

Singapore Food Agency

S/N	CRM description	Product code	CRM provider	Type (seed powder / plasmid)
1	0.1% Roundup Ready Soya	ERMBF410BK	JRC Science Hub	seed powder
2	1% Roundup Ready Soya	ERMBF410dn		seed powder
3	10% Roundup Ready Soya	ERMBF410gk		seed powder
4	0.1% DP-356043-5 soya	ERMBF425b		seed powder
5	1% DP-356043-5 soya	ERMBF425c		seed powder
6	1% DP-305423-1 soya	ERMBF426c		seed powder
7	1% DAS-68416-4 Soya	ERM-BF432C		seed powder
8	10% DAS-68416-4 Soya	ERM-BF432D		seed powder
9	0.1% Bt11 maize	ERMBF412B		seed powder
10	1% Bt11 maize	ERMBF412D		seed powder
11	1 96% Bt11 maize	ERMBF412E		seed powder
12	10% Bt11 maize	ERM-BF412ek		seed powder
13	0.1% Bt-176 maize	ERMBF411B		seed powder
14	1% Bt-176 maize	ERMBF411D		seed powder
15	5% Bt-176 maize	ERMBF411F		seed powder
16	2% Mon810 maize	ERMBF413EK		seed powder
17	0.1% GA21 maize	ERMBF414B		seed powder
18	1 0% GA21 maize	ERMBF414D		seed powder
19	5% GA21 maize	ERMBF414F		seed powder
20	0.1% NK603 maize	ERMBF415B		seed powder
21	1% NK603 maize	ERMBF415D		seed powder
22	5% NK603 maize	ERMBF415F		seed powder
23	0.1% Mon863 maize	ERMBF416B		seed powder
24	1% Mon863 maize	ERMBF416C		seed powder
25	10% Mon863 maize	ERMBF416D		seed powder
26	0.1% TC1507 maize	ERMBF418B		seed powder
27	1% TC1507 maize	ERMBF418C		seed powder
28	10% TC1507 maize	ERMBF418D		seed powder
29	1% ES3272 maize	ERMBF420b		seed powder
30	0.1% MIR604 maize	ERMBF423b		seed powder
31	1% MIR604 maize	ERMBF423c		seed powder
32	0.1% 59122 maize	ERMBF 424b		seed powder
33	1% 59122 maize	ERMBF 424c		seed powder
34	2% 98140 maize	ERMBF427c		seed powder
36	1% DAS-40278-9 maize	ERMBF433C		seed powder
37	10% DAS-40278-9 maize	ERMBF433D		seed powder
38	0% EH92-527-1 potato	ERMBF421a		seed powder
39	100% EH92-527-1 potato	ERMBF421b		seed powder
40	0% H7-1 sugar beet	ERMBF419a		seed powder
41	100% H7-1 sugar beet	ERMBF419b		seed powder
42	Non-modified maize leaf tissue genomic DNA	AOCS 0306-C4	AOCS (https://www.aocs.org/technical-products/certified-reference-materials-crms/)	DNA solution
43	Non-modified Rice leaf tissue genomic DNA	AOCS 0306-D5		DNA solution
45	Soya A2704-12 DNA	AOCS 0707-B12		DNA solution
46	Soya A5547-127 DNA	AOCS 0707-C7		DNA solution
47	Maize T25 DNA	AOCS 0306-h9		DNA solution
48	LLRICE62 Rice	AOCS 1022-B		seed powder
49	100% Soya MON89788 (RR II)	AOCS 0906-B2		seed powder
50	5% Soya CV127	AOCS 0911-D		seed powder
51	100% Maize MON88017	AOCS 0406-D2		seed powder
52	100% Maize MON89034	AOCS 0906-E2		seed powder
53	Maize MON87460	AOCS 0709-A2		seed powder
54	Maize MIR162	AOCS 1208-A3		seed powder

Inventory of Certified Reference Materials (CRMs) in GM Testing Laboratories in the Philippines

BPI Central Post Entry Quarantine Station

GM Event	CRM Code	Description	Remarks
MON810 Maize	ERM-BF413gk	ERM-BF413gk was produced from whole seeds of a non-modified maize (variety EXP258B) and genetically modified MON 810 maize (variety DKC57-84) delivered by Monsanto Company (St. Louis, MO, USA). The CRM is available in a glass bottle containing approximately 1g of dried soya powder closed under argon atmosphere. ANALYTICAL METHODS USED FOR CHARACTERISATION: Event-specific quantitative polymerase chain reaction (qPCR).	Procured from EU-JRC-GM
GTS40-3-2 Soya Bean	ERM-BF410ep	ERM-BF410ep was produced from whole seeds of a non-genetically modified soya bean and genetically modified MON-04032-6 soya bean, both supplied by Monsanto, US. The CRM is available in a glass bottle containing approximately 1g of dried soya powder closed under argon atmosphere. ANALYTICAL METHODS USED FOR CHARACTERISATION: Event-specific quantitative polymerase chain reaction (qPCR).	Procured from EU-JRC-GM
DP356043 Soya Seed	ERM-BF425b	ERM-BF425b was produced from whole kernels of event 356043 soybean and non-modified near-isogenic soybean, both supplied by Pioneer Hi-Bred International Inc. (Johnston, IA, USA). The CRM is available in a glass bottle containing approximately 1g of dried soya powder closed under argon atmosphere. ANALYTICAL METHODS USED FOR CHARACTERISATION:	Procured from EU-JRC-GM

