

Pesticide Reference Materials for Water Testing



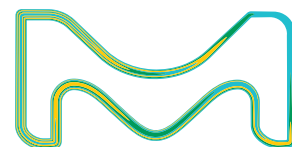
Water is the most essential product in life. Thus, protecting water—whether it be ground, surface, or drinking water – is one of the priorities of European water policy. Pesticides which are applied directly to the soil or the plants may be washed off into nearby bodies of surface water or may percolate through the soil to lower soil layers and groundwater. They can also transform into one or more metabolites, which can potentially contaminate water resources and even water supplied to consumers. To address these risks, the European Commission implemented several environmental monitoring programs to protect the aquatic environment

The Directive 2008/105/EC sets environmental quality standards for surface water. It establishes a vigilance list of substances for which monitoring data must be collected at European level. The substances selected are those that are likely to present a significant risk to the aquatic environment and for which monitoring data are needed to assess the actual risk. The first watch list of substances was set out in Commission Implementing Decision (EU) 2015/495, updated in 2018 to decision (EU) 2018/840. The newest update was published on August 6, 2020, decision (EU) 2020/1161.

The presence of pesticide residues and their metabolites in drinking water is regulated by European Directive 1998/83/EC, which sets quality limits: 0.1µg/L per individual substance (for the active substance within pesticide products and their human toxicological relevant metabolites), 1µg/L for non-relevant metabolites and 0.5µg/L for the sum of these compounds. This directive is under revision, and the update will include rules for emerging pollutants (microplastics, endocrine disruptors and new types of chemicals, such as PFAS).

Under Directive 2000/60/EC, Directive 2006/118/EC environmental monitoring programs for groundwater are established. It includes also a list of priority substances which have to be monitored as well as their metabolites.

We strive to provide you with high quality reference materials to help you achieve quantifiable, accurate, and traceable results, and to continuously extend our portfolio with relevant substances and their metabolites.



Directive 2008/105/EC - List of monitored pesticides and pharmaceuticals

Product	Pestanal® (analytical standard grade)	Reference Material	CAS-No	Max. acceptable method detection limit (ng/L)	Group
Imazalil	32007-100mg	53259-100mg RM* (ISO 17025)	35554-44-0	800	Imidazole fungicide
Ipconazole		in preparation	125225-28-7	44	Triazole fungicide
Metconazole (mix of isomers)	37909-100mg-R		125116-23-6	29	Triazole fungicide
Penconazol	36189-100mg	90067-50mg CRM**, TraceCERT®	66246-88-6	1700	Triazol fungicide
Prochloraz	45631-250mg	64947-50mg CRM, TraceCERT®	67747-09-5	161	Imidazole fungicide
Tebuconazole	32013-250mg	43897-50mg CRM, TraceCERT®	107534-96-3	240	Triazole fungicide
Tetraconazole	37087-100mg		112281-77-3	1900	Triazole fungicide
Famoxadone solution	33405-2ml-R		131807-57-3	8.5	Oxazolidinedione fungicide
Dimoxystrobin	33499-100mg-R		149961-52-4	32	Oximinoacetamide fungicide
Metaflumizone	32966-100mg		139968-49-3	64	Semicarbazone insecticide
Fluconazole		PHR1160-1g CRM	86386-73-4	250	Triazole antimycotica
Miconazole		PHR1163-1g CRM	22916-47-8	200	Imidazole antimycotica
Clotrimazole	33894-100mg-R	PHR1058-1g CRM	23593-75-1	20	Azole antimycotica
Amoxicillin	31586-250mg	PHR1127-1g CRM	26787-78-0	78	β-Lactam antibiotica
Ciprofloxacin	33434-100mg-R	PHR1167-1g CRM	85721-33-1	89	β-Lactam antibiotica
Sulfamethoxazole	31737-250mg	PHR1126-1g CRM	723-46-6	100	Sulfonamide antibiotica
Venlafaxine hydrochloride		PHR1736-1g CRM	93413-69-5	6	Phenylethylamine antidepressiva
O-Desmethylvenlafaxine	93867-50mg		93413-62-8	6	Phenylethylamine antidepressiva

