS	0	0	0	0	1	0	1
No of Results |z|>3, % or NS,%	0,000	0,000	0,000	0,000	6,667	0,000	12,500
Mean		4,162	5,176	4,376	4,353	18,328	4,593
Min		1,530	2,980	3,060	2,880	11,730	3,400
Max		7,070	8,218	5,400	10,508	25,568	8,551
SD		1,557	1,697	0,726	1,836	3,823	1,696
Median		4,070	4,620	4,520	3,900	17,630	4,130
Robust mean (assigned value)		4,157	5,130	4,411	3,970	18,274	4,179
Robust SD		1,224	1,615	0,665	0,707	3,325	0,710
SD from method (Tr.SD)		1,781	2,198	1,891	1,755	6,148	1,819
SD from Horwitz eq.		0,914	1,129	0,970	0,873	4,020	0,919
Target SD		1,781	2,198	1,891	0,873	4,020	0,919
Source of target SD of PT		Method Tr SD	Method Tr SD	Method Tr SD	Horwitz	Horwitz	Horwitz

Sample B

Method	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015
	Palmitic acid C16:0, %	Palmitoleic acid C16:1, %	Stearic acid C18:0, %	Total C18:1 (Sum of cis-isomers), %	Total C18:2 (Sum of cis-isomers), %	Total C18:3 (Sum of cis-isomers), %	Arachidic acid C 20:0, %	Gadoleic acid C 20:1, %	Behenic acid C 22:0, %	Erucic acid C 22:1, %	Total C18:1 (Sum of trans-isomers), %	Total C18:2 (Sum of trans-isomers), %
No of Results	14	12	14	13	13	13	12	11	12	12	10	8
No of Results |z|>3 or NS	0	0	1	0	1	0	3	2	2	0	2	1
No of Results |z|>3, % or NS,%	0,000	0,000	7,143	0,000	7,692	0,000	25,000	18,182	16,667	0,000	20,000	12,500
Mean	4,701	0,198	1,833	62,929	18,662	7,681	0,552	1,249	0,304	0,100	0,854	0,174
Min	4,520	0,170	1,580	61,110	18,050	7,200	0,220	1,100	0,170	0,090	0,110	0,050
Max	5,020	0,220	1,970	64,720	20,250	8,530	0,800	1,600	0,400	0,120	1,210	0,410
SD	0,158	0,012	0,099	1,095	0,718	0,417	0,131	0,163	0,052	0,009	0,352	0,112
Median	4,640	0,200	1,865	62,720	18,380	7,500	0,545	1,180	0,305	0,100	0,945	0,170
Robust mean (assigned value)	4,667	0,199	1,859	62,902	18,415	7,620	0,549	1,185	0,307	0,099	0,987	0,172
Robust SD	0,095	0,006	0,035	0,956	0,262	0,302	0,029	0,037	0,013	0,006	0,213	0,065
SD from method (Tr.SD)	0,430	0,020	0,090	4,030	0,590	0,311	0,030	0,040	0,030	0,080	0,118	0,076
SD from Horwitz eq.	0,148	0,010	0,068	0,793	0,429	0,225	0,024	0,046	0,015	0,006	0,040	0,009
Target SD	0,430	0,020	0,090	4,030	0,590	0,311	0,030	0,046	0,030	0,080	0,118	0,076
Source of target SD of PT	Method Tr SD	Method Tr SD	Method Tr SD	Method Tr SD	Method Tr SD	Method Tr SD	Method Tr SD	Horwitz	Method Tr SD	Method Tr SD	Method Tr SD	Method Tr SD

Method	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 15304:2007	ДСТУ ISO 15304:2007
	Palmitic acid C16:0, %	Palmitoleic acid C16:1, %	Stearic acid C18:0, %	Total C18:1 (Sum of cis-isomers), %	Total C18:2 (Sum of cis-isomers), %	Total C18:3 (Sum of cis-isomers), %	Arachidic acid C 20:0, %	Gadoleic acid C 20:1, %	Behenic acid C 22:0, %	Erucic acid C 22:1, %	Relative mass fraction of trans-isomers C18:1, % by sum of the corrected areas of all peaks	Relative mass fraction of trans-isomers C18:2, % by sum of the corrected areas of all peaks
No of Results	15	13	15	14	14	13	13	13	13	14	7	7
No of Results |z|>3 or NS	0	0	0	0	0	0	0	0	0	0	0	0
No of Results |z|>3, % or NS,%	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
Mean	4,739	0,213	1,795	63,202	18,411	7,614	0,545	1,195	0,293	0,116	1,090	0,263
Min	4,500	0,186	1,700	62,090	17,730	7,200	0,450	0,980	0,200	0,080	0,700	0,160
Max	5,240	0,300	1,880	64,720	19,020	7,911	0,700	1,700	0,340	0,200	1,303	0,410
SD	0,223	0,033	0,056	0,795	0,308	0,256	0,062	0,181	0,039	0,033	0,213	0,098
Median	4,660	0,200	1,800	63,315	18,392	7,700	0,550	1,160	0,310	0,100	1,170	0,210
Robust mean (assigned value)	4,691	0,205	1,796	63,120	18,417	7,617	0,540	1,157	0,297	0,109	1,114	0,263
Robust SD	0,120	0,016	0,054	0,622	0,216	0,251	0,035	0,068	0,031	0,018	0,168	0,098
SD from method (Tr.SD)	0,235	0,250	0,250	1,500	0,921	0,381	0,250	0,250	0,250	0,250	N/A	N/A
SD from Horwitz eq.	0,149	0,010	0,066	0,794	0,429	0,224	0,024	0,045	0,014	0,006	0,044	0,013
Target SD	0,235	0,250	0,250	1,500	0,921	0,381	0,250	0,250	0,250	0,250	0,168	0,098
Source of target SD of PT	Method Tr SD	Method Tr SD	Method Tr SD	Method Tr SD	Method Tr SD	Method Tr SD	Method Tr SD	Method Tr SD	Method Tr SD	Method Tr SD	Trial SD	Trial SD

6. RAW DATA
Sample A

Method	ISO 9832:2002/ ДСТУ ISO 9832:2004	ISO/TS 23647:2010	ДСТУ 4602:2006, п. 6	ISO 12228-1:2014	ISO 12228-1:2014	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ДСТУ ISO 5508: 2001
Laboratory number	Residual technical hexane content, mg/kg	Wax content, mg/kg	Wax content, µg/g	Total sterols content, mg/kg	Cholesterol content, % by sum of all peak areas of sterols	Palmitic acid C16:0, %	Stearic acid C18:0, %	Total C18:1 (Sum of cis-isomers), %	Total C18:1 (Sum of trans-isomers), %	Total C18:2 (Sum of cis-isomers), %	Total C18:2 (Sum of trans-isomers), %	Total C18:3 (Sum of cis-isomers), %	Palmitic acid C16:0, %
1	114,00	92,00	92,00	2992,00	2,80	7,54	3,71	27,94	< 0,05	59,96	< 0,05	0,170	7,54
2						7,49	3,68	27,70	менше 0.05	59,19	менше 0.05	0,16	7,50
3	120,00	75,00				7,53	3,73	27,67		59,15	0,070	0,160	
4	123,89					7,55	3,78	27,86		58,58			
5													7,52
6	99,8	130,5	142,0	3864,3	2,45	7,5	3,6	27,8	<0.1	59,4	<0.1	0,15	7,5
7													7,515
8	117,00	120,00				8,13	3,88	27,84		58,94		0,150	
9	101,899												7,78
10	135,00	86,00	-	3609,00	2,60	7,46	3,68	-	-	-	-	-	7,46
11	92,66					7,51	3,68	26,61		59,37		0,160	
12	не досліджували	не досліджували	не досліджували	не досліджували	не досліджували	не досліджували	не досліджували	не досліджували	не досліджували	не досліджували	не досліджували	не досліджували	7,65
13	85,76			3562,90	2,77	7,58	3,71	27,42	0,046	58,38	0,069	0,180	7,58
14	68,540												7,590
15		130,6	126,0			7,60	3,75	27,81	<0,05	58,61	<0,05	0,16	7,63
16	112,31												7,48
17	123,1	98,0	-	-	-	7,53	3,71	27,78	< 0.05	59,01	< 0.05	0,160	-
18													7,61
19	58,55 мг/кг												
20	103,3	73,0		3524,4	2,75	7,35	3,63	27,60	0,038	59,21	0,058	0,166	
21	155,17	-	-	-	-	7,76	3,76	27,00	0,07	59,10	ND less than 0,05	0,20	-
22													
23	71,50					7,62	3,66	26,32		59,85		0,540	
24	119,00	93,6		3300,00	2,50	7,45	3,64	27,46	<0.05	59,50	<0.05	0,11	7,45
25	125,82	-	-	3538,15	2,61	-	-	-	-	-	-	-	7,62

Method	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 15304:2007	ДСТУ ISO 15304:2007	ISO 15753:2016/ ДСТУ EN ISO 15753:2019, ISO 22959:2009/ ДСТУ EN ISO 22959:2019	ISO 15753:2016/ ДСТУ EN ISO 15753:2019, ISO 22959:2009/ ДСТУ EN ISO 22959:2019	ISO 15753:2016/ ДСТУ EN ISO 15753:2019, ISO 22959:2009/ ДСТУ EN ISO 22959:2019	ISO 15753:2016/ ДСТУ EN ISO 15753:2019, ISO 22959:2009/ ДСТУ EN ISO 22959:2019	ISO 15753:2016/ ДСТУ EN ISO 15753:2019 (EN ISO 15753:2016, IDT)	ISO 15302:2017
Laboratory number	Stearic acid C18:0, %	Total C18:1 (Sum of isomers), %	Total C18:2 (Sum of isomers), %	Total C18:3 (Sum of cis-isomers), %	Relative mass fraction of trans-isomers C18:1, % by sum of the corrected areas of all peaks	Relative mass fraction of trans-isomers C18:2, % by sum of the corrected areas of all peaks	Benz(a) anthracene, µg/kg	Chrysene, µg/kg	Benzo(b) fluoranthene, µg/kg	Benzo(a)pyrene, µg/kg	Sum of PAHs-4, µg/kg	Benzo(a) pyrene, µg/kg
1	3,71	27,94	59,96	0,17	< 0,05	< 0,05	4,63	5,07	4,41	3,50	17,61	3,40
2	3,67	27,68	59,20				4,40	3,54	3,34	4,48	15,76	4,48
3							4,60	4,36	4,78	3,91	17,65	
4												
5	3,69	28,96	57,09	0,09			2,17	3,25	3,31	3,00	11,73	
6	3,6	27,9	59,3	0,1	<0.1	<0.1	5,8	4,8	5,4	4,4	20,4	5,05
7	3,536	27,559	59,582	0,158	<0,084	<0,084						
8												3,52
9	3,66	27,57	59,19									
10	3,68	-	-	-	-	-	4,70	7,20	4,60	3,80	20,30	-
11							3,64	4,26	3,78	2,88	14,56	
12	3,64	27,46	58,92	0,18	не досліджували	не досліджували	1,53	2,98	5,16	5,27	14,94	не досліджували
13	3,71	27,42	58,38	0,18	0,046	0,069	1,832	8,218	5,010	10,508	25,568	8,551
14	2,966	27,298	59,457	0,236								
15	3,77	27,89	58,53	0,16								
16	3,60	27,64	59,22	0,16			4,07	4,15	4,06	3,81	15,81	
17	-	-	-	-	-	-	3,90	7,40	5,00	3,90	20,20	4,20
18	3,47	26,73	60,25	0,15								
19												
20					0,038	0,058	7,07	7,58	4,30	4,06	23,01	4,06
21	-	-	-	-	-	-	-	-	-	-	-	-
22												
23							6,42	6,10	4,91	5,09	22,52	
24	3,64	27,46	59,50	0,11	<0.05	<0.05	3,97	4,62	4,52	3,48	16,53	3,48
25	3,64	27,81	58,82	0,18	0,050	0,057	3,70	4,11	3,06	3,21	-	-

Sample B

Method	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ДСТУ ISO 5508:2001
Laboratory number	Palmitic acid C16:0, %	Palmitoleic acid C16:1, %	Stearic acid C18:0, %	Total C18:1 (Sum of cis-isomers), %	Total C18:2 (Sum of cis-isomers), %	Total C18:3 (Sum of cis-isomers), %	Arachidic acid C 20:0, %	Gadoleic acid C 20:1, %	Behenic acid C 22:0, %	Erucic acid C 22:1, %	Total C18:1 (Sum of trans-isomers), %	Total C18:2 (Sum of trans-isomers), %	Palmitic acid C16:0, %
1	4,70	0,20	1,88	64,72	18,30	7,83	0,55	1,16	0,32	0,10	1,21	0,21	4,70
2										0,11			
3	4,75		1,88	62,74	18,59	7,55					0,65	0,11	
4	4,62	0,20	1,87	62,67	18,05	7,32							
5													4,50
6	4,6	0,2	1,7	64,0	18,7	7,5	0,8	1,6	0,3	0,1	0,7	0,2	4,7
7													4,632
8	5,02		1,58	64,66	20,25	8,03	0,22		0,17				
9													4,87
10	4,64	0,20	1,84	-	-	-	0,60	1,20	0,32	0,10	-	-	4,64
11	4,59	0,20	1,82	61,84	18,17	7,44	0,57	1,18	0,29	0,09			
12	не досліджували	не досліджували	не досліджували	не досліджували	не досліджували	не досліджували	не досліджували	не досліджували	не досліджували	не досліджували	не досліджували	не досліджували	5,23
13	4,66	0,20	1,86	62,09	18,13	7,37	0,54	1,17	0,31	0,10	0,92	0,41	4,66
14													4,605
15	4,62	0,19	1,87	62,38	18,33	7,39	0,53	1,14	0,29	0,12	1,18	не досліджували	4,65
16													4,59
17	4,64	0,19	1,84	63,51	18,48	7,78	0,53	1,26	0,40	0,10	0,97	< 0.05	-
18													4,81
19													5,24%
20	4,56	0,17	1,87	62,72	18,38	7,50	0,65	1,23	0,30	0,10	1,08	0,18	
21	4,97	0,21	1,97	62,10	18,85	8,41	0,59	1,53	0,34	0,10	0,11	0,05	-
22													
23	4,93	0,20	1,93	61,11	20,14	8,53	0,53	1,17	0,31	0,09	0,55	0,07	
24	4,52	0,22	1,75	63,54	18,23	7,20	0,51	1,10	0,30	0,09	1,17	0,16	4,52
25	-	-	-	-	-	-	-	-	-	-	-	-	4,74

Method	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 15304:2007	ДСТУ ISO 15304:2007
Laboratory number	Palmitoleic acid C16:1, %	Stearic acid C18:0, %	Total C18:1 (Sum of cis-isomers), %	Total C18:2 (Sum of cis-isomers), %	Total C18:3 (Sum of cis-isomers), %	Arachidic acid C 20:0, %	Gadoleic acid C 20:1, %	Behenic acid C 22:0, %	Erucic acid C 22:1, %	Relative mass fraction of trans-isomers C18:1, % by sum of the corrected areas of all peaks	Relative mass fraction of trans-isomers C18:2, % by sum of the corrected areas of all peaks
1	0,20	1,88	64,72	18,30	7,83	0,55	1,16	0,32	0,10	1,21	0,21
2									0,11		
3											
4											
5	0,25	1,74	62,57	17,73	7,71	0,56	1,18	0,32	0,20		
6	0,3	1,7	63,6	18,6	7,4	0,7	1,7	0,25	0,1	0,70	0,20
7	0,186	1,763	63,461	18,373	7,700	0,501	1,398	0,262	<0,084	1,303	0,350
8											
9		1,82	62,51	18,41							
10	0,20	1,84	-	-	-	0,60	1,20	0,32	0,10	-	-
11											
12	0,19	1,73	63,28	18,64	7,91	0,45	0,98	0,20	не досліджували	не досліджували	не досліджували
13	0,20	1,86	62,09	18,13	7,37	0,54	1,17	0,31	0,10	0,92	0,41
14	0,198	1,821	62,448	18,655	7,911	0,563	1,211	0,326	0,098		
15	0,19	1,87	62,42	18,33	7,36	0,54	1,14	0,29	0,12		
16	0,19	1,78	63,35	18,51	7,53	0,55	1,16	0,31	0,11		
17	-	-	-	-	-	-	-	-	-	-	-
18	0,24	1,80	63,42	19,02	7,90	0,47	1,04	0,26	0,08		
19		1,74%	64,63%	18,64%	7,82%				0,15%		
20										1,08	0,18
21	-	-	-	-	-	-	-	-	-	-	-
22											
23											
24	0,22	1,75	63,54	18,23	7,20	0,51	1,10	0,30	0,09	1,17	0,16
25	0,20	1,83	62,79	18,18	7,34	0,55	1,09	0,34	0,15	1,25	0,33

7. Z SCORES
Sample A

Method	ISO 9832:2002/ ДСТУ ISO 9832:2004	ISO/TS 23647:2010	ДСТУ 4602:2006, п. 6	ISO 12228-1:2014	ISO 12228-1:2014	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015
Laboratory number	Residual technical hexane content, mg/kg	Wax content, mg/kg	Wax content, µg/g	Total sterols content, mg/kg	Cholesterol content, % by sum of all peak areas of sterols	Palmitic acid C16:0, %	Stearic acid C18:0, %	Total C18:1 (Sum of cis-isomers), %	Total C18:1 (Sum of trans-isomers), %	Total C18:2 (Sum of cis-isomers), %	Total C18:2 (Sum of trans-isomers), %	Total C18:3 (Sum of cis-isomers), %
1	0,25	-0,29	-1,10	-1,62	1,17	0,01	0,10	0,42	S	0,59	S	0,22
2						-0,17	-0,24	0,11	S	0,03	S	-0,11
3	0,52	-0,93				-0,03	0,32	0,07		0,00		-0,11
4	0,70					0,04	0,87	0,32		-0,42		
5												
6	-0,39	1,15	0,86	1,12	-1,39	-0,13	-1,13	0,24	S	0,18	S	-0,45
7												
8	0,39	0,75				2,09	1,98	0,29		-0,15		-0,45
9	-0,30											
10	1,20	-0,52		0,32	-0,29	-0,28	-0,24					
11	-0,71					-0,10	-0,24	-1,30		0,16		-0,11
12												
13	-1,03			0,18	0,95	0,15	0,10	-0,25	S	-0,56		0,55
14	-1,81											
15		1,15	0,23			0,22	0,54	0,26	S	-0,39	S	-0,11
16	0,18											
17	0,66	-0,07				-0,03	0,10	0,22	S	-0,10	S	-0,11
18												
19	-2,26											
20	-0,23	-1,01		0,06	0,80	-0,66	-0,79	-0,02	S	0,04		0,09
21	2,11					0,78	0,65	-0,80		-0,04	S	1,22
22												
23	-1,67					0,29	-0,46	-1,68		0,51		12,55
24	0,48	-0,23		-0,65	-1,02	-0,31	-0,68	-0,20	S	0,26	S	-1,78
25	0,79			0,10	-0,22							

Method	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 15304:2007	ДСТУ ISO 15304:2007	ISO 15753:2016/ ДСТУ EN ISO 15753:2019, ISO 22959:2009/ ДСТУ EN ISO 22959:2019	ISO 15753:2016/ ДСТУ EN ISO 15753:2019, ISO 22959:2009/ ДСТУ EN ISO 22959:2019	ISO 15753:2016/ ДСТУ EN ISO 15753:2019, ISO 22959:2009/ ДСТУ EN ISO 22959:2019	ISO 15753:2016/ ДСТУ EN ISO 15753:2019, ISO 22959:2009/ ДСТУ EN ISO 22959:2019	ISO 15753:2016/ ДСТУ EN ISO 15753:2019 (EN ISO 15753:2016, IDT)	ISO 15302:2017
Laboratory number	Palmitic acid C16:0, %	Stearic acid C18:0, %	Total C18:1 (Sum of isomers), %	Total C18:2 (Sum of isomers), %	Total C18:3 (Sum of cis-isomers), %	Relative mass fraction of trans-isomers C18:1, % by sum of the corrected areas of all peaks	Relative mass fraction of trans-isomers C18:2, % by sum of the corrected areas of all peaks	Benz(a)anthracene, µg/kg	Chrysene, µg/kg	Benzo(b) fluoranthene, µg/kg	Benzo(a) pyrene, µg/kg	Sum of PAHs-4, µg/kg	Benzo(a)pyrene, µg/kg
1	-0,06	0,27	0,22	0,53	0,06	S	S	0,27	-0,03	0,00	-0,54	-0,17	-0,85
2	-0,24	0,11	0,03	0,02				0,14	-0,72	-0,57	0,58	-0,63	0,33
3								0,25	-0,35	0,20	-0,07	-0,16	
4													
5	-0,15	0,19	0,96	-1,39	-0,26			-1,12	-0,86	-0,58	-1,11	-1,63	
6	-0,24	-0,17	0,19	0,09	-0,22	S	S	0,92	-0,15	0,52	0,49	0,53	0,95
7	-0,17	-0,42	-0,06	0,27	0,01	S	S						
8													-0,72
9	1,02	0,07	-0,05	0,01									
10	-0,42	0,15						0,30	0,94	0,10	-0,20	0,50	
11								-0,29	-0,40	-0,33	-1,25	-0,92	
12	0,43	-0,01	-0,13	-0,17	0,10			-1,47	-0,98	0,40	1,49	-0,83	
13	0,12	0,27	-0,16	-0,53	0,10	S		-1,30	1,40	0,32	7,48	1,81	4,75
14	0,16	-2,70	-0,24	0,19	0,32								
15	0,34	0,51	0,18	-0,43	0,02								
16	-0,33	-0,17	0,00	0,03	0,02			-0,05	-0,45	-0,19	-0,18	-0,61	
17								-0,14	1,03	0,31	-0,08	0,48	0,02
18	0,25	-0,69	-0,66	0,72	-0,02								
19													
20						S		1,64	1,11	-0,06	0,10	1,18	-0,13
21													
22													
23								1,27	0,44	0,26	1,28	1,06	
24	-0,46	-0,01	-0,13	0,22	-0,18	S	S	-0,10	-0,23	0,06	-0,56	-0,43	-0,76
25	0,30	-0,01	0,13	-0,23	0,10	S		-0,26	-0,46	-0,71	-0,87		

Sample B

Method	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ISO 12966-4:2015	ДСТУ ISO 5508:2001
Laboratory number	Palmitic acid C16:0, %	Palmitoleic acid C16:1, %	Stearic acid C18:0, %	Total C18:1 (Sum of cis-isomers), %	Total C18:2 (Sum of cis-isomers), %	Total C18:3 (Sum of cis-isomers), %	Arachidic acid C 20:0, %	Gadoleic acid C 20:1, %	Behenic acid C 22:0, %	Erucic acid C 22:1, %	Total C18:1 (Sum of trans-isomers), %	Total C18:2 (Sum of trans-isomers), %	Palmitic acid C16:0, %
1	0,08	0,06	0,23	0,45	-0,19	0,68	0,03	-0,54	0,45	0,01	1,89	0,50	0,04
2										0,14			
3	0,19		0,23	-0,04	0,30	-0,22					-2,86	-0,82	
4	-0,11	0,06	0,12	-0,06	-0,62	-0,96							
5													-0,82
6	-0,16	0,06	-1,77	0,27	0,48	-0,38	8,36	8,98	-0,22	0,01	-2,43	0,37	0,04
7													-0,25
8	0,82		-3,10	0,44	3,11	1,32	-10,97		-4,55				
9													0,76
10	-0,06	0,06	-0,21				1,69	0,32	0,45	0,01			-0,22
11	-0,18	0,06	-0,43	-0,26	-0,41	-0,58	0,69	-0,11	-0,55	-0,11			
12													2,30
13	-0,02	0,06	0,01	-0,20	-0,48	-0,80	-0,31	-0,32	0,12	0,01	-0,57	3,13	-0,13
14													-0,37
15	-0,11	-0,44	0,12	-0,13	-0,14	-0,74	-0,64	-0,97	-0,55	0,26	1,63		-0,18
16													-0,43
17	-0,06	-0,44	-0,21	0,15	0,11	0,52	-0,64	1,62	3,12	0,01	-0,15		
18													0,51
19													2,34
20	-0,25	-1,44	0,12	-0,05	-0,06	-0,38	3,36	0,97	-0,22	0,01	0,79	0,11	
21	0,71	0,56	1,23	-0,20	0,74	2,54	1,36	7,47	1,12	0,01	-7,43	-1,61	
22													
23	0,61	0,06	0,79	-0,44	2,92	2,93	-0,64	-0,32	0,12	-0,11	-3,70	-1,34	
24	-0,34	1,06	-1,21	0,16	-0,31	-1,35	-1,31	-1,84	-0,22	-0,11	1,55	-0,16	-0,73
25													0,21

Method	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 5508:2001	ДСТУ ISO 15304:2007	ДСТУ ISO 15304:2007
Laboratory number	Palmitoleic acid C16:1, %	Stearic acid C18:0, %	Total C18:1 (Sum of cis-isomers), %	Total C18:2 (Sum of cis-isomers), %	Total C18:3 (Sum of cis-isomers), %	Arachidic acid C 20:0, %	Gadoleic acid C 20:1, %	Behenic acid C 22:0, %	Erucic acid C 22:1, %	Relative mass fraction of trans-isomers C18:1, % by sum of the corrected areas of all peaks	Relative mass fraction of trans-isomers C18:2, % by sum of the corrected areas of all peaks
1	-0,02	0,34	1,07	-0,13	0,56	0,04	0,01	0,09	-0,04	0,57	-0,54
2									0,00		
3											
4											
5	0,18	-0,22	-0,37	-0,75	0,24	0,08	0,09	0,09	0,36		
6	0,38	-0,38	0,32	0,20	-0,57	0,64	2,17	-0,19	-0,04	-2,46	-0,64
7	-0,08	-0,13	0,23	-0,05	0,22	-0,16	0,96	-0,14	S	1,13	0,89
8											
9		0,10	-0,41	-0,01							
10	-0,02	0,18				0,24	0,17	0,09	-0,04		
11											
12	-0,06	-0,26	0,11	0,24	0,77	-0,36	-0,71	-0,39			
13	-0,02	0,26	-0,69	-0,31	-0,65	0,00	0,05	0,05	-0,04	-1,15	1,50
14	-0,03	0,10	-0,45	0,26	0,77	0,09	0,22	0,12	-0,05		
15	-0,06	0,30	-0,47	-0,09	-0,68	0,00	-0,07	-0,03	0,04		
16	-0,06	-0,06	0,15	0,10	-0,23	0,04	0,01	0,05	0,00		
17											
18	0,14	0,02	0,20	0,66	0,74	-0,28	-0,47	-0,15	-0,12		
19		-0,22	1,01	0,24	0,53				0,16		
20										-0,20	-0,84
21											
22											
23											
24	0,06	-0,18	0,28	-0,20	-1,10	-0,12	-0,23	0,01	-0,08	0,34	-1,05
25	-0,02	0,14	-0,22	-0,26	-0,73	0,04	-0,27	0,17	0,16	0,81	0,68

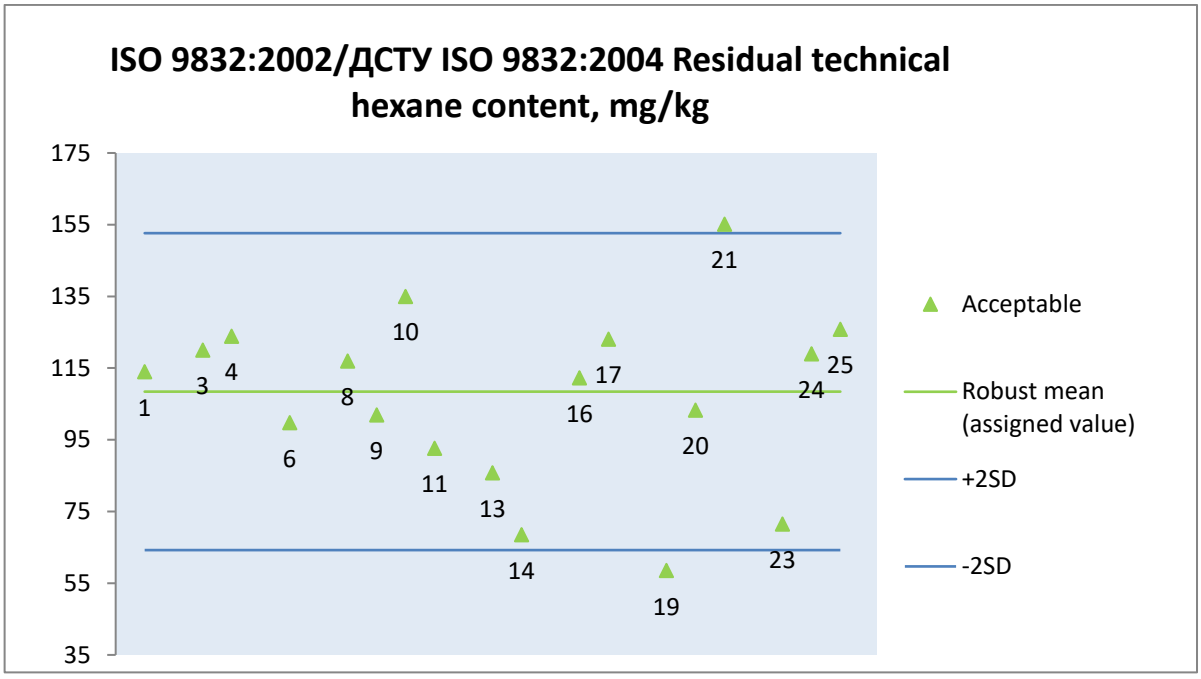
Remarks

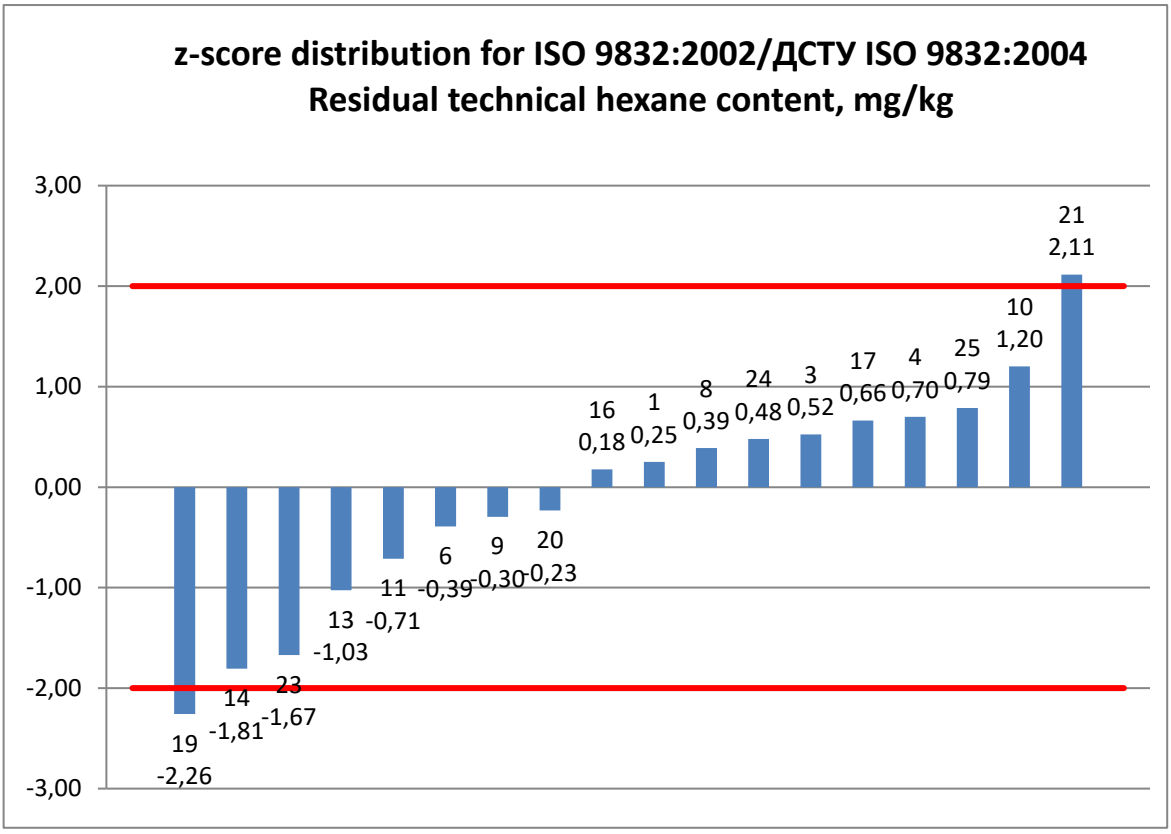
1. Green colored cells contain results that are considered to be satisfactory.
2. Red colored cells contain results that are considered to be not satisfactory.
3. Results that are considered to be questionable are marked by yellow colored cell.
4. Blank cell – results were not reported by the Participant

