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Testing conditions for kitchenware articles in contact with foodstuffs: plastics metals, silicone & rubber, paper & board

The EURL-FCM harmonised approach series

Beldi, G., Senaldi, C., Robouch, P., Hoekstra, E.

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Contact information
Name: E. Hoekstra
Email: JRC-EURL-FCM@ec.europa.eu

EU Science Hub
https://joint-research-centre.ec.europa.eu

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Contents

Introduction

The European Union Reference Laboratory for Food Contact Materials (EURL-FCM) and the National Reference Laboratories (NRLs) of the network have agreed on a set of test conditions, i.e. contact temperature and contact time, to ensure the comparability of measurement results reported in the frame of the implementation of official controls for FCM (Regulation (EU) 2017/625). These test conditions apply only for home use articles. These test conditions may be used as a starting point for establishing test conditions for articles for industrial use (e.g. food processing) where the applicable test conditions could be different.

The comprehensive tables included in this **fourth edition** of the kitchenware report replace the relevant sections in JRC's "*Guidelines on testing conditions for articles in contact with foodstuffs (with a focus on kitchenware)*" of 2009 (https://europa.eu/!RH66Bd), and the first three editions of the report published in 2019 (Ed. 1), 2020 (Ed. 2) and 2021 (Ed. 3, https://bit.ly/3jcdXO2).

The test conditions for specific migration from **plastics and plastic containing articles** are based on expert judgement on the "worst case" foreseeable conditions of use by the consumer, followed by the application of the principles of sections 2.1.3 and 2.1.4 of Annex V of Regulation (EU) No 10/2011(#). Section 3.1 of Annex V of the same Regulation applies to test conditions for overall migration. The shape, form, material and functionality of an article influence the determination of the foreseeable use, in particular in view of how consumers expect to use such articles on the basis of their likely experience. This choice was based on considerations on how consumers could foreseeably use the article, not on how the producer of the article intended it to be used. It should be emphasised that, in addition to the general requirements of Article 3 of Regulation (EC) No 1935/2004, no material specific EU legislation exists for **metals and alloys, silicone and rubber, and paper and board** in contact with food. Therefore, national legislation shall apply. In the absence of national legislation, the test conditions (time and temperature) presented in these guidelines (based on the test conditions for plastic articles) should apply.

It is assumed that in most cases consumers would make the same use of a specific utensil, independently of the material it is made of. Therefore, the same test conditions are generally recommended for different materials. This may result in less laborious testing of multi-material articles. An exception holds for test conditions of some metallic food preparation utensils (sub-classes: FPU/CAH6, FPU/H1-H4, see Table 1). **Paper and board** articles often do not withstand test conditions and food simulants described in Regulation (EU) No 10/2011 and in those cases other test conditions are suggested.

When an article (main class/subclass) does not exist in a particular material, no test conditions are suggested (left empty) in the corresponding table. If a new article is encountered, the testing conditions from tables of other materials may be considered.

The food simulants to be used during the migration test are defined in Regulation (EU) No 10/2011(#) for plastics and plastic containing articles. In the absence of defined food simulants for metals and alloys, silicones and rubbers, and paper and board at EU level, national legislation shall apply. In the absence of national legislation, national recommendations or recommendations of the Council of Europe can be considered. In absence of those, the food simulants presented in these guidelines (based on the test conditions for plastic articles) should be used, when feasible. The practical guidelines for manufacturers and regulators on "*Metals and alloys used in food contact materials and articles*", and "*Paper and Board used in food contact materials and articles*" published by the Council of Europe are available from https://www.edqm.eu/en/food-contact-materials-and-articles.

If the indicated food simulants are not appropriate, specific migration testing into food should be considered. The results of specific migration tests in food always prevail over the results obtained in

food simulant. Please note that the test conditions to be used for food (cf. cooking instructions) may differ from the test conditions in this guide.

This guide recommends other aspects related to migration testing, such as sample preparation, test type and considerations on the surface-to-volume to be used for the calculation of the result. The sample preparation concerns advice on cutting the sample or not, testing the intact article or testing a part of the article. The test type relates to testing by immersion (e.g. complete, reverse pouch), by filling (e.g. article, pouch), by migration cell (flat articles), or by actual use (assembled articles). "Actual" use means that the test conditions are the same as the operational conditions of the article and may be different from "worst foreseeable" conditions of use. Actual use test conditions are typically used for kitchenware small appliances or for articles for which it is difficult to separate the different materials that are fixed together. Such articles should be tested as one, applying the test conditions as indicated in the instruction.

The test results need to be recalculated based on the real surface-to-volume ratio according to Article 17 of the plastic Regulation (EU) No 10/2011. However, some exceptions exist, e.g. for very small or large volume articles (V < 500 mL or V > 10 L) or for articles for which it is difficult to determine the amount of food that comes into contact with the article. In these cases "6 dm^2/kg food" applies. Similarly, this concept applies for metals and alloys, silicone and rubber, and paper and board. In addition to this concept the Council of Europe developed an alternative approach for metals and alloys called the "envelop volume method".

The following approach should be used for selecting the test conditions and food simulants:

1. At first, select the test conditions recommended by the present guide.
2. When a label and/or instructions are present on the article, defining limiting conditions of use or providing operating instructions, the test conditions should be adapted accordingly, even if they deviate from those suggested in the first step.

   Note: The conditions of use indicated on the label and/or on the packaging of the kitchenware or tableware article (including pictures and/or instructions), present the way in which the manufacturer intends the article to be used. However, these instructions should not be used to select the test conditions if they are unrealistic and do not represent the foreseeable use of the article by consumers.