		Event-specific quantitative polymerase chain reaction (qPCR).	
NK603 Maize	ERM-BF415F	ERM-BF415F was produced from whole kernels of event NK603 maize and its non-genetically modified near-isogenic counterpart, both provided by Monsanto Company (St. Louis, MO, USA). The CRM is available in a glass bottle containing approximately 1g of dried soya powder closed under argon atmosphere. ANALYTICAL METHODS USED FOR CHARACTERISATION: Event-specific quantitative polymerase chain reaction (qPCR).	Procured from EU-JRC-GM
DP305423 Soya Seed	ERM-BF426d	ERM-BF426d was produced from whole beans of 305423 soya and non-modified soya, both supplied by Pioneer Hi-Bred International Inc. (Johnston, IA, USA). The CRM is available in a glass bottle containing approximately 1g of dried soya powder closed under argon atmosphere. ANALYTICAL METHODS USED FOR CHARACTERISATION: Event-specific quantitative polymerase chain reaction (qPCR).	Procured from EU-JRC-GM
GA21 Maize	ERM-BF414f	ERM-BF414f has been produced from whole seeds of a non modified maize (hybrid seed variety RX670) and genetically modified maize (hybrid event variety RX740RR) delivered by Monsanto St. Louis, MO, USA. The CRM is available in amber glass vial containing approximately 1 g maize powder packed under Argon atmosphere. ANALYTICAL METHODS USED FOR CHARACTERISATION: Event-specific quantitative polymerase chain reaction (qPCR).	Procured from EU-JRC-GM

MON 863 Maize	ERM-BF416d	ERM-BF416d has been produced from whole kernels of non-modified maize (variety 'RX670') and MON 863 maize (hybrid line 'TP5504-TD') both of seed quality and delivered by Monsanto (St. Louis, MO, USA). The CRM is available in a glass bottle containing approximately 1 g of maize powder packed under argon atmosphere. ANALYTICAL METHODS USED FOR CHARACTERISATION: Event-specific quantitative polymerase chain reaction (qPCR).	Procured from EU-JRC-GM
1507 Maize	ERM-BF418d	ERM-BF418d has been produced from whole kernels of non-modified maize and 1507 maize both of seed quality and delivered by Pioneer Hi-Bred International (Johnston, IA, USA). The CRM is available in a glass bottle containing approximately 1 g of maize powder closed under argon atmosphere. ANALYTICAL METHODS USED FOR CHARACTERISATION: Quantitative polymerase chain reaction (qPCR)	Procured from EU-JRC-GM
3273 Maize	ERM-BF420c	ERM-BF420c has been produced from whole kernels of hybrid event 3272 maize and non-modified near isogenic maize supplied by Syngenta Seeds Inc (Bloomington, IL, USA). The CRM is available in a glass bottle containing approximately 1 g of dried maize powder closed under argon atmosphere. ANALYTICAL METHODS USED FOR CHARACTERISATION: Event-specific quantitative polymerase chain reaction (qPCR)	Procured from EU-JRC-GM

MIR604 Maize	ERM-BF423d	ERM-BF423d has been produced from whole kernels of non-modified maize and MIR604 maize of seed quality delivered by Syngenta Protection AG (Basel,CH). The CRM is available in a glass bottle containing approximately 1 g of maize powder closed under argon atmosphere. ANALYTICAL METHODS USED FOR CHARACTERISATION: Quantitative polymerase chain reaction (qPCR)	Procured from EU-JRC-GM
59122 Maize	ERM-BF424d	ERM-BF424d has been produced from whole kernels of non-modified maize and 59122 maize of seed quality delivered by Pioneer Hi-Bred International (Johnston, IA, USA). The CRM is available in a glass bottle containing approximately 1 g of maize powder closed under argon atmosphere. ANALYTICAL METHODS USED FOR CHARACTERISATION: Quantitative polymerase chain reaction (qPCR)	Procured from EU-JRC-GM
MIR162 Maize	ERM-BF446e	ERM-BF446e has been produced from whole seeds non-genetically modified maize and genetically modified maize both supplied by Syngenta Seeds, LLC (Clinton, IL,US). The CRM is available in a glass bottle containing approximately 1 g of maize seed powder under argon atmosphere. ANALYTICAL METHODS USED FOR CHARACTERISATION: Event-specific quantitative polymerase chain reaction (qPCR)	Procured from EU-JRC-GM

T25 Maize	AOCS 0306-H11	AOCS 0306-H11 has been produced from genomic DNA extracted from clean leaves of T25 Maize by BASF Agricultural Solutions Seed US LLC. The CRM is available in sterile 0.5 mL skirted screw-cap self-sealing tubes containing approximately 10 µg of DNA. ANALYTICAL METHODS USED FOR CHARACTERISATION: Event-specific real-time PCR	Procured from AOCS
MON89788 Soybean	AOCS 0906-B2	AOCS 0906-B2 has been produced from ground seed of MON 89788 soybean delivered by Bayer CropScience. The CRM is available in 27-mL glass headspace vials containing approximately 10 g of material. ANALYTICAL METHODS USED FOR CHARACTERISATION: Event-specific real-time PCR	Procured from AOCS
MON 89034 Maize	AOCS 0906-E2	AOCS 0906-E2 has been produced from milled seed of MON 89034 maize delivered by Bayer CropScience. The CRM is available in 27-mL glass headspace vials containing approximately 10 g of material. ANALYTICAL METHODS USED FOR CHARACTERISATION: Event-specific real-time PCR	Procured from AOCS
MON 88017 Maize	AOCS 0406-D2	AOCS 0406-D2 has been produced from milled seed of MON 88017 maize delivered by Bayer CropScience. AOCS 0406-D2 is available in 27-mL glass headspace vials containing approximately 10 g of material. ANALYTICAL METHODS USED FOR CHARACTERISATION: Real-time PCR	Procured from AOCS

A5547-127 Soybean	AOCS 0707-C9	AOCS 0707-C9 has been produced from genomic DNA extracted from clean leaves of A5547-127 soybean delivered by BASF Agricultural Solutions Seed US LLC. AOCS 0707-C9 is available in sterile, 0.5 mL skirted screw-cap self-sealing tubes containing approximately 10 µg of DNA. ANALYTICAL METHODS USED FOR CHARACTERISATION: Event-Specific Real-time PCR	Procured from AOCS
A2704-12 Soybean	AOCS 0707-B14	AOCS 0707-B14 has been produced from genomic DNA extracted from clean leaves of A2704-12 soybean by BASF Agricultural Solutions Seed US LLC. The CRM is available in sterile, 0.5 mL skirted screw-cap self-sealing tubes containing approximately 10 µg of DNA. ANALYTICAL METHODS USED FOR CHARACTERISATION: Event-Specific Real-time PCR	Procured from AOCS