8. Z-SCORE PLOTS AND RESULTS CHARTS

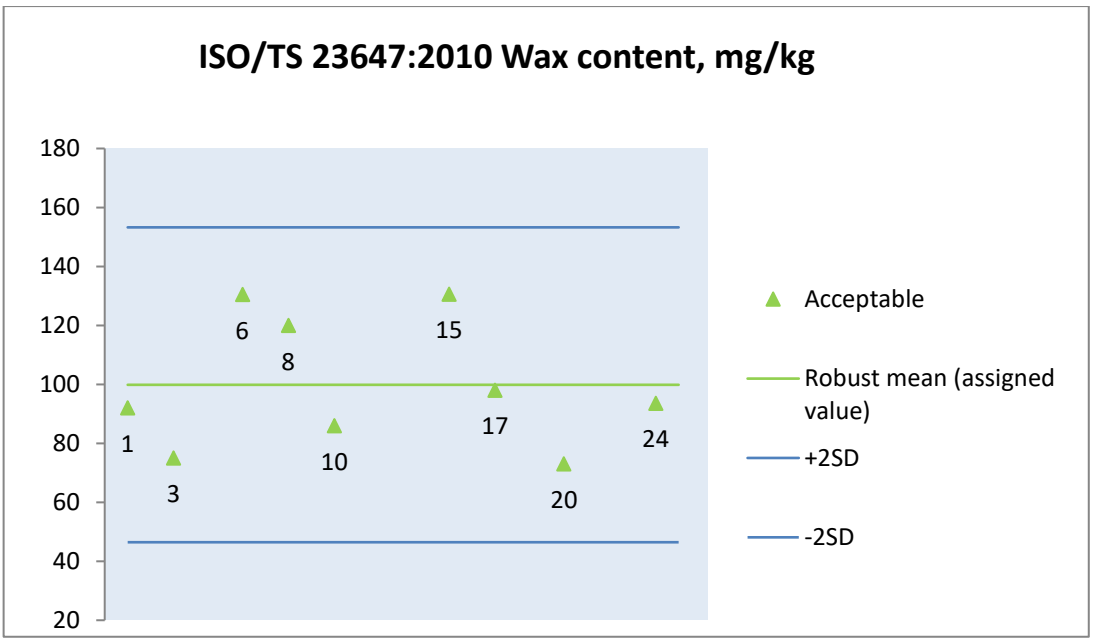
8.1. Sample A

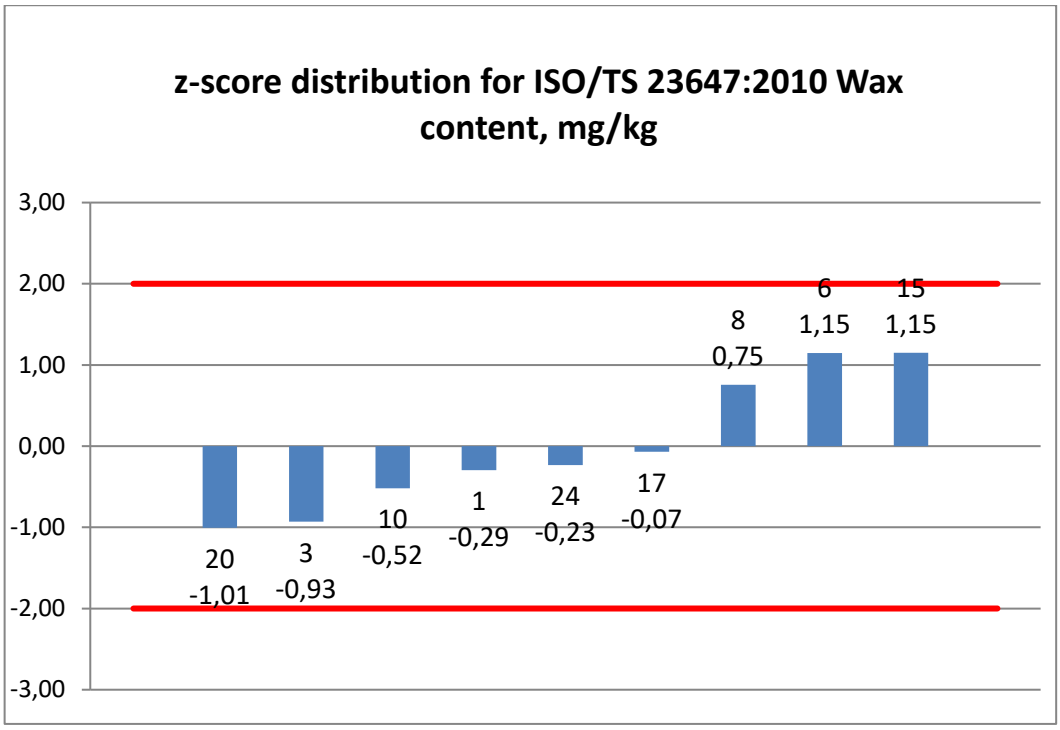
8.1.1. ISO 9832:2002/ ДСТУ ISO 9832:2004 Residual technical hexane content, mg/kg



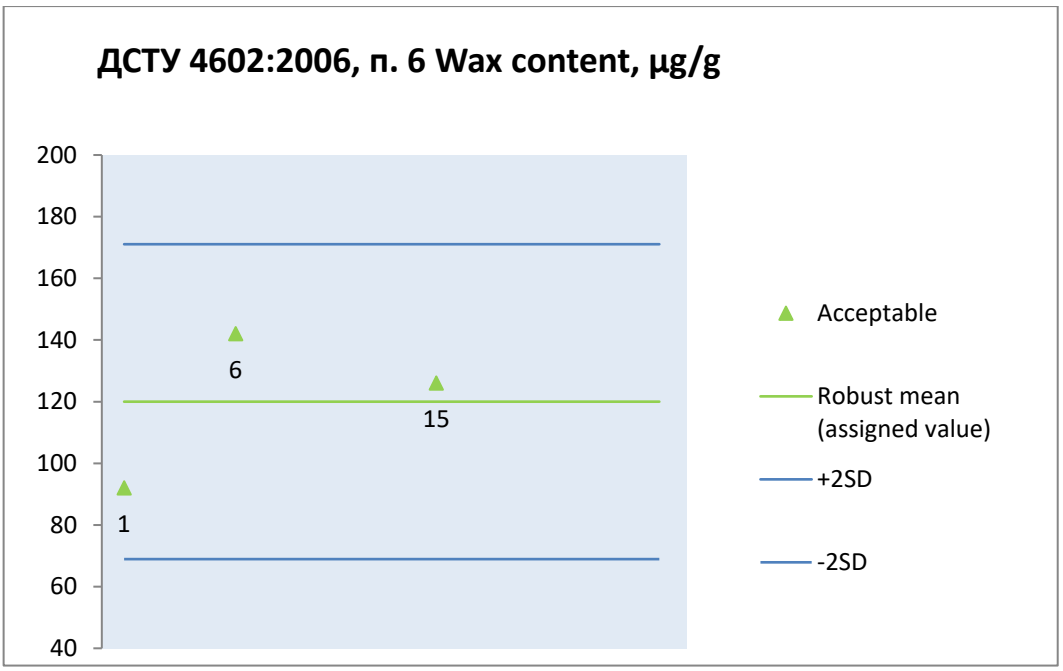


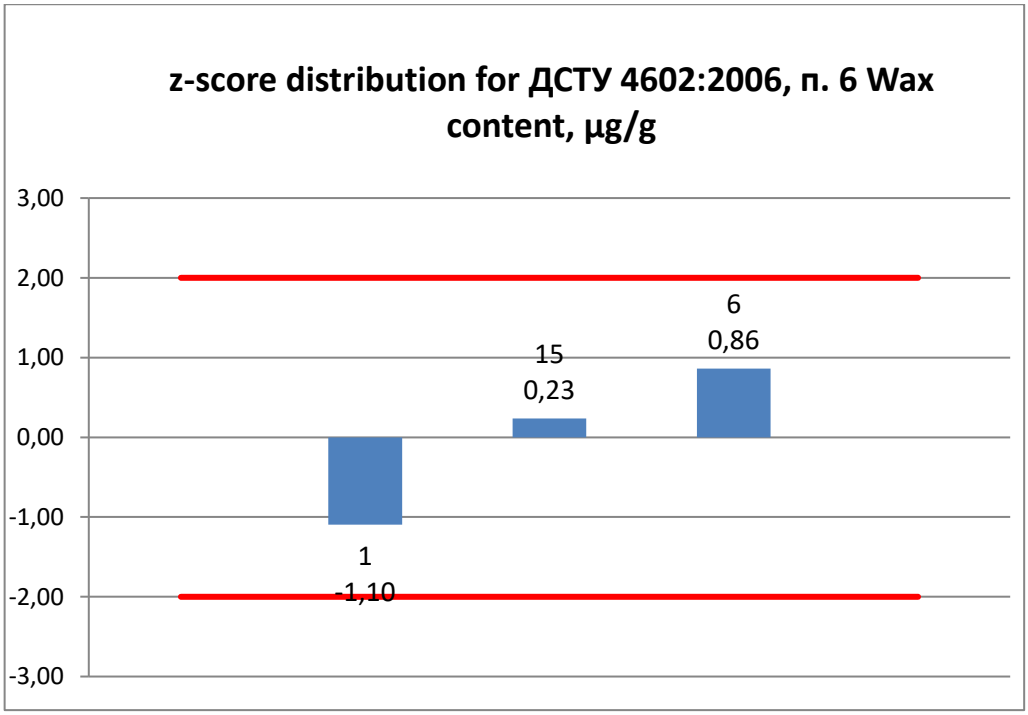
8.1.2. ISO/TS 23647:2010 Wax content, mg/kg



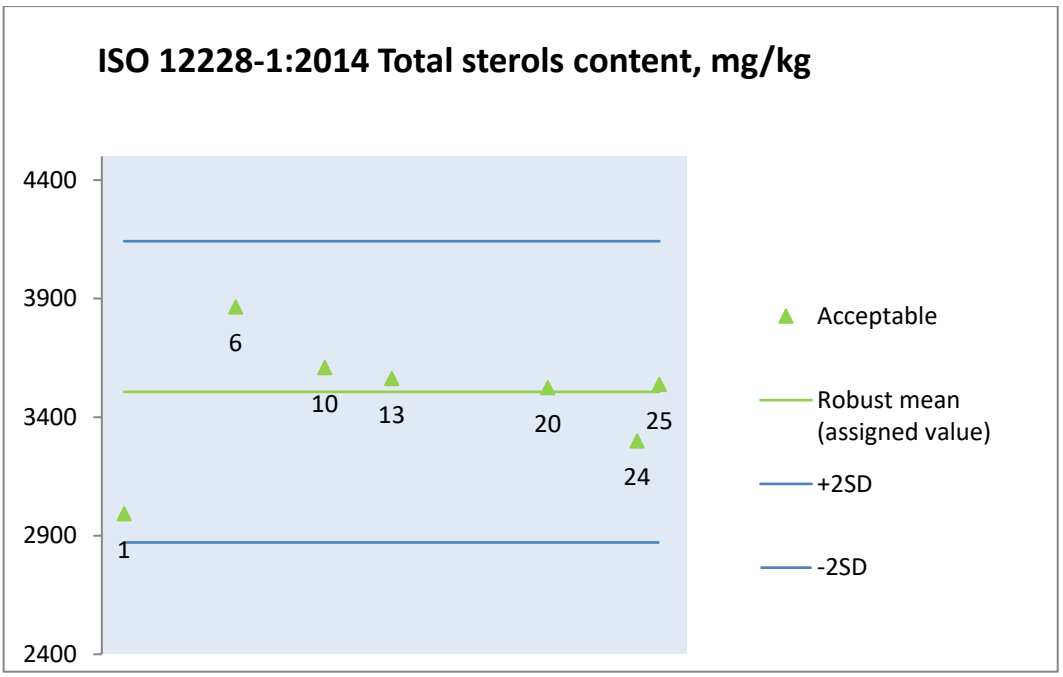


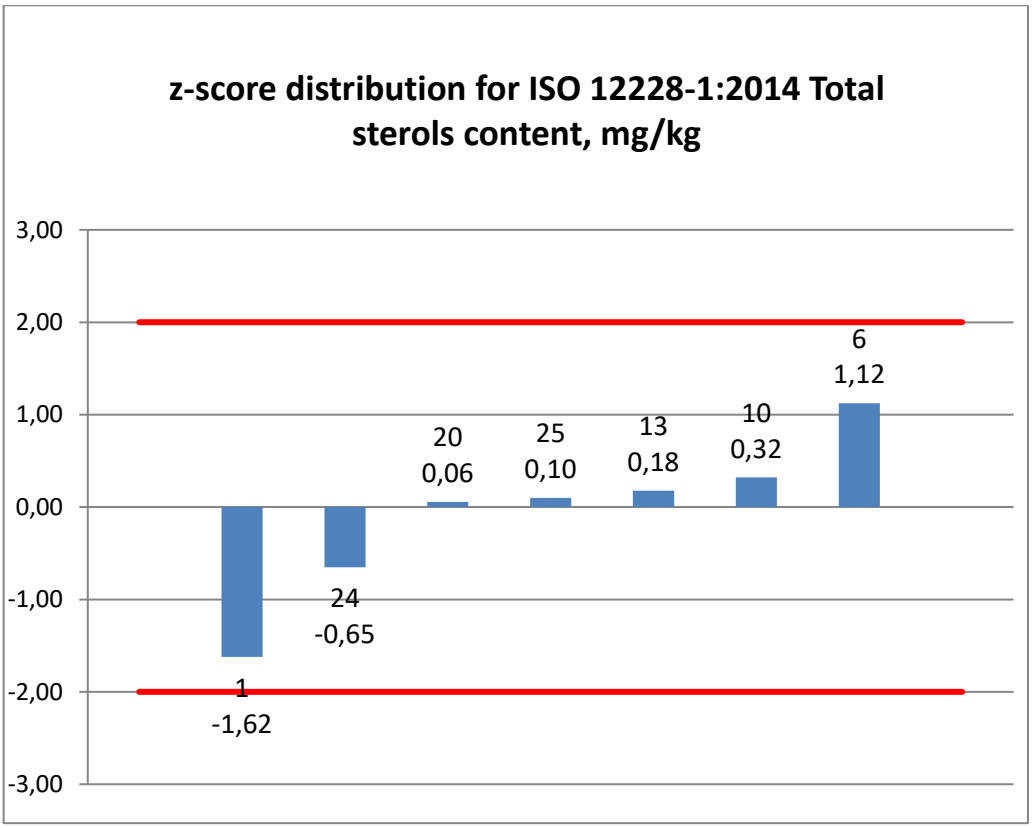
8.1.3. ДСТУ 4602:2006, п. 6 Wax content, µg/g



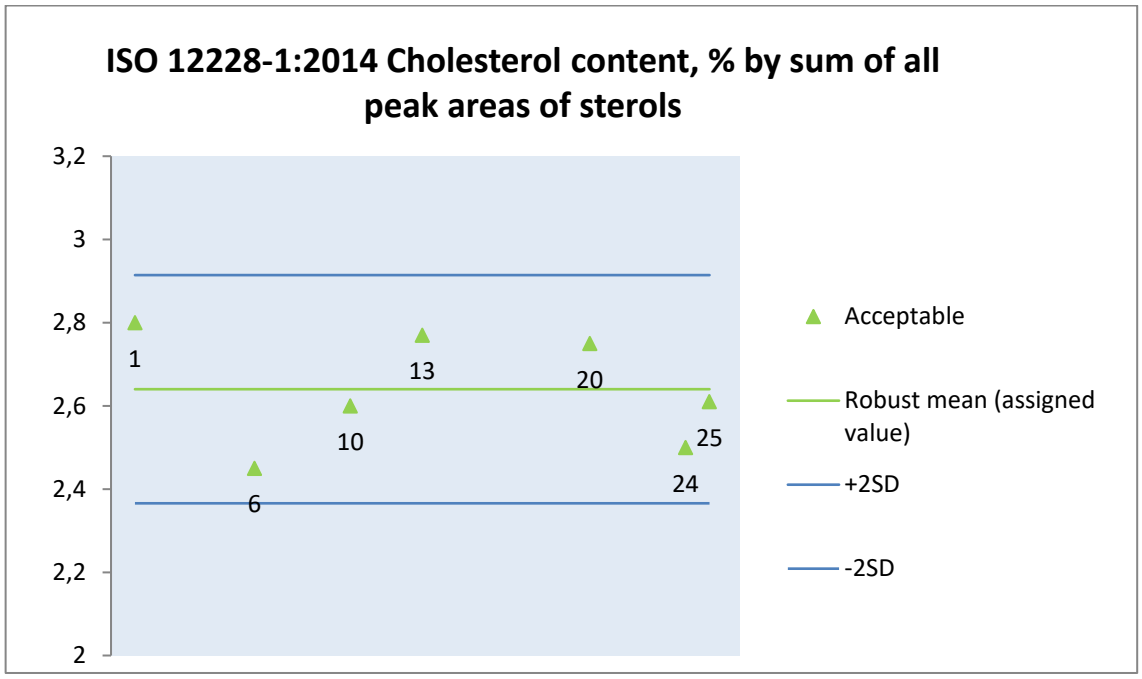


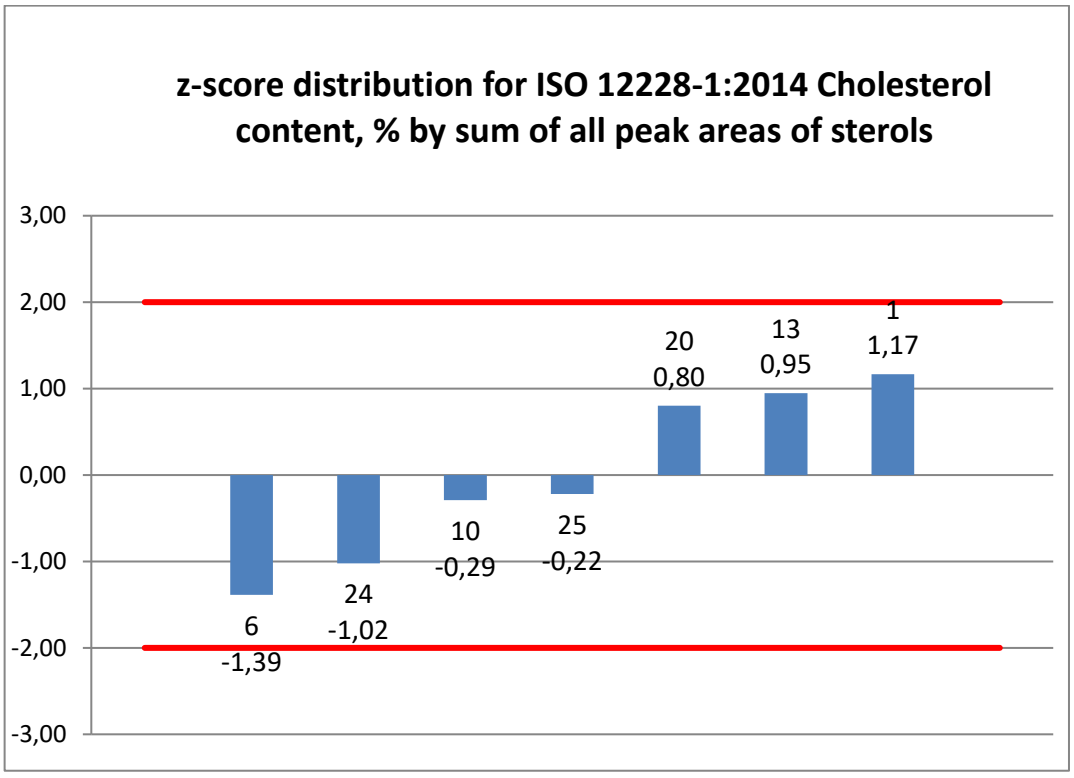
8.1.4. ISO 12228-1:2014 Total sterols content, mg/kg



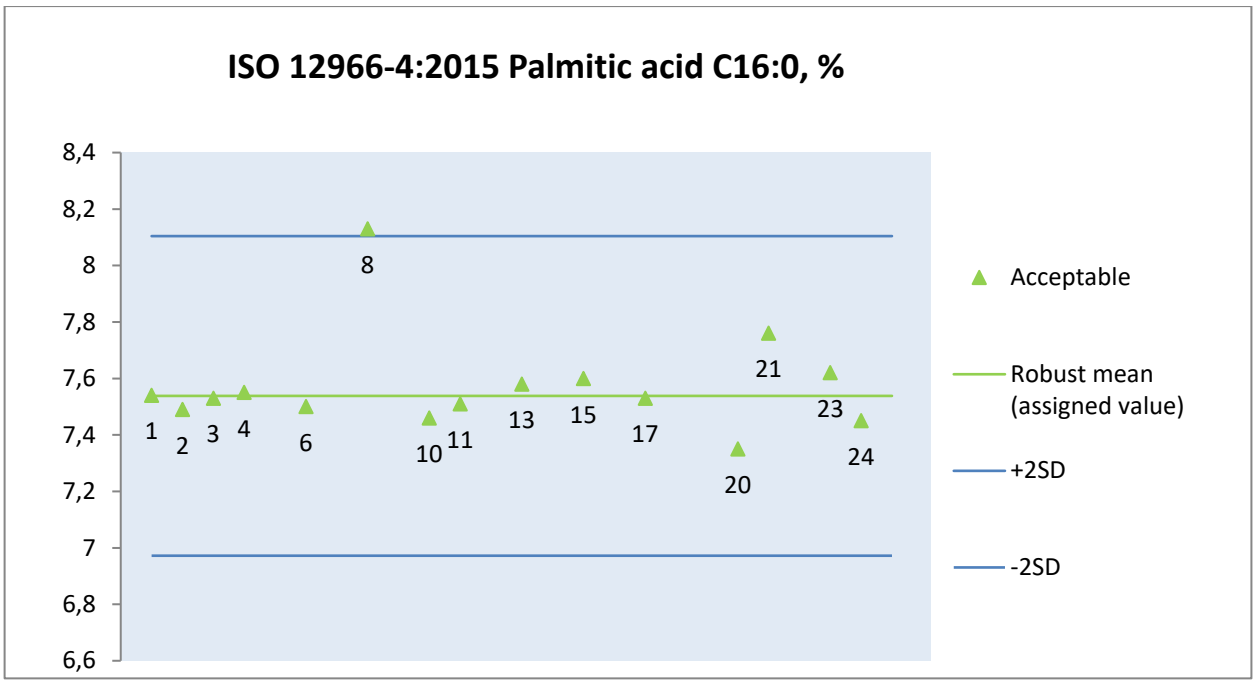


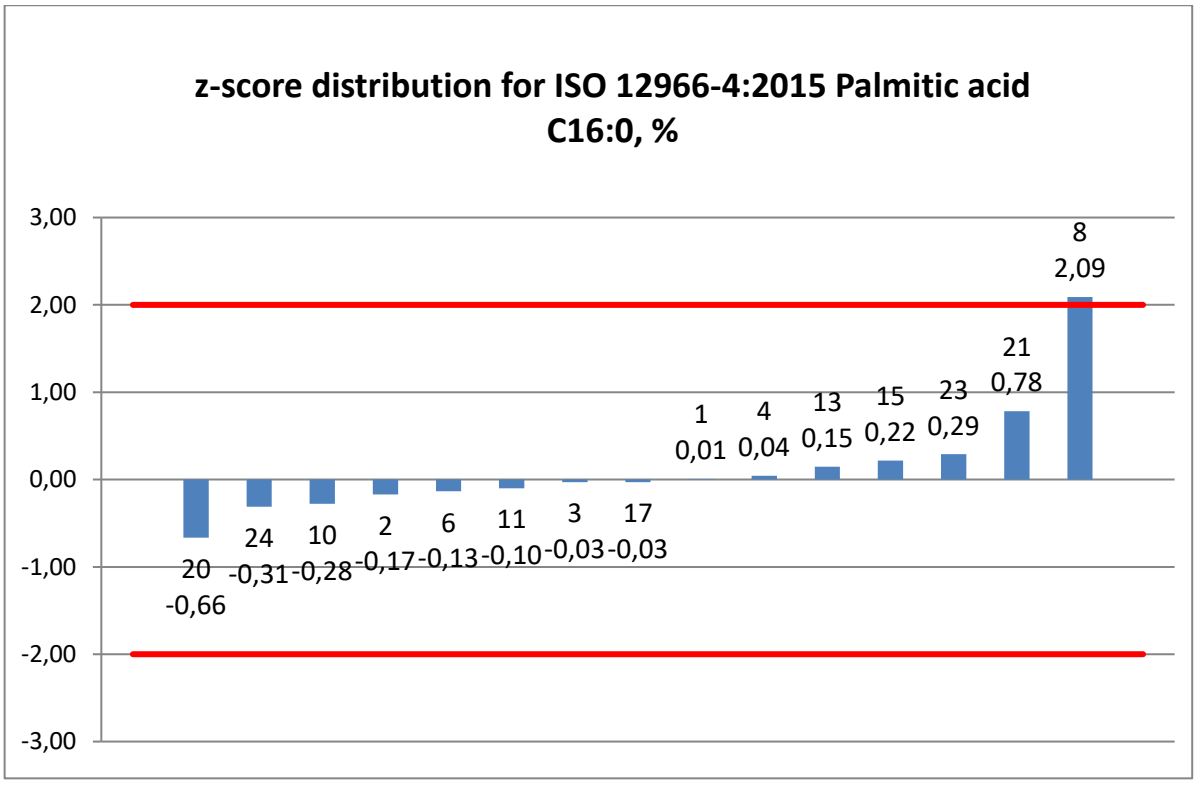
8.1.5. ISO 12228-1:2014 Cholesterol content, % by sum of all peak areas of sterols



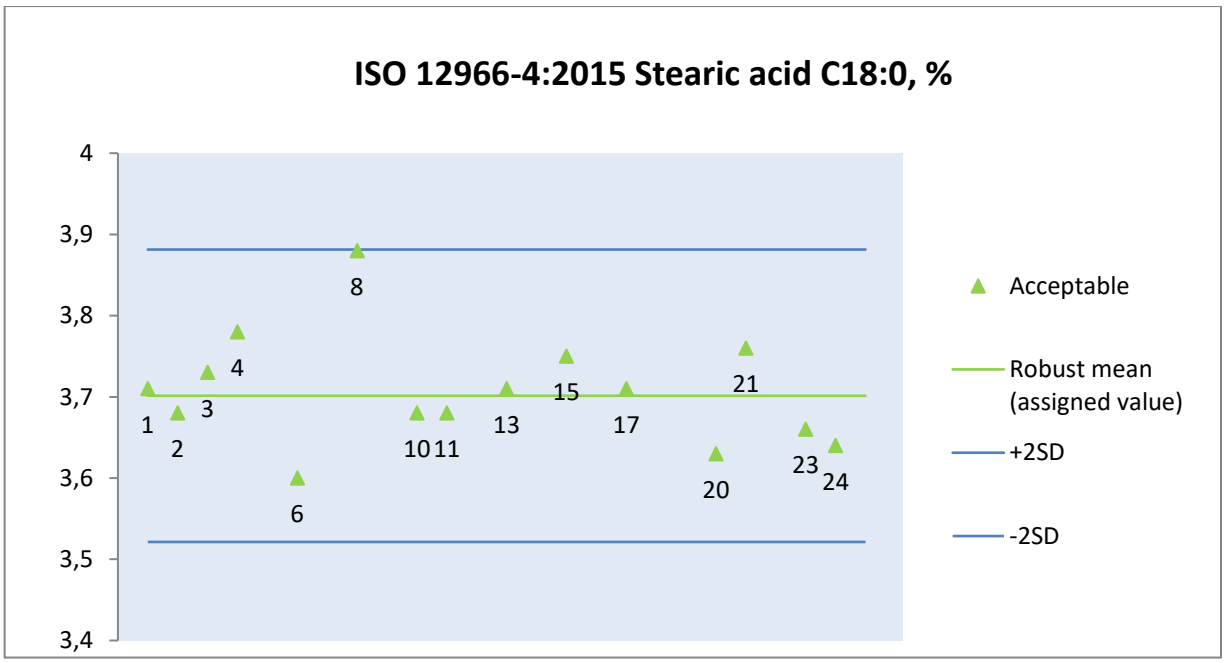


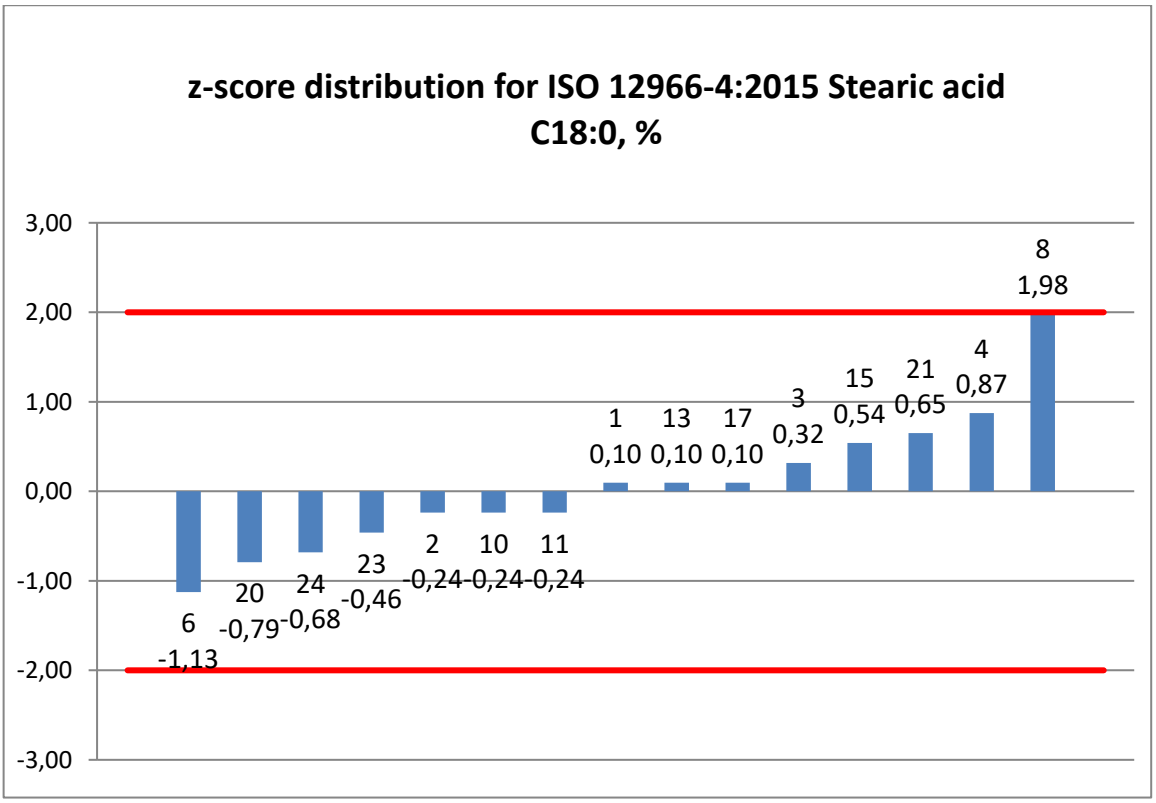
8.1.6. ISO 12966-4:2015 Palmitic acid C16:0, %



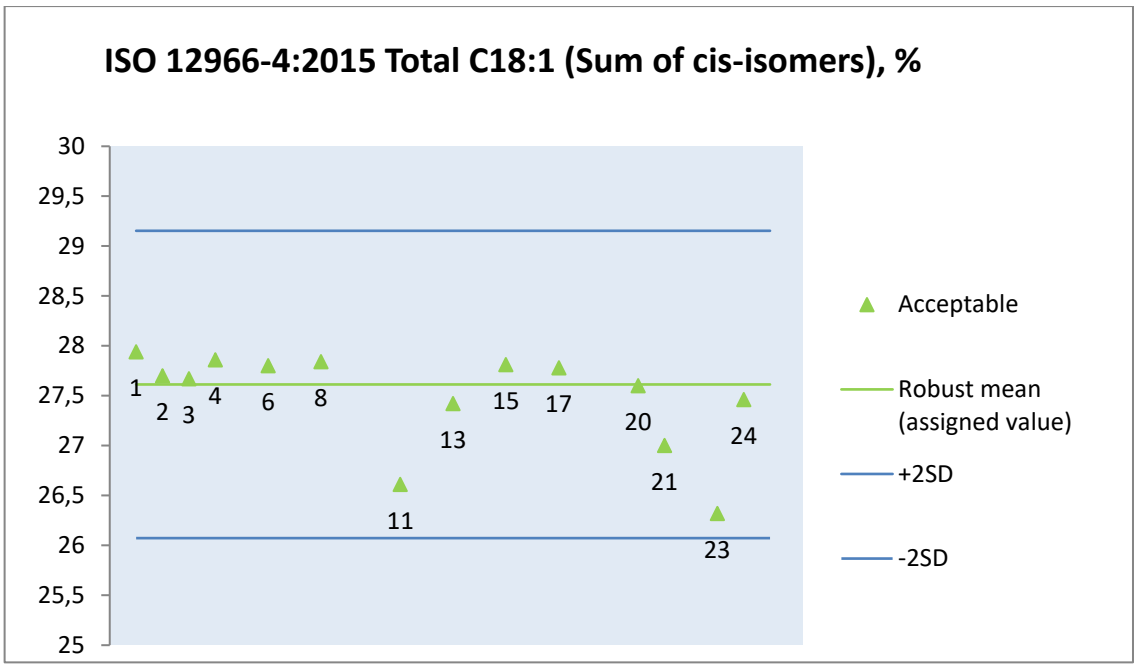


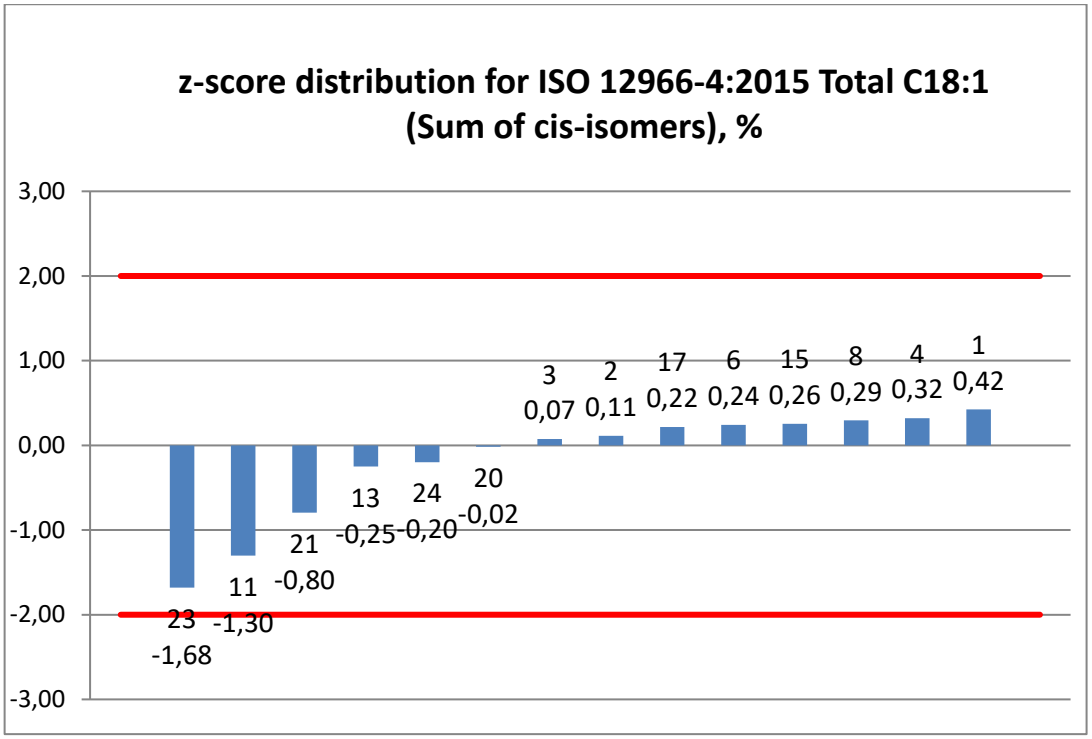
8.1.7. ISO 12966-4:2015 Stearic acid C18:0, %



