

CERTIFICATE OF ACCREDITATION

Korea Testing Laboratory

Accreditation No. : KRMPs-011

Corporation Registration No. : 254371-0012187

Address of Reference Material Producer : (Branch site-1) 87, Digital-ro 26-gil, Guro-gu,
Seoul, Republic of Korea
(Branch site-2) 723, Haeon-ro, Sangnok-gu,
Ansan-si, Gyeonggi-do, Republic of Korea

Date of Initial Accreditation : October 26, 2012

Validity of Accreditation : March 31, 2021 ~ March 30, 2025

Scope of Accreditation : Attached Annex

Date of issue : Dec. 31, 2021

This reference material producer is accredited in accordance with the recognized International Standard ISO 17034:2016. This accreditation demonstrates technical competence for a defined scope and the operation of a reference material producer quality management system.



Sanghoon Lee

Head

Korea Laboratory Accreditation Scheme

Korea Laboratory Accreditation Scheme

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Branch site-1 : 87, Digital-ro 26-gil, Guro-gu, Seoul, Republic of Korea

1. Chemical Composition

109. Environmental pollutants

02. Air pollution

Type	(C)RM Code	Material (matrix etc)	Certified value or Range		Unit	Measurement Uncertainty (Confidence Level is about 95 %, k = 2)	Standard
CRM	KTL-CRM 109-01-1	Fine dust certified reference material for PAHs	Phenanthrene	100 ~ 5 000	mg/kg	60 %	NIER notice no. 2021-61
			Benzo [b]fluoranthene	1.0 ~ 100		60 %	air pollution test standard -ES 01803.1: 2021
CRM	KTL-CRM 109-01-2	Fine dust certified reference material for heavy metal analysis	Cr	1.0 ~ 100		60 %	NIER notice no. 2021-61 air pollution test standard -ES 01700: 2021
			Ni	1.0 ~ 100		60 %	
			Cd	10 ~ 500		60 %	
			Pb	1.0 ~ 100		60 %	

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Branch site-2 : 723, Haeam-ro, Sangnok-gu, Ansan-si, Gyeonggi-do, Republic of Korea

1. Chemical Composition

106. Inorganics, Rocks, Ores

06. Ceramics

Type	(C)RM Code	Material (matrix etc)	Certified value or Range		Unit	Measurement Uncertainty (Confidence Level is about 95 %, $k = 2$)	Standard
CRM	KIL-CRM 106-01-1	Insulating Ceramic certified reference material for heavy metal analysis	Pb	120 ~ 180	mg/kg	10 %	IEC 62321-5: 2013
			Cr	70 ~ 100		10 %	
			Cd	8 ~ 15		10 %	
CRM	KIL-CRM 106-01-2	Insulating Ceramic certified reference material for heavy metal analysis	Pb	750 ~ 1 100		10 %	
			Cr	700 ~ 1 000		10 %	
			Cd	80 ~ 110		10 %	
CRM	KIL-CRM 106-02-1	Barium Titanate certified reference material for heavy metal analysis	Pb	85 ~ 115		10 %	IEC 62321-5: 2013
			Cr	80 ~ 120		10 %	
			Cd	17 ~ 24		10 %	
CRM	KIL-CRM 106-02-2	Barium Titanate certified reference material for heavy metal analysis	Pb	850 ~ 1 100		10 %	
			Cr	850 ~ 1 200		10 %	
			Cd	80 ~ 110		10 %	

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1. Chemical Composition

106. Inorganics, Rocks, Ores

06. Ceramics

Type	(C)RM Code	Material (matrix etc)	Certified value or Range		Unit	Measurement Uncertainty (Confidence Level is about 95 %, $k = 2$)	Standard
RM	KIL-RM 106-04-1	Zirconia reference material for chemical analysis	Al	900 ~ 1500	mg/kg	20 %	BS EN 725-12:2001
			Ti	30 ~ 70		20 %	
			Hf	10 000 ~ 20 000		10 %	
			Y	30 000 ~ 50 000		10 %	
RM	KIL-RM 106-04-2	Zirconia reference material for chemical analysis	Ti	20 ~ 60		20 %	BS EN 725-12:2001
			Hf	10 000 ~ 20 000		10 %	
			Y	90 000 ~ 110 000		10 %	
RM	KIL-RM 106-05-1	Yttrium oxide reference material for chemical analysis	Al	5 ~ 30		20 %	KTL L 137-2020A
			Fe	1 ~ 20		20 %	