BPI BIOTECHNOLOGY OFFICE

GM Event	CRM Code	Description	Remarks
MIR162 Maize (nominal 100 %)	ERM-BF446b	ERM-BF446b has been produced from whole seeds of genetically modified maize supplied by Syngenta Seeds, LLC (Clinton, IL, US). The CRM is supplied in amber glass vials containing at least 1 g of maize seed powder under argon atmosphere. ANALYTICAL METHODS USED FOR CHARACTERISATION: Event-specific quantitative polymerase chain reaction (qPCR) and event specific qualitative PCR	Procured from EU-JRC-GM

DP202216 Maize (nominal 100 % GMO)	ERM-BF444b	ERM-BF444b has been produced from whole seeds of genetically modified maize supplied by Pioneer Hi-Bred International, Inc. (Johnston, US). The CRM is supplied in amber glass vials containing at least 1 g of maize seed powder under argon atmosphere. ANALYTICAL METHODS USED FOR CHARACTERISATION: Event-specific qualitative polymerase chain reaction.	Procured from EU-JRC-GM
MIR604 Maize (level 3 - nominal 10 % GMO)	ERM-BF423d	ERM-BF423d is part of a set of four maize powder CRMs containing different mass fractions of genetically modified (GM) MIR604 maize. ERM-BF423d is available in glass bottles containing approximately 1 g of maize powder closed under argon atmosphere. This reference material has been produced from whole kernels of non-modified maize and MIR604 maize of seed quality delivered by Syngenta Protection AG (Basel, CH). ANALYTICAL METHODS USED FOR CHARACTERISATION: Gravimetric preparation confirmed by real-time Polymerase Chain Reaction (rt-PCR)	Procured from EU-JRC-GM
DP23211 Maize (100 % GMO)	ERM-BF445b	ERM-BF445b has been produced from whole seeds of genetically modified maize supplied by Pioneer Hi-Bred International, Inc. (Johnston, IA, US). The CRM is supplied in amber glass vials containing at least 1 g of maize seed powder under argon atmosphere. ANALYTICAL METHODS USED FOR CHARACTERISATION: Event-specific quantitative polymerase chain reaction (PCR).	Procured from EU-JRC-GM

59122 MAIZE (level 3 - nominal 10 % GMO)	ERM-BF424d	ERM®-BF424d is part of one of four maize powder certified reference materials (CRMs) containing different mass fractions of genetically modified (GM) 59122 maize. The materials were prepared by quantitative mixing of dried non-GM maize powder and 59122 GM dried maize powder, and subsequent homogenisation with the help of a dry-mixing technique. ERM®-BF424d is available in glass bottles containing approximately 1 g of maize powder closed under argon atmosphere. This reference material has been produced from whole kernels of non-modified maize and 59122 maize of seed quality delivered by Pioneer Hi-Bred International (Johnston, IA, USA). ANALYTICAL METHODS USED FOR CHARACTERISATION: Gravimetric preparation confirmed by real-time Polymerase Chain Reaction.	Procured from EU-JRC-GM
DBN-09004-6 SOYA BEAN (nominal 100 %)	ERM-BF441b	ERM-BF441b has been produced from whole seeds of genetically modified soya bean supplied by Beijing DaBeiNong Biotechnology Co., Ltd (Beijing, CN). The CRM is supplied in amber glass vials containing at least 1 g of soya bean seed powder under argon atmosphere. ANALYTICAL METHODS USED FOR CHARACTERISATION: Event-specific quantitative polymerase chain reaction (qPCR).	Procured from EU-JRC-GM
GTS 40-3-2 SOYA BEAN (>98 %)	ERM-BF410bp	ERM-BF410bp has been produced from whole seeds of genetically modified MON-Ø4Ø32-6 soya bean, supplied by Monsanto, US. According to the information provided by Monsanto, the MON-Ø4Ø32-6 soya bean seeds are homozygous. The CRM is supplied in amber glass bottles containing at least 1 g soya bean powder under argon atmosphere. ANALYTICAL METHODS USED FOR CHARACTERISATION: Event-specific real-time polymerase chain reaction (PCR) for ERM-BF410ap and bp. Gravimetry, verified by event-specific real-time PCR, for ERM-BF410cp, dp and ep.	Procured from EU-JRC-GM

SOYA DAS-68416-4 (level 3 - nominal 10 % GMO)	ERM-BF432d	ERM-BF432d has been produced from whole seeds of homozygous DAS-68416-4 soya and non-modified soya both supplied by Dow AgroSciences (DAS, Oxon, UK). The CRM is available in glass vials containing at least 1 g of dried soya seed powder closed in argon atmosphere. ANALYTICAL METHODS USED FOR CHARACTERISATION: Gravimetric preparation verified by event-specific real-time Polymerase Chain Reaction.	Procured from EU-JRC-GM
AM04-1020 POTATO (nominal 100 % GMO)	ERM-BF430b	ERM-BF430b is a dried potato powder prepared from genetically modified AM04-1020 potato tubers delivered by BASF Plant Science Company GmbH (BPS, Ludwigshafen DE). The CRM is supplied in amber glass bottles containing approximately 1 g potato powder packed under argon atmosphere. ANALYTICAL METHODS USED FOR CHARACTERISATION: Colorimetric staining method for amylose (Lugol's test) confirmed by event-specific real-time Polymerase Chain Reaction	Procured from EU-JRC-GM
EH92-527-1 POTATO (level 1 - nominal 100 % GMO)	ERM-BF421b	ERM-BF421a is one of two potato powder CRMs containing different mass fractions of genetically modified (GM) EH92-527-1 potatoes; ERM-BF421b is composed of milled, dried powder from purely EH92-527-1 potatoes and its genetic identity has been confirmed by nucleotide sequencing. ERM-BF421b is available in glass bottles containing approximately 0.5 g of potato powder closed under argon atmosphere. ANALYTICAL METHODS USED FOR CHARACTERISATION: The mass fraction is calculated based on the fact that each individual potato was tested for the presence of the genetic modification EH92-527-1 by staining a small potato piece for the presence of amylose (Lugol's test). The genetic identification is based on event-specific real-time PCR for EH92-527-1.	Procured from EU-JRC-GM