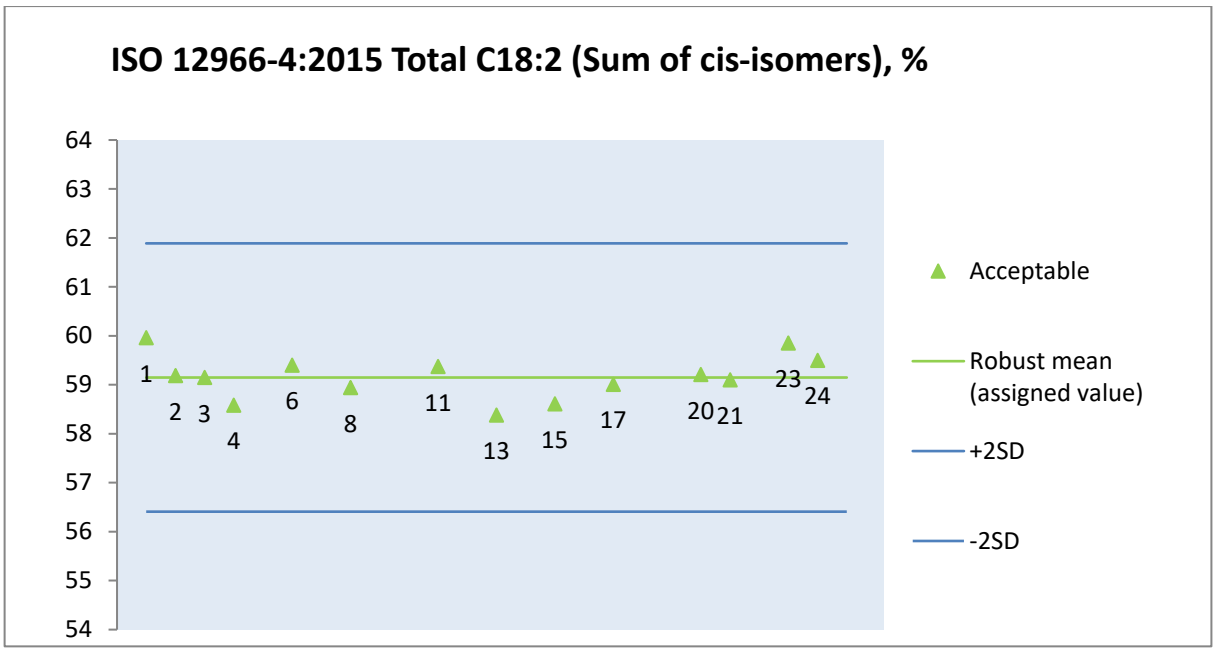


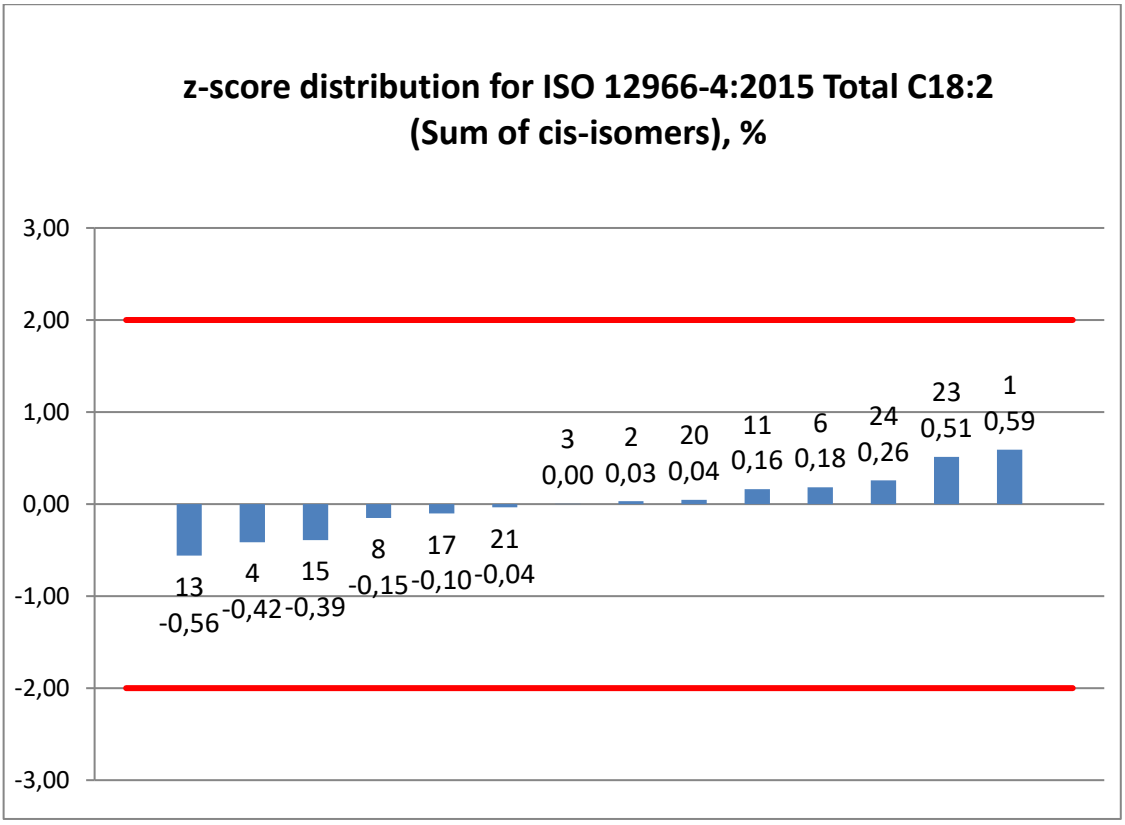
8.1.8. ISO 12966-4:2015 Total C18:1 (Sum of cis-isomers), %



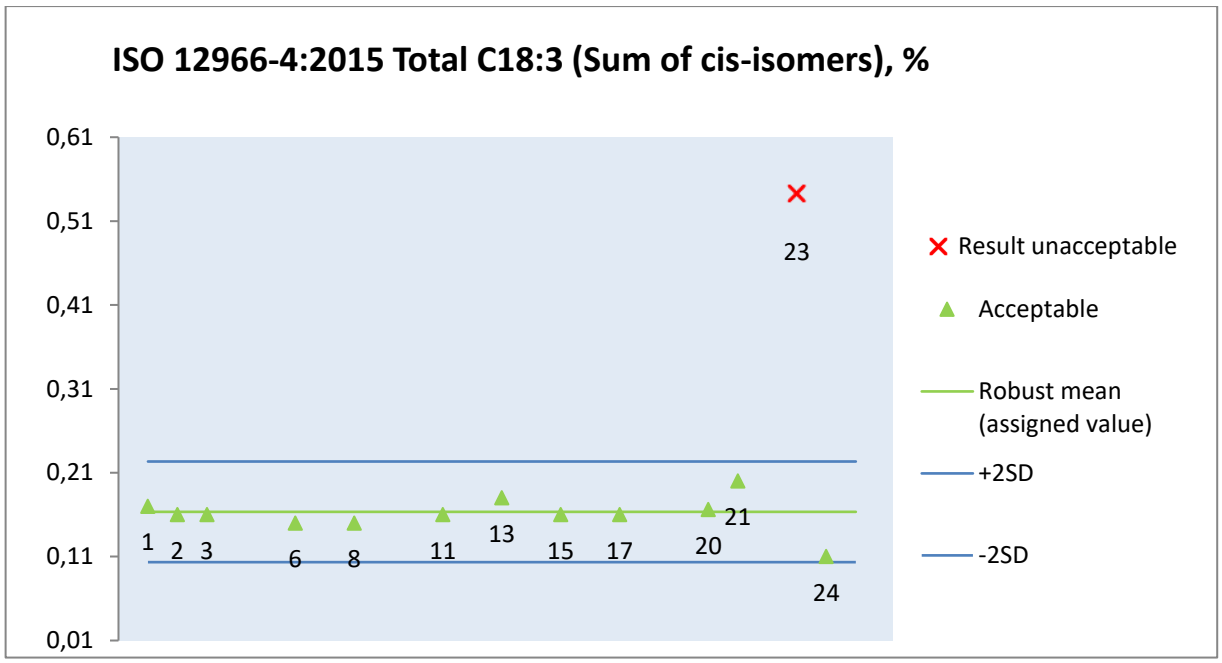


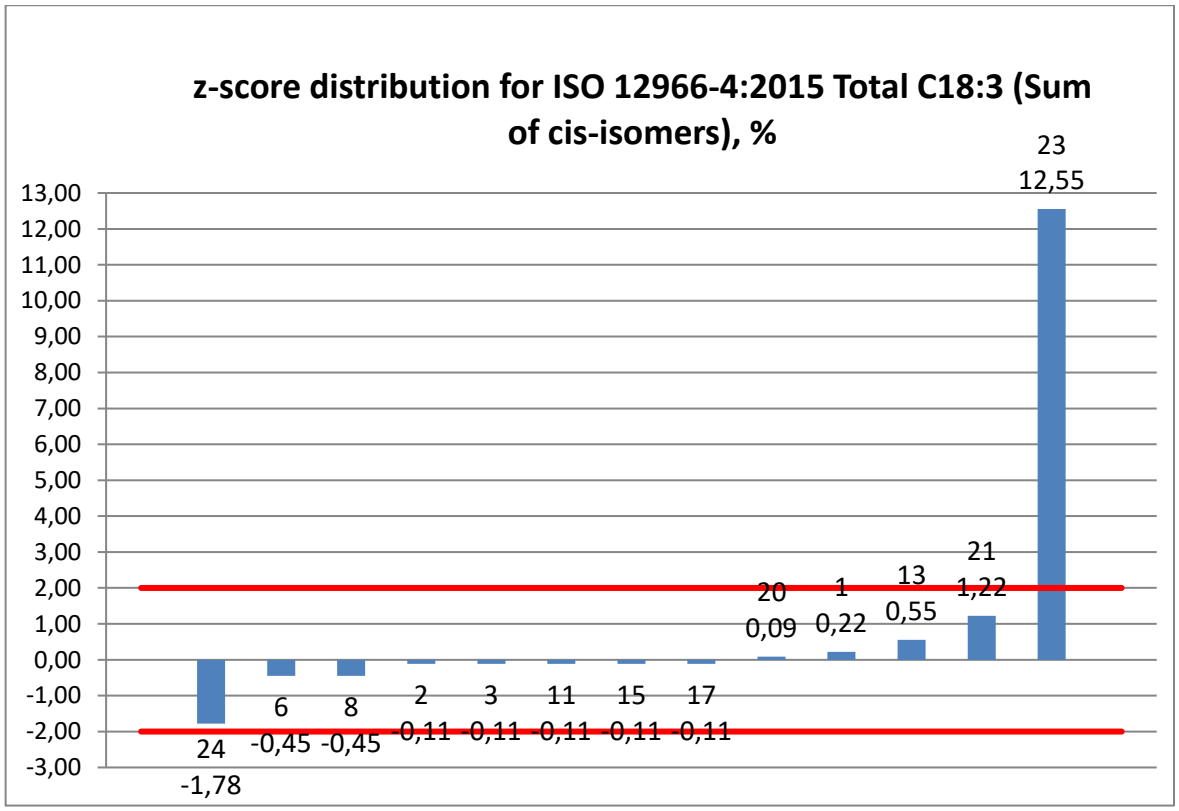
8.1.9. ISO 12966-4:2015 Total C18:2 (Sum of cis-isomers), %



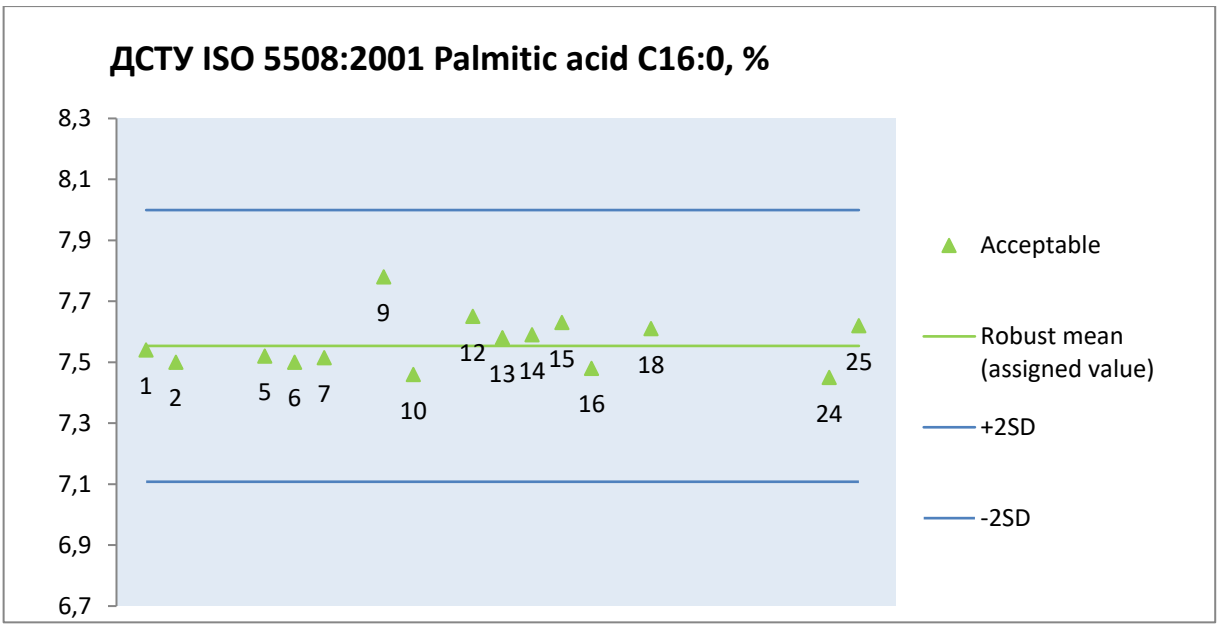


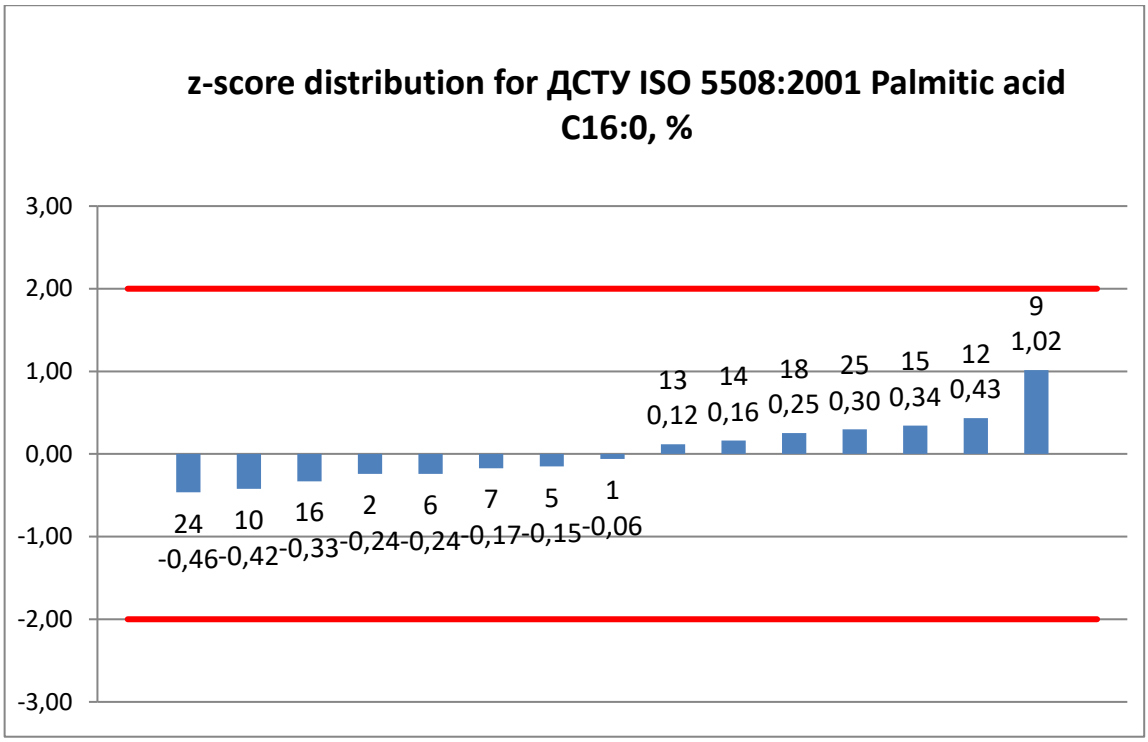
8.1.10. ISO 12966-4:2015 Total C18:3 (Sum of cis-isomers), %



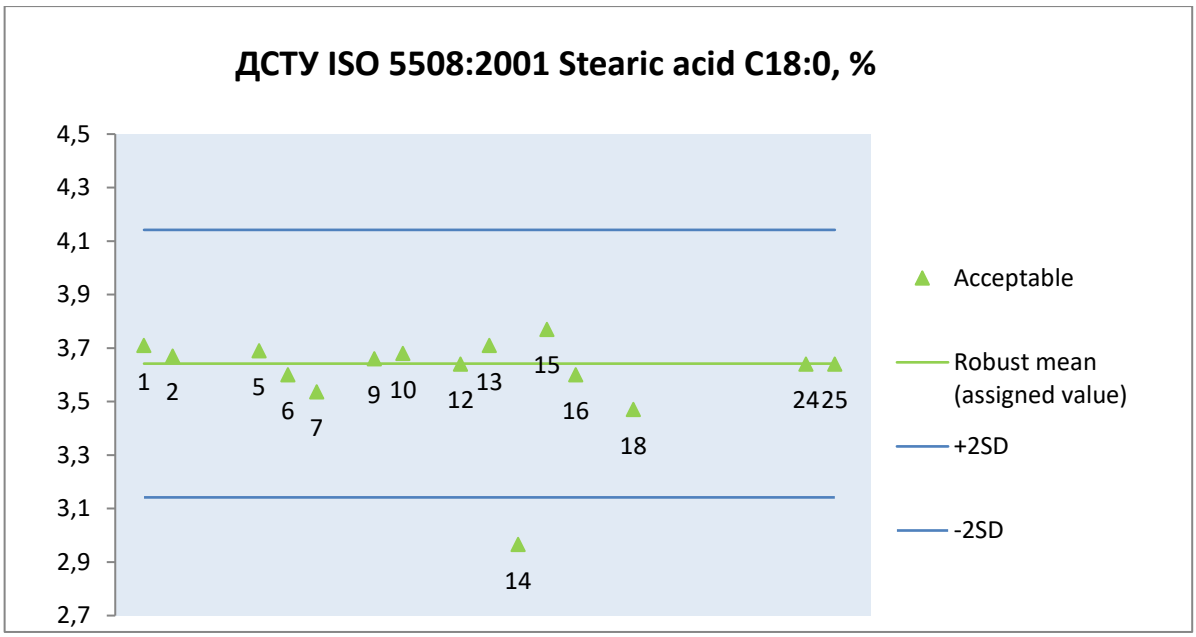


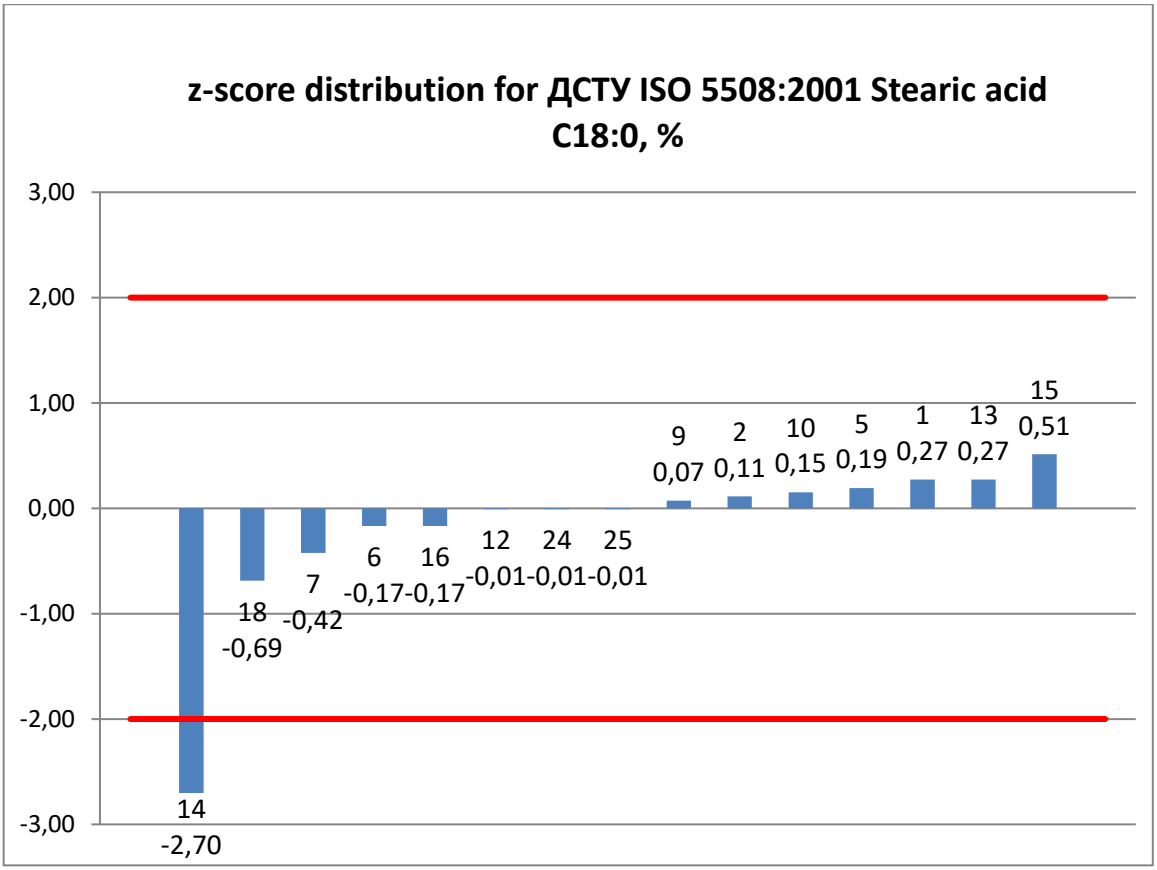
8.1.11. ДСТУ ISO 5508:2001 Palmitic acid C16:0, %



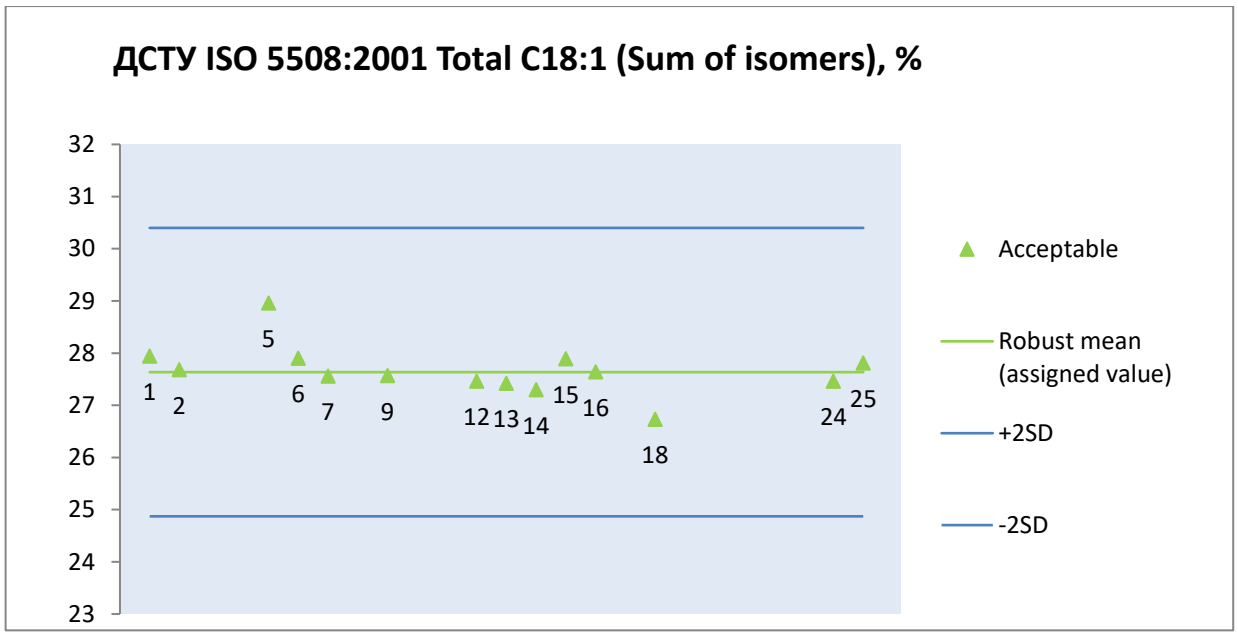


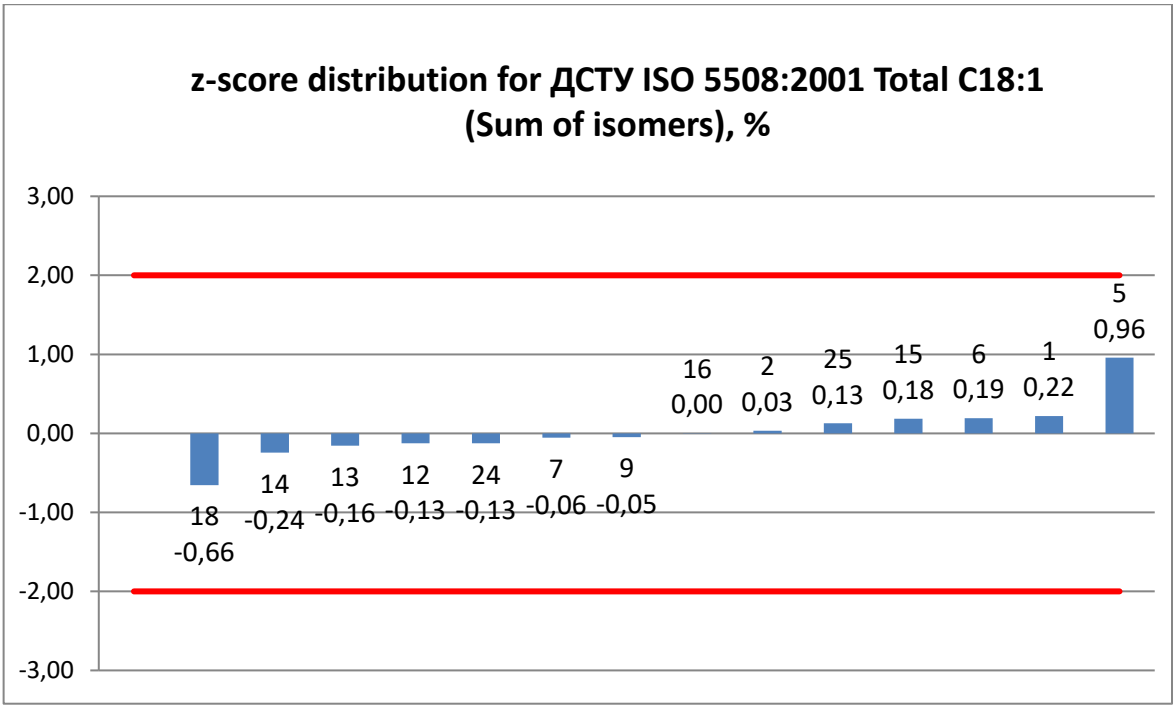
8.1.12. ДСТУ ISO 5508:2001 Stearic acid C18:0, %



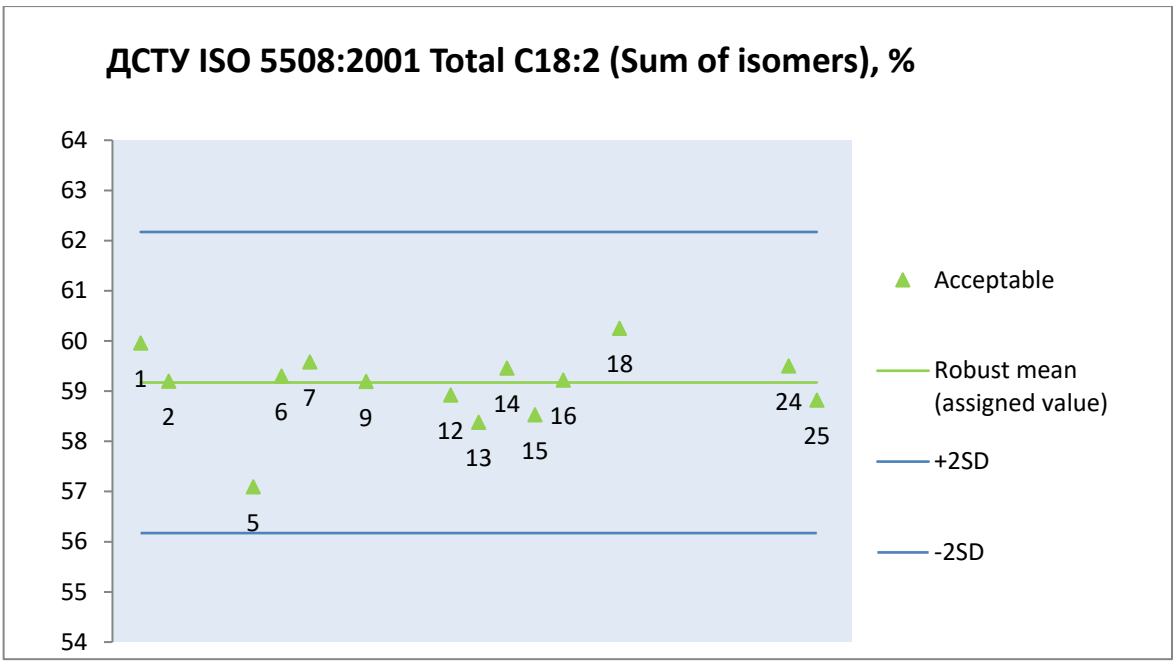


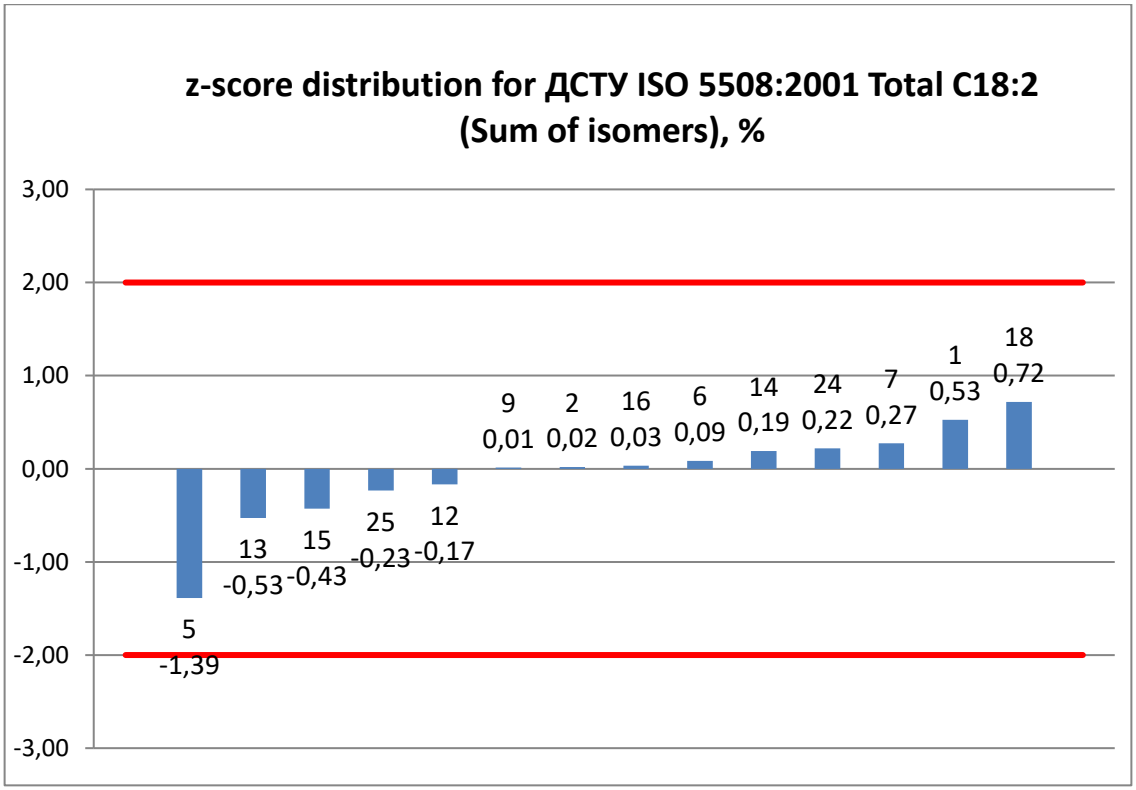
8.1.13. ДСТУ ISO 5508:2001 Total C18:1 (Sum of cis-isomers), %



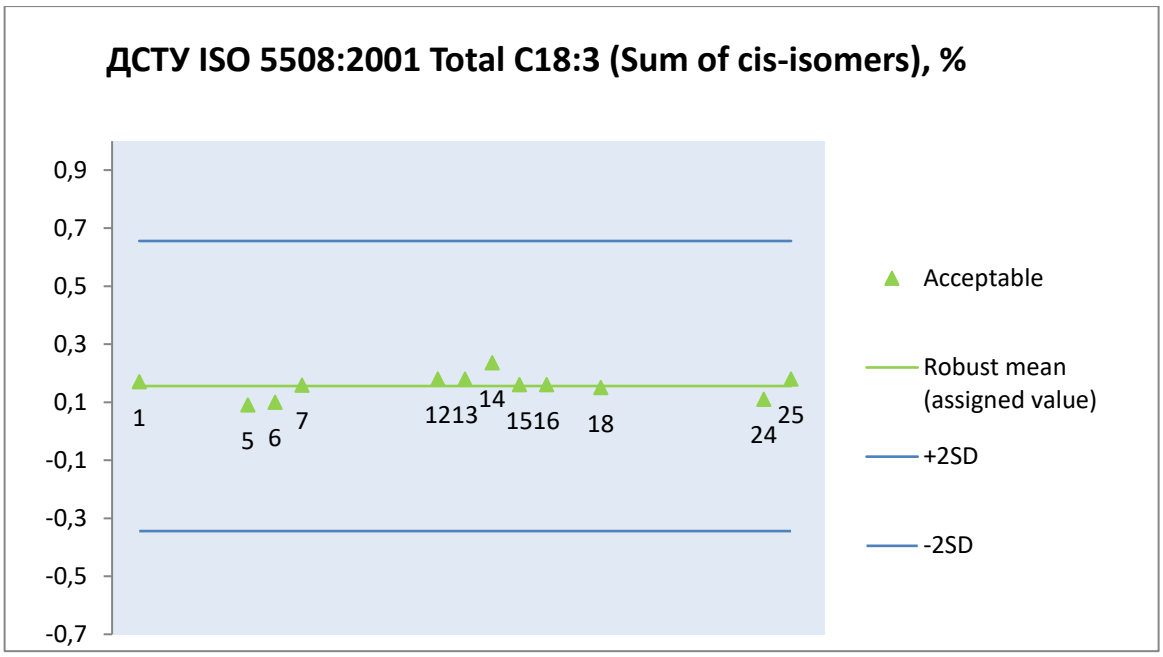


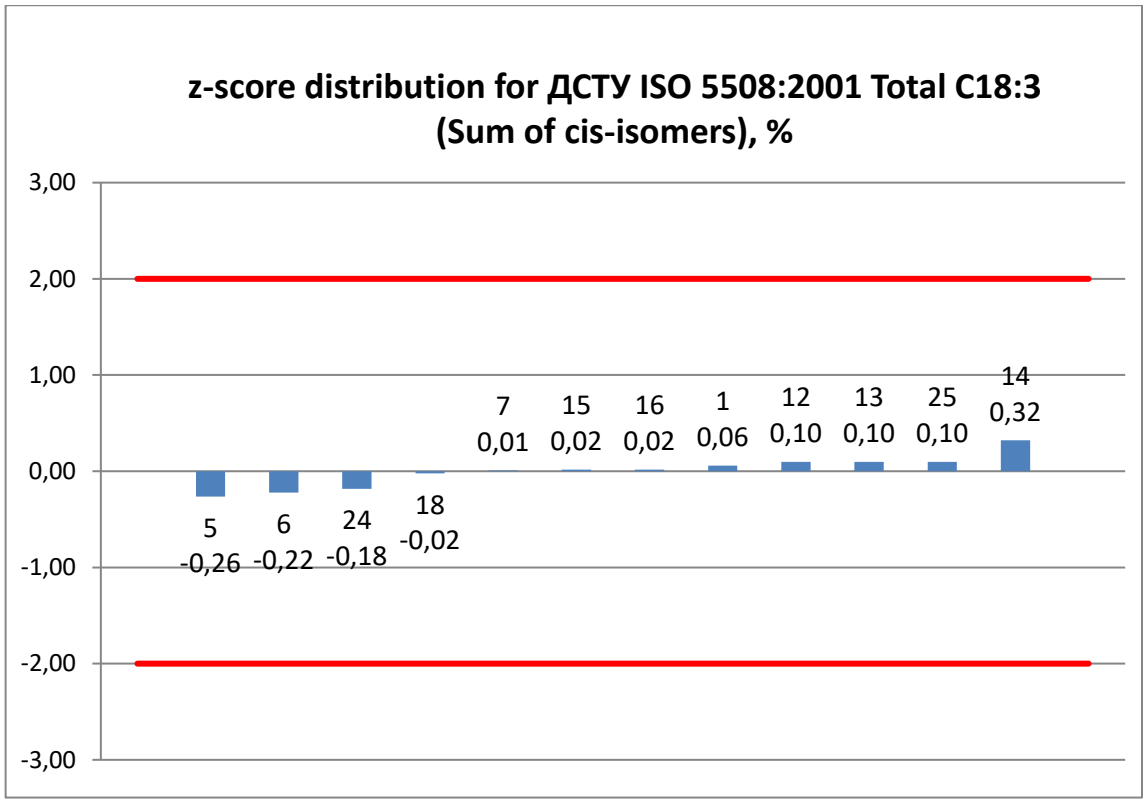
8.1.14. ДСТУ ISO 5508:2001 Total C18:2 (Sum of cis-isomers), %