07. Glasses

Type	(C)RM Code	Material (matrix etc)	Certified value or Range		Unit	Measurement Uncertainty (Confidence Level is about 95 %, $k = 2$)	Standard
CRM	KIL-CRM 106-08-1	Glasses certified reference material for heavy metal analysis	Pb	1 000 ~ 1 500	mg/kg	10 %	IEC 62321-5: 2013
			Cr	100 ~ 150		10 %	
			Cd	50 ~ 100		10 %	
CRM	KIL-CRM 106-08-2	Glasses certified reference material for heavy metal analysis	Pb	200 ~ 300		10 %	
			Cr	15 ~ 25		10 %	
			Cd	5 ~ 15		10 %	

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1. Chemical Composition

113. High molecular substance

02. High molecular substance additives

Type	(C)RM Code	Material (matrix etc)	Certified value or Range		Unit	Measurement Uncertainty (Confidence Level is about 95 %, $k = 2$)	Standard
CRM	KIL-CRM 11301-1	ABS certified reference material for bromine-based flame retardant analysis	Decabromo diphenyl ether (BDE-209)	800 ~ 1200	mg/kg	10 %	IEC6231 -6:2015
CRM	KIL-CRM 11301-2	ABS certified reference material for bromine-based flame retardant analysis	Decabromo diphenyl ether (BDE-209)	90 ~ 140		10 %	IEC6231 -6:2015
RM	KIL-RM 11302-1	ABS certified reference material for chlorine-based flame retardant analysis	Tris (2-chloroethyl) phosphate (TCEP)	600 ~ 1000		10 %	KS M 1083 :2019
RM	KIL-RM 11302-1	ABS certified reference material for chlorine-based flame retardant analysis	Tris (2-chloroethyl) phosphate (TCEP)	80 ~ 120		10 %	KS M 1083 :2019

114. Other Chemical Composition

Type	(C)RM Code	Material (matrix etc)	Certified value or Range		Unit	Measurement Uncertainty (Confidence Level is about 95 %, $k = 2$)	Standard
CRM	KIL-CRM 114 01-1	Composite plastic certified reference material for heavy metal analysis	Pb	60 ~ 140	mg/kg	15 %	IEC 62321-5: 2013
			Cr	15 ~ 35		15 %	
			Cd	12 ~ 28		15 %	
CRM	KIL-CRM 114 01-2	Composite plastic certified reference material for heavy metal analysis	Pb	500 ~ 1 000		15 %	
			Cr	150 ~ 350		15 %	
			Cd	120 ~ 280		15 %	

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2. Physical properties

206. Electrical and magnetic properties

03. Permittivity

Type	(C)RM Code	Material (matrix etc)	Certified value or Range		Unit	Measurement Uncertainty (Confidence Level is about 95 %, $k = 2$)	Standard
CRM	KIL-CRM 20601-1	Ceramic/plastic certified reference material for Permittivity measurement	dielectric constant	(100 Hz~10 MHz) 2~5	-	1.10 % (relative value)	ASTM D150-18 BS 7663:1993
			loss tangent	(100 Hz~10 MHz) 0.000 01 ~ 0.005		232×10 ⁻⁶ (absolute value)	
CRM	KIL-CRM 20601-2		dielectric constant	(100 Hz~10 MHz) 5~7		1.56 % (relative value)	
			loss tangent	(100 Hz~10 MHz) 0.000 01 ~ 0.005		160×10 ⁻⁶ (absolute value)	
CRM	KIL-CRM 20601-3		dielectric constant	(100 Hz~10 MHz) 7~11		1.97 % (relative value)	
			loss tangent	(100 Hz~10 MHz) 0.000 01 ~ 0.005		378×10 ⁻⁶ (absolute value)	
CRM	KIL-CRM 20602-1		dielectric constant	(100 Hz~10 MHz) 2~5		1.29 % (relative value)	
			loss tangent	(100 Hz~10 MHz) 0.000 01 ~ 0.005		154×10 ⁻⁶ (absolute value)	
CRM	KIL-CRM 20602-2		dielectric constant	(100 Hz~10 MHz) 5~7		2.00 % (relative value)	
			loss tangent	(100 Hz~10 MHz) 0.000 01 ~ 0.005		158×10 ⁻⁶ (absolute value)	
CRM	KIL-CRM 20602-3		dielectric constant	(100 Hz~10 MHz) 7~11		2.79 % (relative value)	
			loss tangent	(100 Hz~10 MHz) 0.000 01 ~ 0.005		163×10 ⁻⁶ (absolute value)	