3272 MAIZE (level 2 - nominal 10 % GMO)	ERM-BF420c	ERM®-BF420c has been produced from whole kernels of hybrid event 3272 maize and non-modified near-isogenic maize supplied by Syngenta Seeds Inc. (Bloomington, IL, USA). The CRM is available in glass bottles containing approximately 1 g of dried maize powder closed under argon atmosphere. ANALYTICAL METHODS USED FOR CHARACTERISATION: Gravimetric preparation confirmed by event-specific real-time Polymerase Chain Reaction	Procured from EU-JRC-GM
73496 RAPESEED (nominal 100 % GMO)	ERM-BF434b	ERM-BF434b has been produced from seeds of genetically modified 73496 rapeseed supplied by DuPont Pioneer (Iowa, US). The CRM is supplied in amber glass bottles containing at least 1 g rapeseed powder packed under argon atmosphere. ANALYTICAL METHODS USED FOR CHARACTERISATION: Gravimetric preparation verified by event-specific real-time polymerase chain reaction.	Procured from EU-JRC-GM
GHB811 COTTON (nominal 100 %)	ERM-BF442b	ERM-BF442b has been produced from whole seeds of genetically modified GHB811 cotton supplied by BASF Agricultural Solutions Belgium NV (Gent, BE). The CRM is supplied in amber glass vials containing at least 1 g cottonseed powder under argon atmosphere. ANALYTICAL METHODS USED FOR CHARACTERISATION: Event-specific quantitative polymerase chain reaction (PCR)	Procured from EU-JRC-GM
Bt-176 MAIZE (nominal 100 % GMO)	ERM-BF411g	ERM-BF411g is supplied in amber glass vials containing approximately 1 g maize powder closed under argon atmosphere. ERM-BF411g is part of a set of CRMs of dried maize powder with different mass fractions of dried powder from genetically modified Bt-176 maize. ANALYTICAL METHODS USED FOR CHARACTERISATION: Event-specific quantitative polymerase chain reaction (PCR)	Procured from EU-JRC-GM

GENETICALLY MODIFIED VCO-Ø1981-5 MAIZE (nominal 100% GMO)	ERM-BF438b	ERM-BF438b has been produced from whole seeds of genetically modified VCO-Ø1981-5 maize supplied by Genective SA (Chappes, France). The CRM is supplied in amber glass bottles containing at least 1 g maize powder packed under argon atmosphere. ANALYTICAL METHODS USED FOR CHARACTERISATION: Event-specific real-time polymerase chain reaction (PCR) for ERM-BF438a and b. Gravimetry, verified by event-specific real-time PCR, for ERM-BF438c, d and e.	
EH92-527-1 POTATO (blank)	ERM-BF421a	ERM-BF421a is one of two potato powder CRMs containing different mass fractions of genetically modified (GM) EH92- 527-1 potatoes; ERM-BF421a is the blank material composed of milled, dried powder from solely “non-EH92-527-1” potatoes. This CRM is certified for both the mass fraction of EH92-527-1 potatoes per total mass of potatoes used for the processing. ERM-BF421a is available in glass bottles containing approximately 1 g of potato powder closed under argon atmosphere. This reference material has been produced from whole tubers of non-modified starch potato cultivar KURAS delivered by BASF Plant Science GmbH (Ludwigshafen, Germany).	Procured from EU-JRC-GM
DAS-40278-9 MAIZE (nominal 10 % GMO)	ERM-BF433d	ERM-BF433d has been produced from whole seeds of non-modified maize and genetically modified DAS-40278-9 maize, both supplied by Dow AgroSciences (DAS, Oxon, UK). The CRM is supplied in amber glass bottles containing at least 1 g maize powder packed under argon atmosphere. ANALYTICAL METHODS USED FOR CERTIFICATION Gravimetric preparation verified by event-specific real-time Polymerase Chain Reaction.	Procured from EU-JRC-GM

MON 863 MAIZE (level 3 - nominal 10 % GMO)	ERM-BF416d	CRM ERM®-BF416d is part of a set of CRMs containing different mass fractions of maize powder prepared from genetically modified (GM) MON 863 maize. The materials were prepared by quantitative mixing of dried non-GM maize powder and MON 863 GM dried maize powder, and subsequent homogenisation with the help of a dry-mixing technique. ERM-BF416d is available in glass bottles containing approximately 1 g of maize powder packed under argon atmosphere. ANALYTICAL METHOD USED FOR CERTIFICATION Gravimetric preparation confirmed by real-time Polymerase Chain Reaction (rt-PCR).	
GA21 MAIZE (level 3 - nominal 1 % GMO)	ERM-BF414d	ERM®-BF414d is supplied in amber glass vials containing approximately 1 g maize powder packed under Argon atmosphere. ERM®-BF414d is part of a set of CRMs of dried maize powder with GA21 RoundupReady® maize. ANALYTICAL METHOD USED FOR CERTIFICATION The certified value is based on the mass fraction of dried non-GMO powder and dried GMO powder mixed and corrected for the water content. Verification measurements using event specific real-time PCR have been used to prove the consistency of the set of ERM®-BF414.	Procured from EU-JRC-GM
GA21 MAIZE (blank)	ERM-BF414a	ERM®-BF414a is supplied in amber glass vials containing approximately 1 g maize powder packed under Argon atmosphere. ERM®-BF414a is part of a set of CRMs of dried maize powder with different mass fractions (< 0.8, 1.0, 4.9, 9.9, 17.2, 42.9 g/kg) of dried powder from genetically modified GA21 Roundup Ready® maize. ANALYTICAL METHOD USED FOR CERTIFICATION The certified value is based on the mass fraction of dried non-GMO powder. Verification measurements using event specific real-time PCR have been used to prove the consistency of the set of ERM®-BF414.	Procured from EU-JRC-GM