*RM: reference material (certified according to ISO 17025)

**CRM: certified reference material (certified according to ISO 17025 and ISO 17034)

Directive 2000/60/EC – List of pesticide priority substances and their metabolites to be monitored

Product	Pestanal® (analytical standard grade)	Cat. No	Reference material grade	Identified as priority hazardous substance	CAS-No
Alachlor	45316-250mg	028288-100mg	CRM, TraceCERT®		15972-60-8
Atrazine	45330-250mg-R	90935-50mg	CRM, TraceCERT®		1912-24-9
Chlorfenvinphos	36551-250mg				470-90-6
Chlorpyrifos	45395-100mg	94114-100mg	CRM, TraceCERT®		2921-88-2
Diuron	45463-250mg	16902-50mg	CRM, TraceCERT®		330-54-1
Endosulfan	32015-250mg			x	115-29-7
α-Endosulfan	45468-100mg	74119-50mg	CRM, TraceCERT®	x	959-98-8
β-Endosulfan	33385-100mg	40828-50mg	CRM, TraceCERT®	x	33213-65-9
Hexachlorobenzene	45522-250mg			x	118-74-1
Hexachlorocyclohexane	36756-250mg			x	608-73-1
Isoproturon	36137-100mg	90026-50mg	CRM, TraceCERT®	x	34123-59-6
Pentachlorobenzene	35886-100mg	93074-100mg	CRM, TraceCERT®	x	68-93-5
Pentachlorophenol	45888-U-5000mg				87-86-5
Simazine	32059-250mg				122-34-9
Trifluralin	32061-250mg	NMIP1408-50mg	CRM, NMI Australia	x	1582-09-8
Dicofol	36677-100mg-R	74046-50mg	CRM, TraceCERT®	x	115-32-2
Quinoxifen	46439-100mg			x	124495-18-7
Aclonifen	36792-50mg-R				74070-46-5
Bifenox	31477-50mg				42576-02-3
Cybutryne (Irgarol®)	46105-250mg-R				28159-98-0
Cypermethrin (mix of isomers)	36128-100mg	51991-50mg	CRM, TraceCERT®		52315-07-8
Dichlorvos	45441-250mg	18185-250mg	RM (ISO 17025)		62-73-7
Heptachlor	32349-100mg	90426-50mg	CRM, TraceCERT®	x	76-44-8
Heptachlor epoxide	49042-100mg	NMIP1395-20mg	CRM, NMI Australia	x	1024-57-3
Terbutryn	45677-250mg				886-50-0

Relevant pesticide metabolites for monitored pesticides listed in directive 2008/105/EC

Product	Cat. No	Quality grade	Main substance	CAS-No	Comments
Imazalil metabolite R014821	PHR2231	CRM, <i>TraceCERT</i> [®]	Imazalil	24155-42-8	Imazalil is likely to degrade during the storage of post-harvest treated commodities (fruit & root crops).
Prochloraz Metabolite BTS40348	34508-10mg	Pestanal [®] , analytical standard	Prochloraz	67747-01-7	Major metabolite formed in soil under aerobic conditions
Prochloraz Metabolite BTS44595	34507-10mg	Pestanal [®] , analytical standard		139520-94-8	Common metabolite in all plant parts after plant metabolism
Prochloraz Metabolite BTS44596	34522-10mg	Pestanal [®] , analytical standard		139542-32-8	Common metabolite in all plant parts after plant metabolism
2,4,6-Trichlorophenol (Prochloraz Metabolite BTS45186)	36543-250mg 08896-100mg	Pestanal [®] , analytical standard CRM, <i>TraceCERT</i> [®]		88-06-2	
2-(1H-1,2,4-Triazole-1-yl)acetic acid	74044-50mg	RM (ISO 17025)	All pesticides with triazole moiety	28711-29-7	
2-Hydroxy-3-(1H-1,2,4-Triazole-1-yl)propanoic acid	79601-10mg	RM (ISO 17025)		1450828-63-3	Degradation product of triazole pesticides
2-Amino-3-(1H-1,2,4-Triazole-1-yl)propanoic acid	74418-50mg	RM (ISO 17025)		114419-45-3	
Dimoxystrobin Metabolite 505M09	93127-10mg	Pestanal [®] , analytical standard	Dimoxystrobin	none	Degradation product found in soil