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2. Physical properties

207. Precision measurement

07. Density

Type	(C)RM Code	Material (matrix etc)	Certified value or Range	Unit	Measurement Uncertainty (Confidence Level is about 95 %, $k = 2$)	Standard
CRM	KIL-CRM 20701-1	Liquid certified reference material for density measurement	0.7	g/cm ³	0.003	KSMISO 12185:1996
CRM	KIL-CRM 20701-2		0.8		0.003	
CRM	KIL-CRM 20701-3		1.0		0.003	
CRM	KIL-CRM 20701-4		1.2		0.003	
CRM	KIL-CRM 20701-5		1.3		0.003	
CRM	KIL-CRM 20701-6		1.6		0.003	
CRM	KIL-CRM 20702-1	Water certified reference material for sugar content measurement	10	Sucrose in Water (%)	0.05	KSM 0015:2017
CRM	KIL-CRM 20702-2		12		0.05	
CRM	KIL-CRM 20702-3		20		0.05	
CRM	KIL-CRM 20702-4		30		0.05	
CRM	KIL-CRM 20702-5		40		0.05	
CRM	KIL-CRM 20702-6		50		0.05	
CRM	KIL-CRM 20702-7		60		0.05	

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2. Physical properties

207. Precision measurement

08. Liquid viscosity

Type	(C)RM Code	Material (matrix etc)	Certified value or Range						Unit	Measurement Uncertainty (Confidence Level is about 95 % $k = 2$)	Standard
			viscosity (mm ² /s)			viscosity (mPas)					
			20 °C	30 °C	40 °C	20 °C	30 °C	40 °C			
CRM	KIL-CRM 20708-1	Silicone certified reference material for viscosity measurement	2.0	1.7	1.5	1.8	1.5	1.3	k- viscosity (mm ² /s) viscosity (mPas)	1.0 %	KSA 081:2016
CRM	KIL-CRM 20708-2		10	9	7	9	8	7		1.0 %	
CRM	KIL-CRM 20708-3		50	40	35	48	38	32		1.0 %	
CRM	KIL-CRM 20708-4		100	80	66	97	78	62		1.0 %	
CRM	KIL-CRM 20708-5		500	410	320	490	390	320		1.0 %	
CRM	KIL-CRM 20708-6		1000	780	630	970	770	610		1.0 %	
CRM	KIL-CRM 20708-7		5000	4000	3100	4800	3800	3000		1.0 %	
CRM	KIL-CRM 20708-8		10 000	8200	6700	9700	7700	6200		1.0 %	
CRM	KIL-CRM 20708-9		100 000	80 000	67 000	97 000	77 000	60 000		1.0 %	
CRM	KIL-CRM 20708-10		300 000	246 000	206 000	291 000	241 000	191 000		1.0 %	

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2. Engineering characteristics

301. Particle characteristics

01. Particle size

Type	(C)RM Code	Material (matrix etc)	Certified value or Range	Unit	Measurement Uncertainty (Confidence Level is about 95 %, $k = 2$)	Standard
CRM	KIL-CRM 301-01-1	Silver nano-particle certified reference material for particle size analysis	15 ~ 25	nm	25 %	IEC 22412 : 2017
CRM	KIL-CRM 301-01-2		50 ~ 70		10 %	
CRM	KIL-CRM 301-01-3		95 ~ 125		10 %	

End.