MON 810 MAIZE (level 3 - nominal 10 % GMO)	ERM-BF413gk	ERM-BF413gk is a powder mixture produced from whole seeds of a non-modified maize (variety EXP258B) and genetically modified MON 810 maize (variety DKC57-84) delivered by Monsanto Company (St. Louis, MO, USA). The CRM is supplied in amber glass vials containing approximately 1 g maize powder closed under argon atmosphere. ANALYTICAL METHOD USED FOR CERTIFICATION Gravimetric preparation verified by event-specific real-time Polymerase Chain Reaction	
59122 MAIZE (level 2 - nominal 1 % GMO)	ERM-BF424c	ERM®-BF424c is part of one of four maize powder certified reference materials (CRMs) containing different mass fractions of genetically modified (GM) 59122 maize. The materials were prepared by quantitative mixing of dried non-GM maize powder and 59122 GM dried maize powder, and subsequent homogenisation with the help of a dry-mixing technique. ERM®-BF424c is available in glass bottles containing approximately 1 g of maize powder closed under argon atmosphere. ANALYTICAL METHOD USED FOR CERTIFICATION Gravimetrical preparation confirmed by real-time Polymerase Chain Reaction	Procured from EU-JRC-GM
59122 MAIZE (blank)	ERM-BF424a	ERM®-BF424a is part of one of four maize powder certified reference materials (CRMs) containing different mass fractions of genetically modified (GM) 59122 maize. ERM®-BF424a is available in glass bottles containing approximately 1 g of maize powder closed under argon atmosphere. ANALYTICAL METHOD USED FOR CERTIFICATION Gravimetrical preparation confirmed by real-time Polymerase Chain Reaction.	Procured from EU-JRC-GM

1507 MAIZE (level 2 - nominal 1 % GMO)	ERM-BF418c	ERM®-BF418c is part of a set of four maize powder CRMs containing different mass fractions of genetically modified (GM) 1507 maize. The materials were prepared by quantitative mixing of dried non-GM maize powder and 1507 GM dried maize powder, and subsequent homogenisation with the help of a dry-mixing technique. ERM®-BF418c is available in glass bottles containing approximately 1 g of maize powder closed under argon atmosphere. ANALYTICAL METHOD USED FOR CERTIFICATION Gravimetical preparation confirmed by real-time Polymerase Chain Reaction (rt-PCR).	
1507 MAIZE (blank)	ERM-BF418a	ERM®-BF418a is part of a set of four maize powder CRMs containing different mass fractions of genetically modified (GM) 1507 maize. ERM-BF418a is available in glass bottles containing approximately 1 g of maize powder closed under argon atmosphere. ANALYTICAL METHOD USED FOR CERTIFICATION Gravimetical preparation confirmed by real-time Polymerase Chain Reaction (rt-PCR).	Procured from EU-JRC-GM
3272 MAIZE (blank)	ERM-BF420a	ERM®-BF420a is one of three maize powder certified reference materials (CRMs) containing different mass fractions of genetically modified maize event 3272. ERM®-BF420a has been produced from whole kernels of non-modified maize supplied by Syngenta Seeds Inc. (Bloomington, IL, USA). The CRM is available in glass bottles containing approximately 1 g of dried maize powder closed under argon atmosphere. ANALYTICAL METHOD USED FOR CERTIFICATION Gravimetical preparation confirmed by event-specific real-time Polymerase Chain Reaction.	Procured from EU-JRC-GM

3272 MAIZE (level 1 - nominal 1 % GMO)	ERM-BF420b	ERM®-BF420b is one of three maize powder certified reference materials (CRMs) containing different mass fractions of genetically modified maize event 3272. ERM®-BF420b has been produced from whole kernels of hybrid event 3272 maize and non-modified near-isogenic maize supplied by Syngenta Seeds Inc. (Bloomington, IL, USA). The CRM is available in glass bottles containing approximately 1 g of dried maize powder closed under argon atmosphere. ANALYTICAL METHOD USED FOR CERTIFICATION Gravimetical preparation confirmed by event-specific real-time Polymerase Chain Reaction	Procured from EU-JRC-GM
MON 863 MAIZE (blank)	ERM-BF416a	CRM ERM®-BF416a is part of a set of CRMs containing different mass fractions of maize powder prepared from genetically modified (GM) MON 863 maize. ERM®-BF416a is available in glass bottles containing approximately 1 g of maize powder packed under argon atmosphere. ANALYTICAL METHOD USED FOR CERTIFICATION Gravimetical preparation confirmed by real-time Polymerase Chain Reaction (rt-PCR).	Procured from EU-JRC-GM
PLASMID DNA FRAGMENTS OF 98140	ERM-AD427	The material is composed of a solution of DNA containing a plasmid in which an 80 base pair (bp) fragment of the 98140 5' insert-to-plant junction as well as a 79 bp fragment of the maize endogenous high mobility group (hmg) gene have been inserted. The solution is made of 1 mmol/L TRIS, 0.01 mmol/L EDTA pH 7.0 and supplemented with 1 ng/μL of Col E1 plasmid DNA. Each tube contains approximately 500 μL plasmid solution. ANALYTICAL METHODS USED FOR CERTIFICATION Dye terminator sequencing.	Procured from EU-JRC-GM