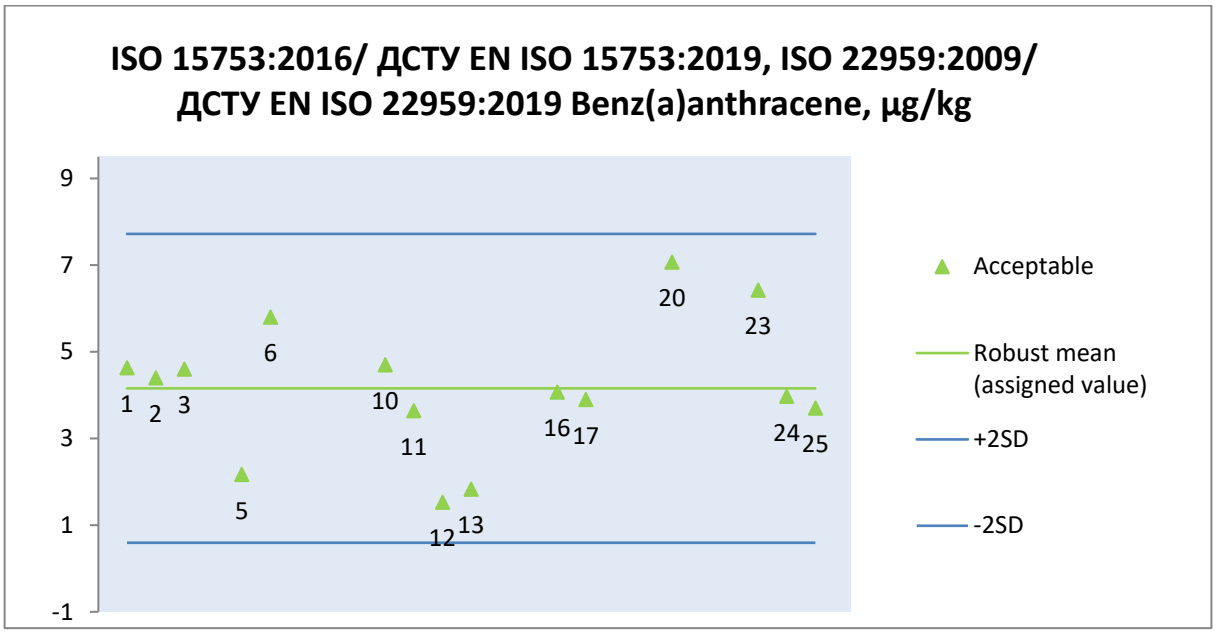


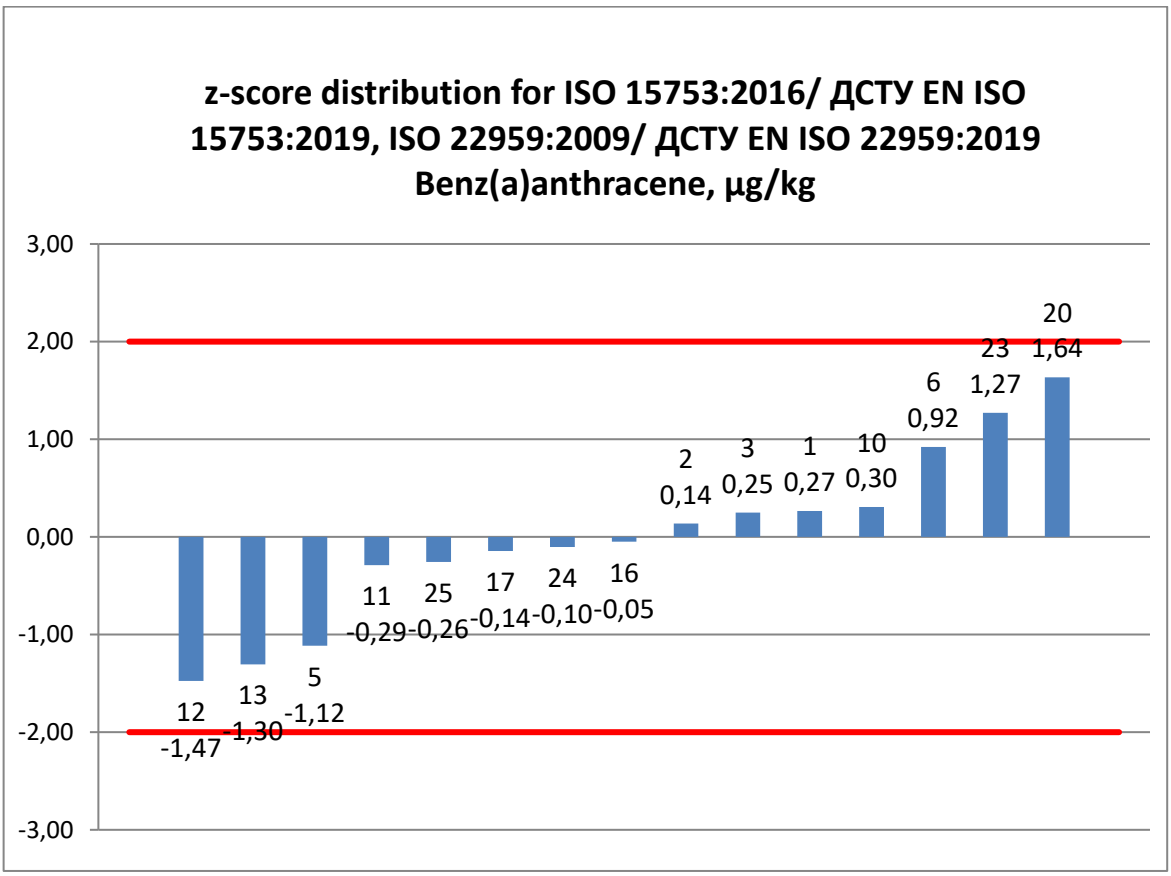
8.1.15. ДСТУ ISO 5508:2001 Total C18:3 (Sum of cis-isomers), %



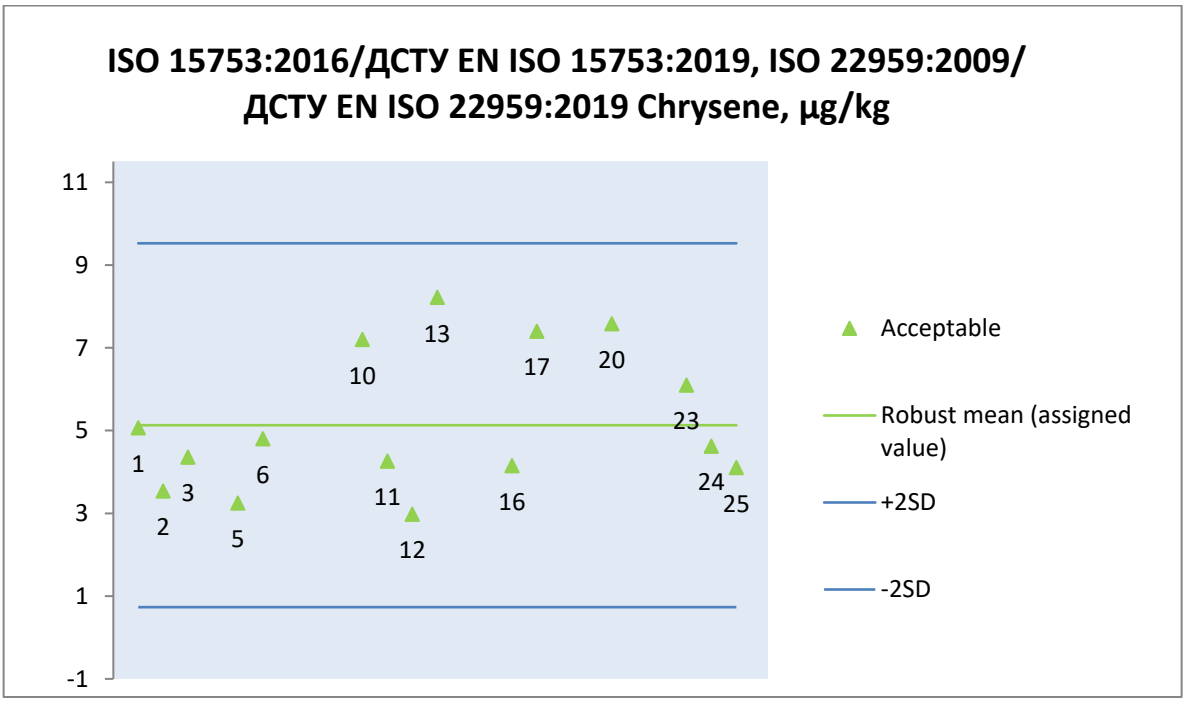


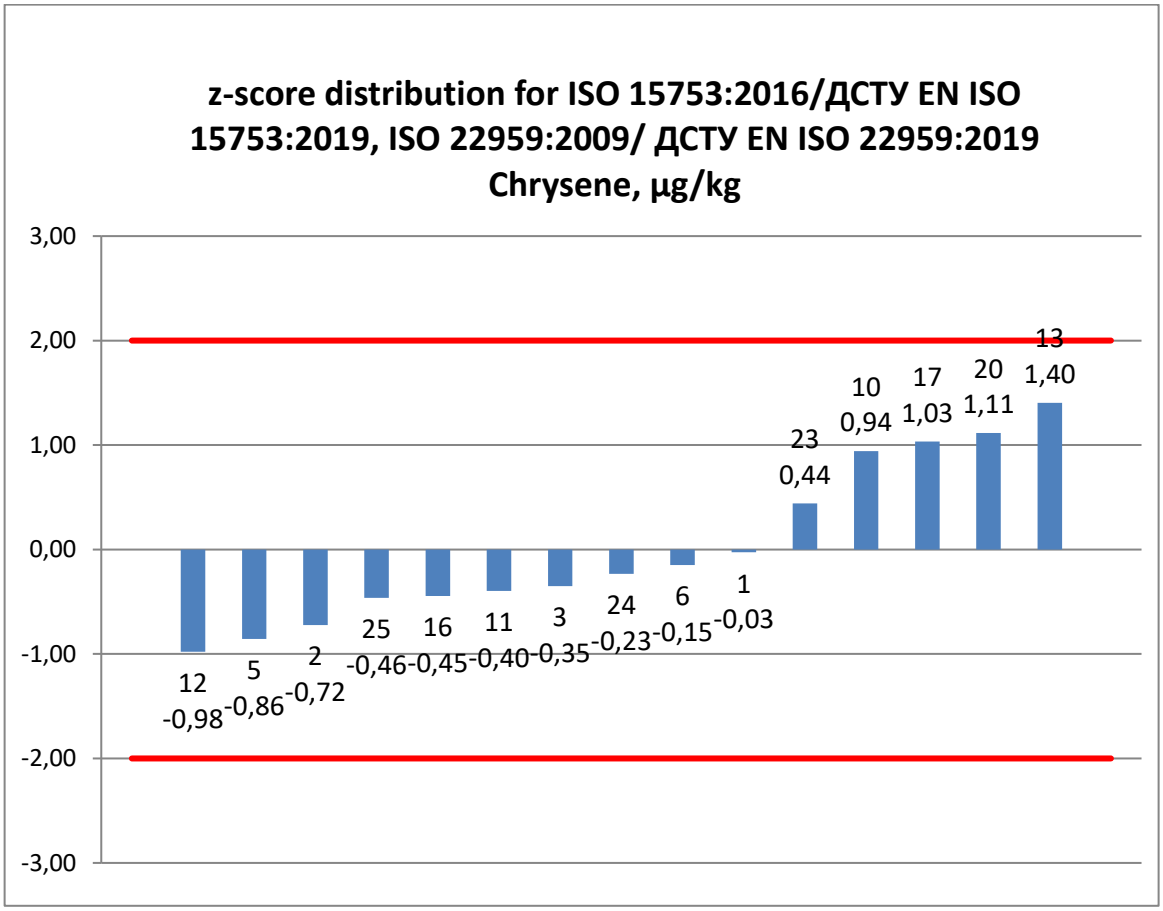
8.1.16. ISO 15753:2016/ ДСТУ EN ISO 15753:2019, ISO 22959:2009/ ДСТУ EN ISO 22959:2019 Benz(a)anthracene, µg/kg



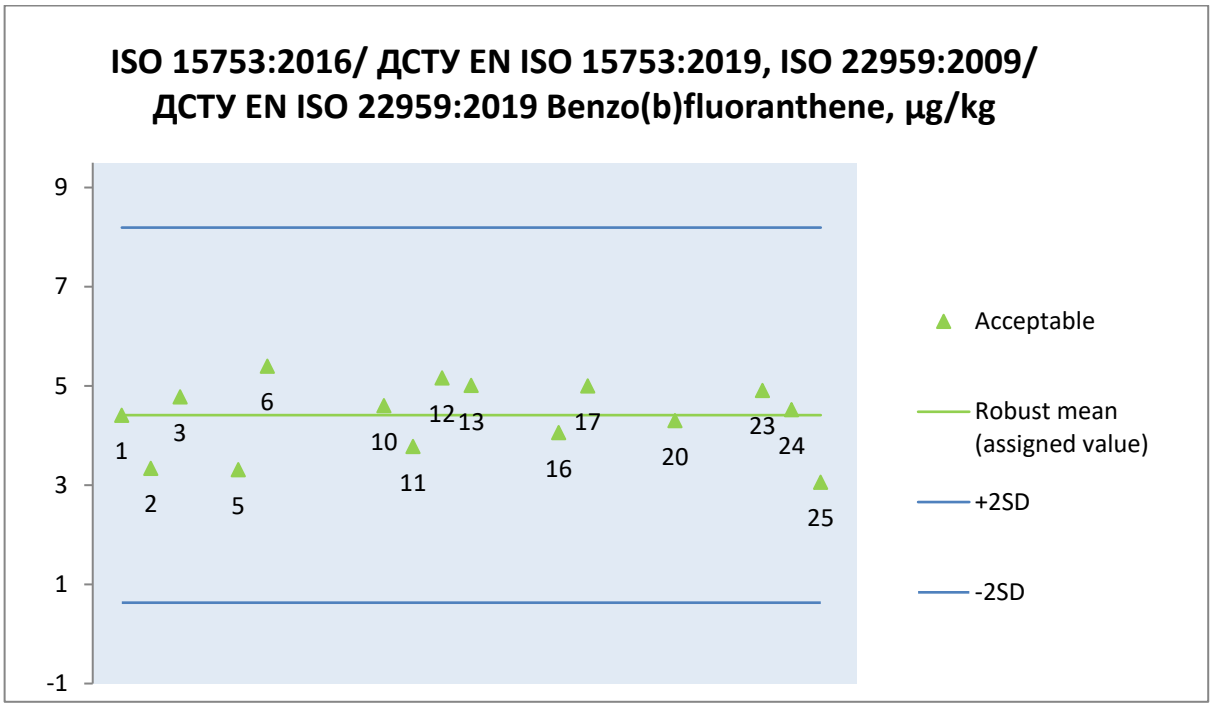


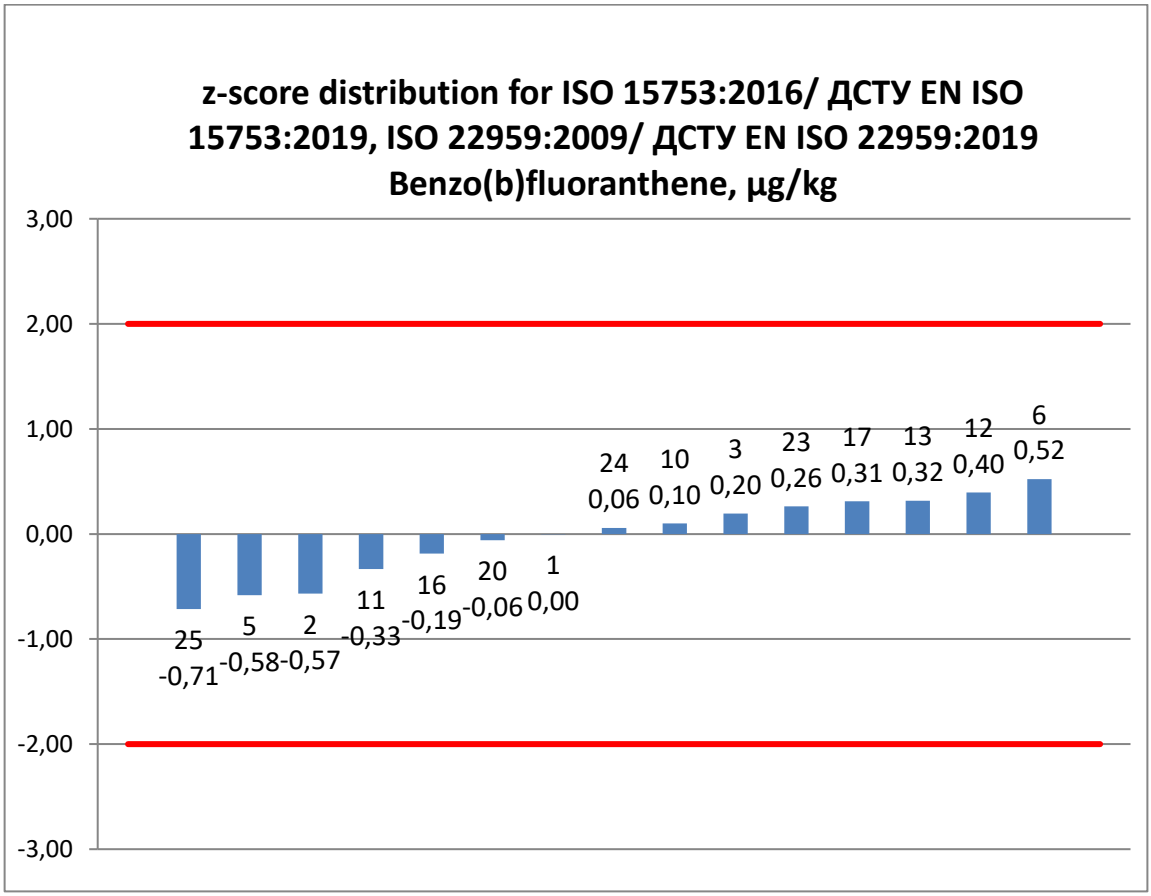
8.1.17. ISO 15753:2016/ ДСТУ EN ISO 15753:2019, ISO 22959:2009/ ДСТУ EN ISO 22959:2019 Chrysene, µg/kg



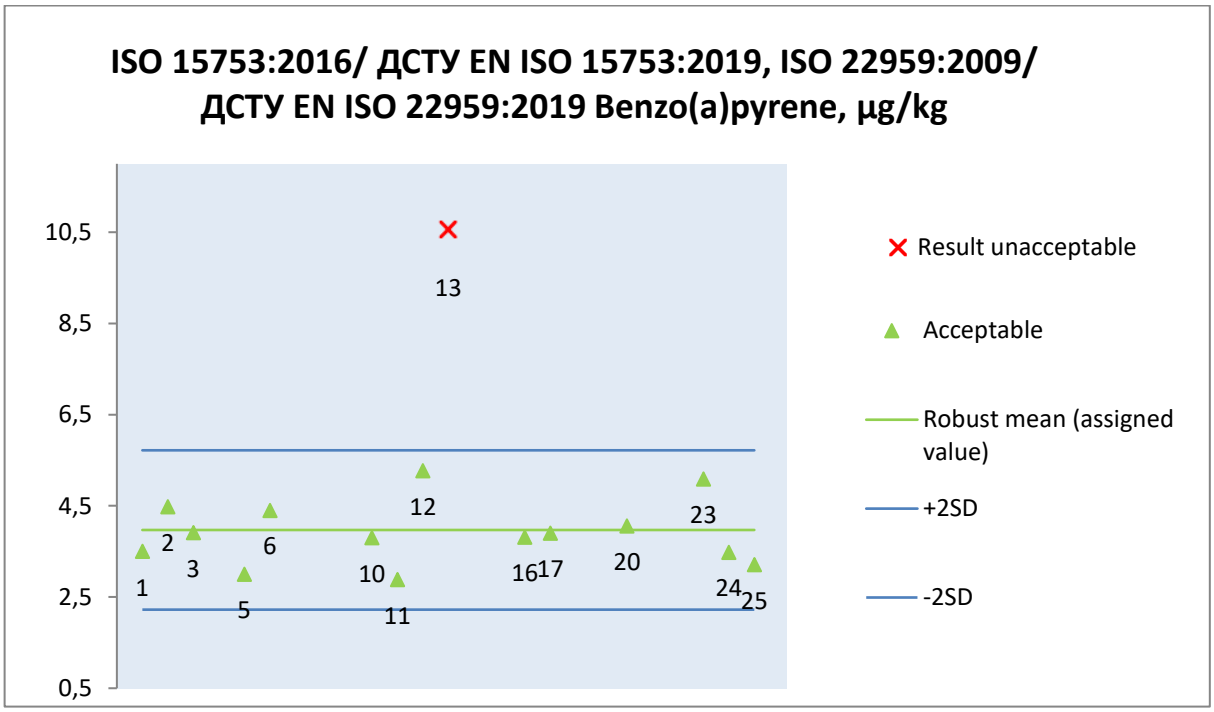


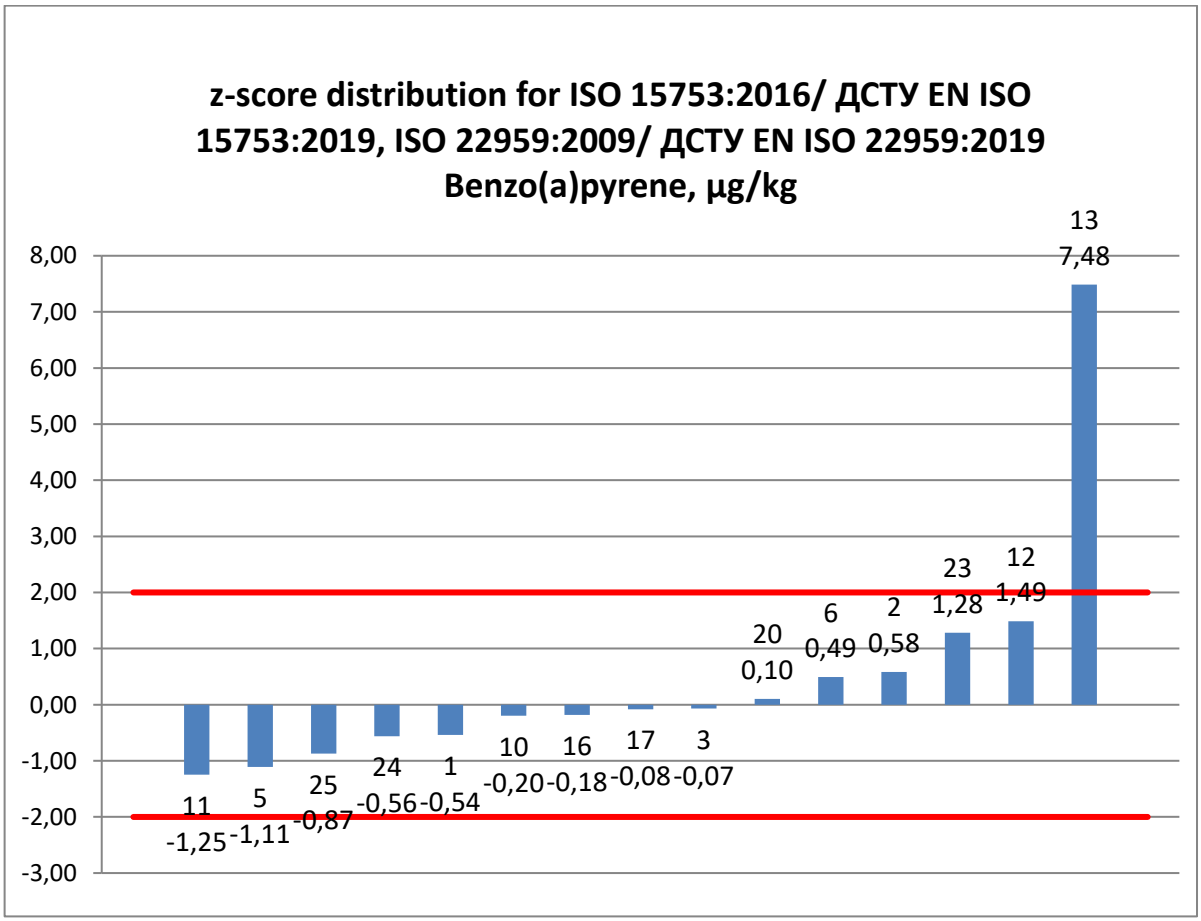
8.1.18. ISO 15753:2016/ ДСТУ EN ISO 15753:2019, ISO 22959:2009/ ДСТУ EN ISO 22959:2019 Benzo(b)fluoranthene, µg/kg



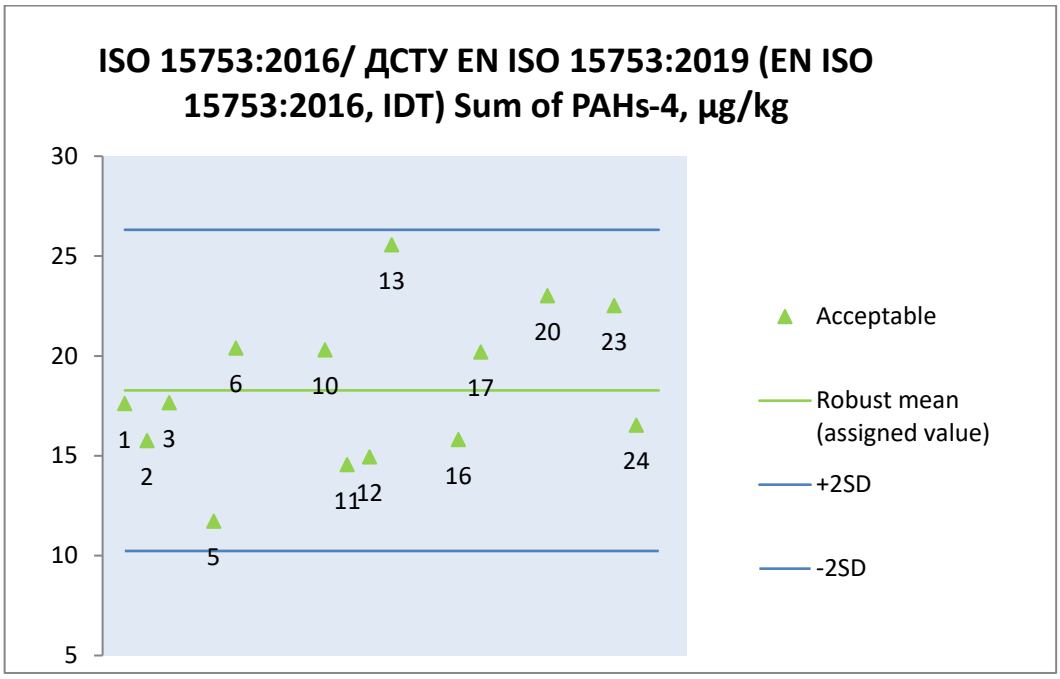


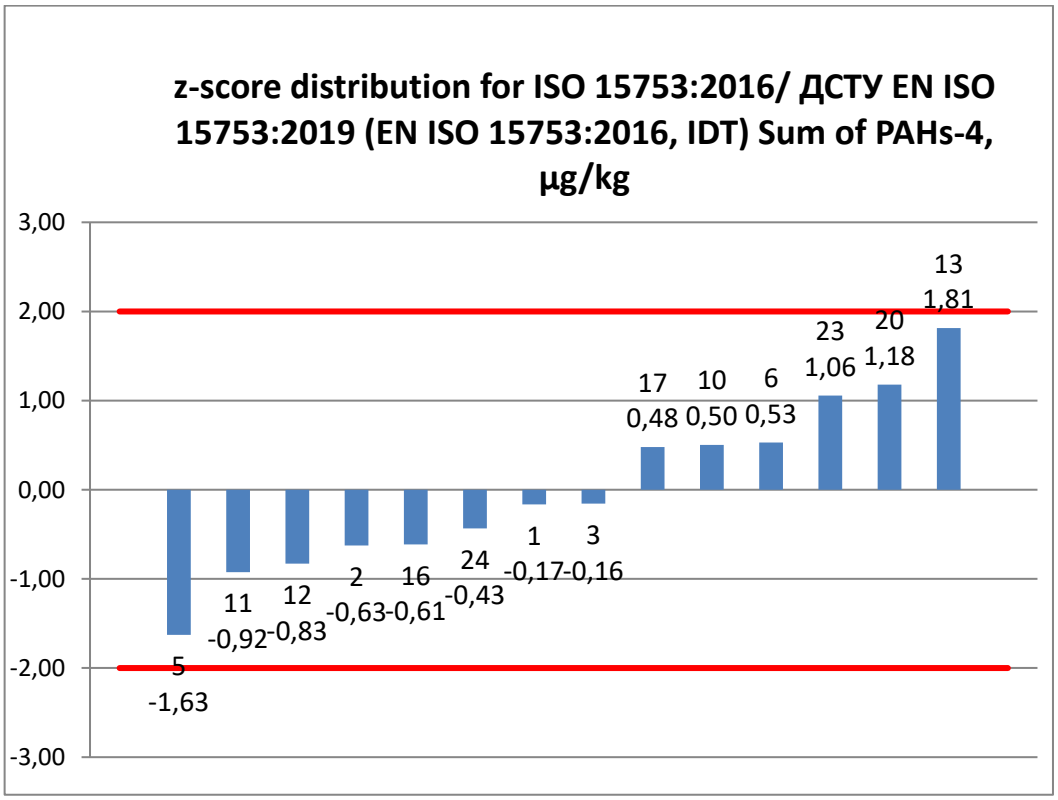
8.1.19. ISO 15753:2016/ ДСТУ EN ISO 15753:2019, ISO 22959:2009/ ДСТУ EN ISO 22959:2019 Benzo(a)pyrene, µg/kg



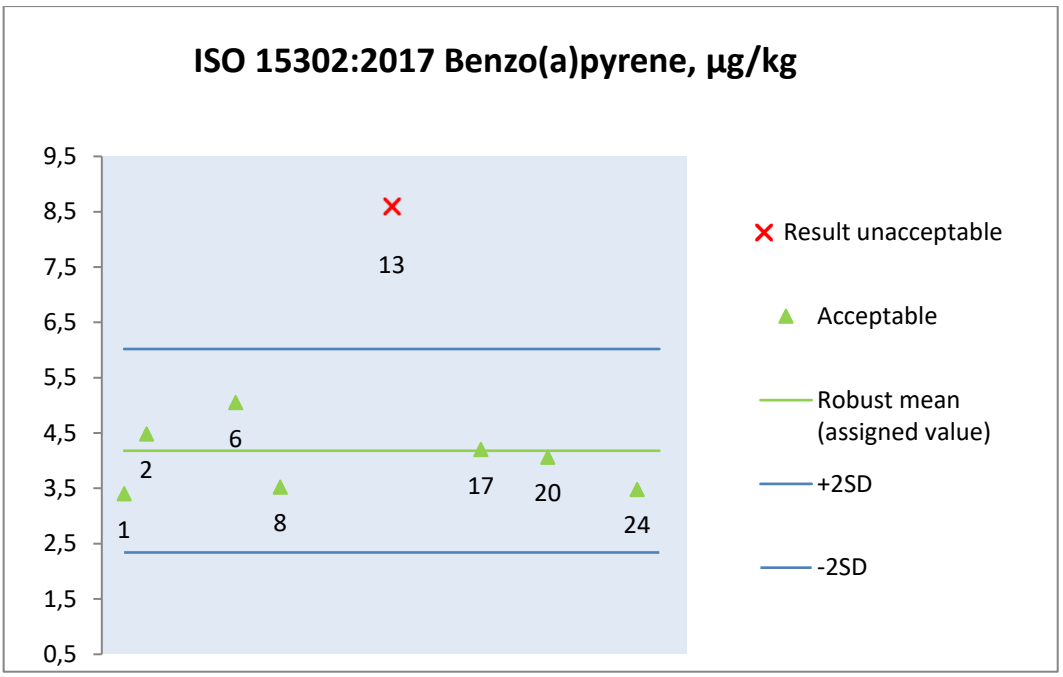


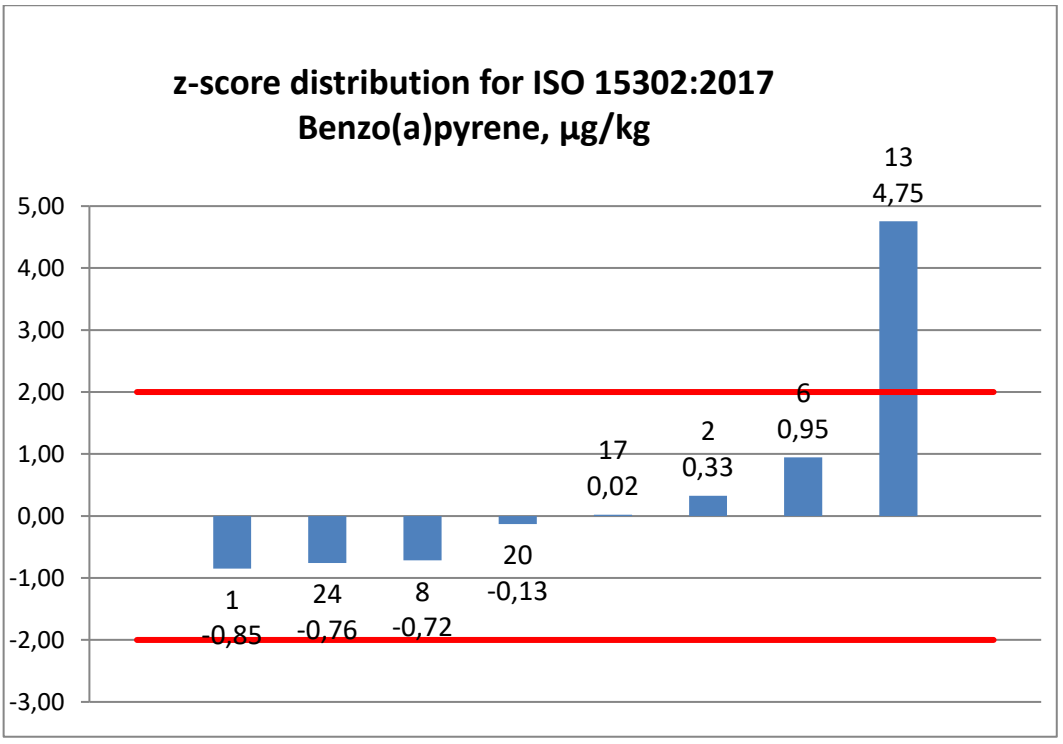
8.1.20. ISO 15753:2016/ ДСТУ EN ISO 15753:2019 (EN ISO 15753:2016, IDT) Sum of PAHs-4, µg/kg