Relevant pesticide metabolites for monitored pesticides listed in directive 2000/60/EC

Product	Cat. No	Quality grade	Main substance	CAS-No	Comments
Alachlor ESA sodium salt	34147-10mg	Pestanal [®] , analytical grade	Alachlor	140939-15-7	Biodegradation products in water
Alachlor OA	34146-10mg	Pestanal [®] , analytical grade	Atrazine	171262-17-2	
Atrazine-2-hydroxy	36631-250mg	Pestanal [®] , analytical grade		2163-568-0	Major metabolites in the environment
Atrazine-desethyl	36629-250mg 68173-100mg	Pestanal [®] , analytical grade RM (ISO 17025)		61990-65-4	
Atrazine-desethyl-2-hydroxy	45490-100mg	Pestanal [®] , analytical grade		19988-24-0	
Atrazine-desethyl-desisopropyl	36667-250mg	Pestanal [®] , analytical grade		3397-62-4	Major metabolite in the environment;
Atrazine-desethyl-desisopropyl-2-hydroxy	45613-250mg	Pestanal [®] , analytical grade		645-92-1	major metabolite of simazine
Atrazine-desisopropyl	36628-250mg	Pestanal [®] , analytical grade		1007-28-9	
Atrazine-desisopropyl-2-hydroxy	31523-100mg	Pestanal [®] , analytical grade		7313-54-4	Major metabolites in the environment
Atraton	31206-250mg	Pestanal [®] , analytical grade		1610-17-9	
Chlorpyrifos-methyl	45396-250mg 18647-50mg	Pestanal [®] , analytical grade CRM, <i>TraceCERT</i> [®]		Chlorpyrifos	5598-13-0
3,5,6-Trichloro-2-pyridinol (TCP)	33972-100mg-R	Pestanal [®] , analytical grade	Endosulfan	6515-38-4	
Endosulfan sulfate	36676-100mg-R	Pestanal [®] , analytical grade		1031-07-8	Major metabolite in soil and sediment
Endosulfan alcohol	36674-100mg	Pestanal [®] , analytical grade		2157-19-9	Major metabolite in water
Endosulfan lactone	36675-100mg	Pestanal [®] , analytical grade		3868-61-9	Metabolite in soil, water

Product	Cat. No	Quality grade	Main substance	CAS-No	Comments
Heptachlor endo-epoxide	35492-50mg	Pestanal®, analytical grade	Heptachlor	28044-83-9	Major metabolites in soil, sediment and groundwater
Heptachlor exo-epoxide	34309-50mg NMIP1395-20mg	Pestanal®, analytical grade CRM, NMI Australia		1024-57-3	
Atrazine-desisopropyl	36628-250mg	Pestanal®, analytical standard	Simazine	1007-28-9	Major metabolites in the environment
Atrazine-desethyl-desisopropyl	36667-250mg	Pestanal®, analytical standard		3397-62-4	
Atrazine-desisopropyl-2-hydroxy	31523-100mg	Pestanal®, analytical standard		7313-54-4	
Atrazine-desethyl-desisopropyl-2-hydroxy	45613-250mg	Pestanal®, analytical standard		645-92-1	
Ammelide	49866-10mg	analytical standard		645-93-2	
Terbutylazine-2-hydroxy	46019-100mg	Pestanal®, analytical standard	Terbutryn	66753-07-9	Major metabolite in surface and ground water

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