0216-A maize powder with 100% sample purity (AOCS) (1 bottle)	AOCS 0216-A	AOCS 0216-A was prepared from MON87403 maize provided by Monsanto Company. Introduction of the ATHB17 gene in MON 87403 confers increased ear biomass at an early reproductive phase (R1) compared to conventional control maize. AOCS 0216-A is available in 10 g of powder, packaged in 27-mL glass headspace vials.	Procured from AOCS
GA21 MAIZE with 100% sample purity (AOCS) (1 bottle)	AOCS 0407-B	AOCS 0407-B was prepared from GA21 maize provided by Syngenta Crop Protection, LLC. GA21 contains the mepsps gene to confer glyphosphate herbicide tolerance. AOCS 0407-B is available in 10 g of powder, packaged in 27-mL glass headspace vials.	Procured from AOCS
MON88017 MAIZE with 100% sample purity (AOCS) (1 bottle)	AOCS 0406-D2	AOCS 0406-D2 was prepared from MON88017 maize provided by Monsanto Company. MON88017 contains the cp4 epsps (aroA:CP4) and cry3Bb1 genes to confer glyphosphate herbicide tolerance and coleopteran insect resistance. AOCS 0406-D2 is available in 10 g of powder, packaged in 27-mL glass headspace vials.	Procured from AOCS
MON89034 MAIZE with 100% sample purity (AOCS) (1 bottle)	AOCS 0906-E2	AOCS 0906-E2 was prepared from MON89034 maize provided by Monsanto Company. MON89034 contains the cry2Ab2 and cry1A.105 genes to confer lepidopteran insect resistance. AOCS 0906-E2 is available in 10 g of powder, packaged in 27-mL glass headspace vials.	Procured from AOCS
T25 Maize leaf tissue genomic DNA (1 bottle)	AOCS 0306-H12	AOCS 0306-H12 was prepared from maize genomic DNA extracted from clean T25 maize leaves by BASF Agricultural Solutions Seed US LLC. T25 contains the pat (syn) and bla genes to confer glufosinate herbicide tolerance and antibiotic resistance. AOCS 0306-H12 is available in sterile, 0.5 ml skirted, screw-cap, self-sealing tubes containing approximately 10 µg extracted DNA.	Procured from AOCS
1507 MAIZE (level 3 - nominal 10 % GMO)	ERM-BF418d	ERM-BF418d is part of a set of four maize powder CRMs containing different mass fractions of genetically modified (GM) 1507 maize. The materials were prepared by quantitative mixing of dried non-GM maize powder and 1507 GM dried maize powder, and subsequent homogenisation with the help of a dry-mixing technique. ERM-BF418d is available in glass bottles containing approximately 1 g of maize powder closed under argon atmosphere. ANALYTICAL METHOD USED FOR CERTIFICATION	Procured from EU-JRC-GM

		Gravimetric preparation confirmed by real-time Polymerase Chain Reaction (rt-PCR).	
GENETICALLY MODIFIED DP-ØØ4114-3 MAIZE (nominal 10% GMO)	ERM-BF439e	ERM-BF439e is one of five DP-ØØ4114-3 maize powder certified reference materials (CRMs) containing different mass fractions of this genetically modified maize. ERM-BF439e has been produced from whole seeds of non-modified maize and genetically modified DP-ØØ4114-3 maize, both supplied by PioneerOverseas Corporation, Johnston, Iowa, US. The CRM is supplied in amber glass bottles containing at least 1 g maize powder packed under argon atmosphere. ANALYTICAL METHODS USED FOR CERTIFICATION Event-specific real-time polymerase chain reaction (PCR) for ERM-BF439a and b. Gravimetry, verified by event-specific real-time PCR, for ERM-BF439c, d and e.	Procured from EU-JRC-GM
DAS-40278-9 MAIZE (nominal 10 % GMO)	ERM-BF433d	ERM-BF433d is one of four DAS-40278-9 maize powder certified reference materials (CRMs) containing different mass fractions of this genetically modified maize. ERM-BF433d has been produced from whole seeds of non-modified maize and genetically modified DAS-40278-9 maize, both supplied by Dow AgroSciences (DAS, Oxon, UK). The CRM is supplied in amber glass bottles containing at least 1 g maize powder packed under argon atmosphere. ANALYTICAL METHODS USED FOR CERTIFICATION Gravimetric preparation verified by event-specific real-time Polymerase Chain Reaction.	Procured from EU-JRC-GM

GENETICALLY MODIFIED VCO-Ø1981-5 MAIZE (blank)	ERM-BF438a	ERM-BF438a is one of five VCO-Ø1981-5 maize powder certified reference materials (CRMs) containing different mass fractions of this genetically modified maize. ERM-BF438a has been produced from whole seeds of non-modified maize supplied by Genective SA (Chappes, France). The CRM is supplied in amber glass bottles containing at least 1 g maize powder packed under argon atmosphere. ANALYTICAL METHODS USED FOR CERTIFICATION Event-specific real-time polymerase chain reaction (PCR) for ERM-BF438a and b. Gravimetry, verified by event-specific real-time PCR, for ERM-BF438c, d and e.	Procured from EU-JRC-GM
MON 863 MAIZE (level 2 - nominal 1 % GMO)	ERM-BF416c	CRM ERM®-BF416c is part of a set of CRMs containing different mass fractions of maize powder prepared from genetically modified (GM) MON 863 maize. The materials were prepared by quantitative mixing of dried non-GM maize powder and MON 863 GM dried maize powder, and subsequent homogenisation with the help of a dry-mixing technique. ERM®-BF416c is available in glass bottles containing approximately 1 g of maize powder packed under argon atmosphere. ANALYTICAL METHOD USED FOR CERTIFICATION Gravimetrical preparation confirmed by real-time Polymerase Chain Reaction (rt-PCR).	Procured from EU-JRC-GM

CRM description of Biotechnology Research and Development Division, Department of Agriculture Laboratory, Thailand