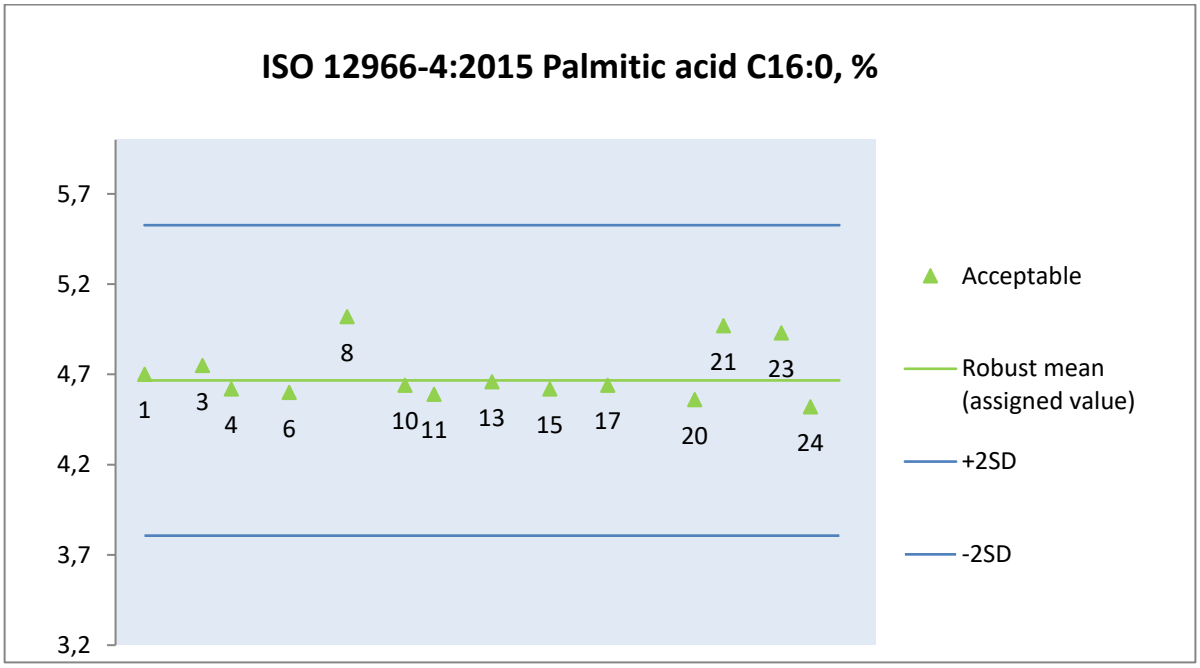
8.1.21. ISO 15302:2017 Benzo(a)pyrene, µg/kg

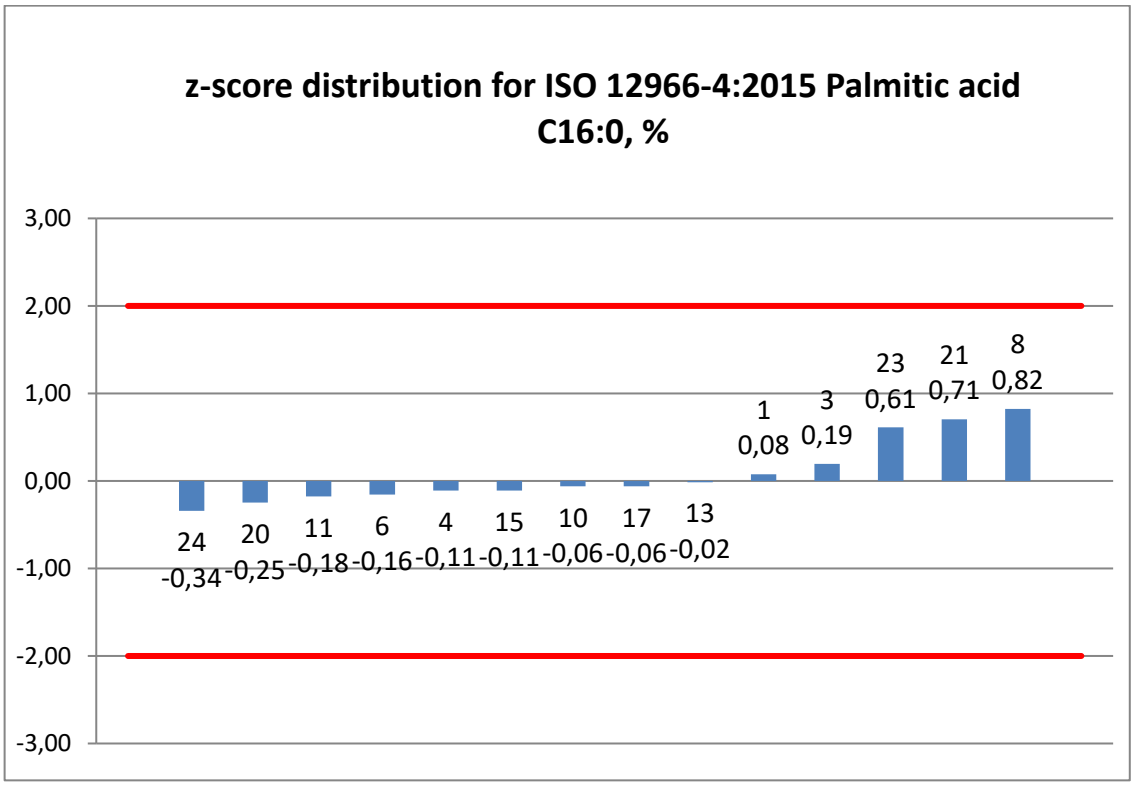




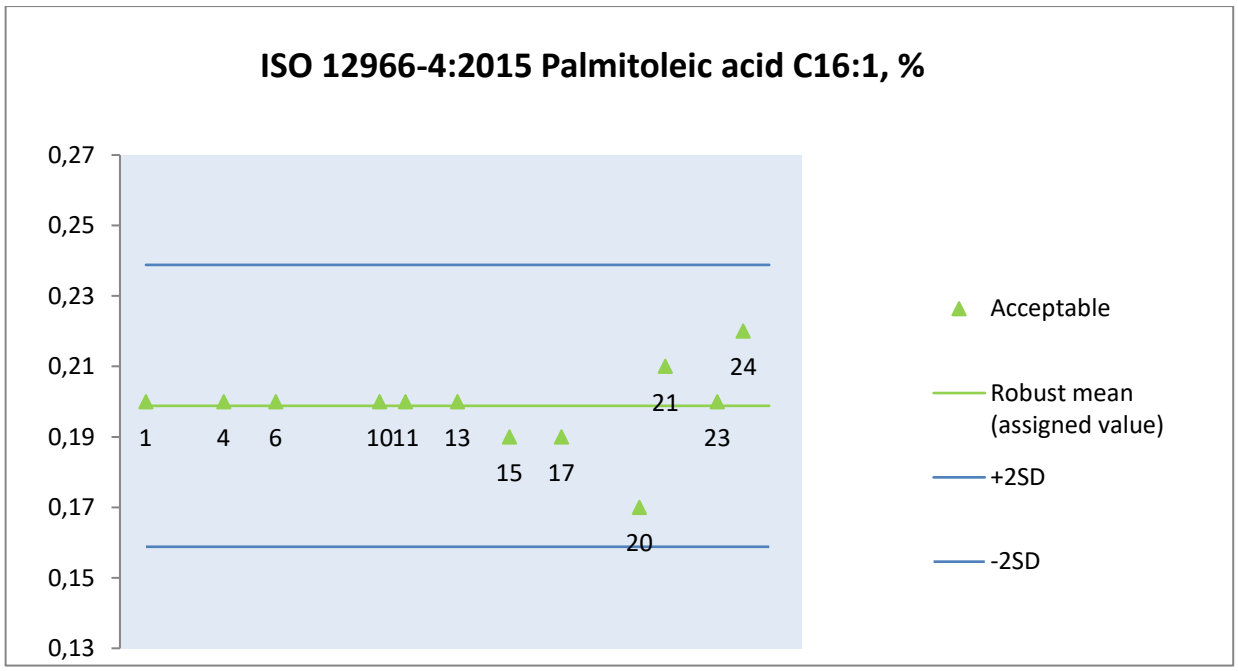
8.2. Sample B

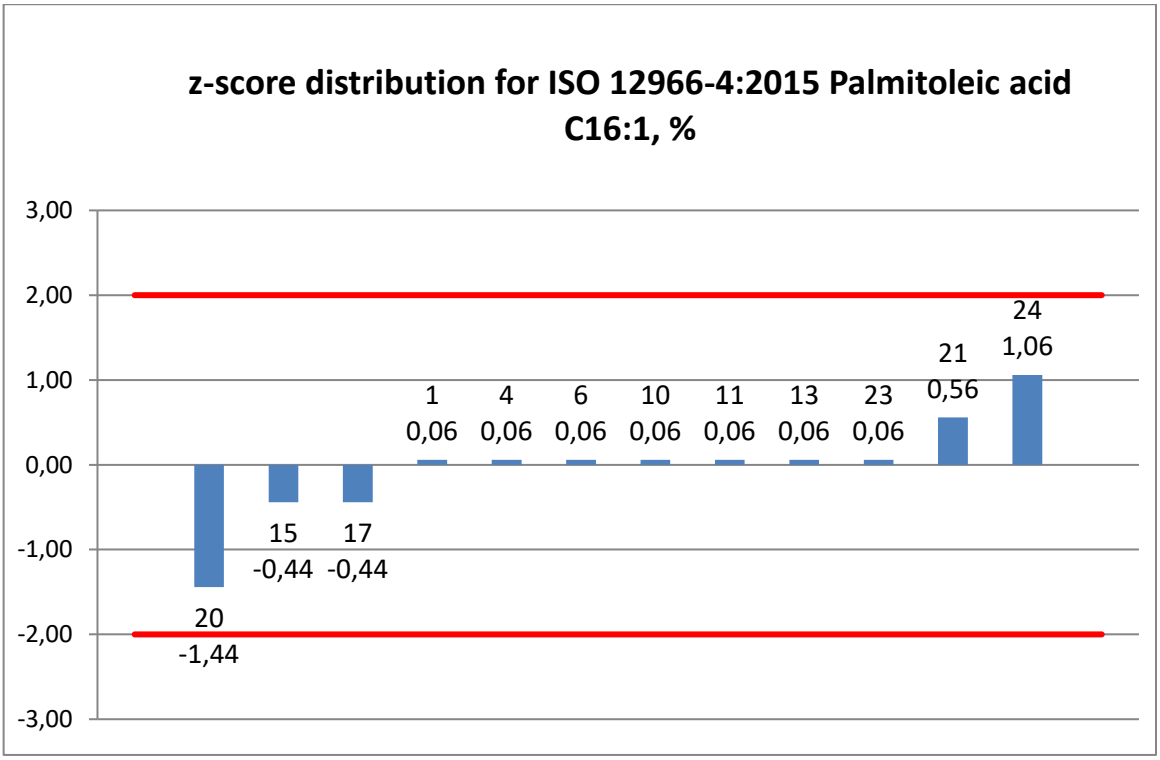
8.2.1. ISO 12966-4:2015 Palmitic acid C16:0, %



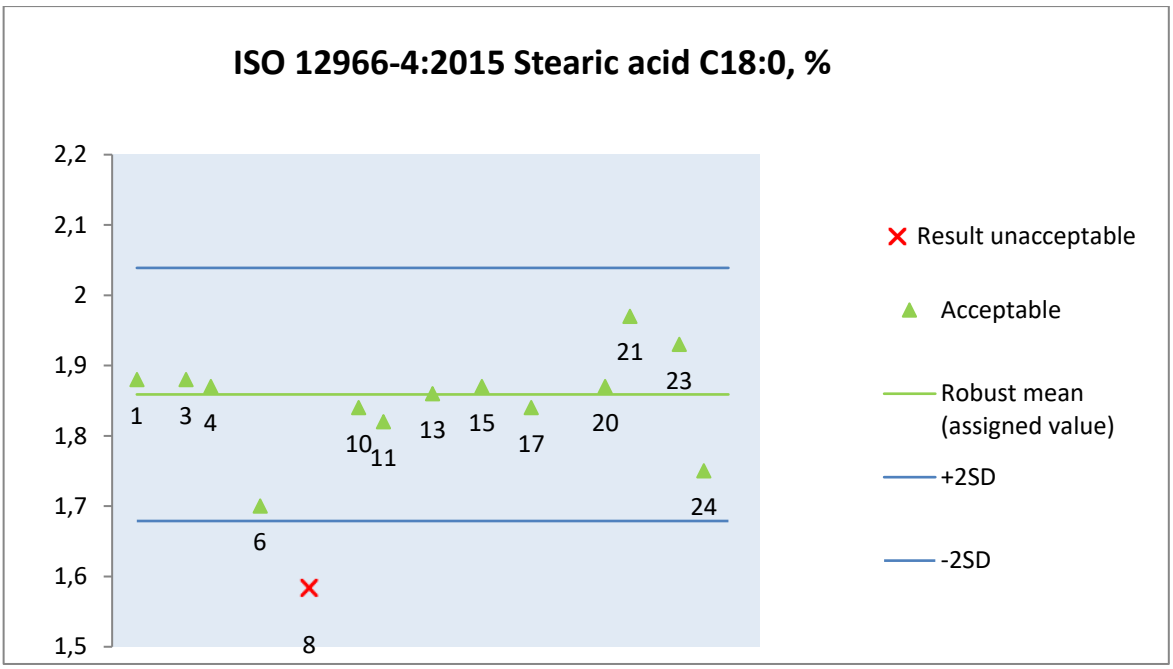


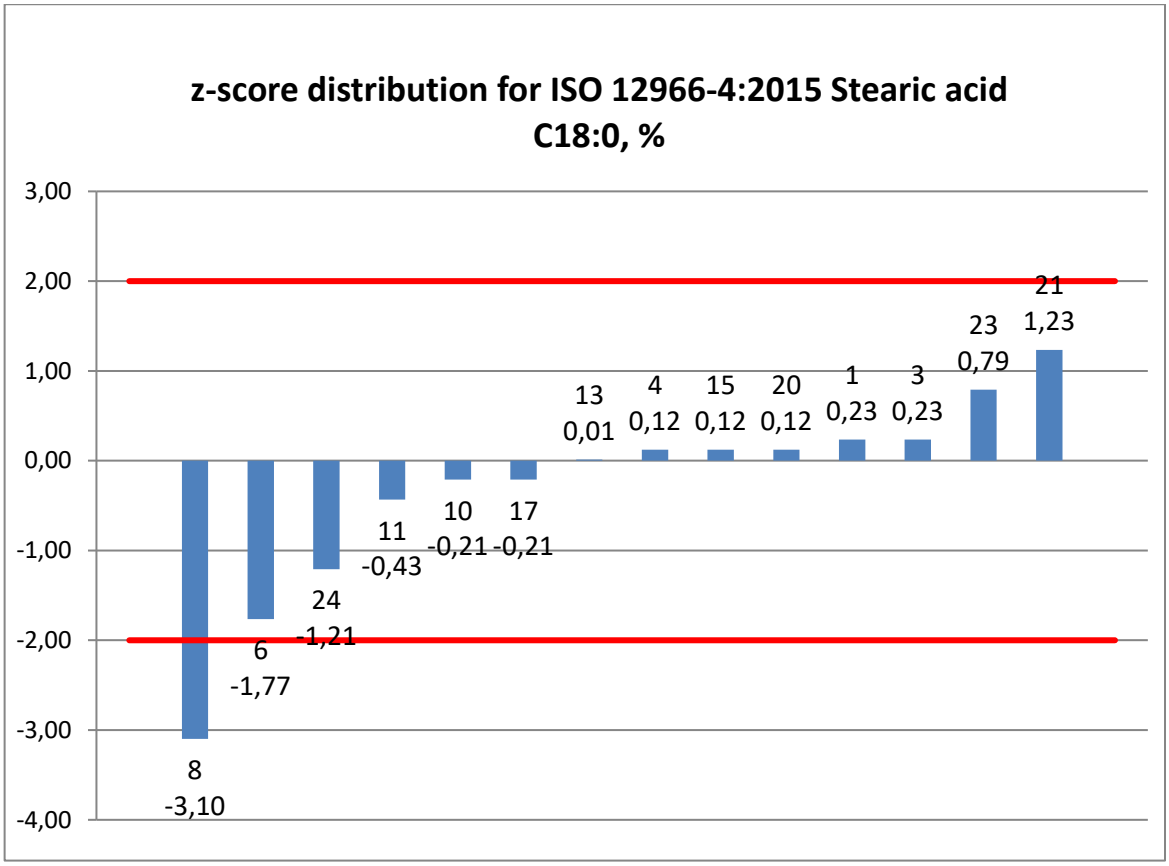
8.2.2. ISO 12966-4:2015 Palmitoleic acid C16:1, %



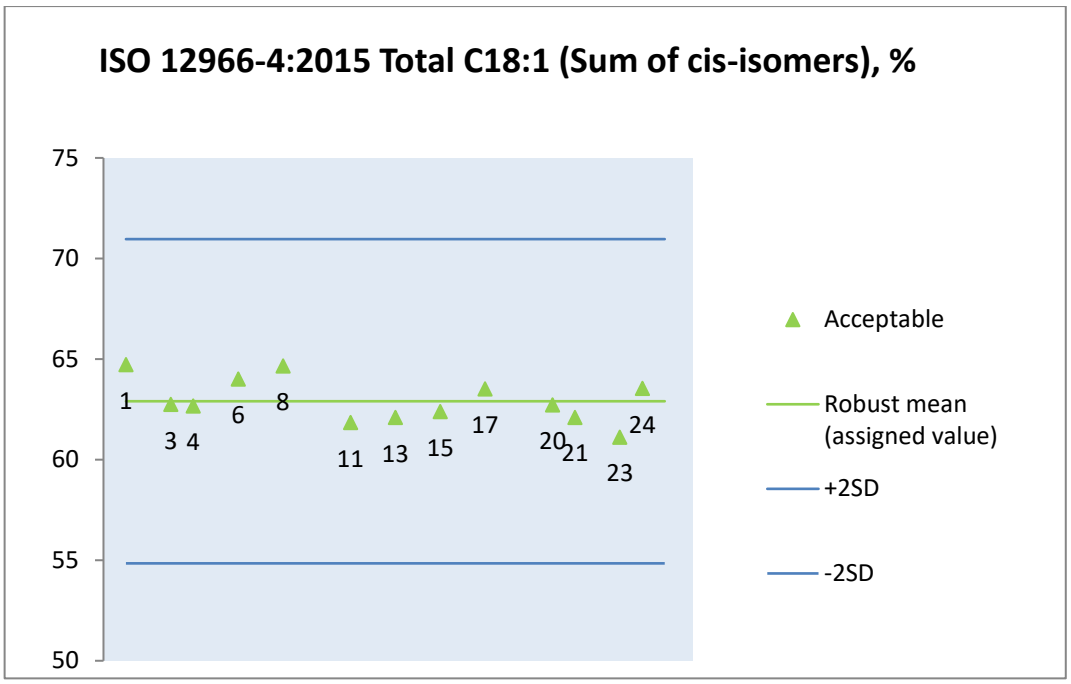


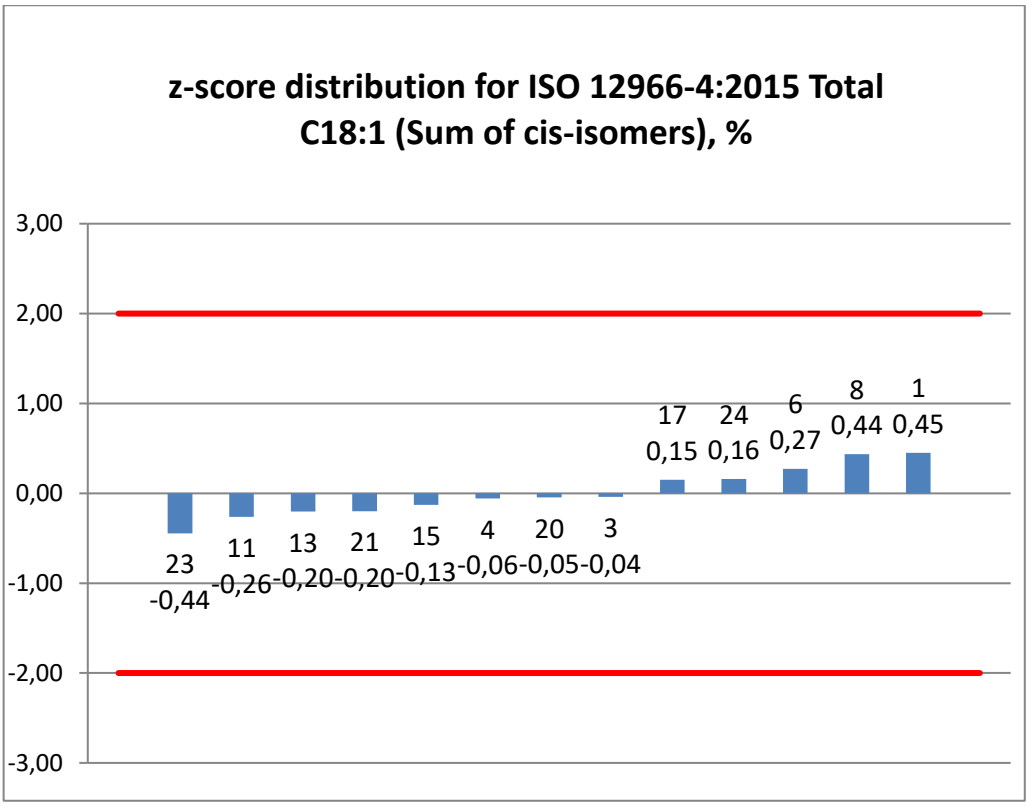
8.2.3. ISO 12966-4:2015 Stearic acid C18:0, %



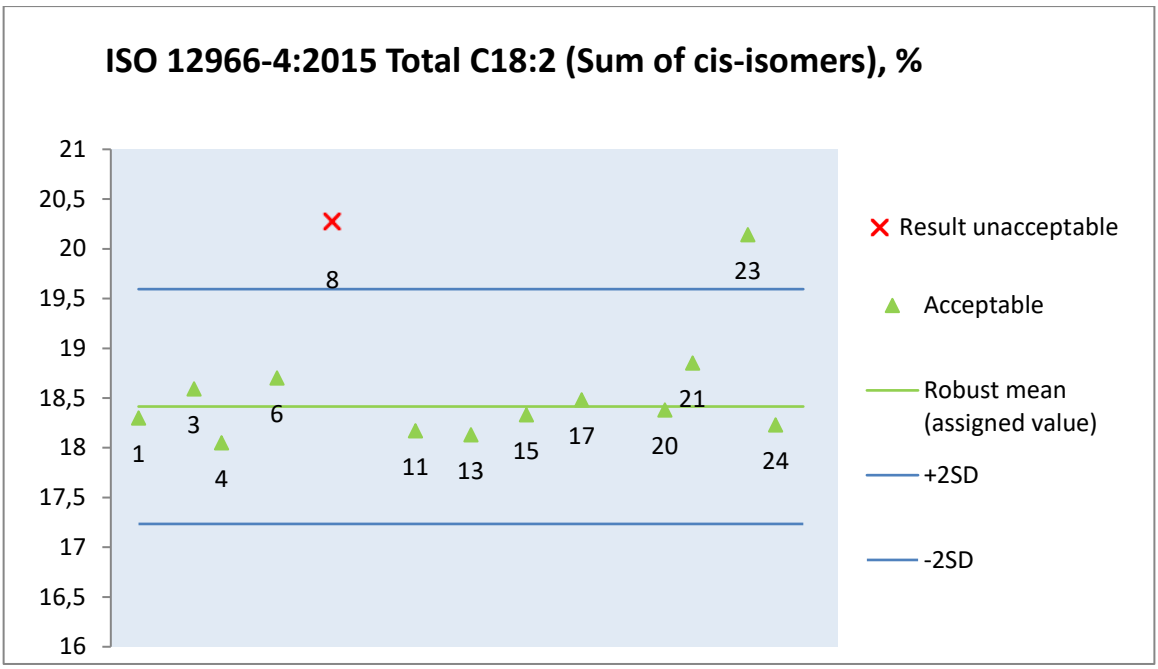


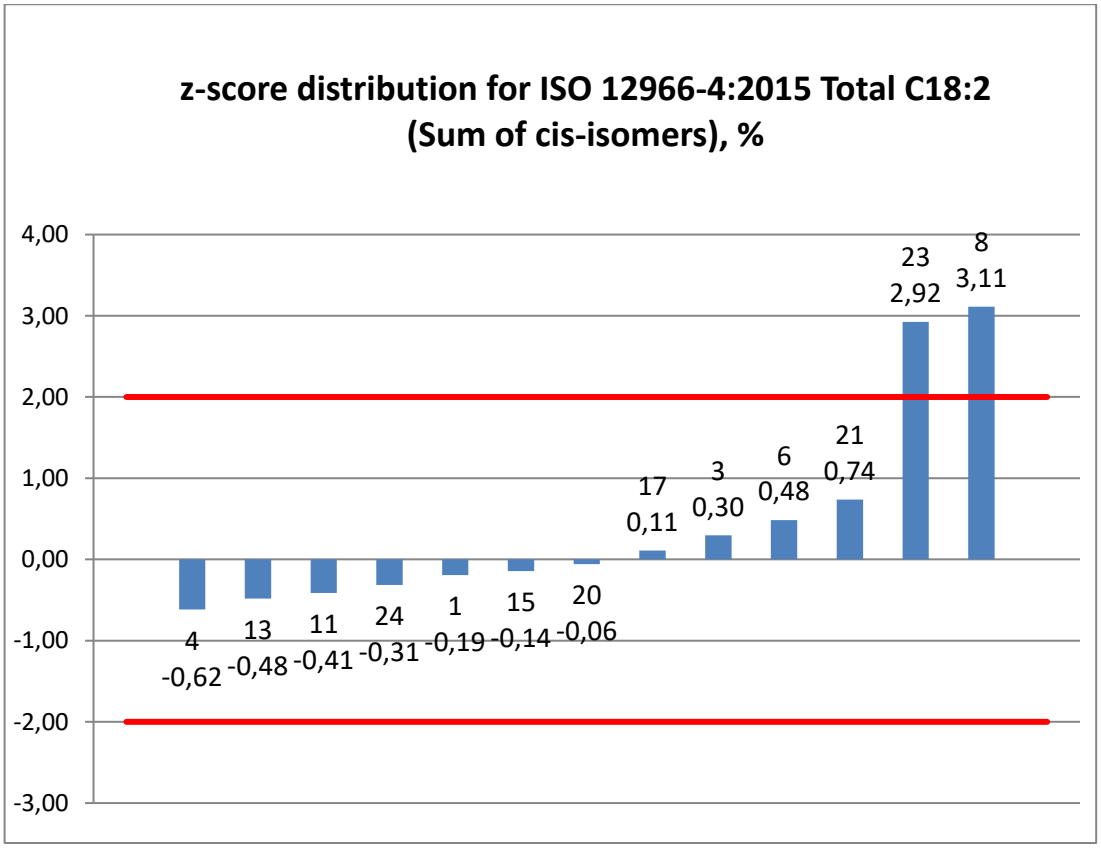
8.2.4. ISO 12966-4:2015 Total C18:1 (Sum of cis-isomers), %



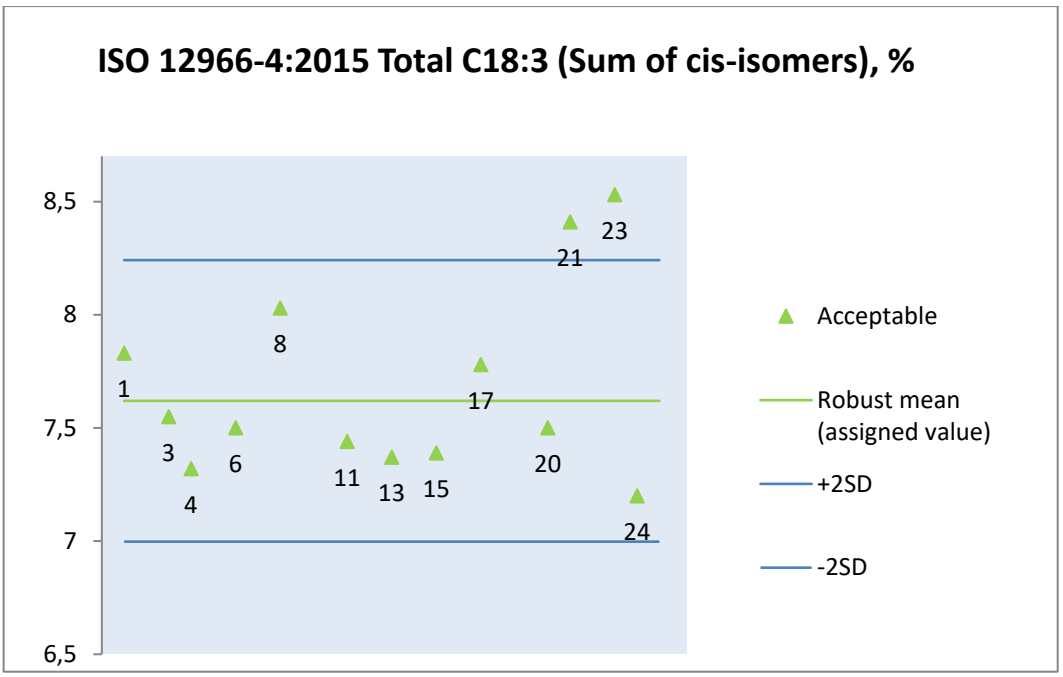


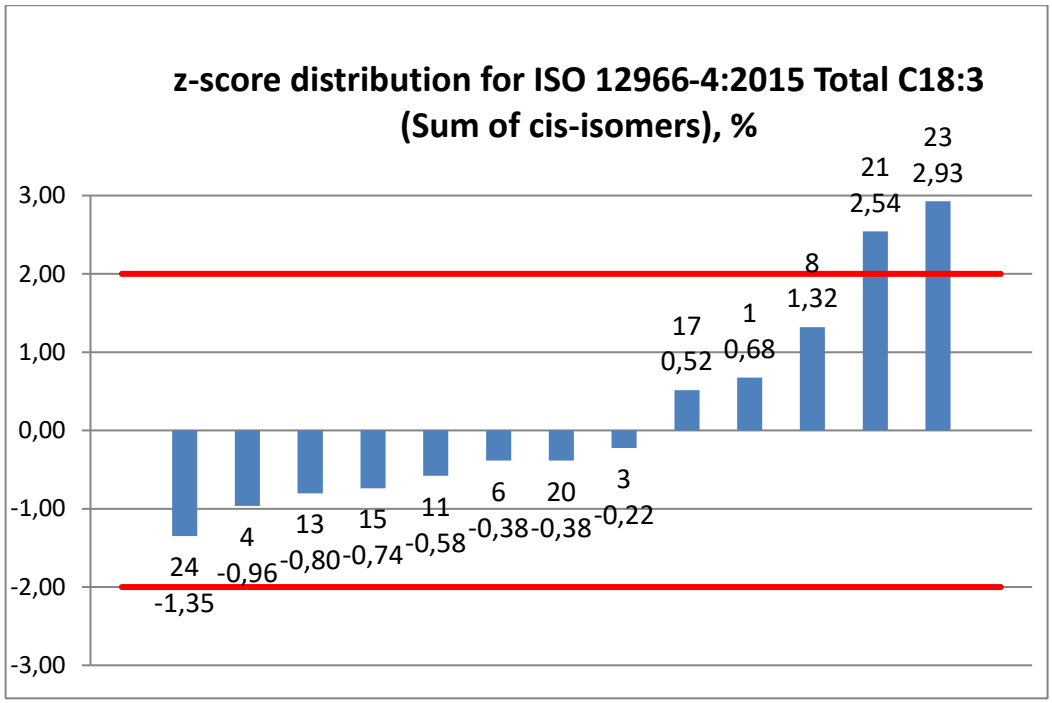
8.2.5. ISO 12966-4:2015 Total C18:2 (Sum of cis -isomers), %



