

**Table 2** EEC Directives related to migration of packaging materials to foods<sup>29-41</sup>

EEC Directives related to migration	Subject
Council Directive 78/142/EEC	Legislation of the Member States in relation with materials and articles containing vinyl chloride monomer and intended to come into contact with foodstuffs.
Commission Directive 81/432/EEC	Community method of analysis for official control of vinyl chloride released by materials and articles into foodstuffs.
Council Directive 82/711/EEC	Basic rules for testing migration of the constituents of plastics materials and articles intended to come into contact with foodstuffs.
Council Directive 85/572/EEC	List of simulants for testing migration of constituents of plastic materials and articles intended to come into contact with foodstuffs.
Council Directive 89/109/EEC	Approximation of the laws of the Member States related to materials and articles intended to come into contact with foodstuffs.
Commission Directive 90/128/EEC	Relating to plastic materials and articles intended to come into contact with foodstuffs.
CEN 1992	ENV methods for the measurement of overall migration from plastics into food simulants.
Commission Directive 93/8/EEC	Amending Council Directive no 82/711/EEC laying down the basic rules necessary for testing migration of constituents of plastics materials and articles intended to come into contact with foodstuffs.
CEC, 1993b, Practical Guide n.1	A practical guide for users of EEC directives on materials and articles intended to come into contact with foodstuffs.
CEC, 1994	Draft of provisional list of monomers and additives used in the manufacture of plastics and coatings intended to come into contact with foodstuffs.
CEC, 1994, Synoptic Document No 7	Draft of provisional List of Monomers and Additives used in the manufacture of plastics and coatings intended to come into contact with foodstuffs.
CEC, 1996a	Commission explanatory guidance for migration testing of food contact plastic materials.
Commission Directive 1996	2nd amendment council Directive 82/711/EEC describing the basic rules necessary for testing migration of constituents of plastic materials and articles intended to come into contact with foodstuffs.
Council Directive 96/11/EEC	Referring to plastics materials and articles intended to come into contact with foodstuffs.
Commission Directive 97/48/EEC	2nd amendment of Council Directive 82/711/EEC laying down the basic rules necessary for testing migration of the constituents of plastics materials and articles intended to come into contact with foodstuffs.

**Table 3** EEC directives related to specific packaging materials<sup>29-41</sup>

Directives	Applicable to all materials	Individual materials and substances			
		Plastics	Regenerated cellulose	Ceramics	Elastomers
76/893/EEC	✓				
78/142/EEC		✓			
80/590/EEC	✓				
80/766/EEC		✓			
82/432/EEC		✓			
83/299/EEC		✓			
84/500/EEC				✓	
85/572/EEC		✓			
86/388/EEC			✓		
89/109/EEC	✓				
90/128/EEC		✓			
92/15/EEC			✓		
92/39/EEC		✓			
93/8/EEC		✓			
93/9/EEC		✓			
93/10/EEC			✓		
93/11/EEC					✓
95/3/EC		✓			
96/11/EC		✓			
97/48/EC		✓			

**Table 7** Migrating substance from packaging materials (other than polymer) to food and methods of determination

Packaging material	Food	Migrated substance	Method of determination	Ref
Wooden Packaging	Apples	1-propanol	HSC (Head space chromatography)	118
Tin	Canned foods	DGEBA	Liquid-liquid extraction/ solid-phase +HPLC	107
Metals/plastics/glass/aseptic Recycled Paper & board	Tomato	DIPNs		16 102
Cans coated with lacquer		Epichlorohydrin		13
Paper cardboard & board	Test foods	Metals (Zn, Sn, Al, Mn, Ba)		119
Cartons (Al-laminated)	Liquid foods (skimmed milk & yogurt drinks)	Al		120
Aseptic	Milk	H <sub>2</sub> O <sub>2</sub>		113
Aluminum Foil paper laminates	Butter, margarine	Phthalate esters (DBP, BBP, DEHP)	GS-FID	121
Cans	Water based simulants	BADGE (lacquer)		12
Aluminum	Food & drinks	Al		122
Paper based food packaging	Fatty & nonfatty foods	2378-TCDD/ 2378-TCDF (polychlorinated dibenzofurans)		123
Ceramic containers	Dairy products	Pb, Cd		124
Aluminum	Milk	Al		125
Can	Canned foods	BADGE		102
Aluminum	Dairy products	Al		126
Paper & board		4,4-bis(dimethylamino benzophenone) (MK) 4,4-bis-(diethylamino benzophenone) (DEAB)	HPLC GC-MS	127

**Table 8** Migrating monomer/oligomer from polymer packaging material to food and method of determination

Packaging material	Food	Monomer/oligomer	Methods of determination	Ref
PS	Instant foods	Styrene dimmers/trimmers	GC + GC mass spectrometry	128
PS cups	Yoghurt	Styrene	Purge & trap GS + MS	103
PS	Water, milk, cold & hot beverages, olive oil	Styrene		129
Polyester cookware	Olive oil	Benzene	Head space analysis	130
PVC films	Cheese	DEHA		131
LDPE	Food simulating	Irganox 1010 (I-1010)		99
HDPE	Liquids (FSL)	Irganox 1076 (I-1076)		
PP				
Microwave packaging		cPET		109
PVC film	Cheese sausages	Diocyladipate		94
PVC films	Cheese	DEHA		132
Coating material (poly(vinyl alcohol) based liquid plast emulsion		Monomers of HA-LA plast		133
Polymeric materials	Dairy products	Styrene		20
PVC film	Cheese	DEHA		10
PP cups	Dairy products			134
R-PP				
Polystyrene	Dairy products	Styrene/ethylbenzene	Dynamic purge & trap GS	18
PP cups	Cheese sauce	2-decanone		135
PS (+ recycled material)	Dairy products	Monostyrene		136
PS + ABS + waxed paperboard	Dairy products	Mineral hydrocarbons	GS	137
Wax coatings	Cheese sausages	Mineral hydrocarbons	GS	138
Polymer	Milk	Diocylphthalate	Chromatography	139
PS	Milk	Monostyrene		101
PP	yoghurt	monomers		140
PE	Cream fruit juices			
PS	Food oil	Styrene		141
PS	Cheese desserts meat products	Styrene	GS + headspace injection + MS	142
PVC	Cheese	DEHA		91
LDPE	Milk	Naphthalene		143
ABS	Dairy products	Mineral hydrocarbons		144
PC	FSL	Bisphenol-A (BPA)	HPLC	96
PVC films	Bread, olive oil, cheese, meat	DEHA		98
PVC	Microwave fatty foods			145