No.	Name	Value (%)	Uncertainty (%)	CRM Code	Lot No.	CRM type		CRM Provider
						powder	plasmid	
1	GTS 40-3-2 soya bean	0.1	0.01	ERM®-BF410cp	1396	/	-	JRC
2	GTS 40-3-2 soya bean	1	0.06	ERM®-BF410dp	2004	/	-	
3	GTS 40-3-2 soya bean	10	0.5	ERM®-BF410ep	2131	/	-	
4	MON 87708 Soybean	>99.3	0.3	AOCS 0311-A2	-	/	-	AOCS
5	305423 Soya (blank)	< 0.08	-	ERM®-BF426a	184	/	-	JRC
6	305423 Soya (Level 2)	1	0.1	ERM®-BF426c	260	/	-	
7	305423 Soya (Level 1)	0.5	0.08	ERM®-BF426b	202	/	-	
8	305423 Soya (Level 3)	10	0.7	ERM®-BF426d	365	/	-	
9	356043 Soya (blank)	0.05		ERM®-BF425a	191	/	-	
10	356043 Soya (Level 2)	1	0.11	ERM®-BF425c	370	/	-	
11	356043 Soya	10	0.9	ERM®-BF425d	362	/	-	
12	356043 Soya (blank)	<0.05	-	ERM®-BF425a	22	/	-	
13	356043 Soya (Level 1)	0.1	0.04	ERM®-BF425b	30	/	-	
14	356043 Soya (Level 2)	0.85	0.11	ERM®-BF425c	39	/	-	
15	356043 Soya (Level 3)	10	0.9	ERM®-BF425d	14	/	-	
16	NK 603 maize (blank)	<0.04	-	ERM®-BF415a	885	/	-	
17	NK 603 maize (level 1)	0.1	0.04	ERM®-BF415b	1411	/	-	
18	NK 603 maize (level 2)	0.49	0.05	ERM®-BF415c	663	/	-	
19	NK 603 maize (level 3)	0.98	0.07	ERM®-BF415d	1499	/	-	
20	NK 603 maize (level 4)	0.95	0.11	ERM®-BF415e	727	/	-	
21	NK 603 maize (level 5)	4.91	0.13	ERM®-BF415f	2156	/	-	
22	NK 603 maize (level 1)	0.1	0.04	ERM®-BF415b	355	/	-	
23	3272 maize	< 0.13	-	ERM®-BF420a	307	/	-	
24	3272 maize	0.98	0.12	ERM®-BF420b	438	/	-	
25	3272 maize	9.8	0.8	ERM®-BF420c	744	/	-	
26	Bt11 maize (blank)	<0.012	-	ERM®-BF412ak	181	/	-	
27	Bt11 maize (level1)	>97	-	ERM®-BF412bk	176	/	-	
28	Bt11 maize (level2)	0.099	0.13	ERM®-BF412ck	216	/	-	

29	Bt11 maize (level3)	0.99	0.07	ERM®-BF412dk	242	/	-	
30	Bt11 maize (level4)	9.9	0.4	ERM®-BF412ek	258	/	-	
31	GA21 maize (blank)	<0.08	-	ERM®-BF414a	774	/	-	
32	GA21 maize (Level 2)	0.1	0.08	ERM®-BF414b	1011	/	-	
33	GA21 maize (Level 3)	0.49	0.1	ERM®-BF414c	601	/	-	
34	GA21 maize (Level 4)	0.99	0.11	ERM®-BF414d	1197	/	-	
35	GA21 maize (Level 5)	1.72	0.12	ERM®-BF414e	578	/	-	
36	GA21 maize (Level 6)	4.29	0.17	ERM®-BF414f	1833	/	-	
37	MIR 604 Maize (blank)	<0.09	not applicable	ERM®-BF423a	398	/	-	
38	MIR 604 Maize (level1)	0.1	-.03;+0.1	ERM®-BF423b	615	/	-	
39	MIR 604 Maize (level2)	0.98	-.09;+0.13	ERM®-BF423c	942	/	-	
40	MIR 604 Maize (level3)	9.85	-.026;+0.29	ERM®-BF423d	1012	/	-	
41	MON 810 maize	<0.09	-	ERM®-BF413ak	635	/	-	
42	MON 810 maize	0.49	0.1	ERM®-BF413ck	901	/	-	
43	MON 810 maize	1.98	0.15	ERM®-BF413ek	894	/	-	
44	MON 810 maize	9.9	0.5	ERM®-BF413gk	1409	/	-	
45	MON 863 x MON 810 maize	0.1	-.02;+0.1	ERM®-BF417b	1040	/	-	
46	1507 maize (blank)	<0.05	not applicable	ERM®-BF418a	743	/	-	
47	1507 maize (level1)	0.1	-.02; +0.06	ERM®-BF418b	1003	/	-	
48	1507 maize (level2)	0.99	-.06; +0.08	ERM®-BF418c	1245	/	-	
49	1507 maize (level3)	9.86	-.017; +0.2	ERM®-BF418d	1849	/	-	
50	Mon 88017	>99.05	NA	AOCS 0406-D	203	/	-	AOCS
51	Mon 88017	>99.05	NA	AOCS 0406-D	968	/	-	
52	Mon 88017	>99.05	NA	AOCS 0406-D	499	/	-	
53	MON 89034	>99.425	NA	AOCS 0906-E	788	/	-	
54	MON89034 maize	>99.425	NA	AOCS 0906-E	754	/	-	
55	MIR 162	0.1	-	AOCS 1208-A	404	/	-	
56	59122 maize (blank)	<0.12	not applicable	ERM®-BF424a	454	/	-	JRC
57	59122 maize (level1)	0.1	0.02-0.12	ERM®-BF424b	607	/	-	
58	59122 maize (level2)	0.99	0.08-0.14	ERM®-BF424c	763	/	-	
59	59122 maize (level3)	9.87	0.58-0.59	ERM®-BF424d	1248	/	-	