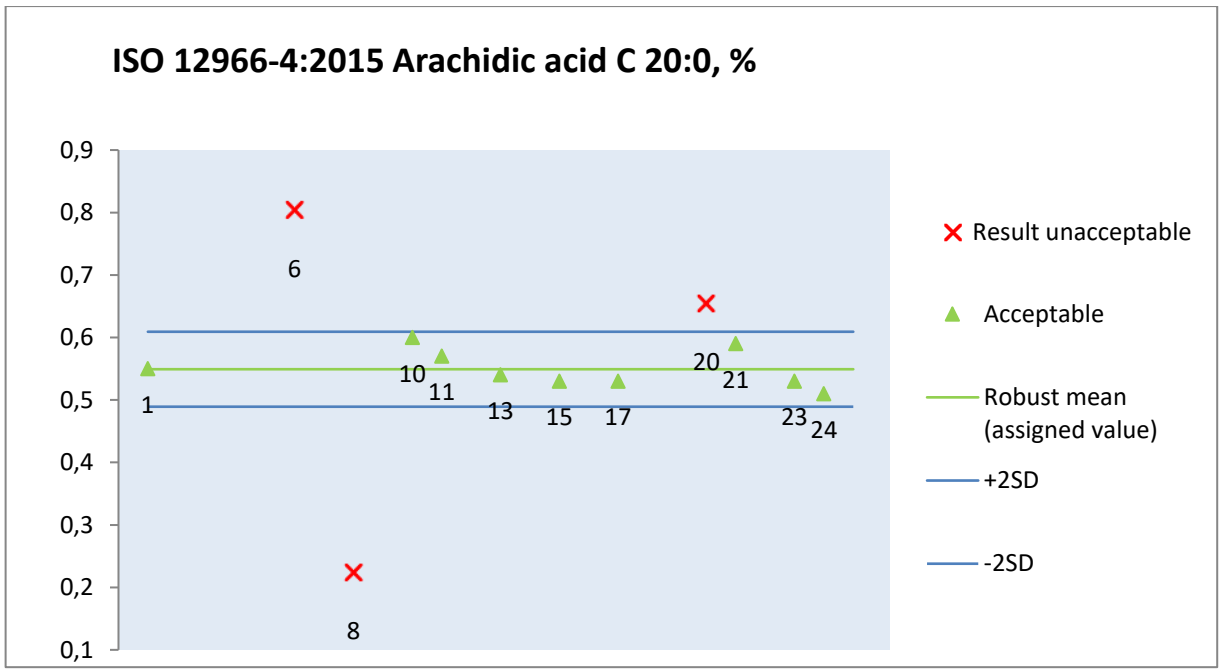


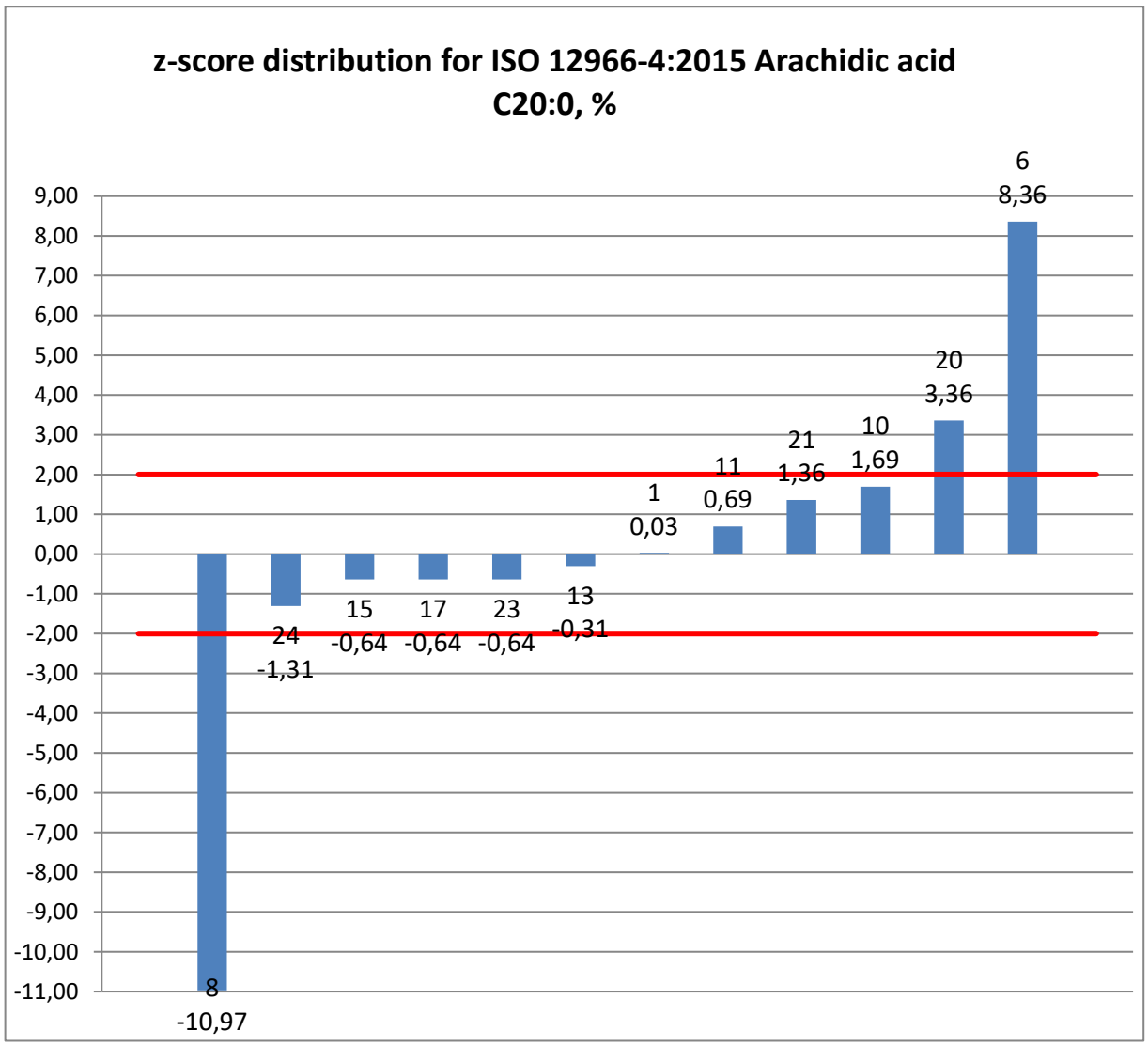
8.2.6. ISO 12966-4:2015 Total C18:3 (Sum of cis-isomers), %



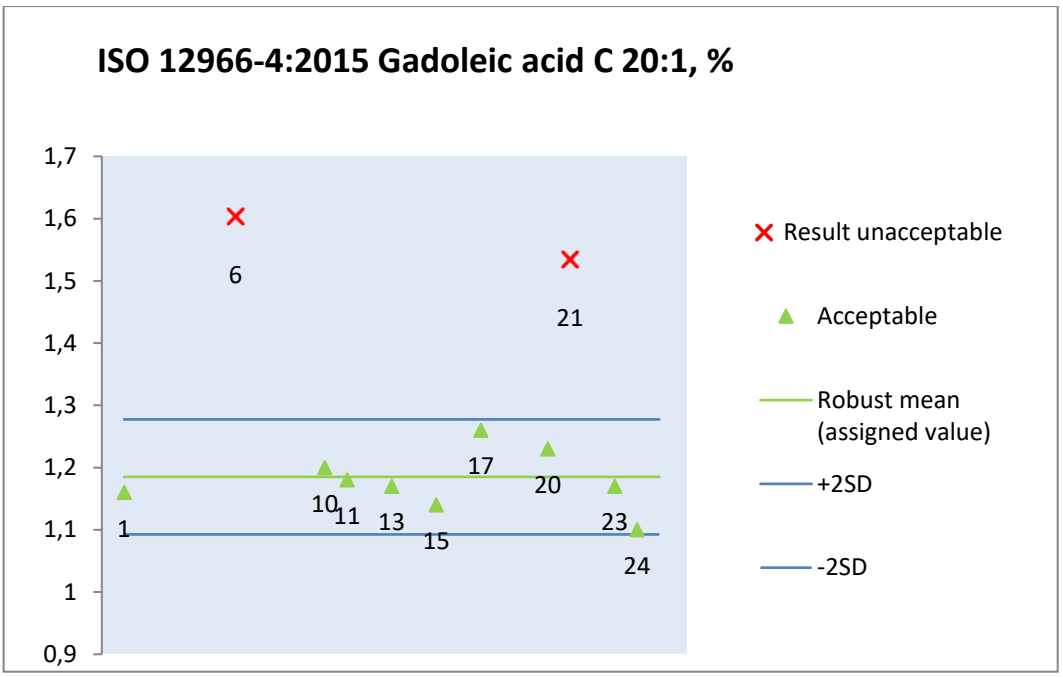


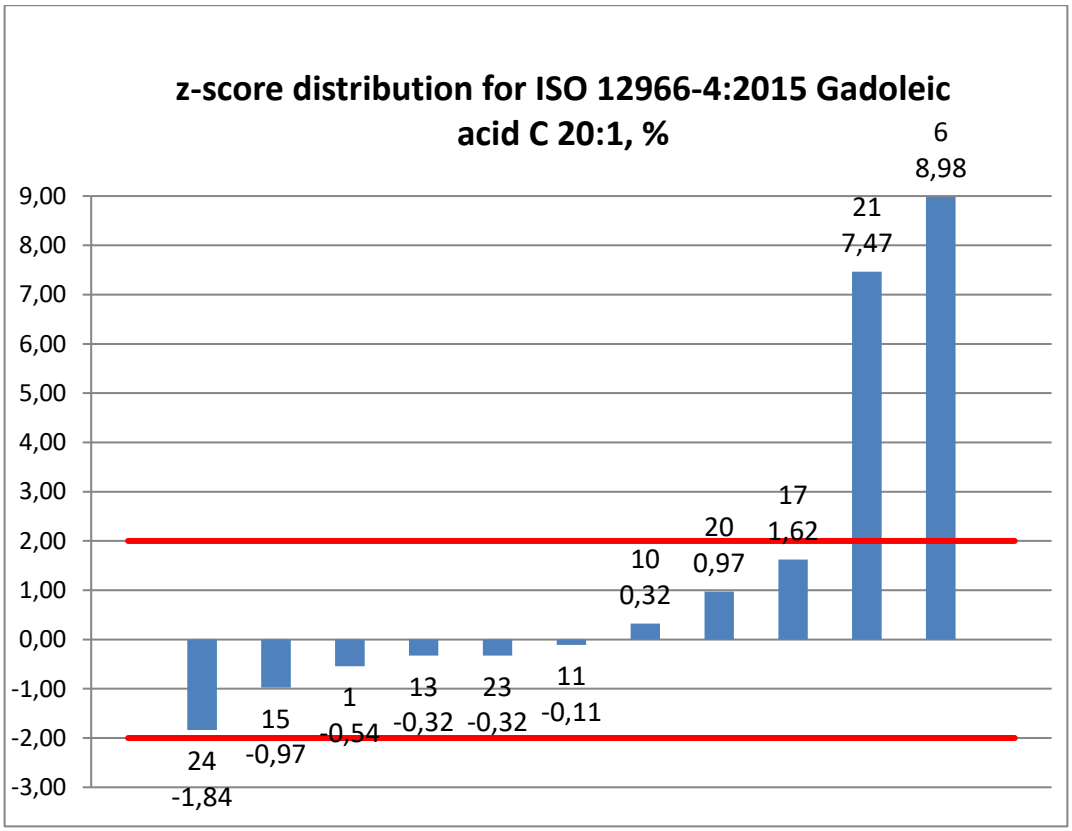
8.2.7. ISO 12966-4:2015 Arachidic acid C 20:0, %



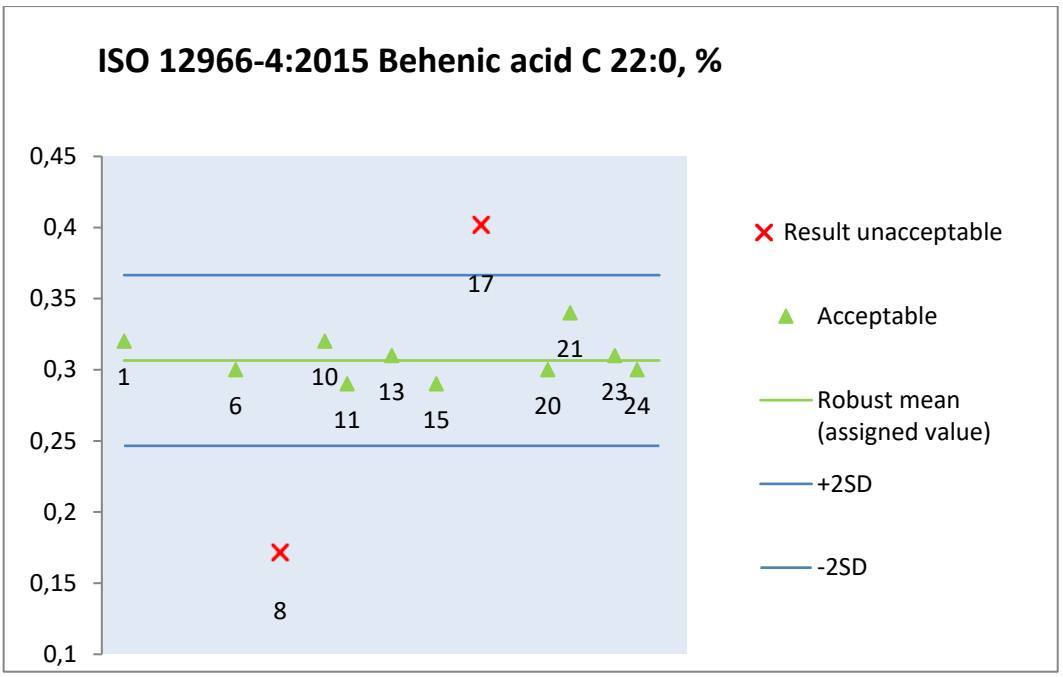


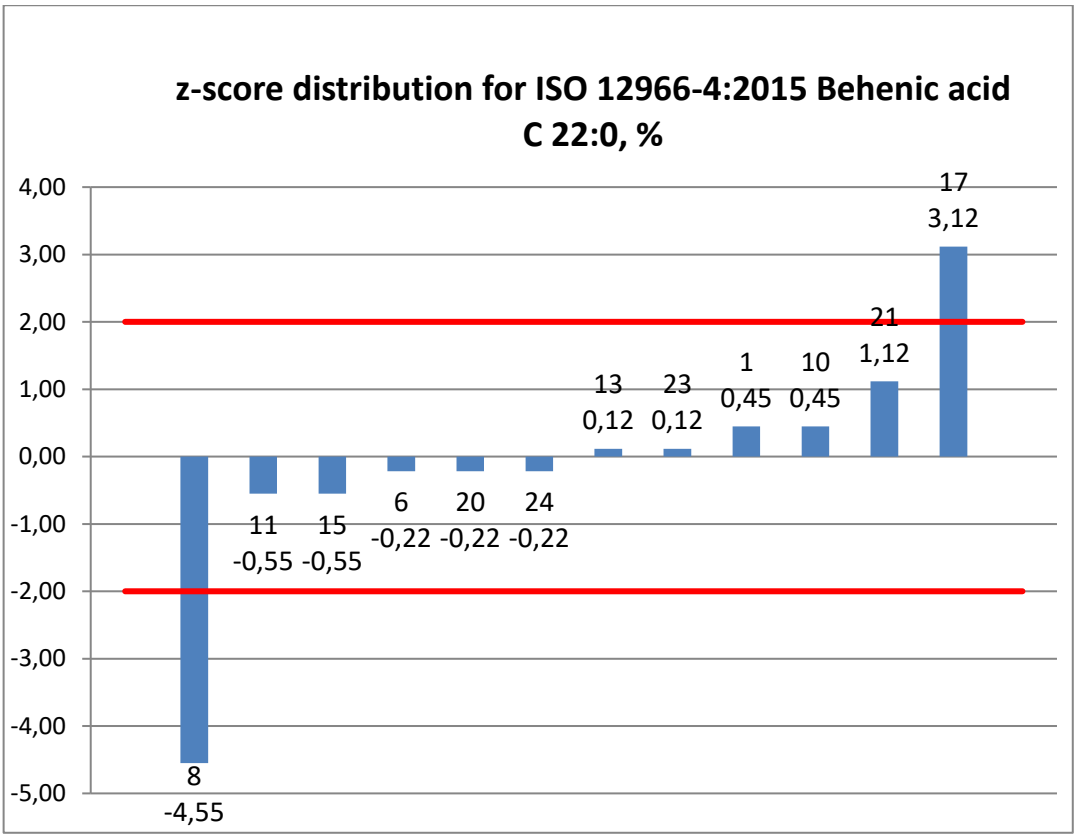
8.2.8. ISO 12966-4:2015 Gadoleic acid C 20:1, %



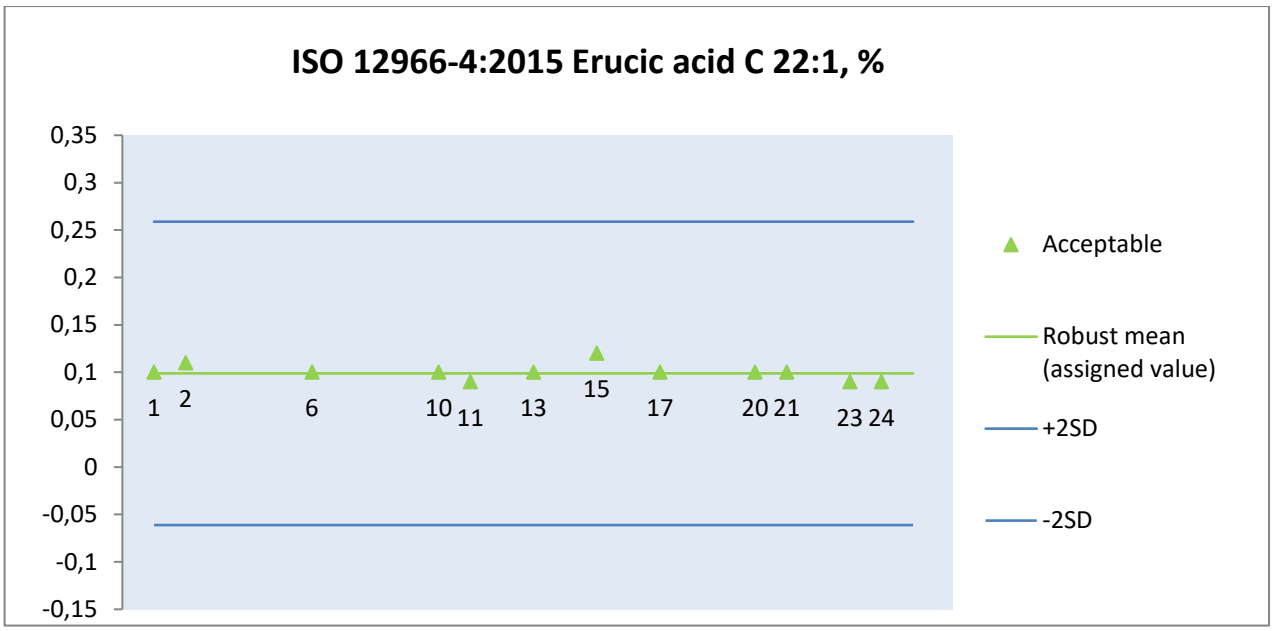


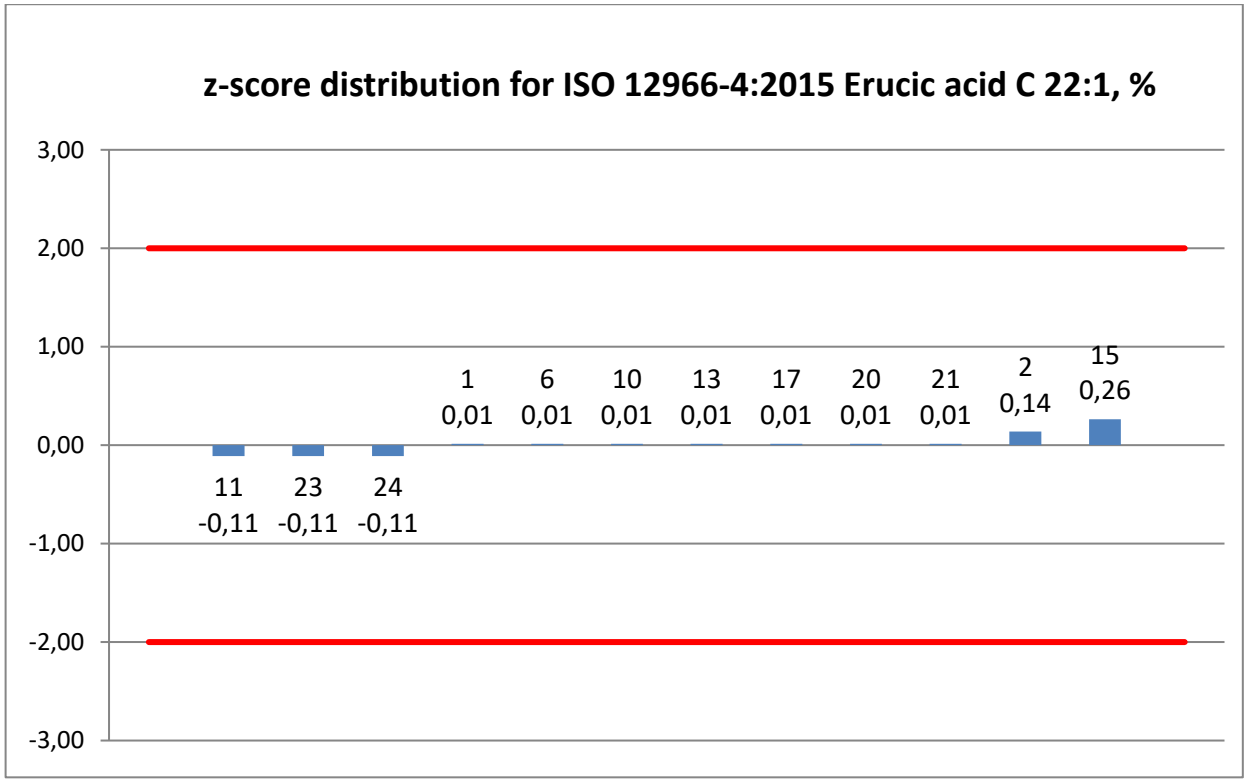
8.2.9. ISO 12966-4:2015 Behenic acid C 22:0, %



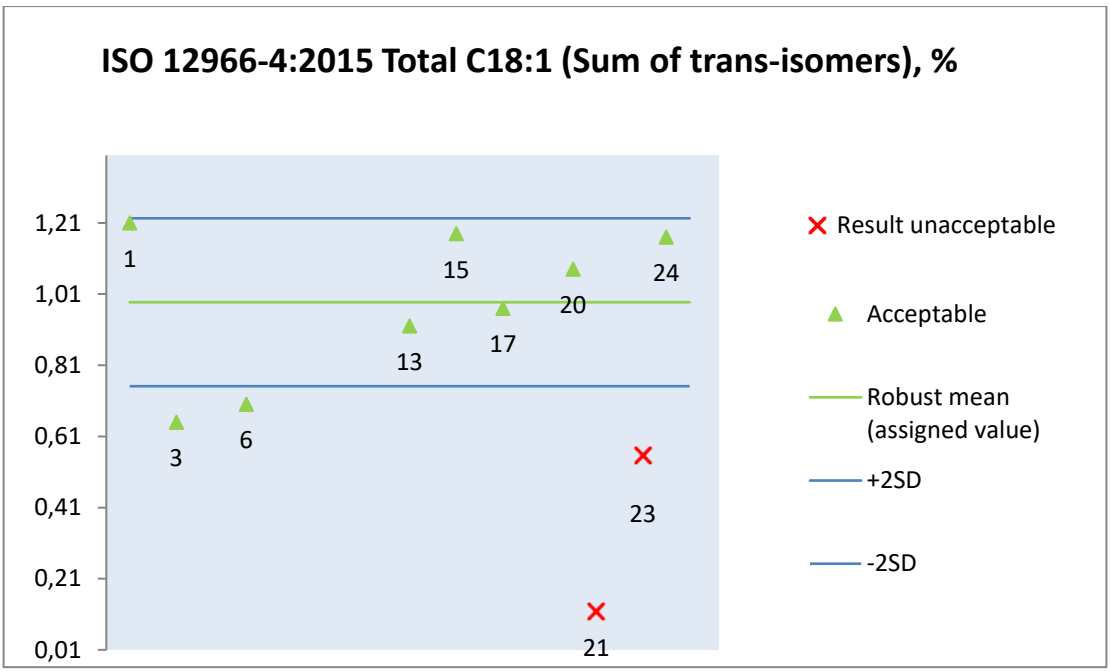


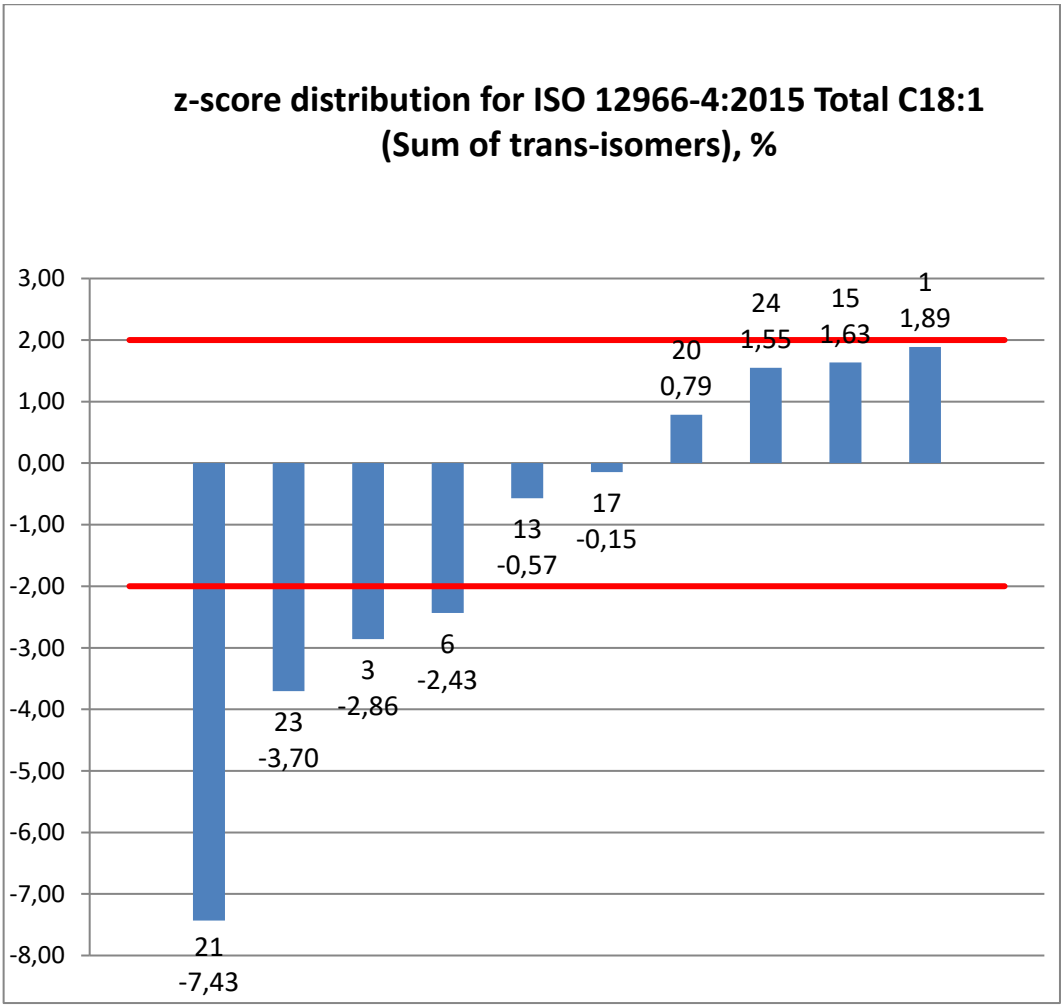
8.2.10. ISO 12966-4:2015 Erucic acid C 22:1, %



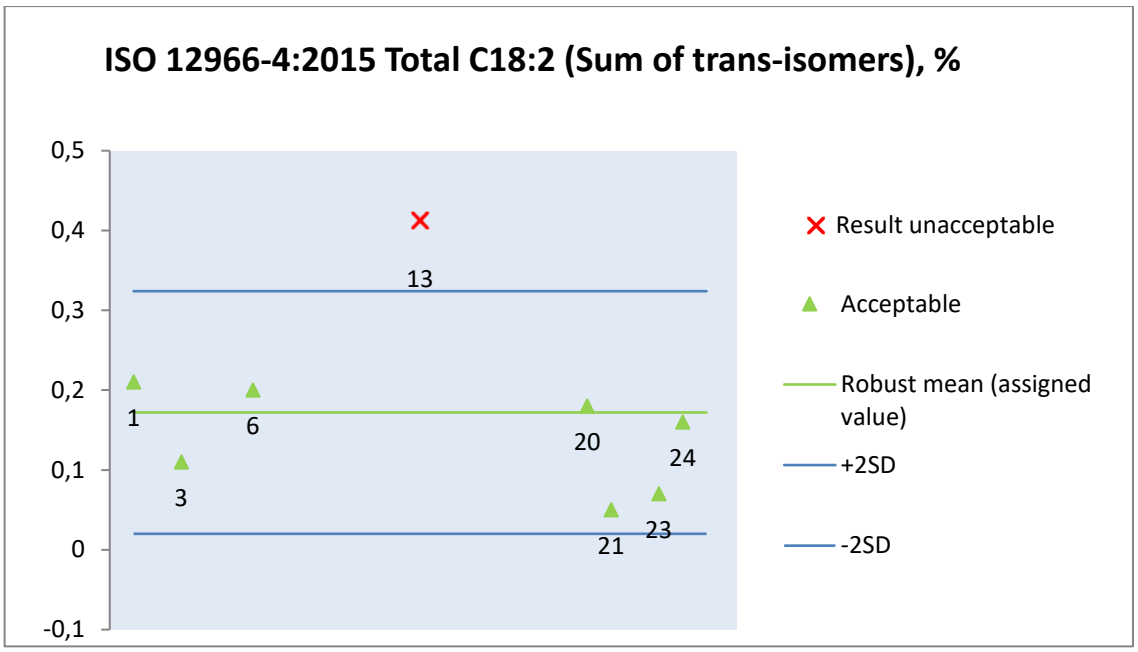


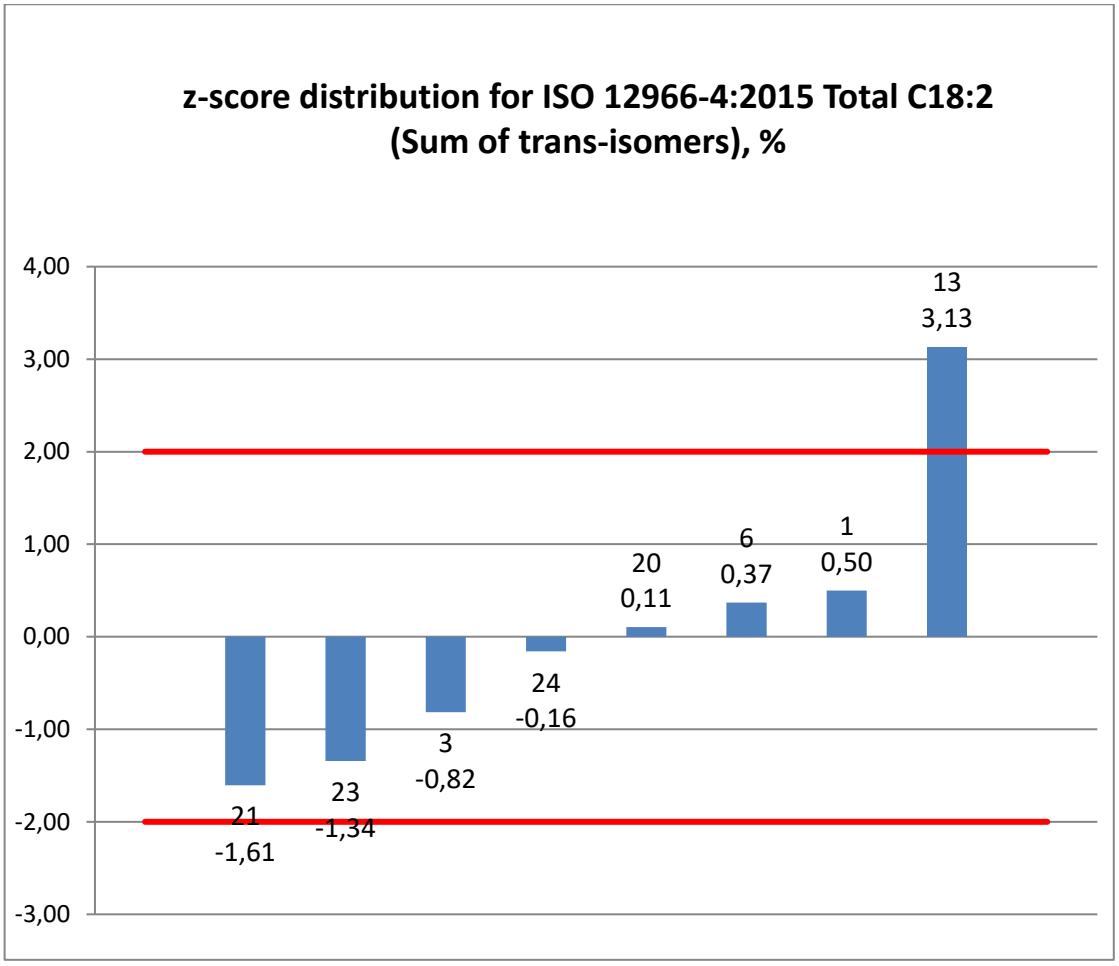
8.2.11. ISO 12966-4:2015 Total C18:1 (Sum of trans-isomers), %



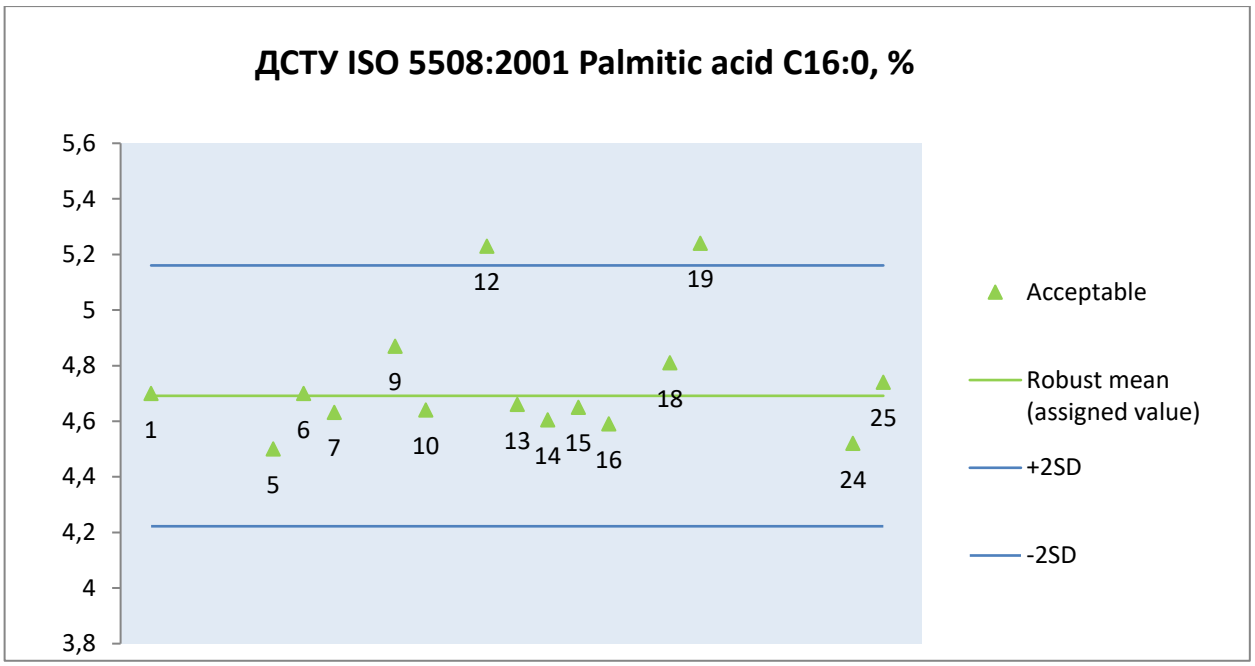


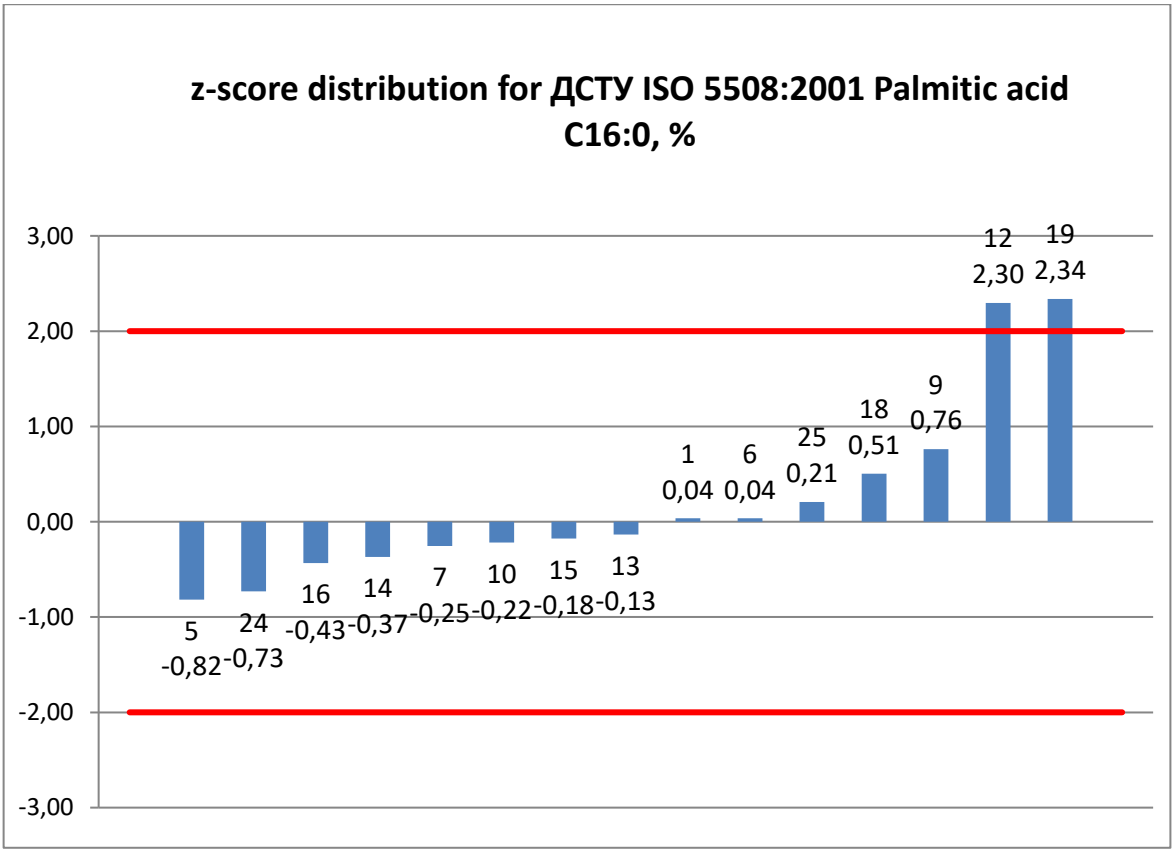
8.2.12. ISO 12966-4:2015 Total C18:2 (Sum of trans-isomers), %



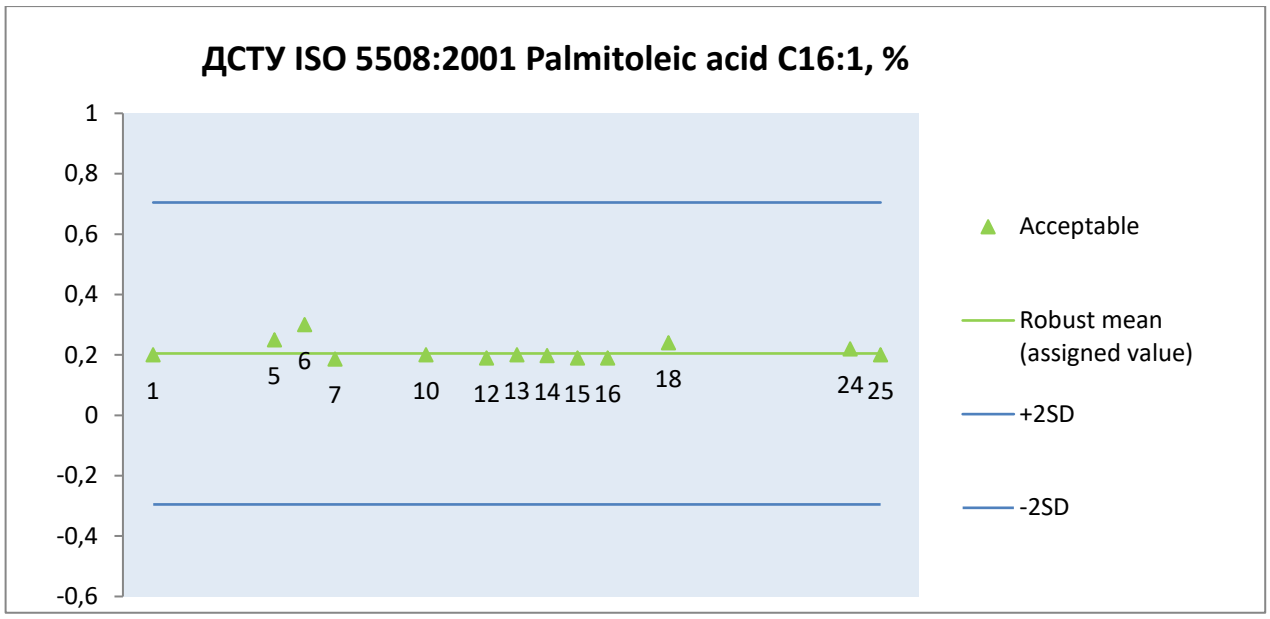


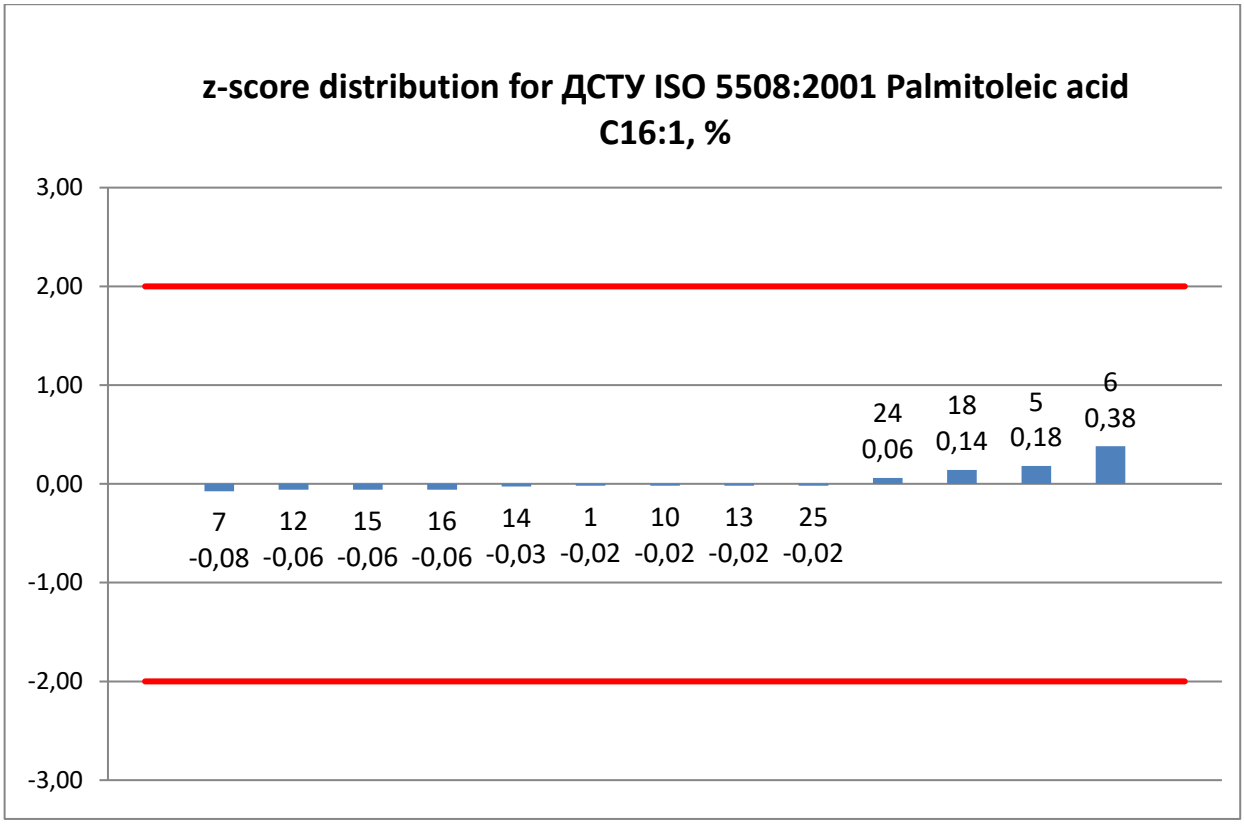
8.2.13. ДСТУ ISO 5508:2001 Palmitic acid C16:0, %



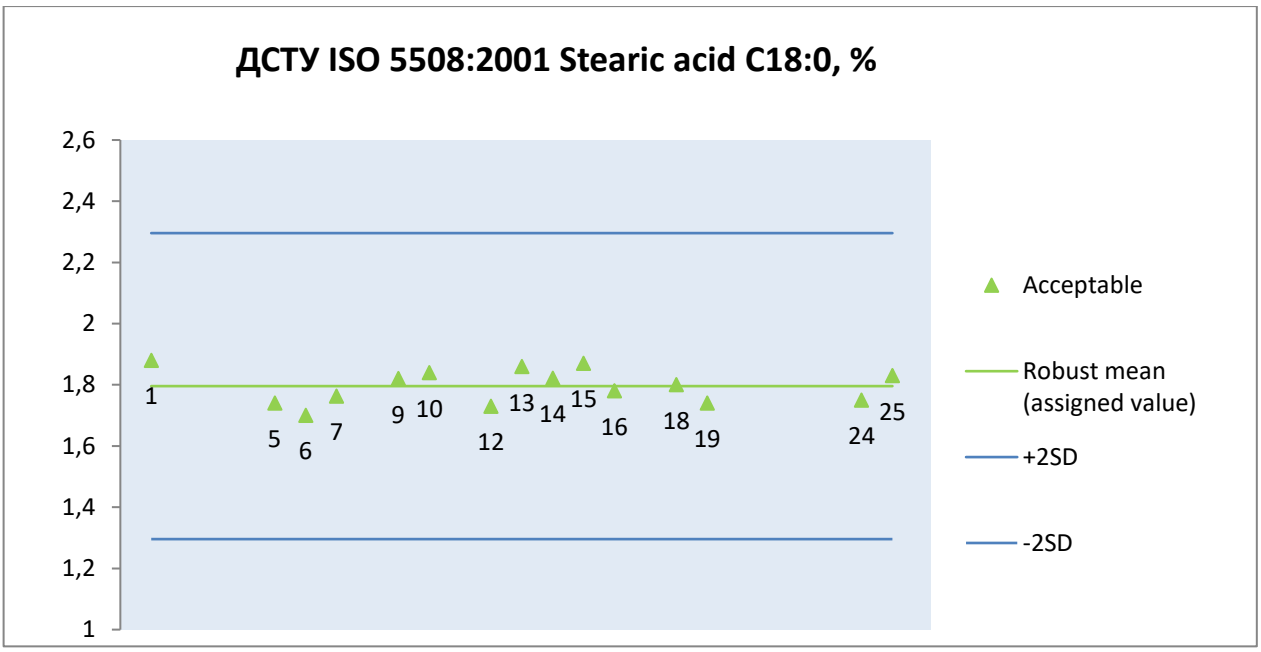


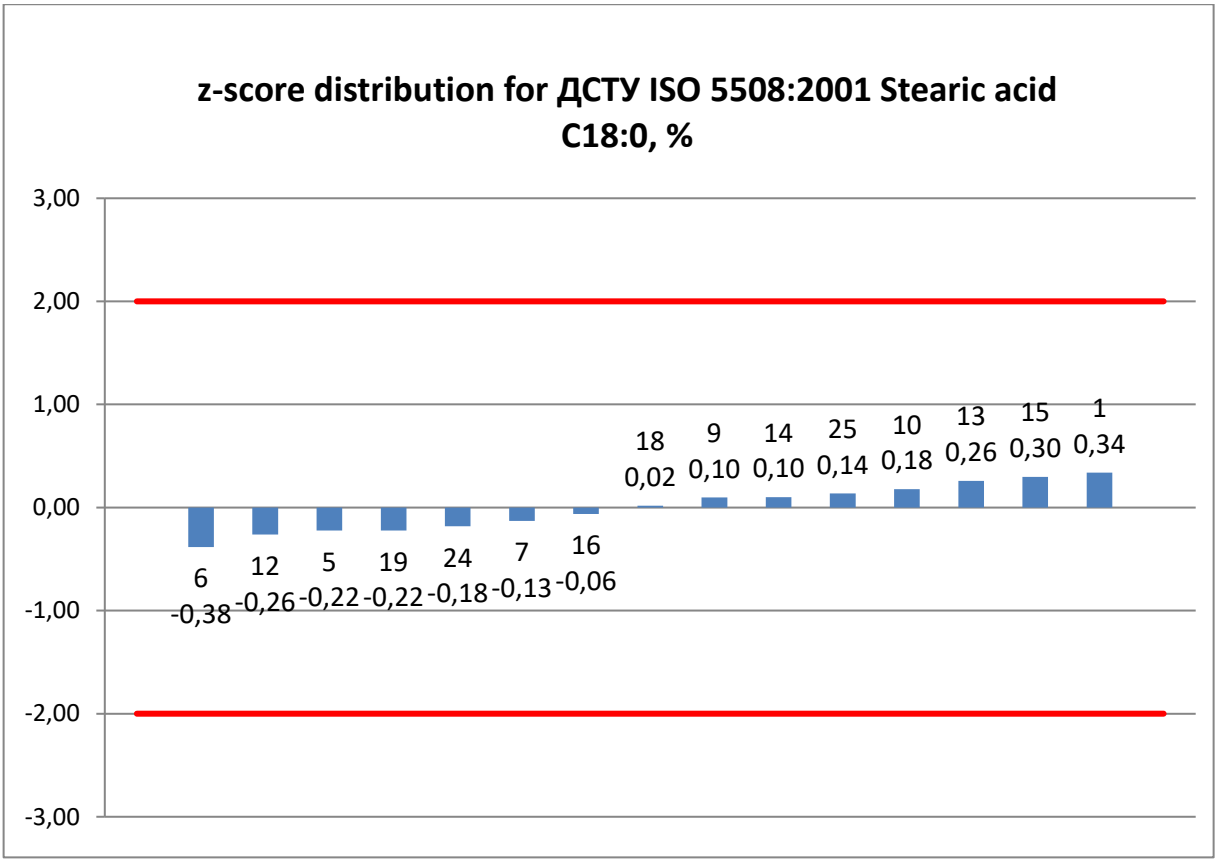
8.2.14. ДСТУ ISO 5508:2001 Palmitoleic acid C16:1, %



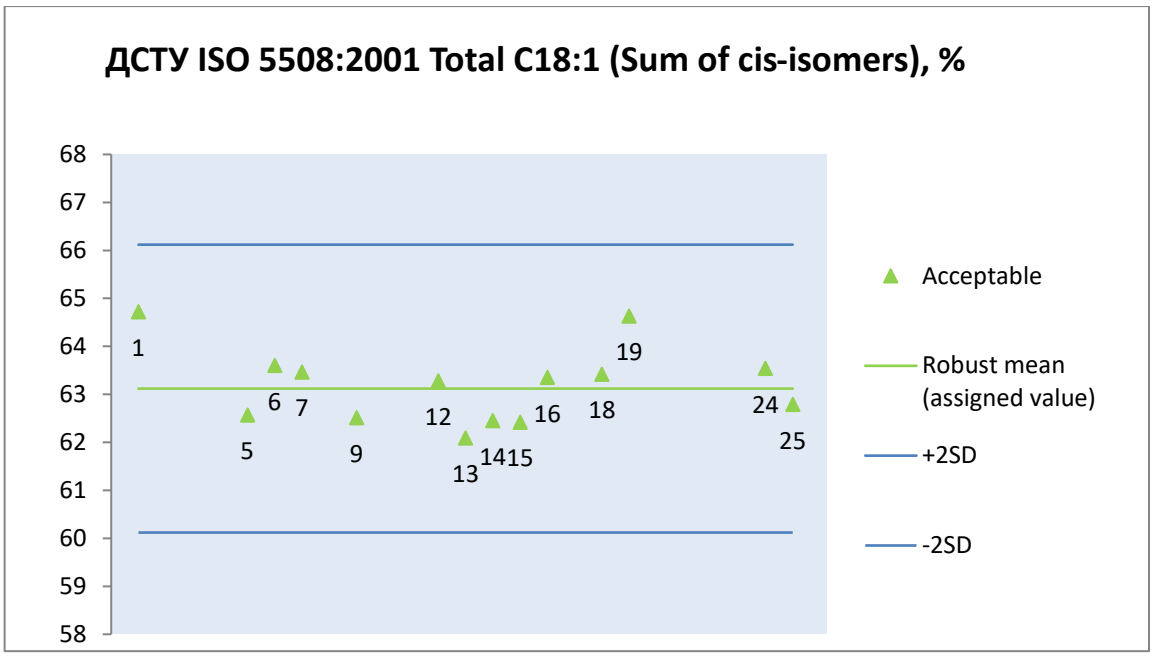


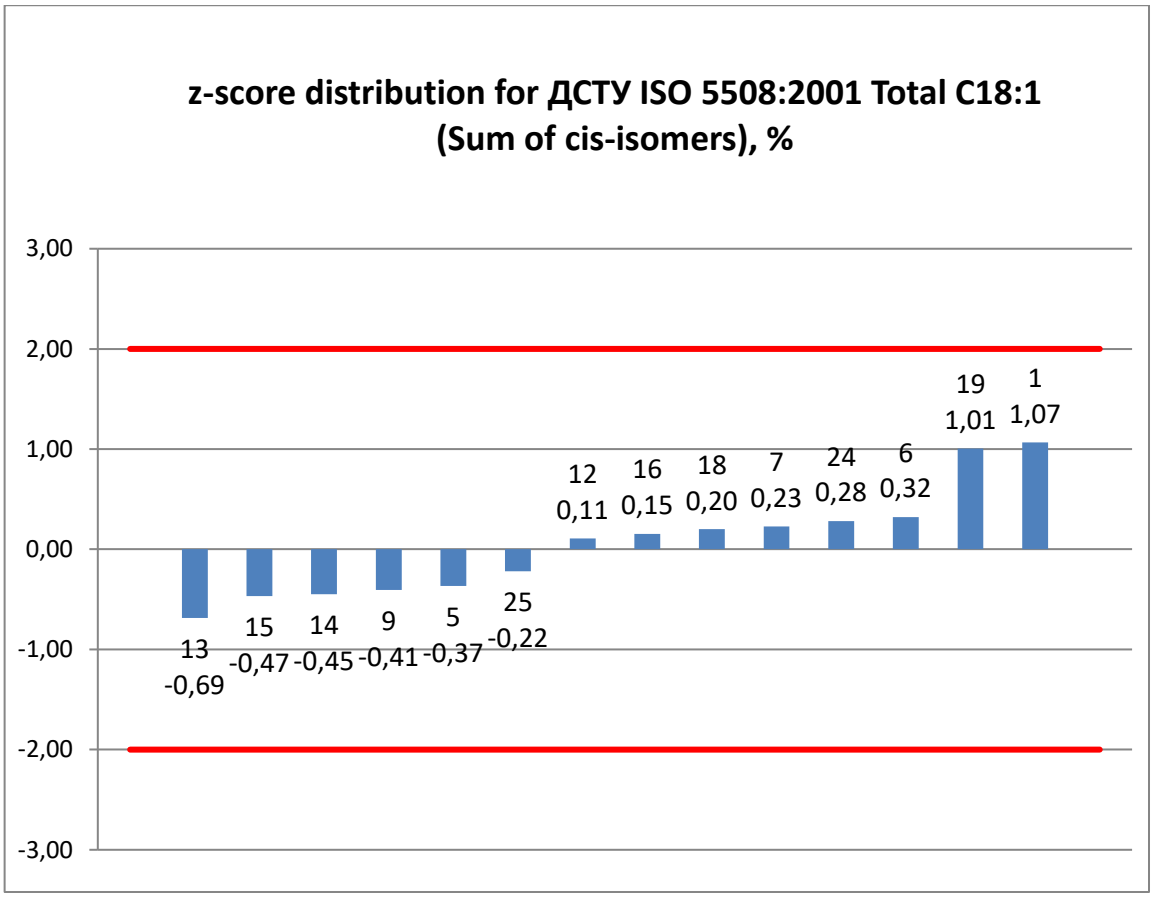
8.2.15. ДСТУ ISO 5508:2001 Stearic acid C18:0, %



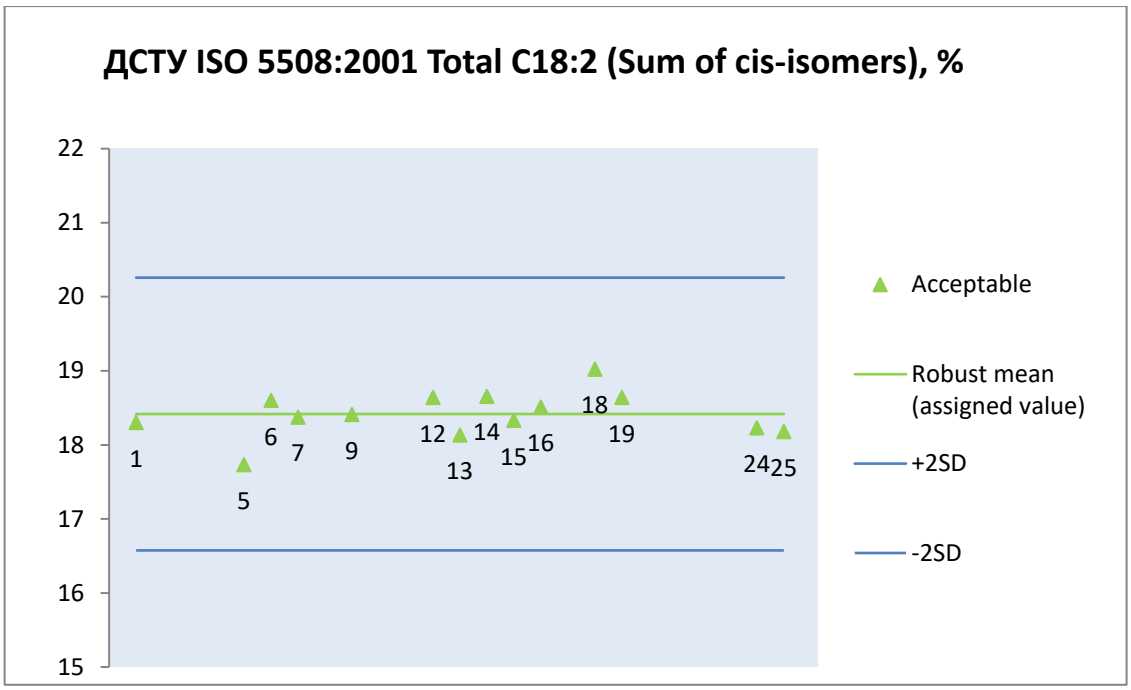


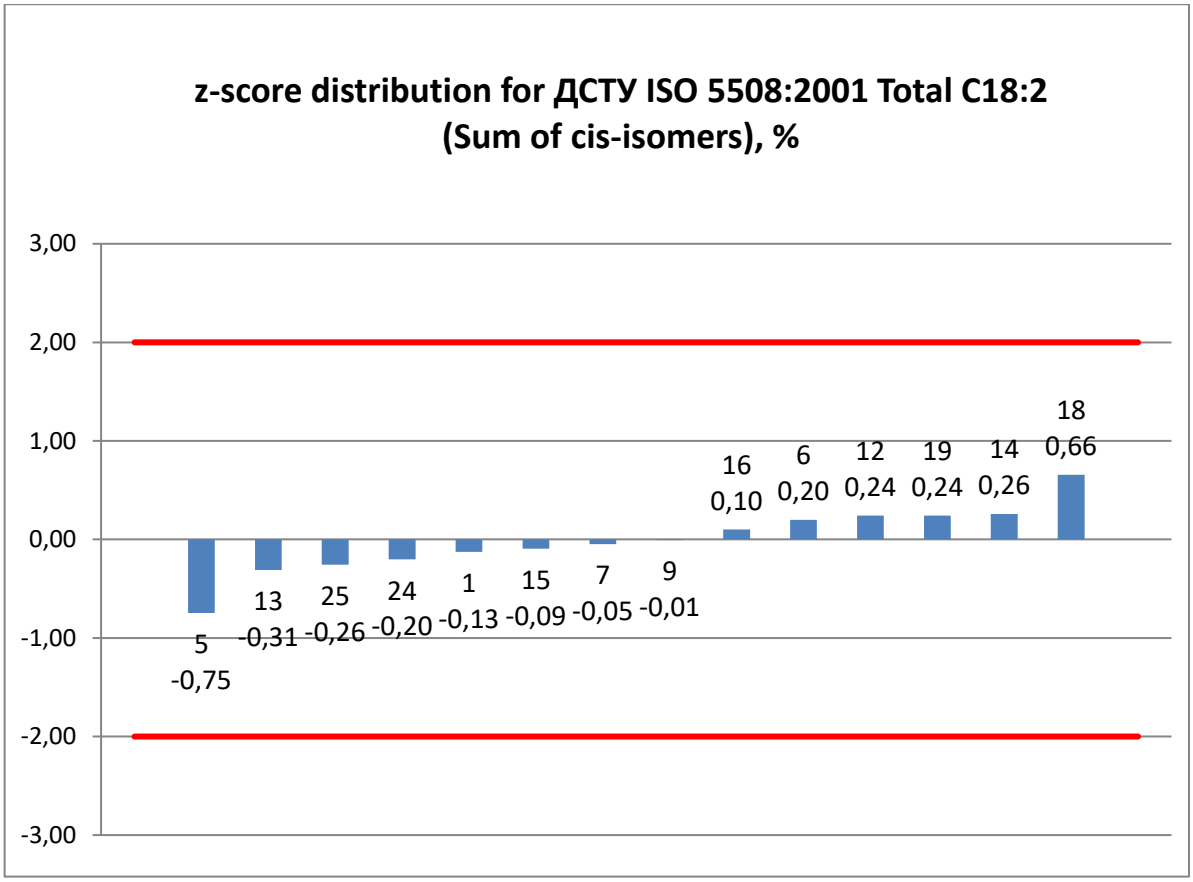
8.2.16. ДСТУ ISO 5508:2001 Total C18:1 (Sum of cis-isomers), %



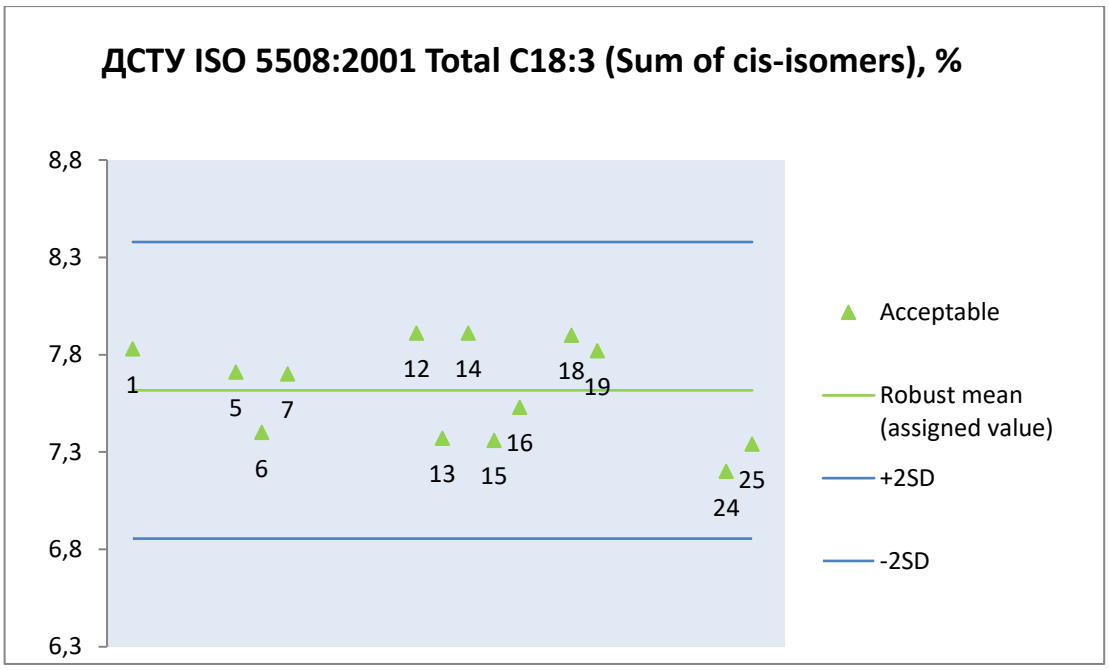


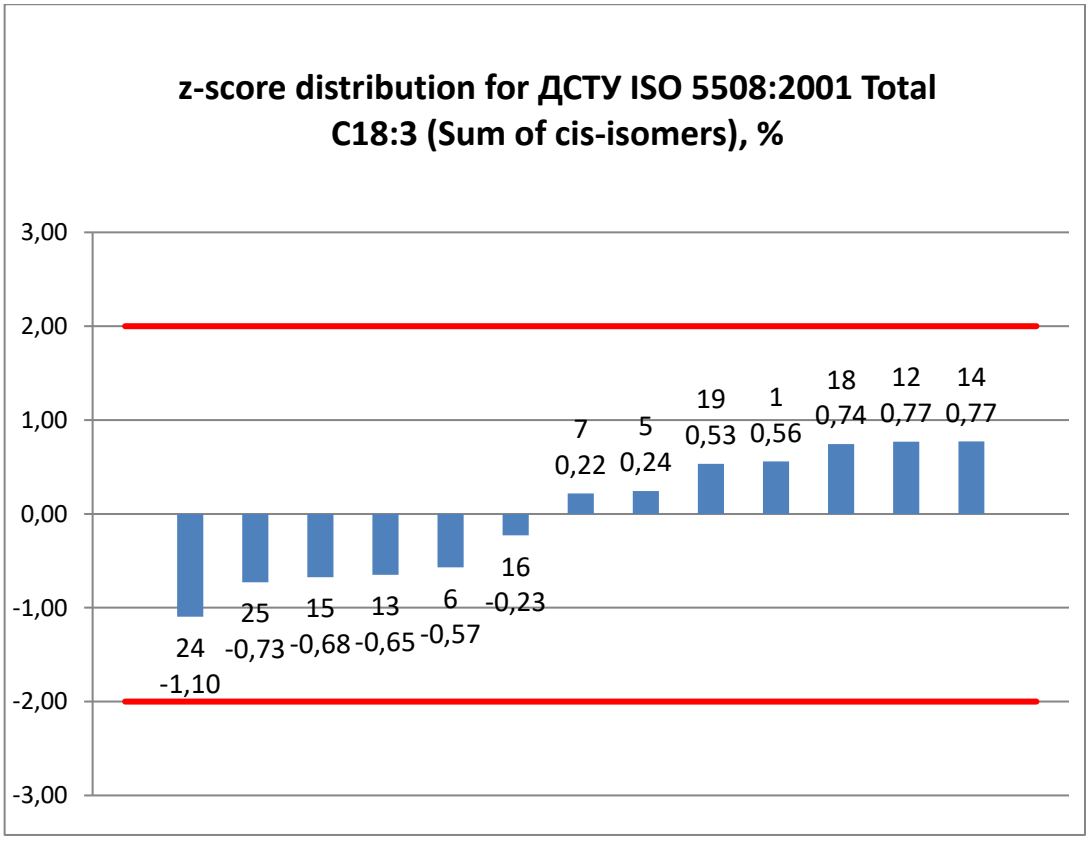
8.2.17. ДСТУ ISO 5508:2001 Total C18:2 (Sum of cis-isomers), %