60	DAS-40278-9 maize (blank)	<0.03	-	ERM®-BF433a	234	/	-	
61	DAS-40278-9 maize (level1)	0.5	0.06	ERM®-BF433b	212	/	-	
62	DAS-40278-9 maize (level2)	1	0.09	ERM®-BF433c	333	/	-	
63	DAS-40278-9 maize (level3)	10	0.8	ERM®-BF433d	844	/	-	
64	DAS-40278-9 maize	10	1.3	ERM®-BF432d	98	/	-	
65	T25 maize	>99.99	-	-	-	/	-	AOCS
66	MON87427 maize	100	≥99.48	AOCS 0512-A	282	/	-	
67	MON87460 maize	-	NA	AOCS 0709-A	528	/	-	
68	MON 89788	0.1	-	AOCS 0906-B	342	/	-	
69	98140 maize	10	0.4	ERM®-BF427d	264	/	-	JRC
70	non-modified maize	-	NA	-	-	/	-	
71	73496 Rapeseed	10	1.2	ERM®-BF434e	382	/	-	
72	Plasmid DNA pGSE220 (LL601)	100 copies/ul	-	5211505401	2701201	-	/	EUROFIN
73	Plasmid DNA pGSE28 (Bt63)	100 copies/ul	-	5211505001	2591201	-	/	
74	Plasmid DNA pGSE219 (LL602)	10 copies/ul	-	5211508501	8050901	-	/	
75	Genomic DNA LL62 rice	20 copies/ul	-	5211514120	14991301	-	-	
76	Plasmid MON71200	100 copies/ul	-	315-08981	01100H	-	/	WAKO
77	PUC57-MON71800	4 ug	-	PCT70275	V140KEK110-1	-	/	In-house
78	MON 87701	1	0.0005 (true value ≥991.5 g/kg)	AOCS 0809-A	-	-	/	AOCS
79	MON 87705	1	NA	AOCS 0210-A	-	-	/	
80	MON 87769	1	NA	AOCS 0809-B	-	-	/	
81	MON 89788	1	0.0005 (true value ≥ 995.8 g/kg)	AOCS 0906-B2	-	-	/	
82	A2704-12	644.2 ng/ul	0	AOCS0707-B11	-	-	-	
83	MON87427 maize	≥99.48	-	-	-	-	-	
84	MON87460 maize	-	NA	-	-	-	-	
85	MON89034 maize	≥98.51	-	-	-	-	-	
CRM description of Bio-Molecular Laboratory, Bureau of Quality and Safety of Food, Department of Medical Sciences, Thailand								
No.	Name	Value (%)	Uncertainty (%)	CRM Code	Lot No.	CRM type		CRM Provider
						powder	plasmid	
1	DAS-68416-4 soya bean	10	1.3	ERM® BF432d	898	/	-	JRC

2	DAS-68416-4 soya bean	10	1.3	ERM® BF432d	899	/	-	JRC
3	MON 89788 -1 soya bean	≥99.6	-	AOCS 0906-B2	567	/	-	AOCS
4	GMB151 soya bean	10	0.6	ERM® BF443e	100	/	-	JRC
5	CV127 soya bean	≥96.3	0.18	AOCS 0911-C2	180	/	-	AOCS
6	MON 87751 soya bean	99.6	0.2	AOCS 0215-A	8	/	-	AOCS
7	MON 87701 soya bean	99.2	+0.8, -2.4	AOCS 0809-A2	400	/	-	AOCS
8	GTS 40-3-2 soya bean	0	-	ERM® BF410ap	1093	/	-	JRC
9	GTS 40-3-2 soya bean	99	-	ERM® BF410bp	1114	/	-	JRC
10	GTS 40-3-2 soya bean	0.1	+/- 0.01	ERM® BF410cp	1286	/	-	JRC
11	GTS 40-3-2 soya bean	1	+/- 0.06	ERM® BF410dp	1871	/	-	JRC
12	GTS 40-3-2 soya bean	10	+/- 0.5	ERM® BF410ep	1975	/	-	JRC
13	DBN-09004-6 soya bean	10	+/- 0.28	ERM® BF441e	54	/	-	JRC
14	GMB151 soya bean	0	+0.004,-0	ERM® BF443a	62	/	-	JRC
15	GMB151 soya bean	100	+0,-0.001	ERM® BF443b	232	/	-	JRC
16	GMB151 soya bean	0.1	+/- 0.009	ERM® BF443c	88	/	-	JRC
17	GMB151 soya bean	1	+/- 0.08	ERM® BF443d	113	/	-	JRC
18	GMB151 soya bean	10	+/- 0.6	ERM® BF443e	165	/	-	JRC
19	VCO Ø1981-5 maize	10	+/- 0.5	ERM® BF438e	89	/	-	JRC
20	VCO Ø1981-5 maize	1	+/- 0.8	ERM® BF438d	104	/	-	JRC
21	VCO Ø1981-5 maize	10	+/- 0.5	ERM® BF438e	147	/	-	JRC
22	DP ØØ4114 maize	10	+/- 0.8	ERM® BF439e	47	/	-	JRC
23	DP ØØ4114 maize	1	+/- 0.1	ERM® BF439d	57	/	-	JRC
24	DP ØØ4114 maize	10	+/- 0.8	ERM® BF439e	67	/	-	JRC
25	98140 Maize	10	+/- 0.4	ERM® BF427d	820	/	-	JRC
26	Mon87403-1 maize	≥99.6	+0.09, -0.22	AOCS 0216-A	660	/	-	AOCS
27	Mon87429-9 maize	≥99.1	+0.04, -0.11	AOCS 0321-A	246	/	-	AOCS
28	Mon95379-3 maize	≥99.6	+/-0.04, -0.21	AOCS 0521-A	941	/	-	AOCS
29	MZIR098 maize	96.2	+/- 3.8	AOCS 1114-B2	337	/	-	AOCS
30	MON 87411 maize	99.6	+/- 0.4	AOCS 0215-B	510	/	-	AOCS
31	MON 88017 maize	99.07	+/- 0.93	AOCS 0406-D2	861	/	-	AOCS
32	MON 94804 maize	100	-0.3	AOCS 1221-B	1004	/	-	AOCS

33	MIR162 maize	100	+0,-0.7	ERM®-BF446b	51	/	-	JRC
34	MON 95275 maize	100	-2.6	AOCS 1221-A	78	/	-	AOCS
35	DP-910521 maize	100	-3.1	AOCS 1221-A	349	/	-	AOCS
36	DP23211 maize	98.7	+/- 0.6	ERM® BF445b	163	/	-	JRC
37	DP202216 maize	10	+/- 0.4	ERM® BF444e	23	/	-	JRC
38	DP915635 maize	9.9	+/- 0.5	ERM® BF447e	60	/	-	JRC
39	MON 87419 maize	99.9	+0.1, -2.6	AOCS 0818-A2	779	/	-	AOCS
40	DAS-01131-3 maize	99.9	+0.1, -2.6	AOCS 0922-B	367	/	-	AOCS