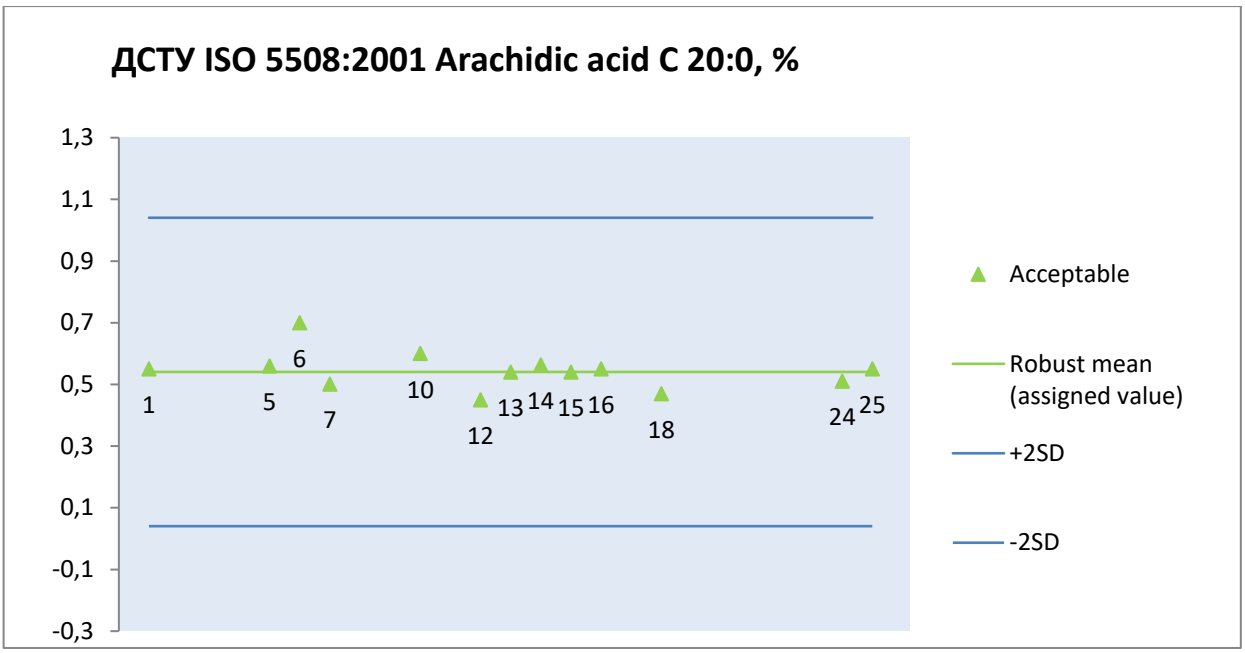


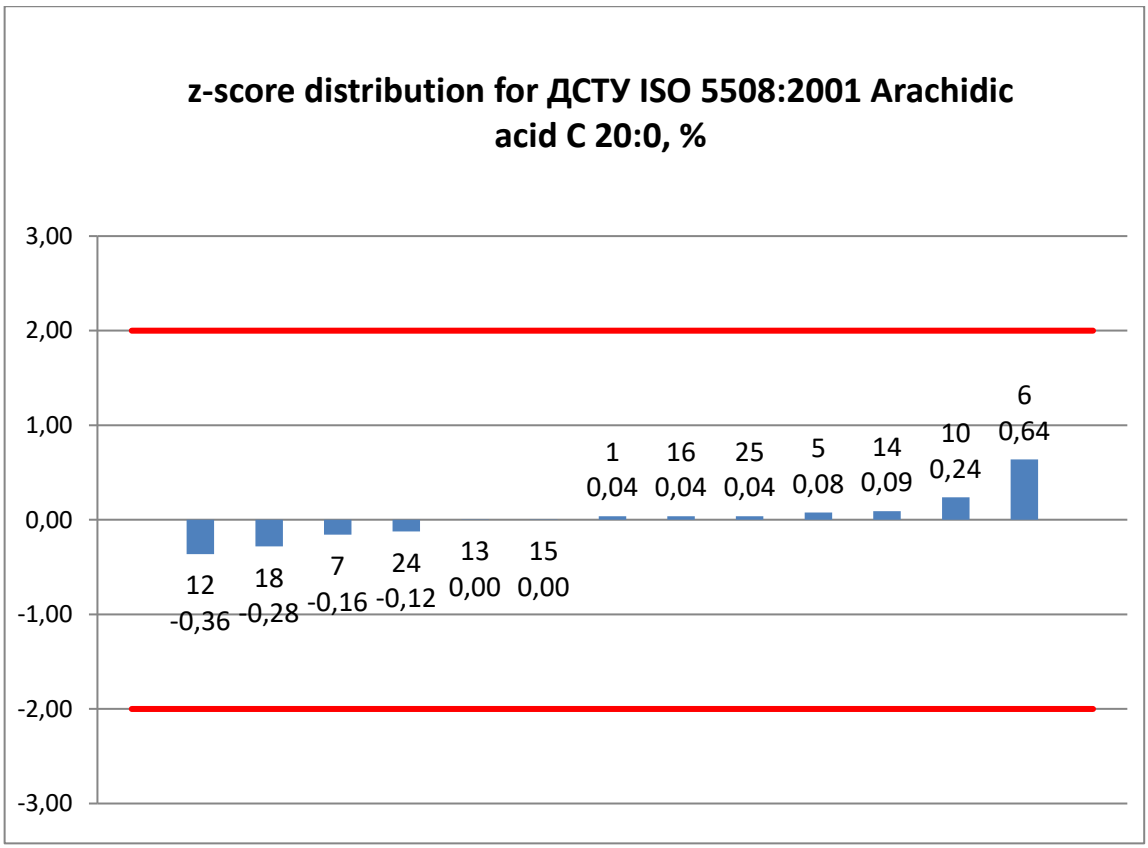
8.2.18. ДСТУ ISO 5508:2001 Total C18:3 (Sum of cis-isomers), %



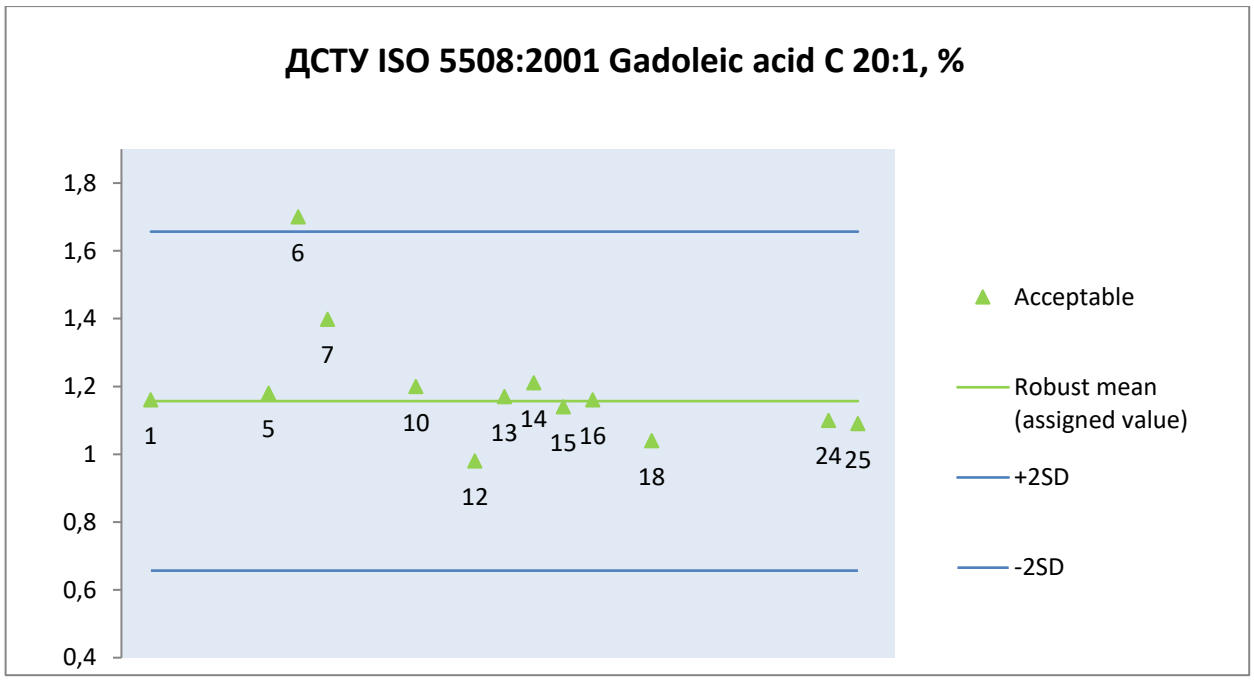


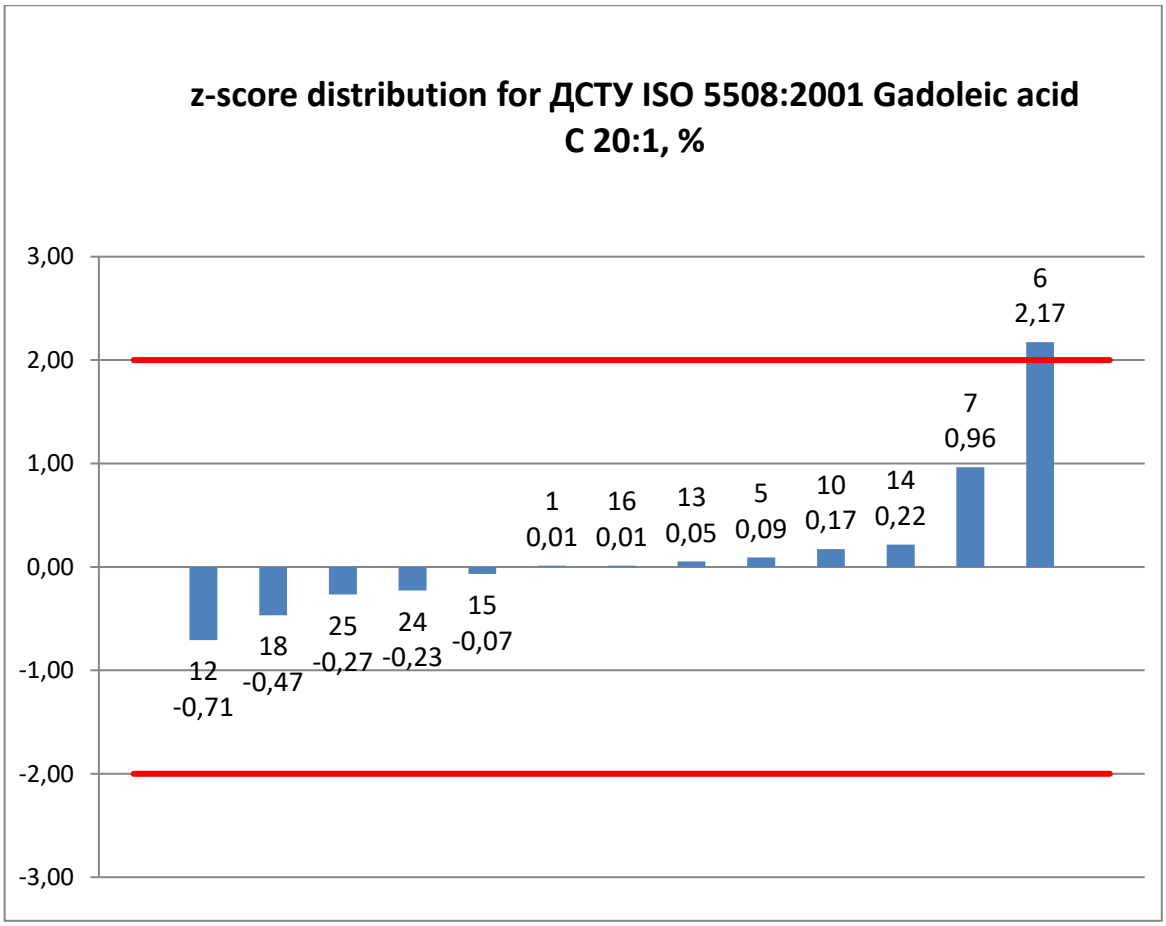
8.2.19. ДСТУ ISO 5508:2001 Arachidic acid C 20:0, %



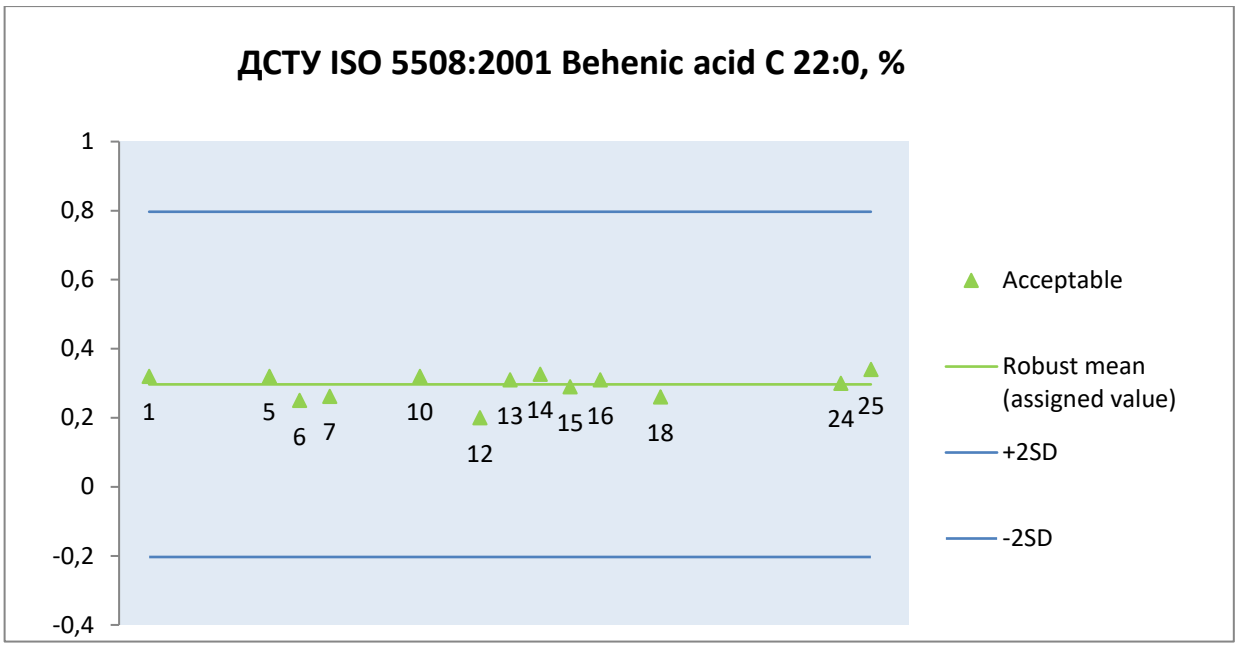


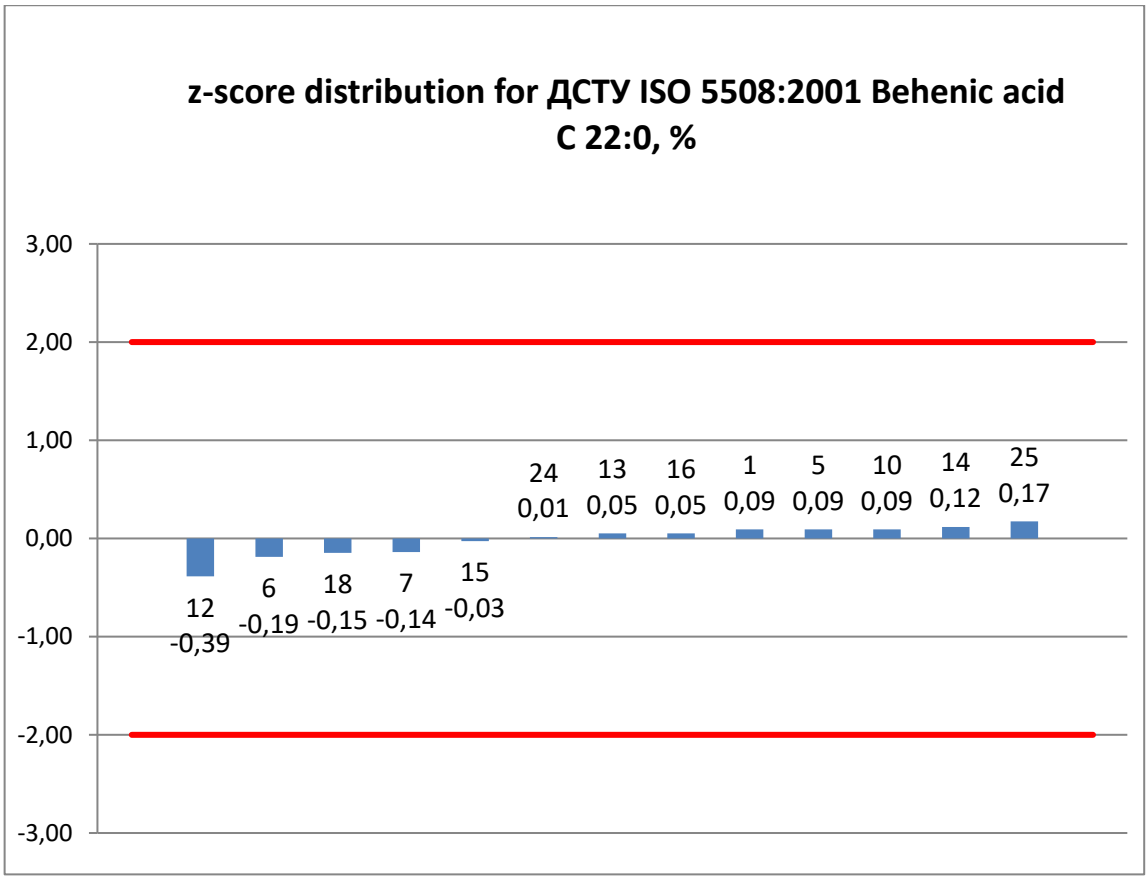
8.2.20. ДСТУ ISO 5508:2001 Gadoleic acid C 20:1, %



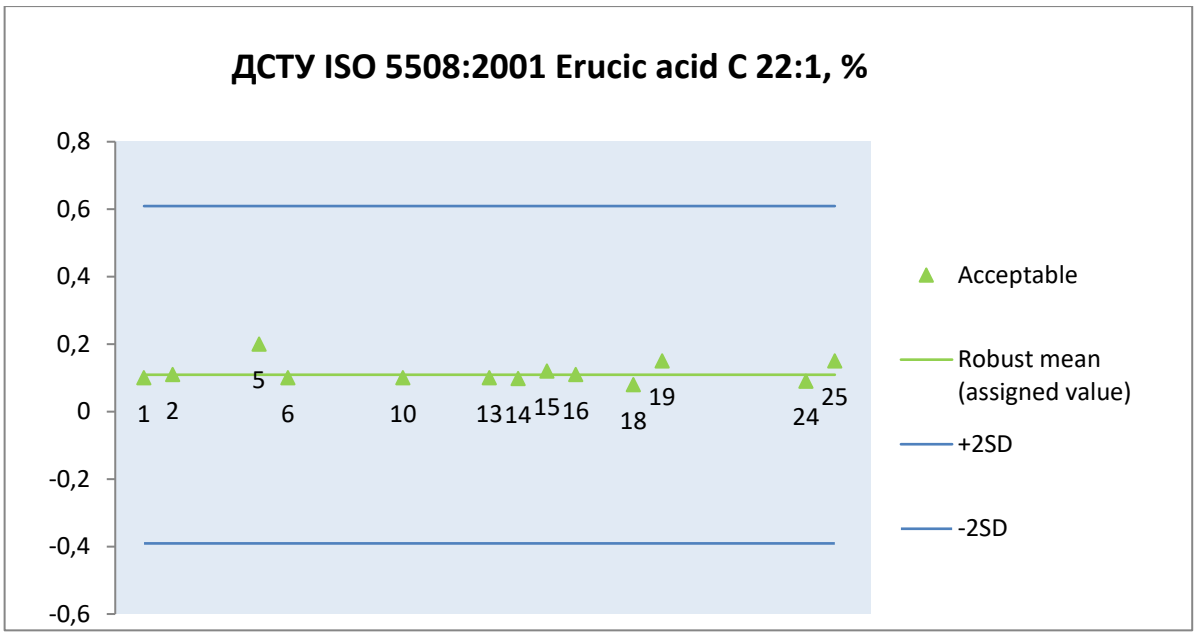


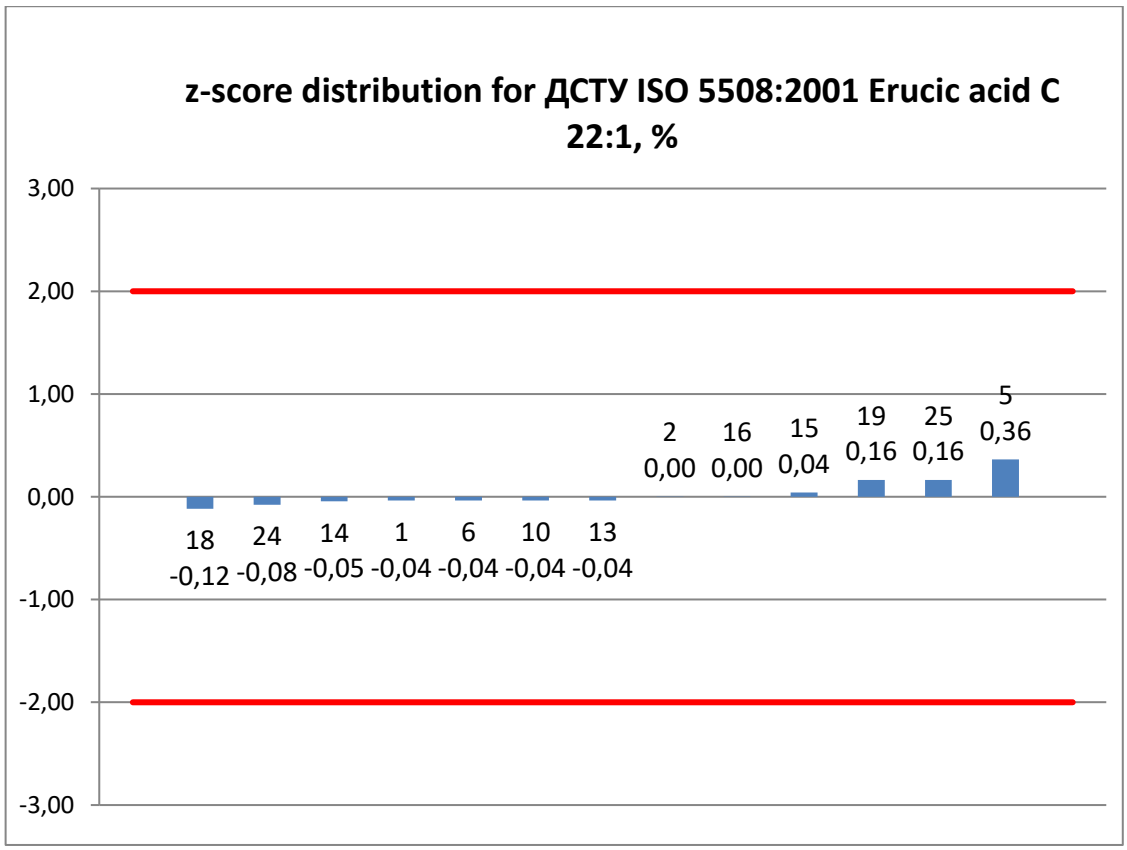
8.2.21. ДСТУ ISO 5508:2001 Behenic acid C 22:0, %



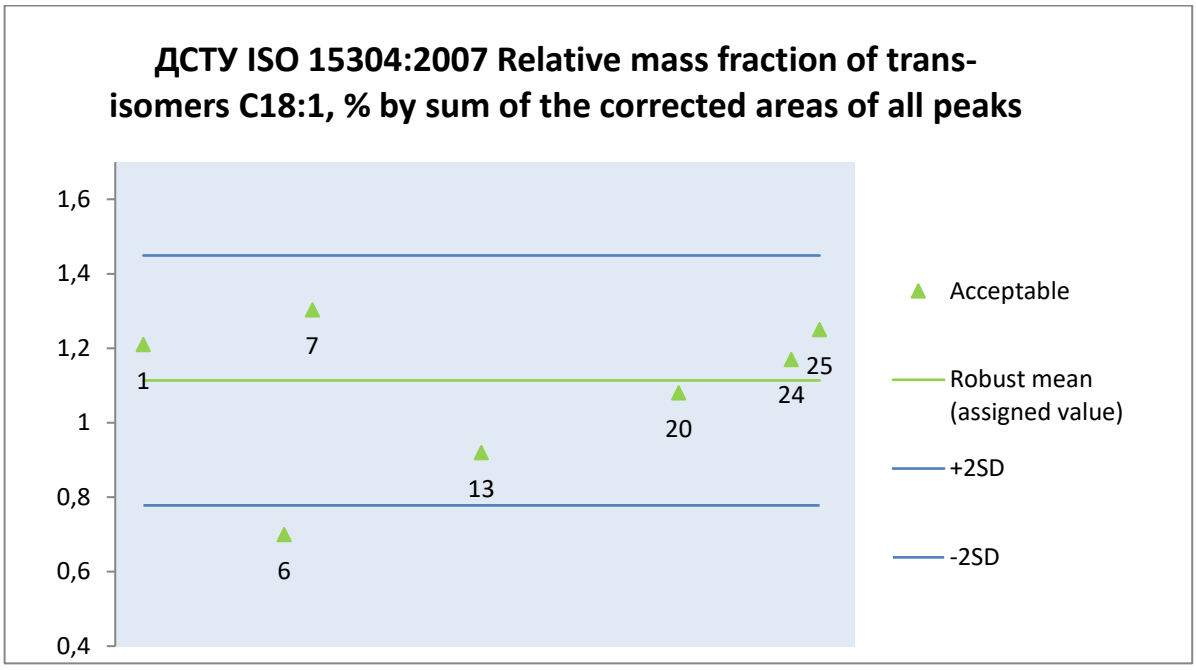


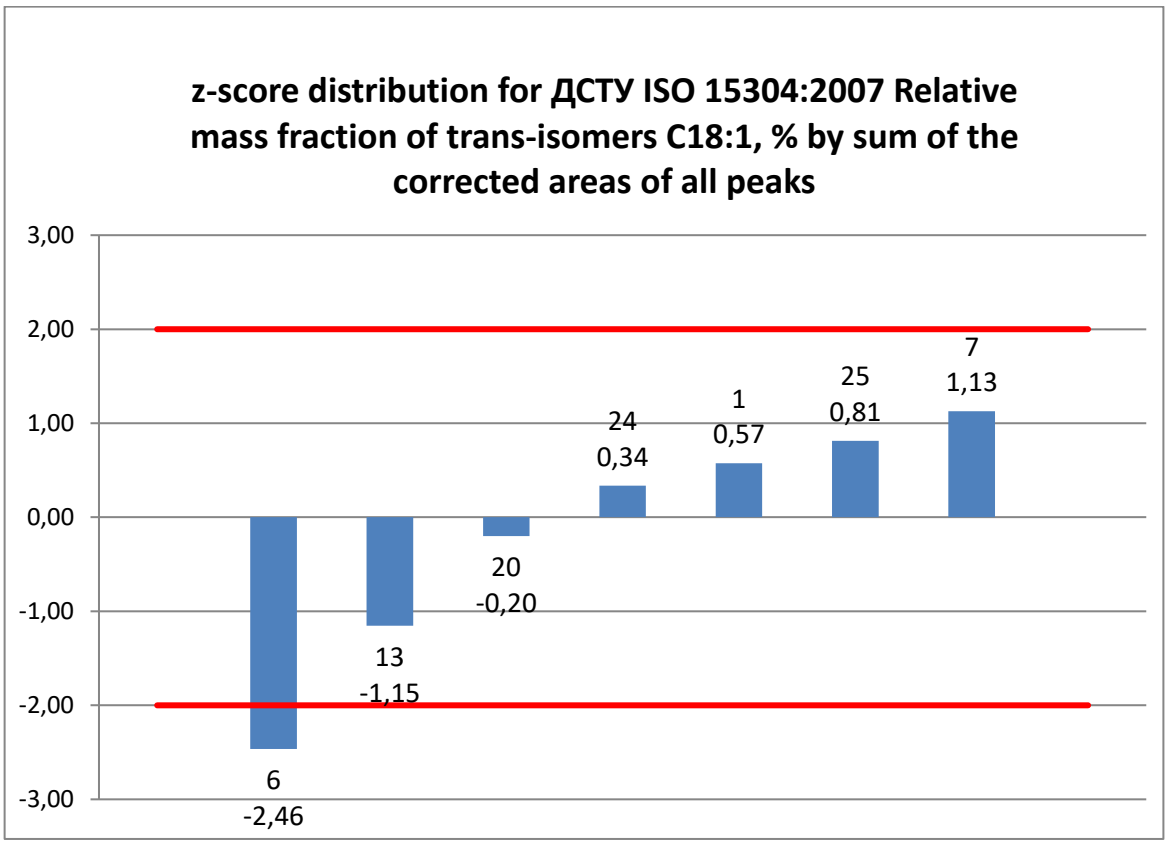
8.2.22. ДСТУ ISO 5508:2001 Erucic acid C 22:1, %



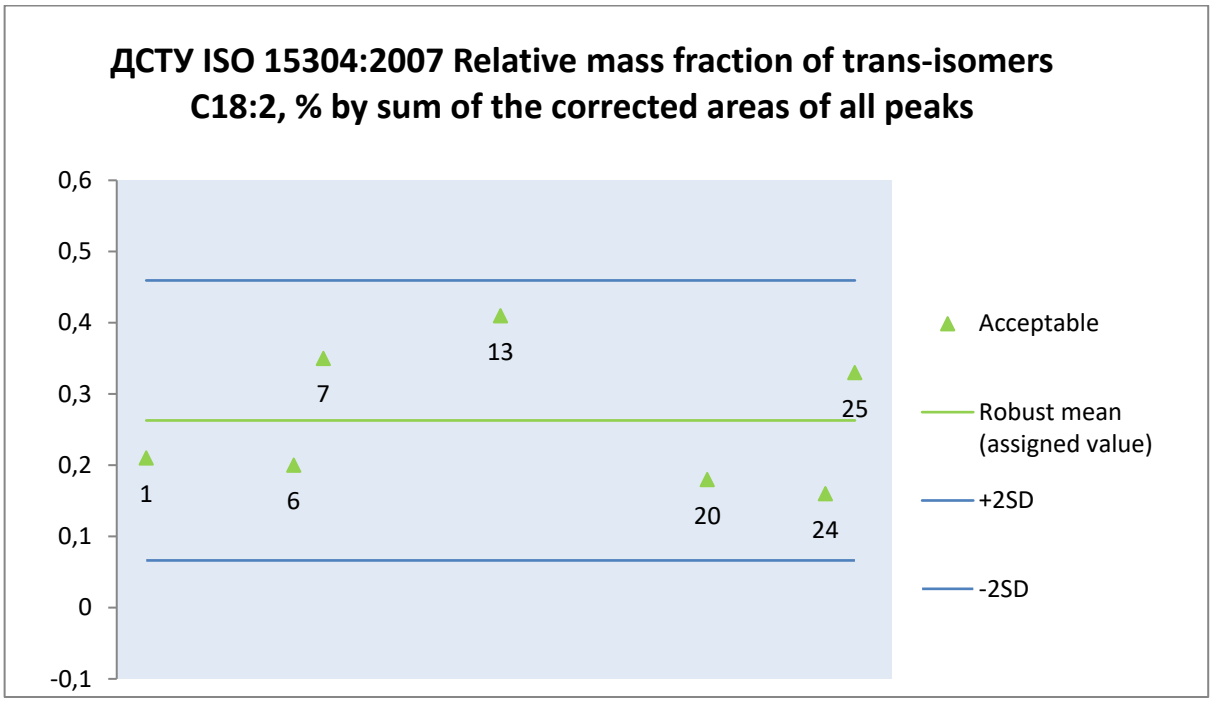


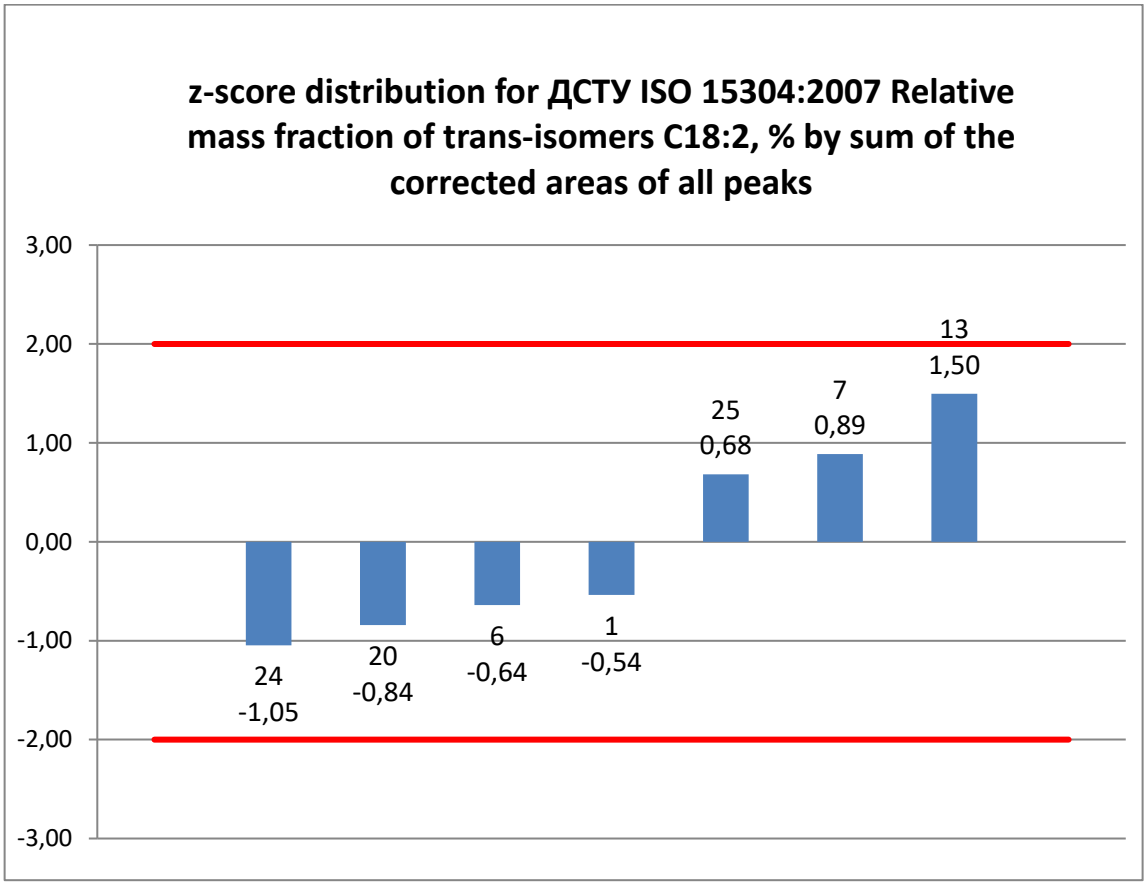
8.2.23. ДСТУ ISO 15304:2007 Relative mass fraction of trans-isomers C18:1, % by sum of the corrected areas of all peaks





8.2.24. ДСТУ ISO 15304:2007 Relative mass fraction of trans-isomers C18:2, % by sum of the corrected areas of all peaks





9. NORMATIVE REFERENCE

1. ISO/IEC 17043:2023 Conformity assessment – General requirements for the competence of proficiency testing providers.

2. Analytical Methods Committee, Robust Statistics – How not to reject outliers Part 1. Basic Concepts, Analyst, 1989, 114, 1693-1697.

3. Fearn, T. and Thompson, M, A new test for ‘sufficient homogeneity’, Analyst, 2001, 126, 1414-1417.

4. ISO 13528:2022 Statistical methods for use in proficiency testing by interlaboratory comparison.

5. ISO 33405:2024 Reference materials — Approaches for characterization and assessment of homogeneity and stability.

6. ILAC Discussion Paper on Homogeneity and Stability Testing, April 2008.