3. When no label nor instructions are permanently present on the article, and when several test conditions are suggested, the most severe test condition of the different possibilities for that type of article should be selected.
4. Whenever the prescribed test conditions, i.e. contact time and temperature, may physically damage the test specimen to be investigated the migration tests shall be carried out under the "worst foreseeable conditions of use" in which these physical changes do not take place according to section 2.1.3 of annex V of Regulation (EU) No 10/2011.
5. If a food simulant causes changes to the test specimen, e.g. swelling, that do not occur with food, this food simulant is not considered as suitable. The migration test should then be performed using food or another equivalent food simulant that does not cause such changes.
6. For articles used only under specific conditions (e.g. time, temperature) and/or for specific foods (e.g. dry food only) the selected test conditions and food simulants should be based on those specific conditions of use.
7. For materials (e.g. paper and board) that do not withstand the combination of test conditions and food simulants set for plastics, other migration/extraction methods may be defined.

Table 1 provides a non-exhaustive list of examples of articles clustered in material independent classes and subclasses of kitchen and tableware.

Tables 2 to 5 present the relevant test conditions, i.e. contact time and contact temperature, for each class of kitchen articles made of plastics, metals and alloys, silicones and rubbers, and paper and board, respectively. They include food simulants, testing conditions (i) based on the foreseeable worst case conditions of use of the article or (ii) according to the instructions on the label, together with the surface-to-volume (S/V) ratios to be applied when calculating the final migration result. The selection of food simulants is based on the foods expected to be used for a particular subclass.

Table 2 presents the relevant test conditions for migration from plastics and plastic containing articles. When a plastic item can be used in contact with all types of foods, food simulants A, B and D2 are indicated. When a plastic article is used with specific foods only, the relevant food simulants need to be selected according to Annex III of the Regulation (EU) No 10/2011(#).

Table 3 presents the relevant test conditions for migration from metals and alloys articles. For metallic articles, the food simulant is selected from national legislation or from the practical guideline for manufacturers and regulators on "*Metals and alloys used in food contact materials and articles*" published by the Council of Europe. When metallic articles are tested with a food simulant for acidic foods (pH ≤ 4.5), additional testing in artificial tap water is not required.

Table 4 presents the relevant test conditions for migration from silicone and rubber articles. In the absence of national legislation and national or Council of Europe recommendations, the food simulants prescribed by Regulation (EU) No 10/2011 for plastic can be applied to silicone and rubbers.

Table 5A presents the relevant test conditions for migration from coated/treated paper and board articles. If the paper and board item includes a barrier layer against fat/grease/water (e.g. a plastic layer) and does not absorb moist and/or oil, and if no loss of physical structure occurs, the test conditions prescribed by Regulation (EU) No 10/2011 for plastic can be applied. When the structural integrity of the paper regarding to the testing conditions prescribed for plastics is unknown, migration conditions as set in Table 5A should be followed in first instance. However, when an alteration of the material is evidenced after the contact phase, the testing conditions of Table 5B should be applied. A case-by-case analysis is necessary.

Table 5B presents ”extraction” conditions for coated, uncoated and treated/impregnated paper and board articles that do not withstand migration test conditions and food simulants prescribed by Regulation (EU) No 10/2011 and that lose their physical structure. These methods are selected taking into account the currently available CEN standards and the practical guideline for manufacturers and regulators on "*Paper and Board used in food contact materials and articles*" published by the Council of Europe.

Standards EN 645:1993, 647:1993 and 15519:2007 require to ”extract” 10 g of paper whereas EN 14338:2004 requires to ”extract” 1 dm^2 of paper. EN 14338 and 15519 require reporting the test results in mg/dm^2 whereas EN 645 and 647 do not specify how to report test results. In absence of national requirements migration test results should be reported in mg/dm^2 taking into account the one-sided area and the grammage of the paper. Test results can be converted into mg/kg of food using the real S/V ratio in actual or foreseen use. For articles where it is impractical to estimate this ratio and for those articles with a capacity < 0.5 L or > 10 L, the conventional factor of 6 dm^2/kg of food should be used.

While EN 15519 does not specify when ethanol 95 % or isooctane has to be used for extraction/migration, the last paragraph of section 2.1.3 of Annex V of Regulation (EU) No 10/2011 should be applied (using ethanol 95 % and isooctane). The highest extraction in ethanol 95 % and isooctane shall be used for compliance assessment. If the temperature under the worst foreseeable conditions of intended use exceeds 100 °C the highest extraction in ethanol 95 %, isooctane and food simulant E shall be used for compliance assessment.

Table 6 describes the rationale behind the selection of specific test conditions (time and temperature) for plastics, metals and alloys, silicones and rubbers, and paper and board.

Table 7 lists the changes implemented in this report, when compared to the previous editions.

These harmonised tables were drafted by the Task Force on Kitchenware consisting of representatives of the National Reference Laboratories of Belgium, Germany, Greece, Italy and Spain, DG SANTE, the European Directorate for the Quality of Medicines & Health Care of the Council of Europe, CEN TC 173/WG3, and the Federation of European manufacturers of Cookware and cutlery (FEC). The tables were thoroughly reviewed by the National Reference Laboratories and official control laboratories dealing with food contact materials, in accordance with Article 94 (2)(a) of Regulation (EU) 2017/625. The authors acknowledge their valuable contributions.

In order to improve these guidelines, feedback from users is welcome.

(#) Commission Regulation (EU) No 10/2011 on plastic materials and articles intended to come into contact with food (https://europa.eu/!fm68fy)

Article 17: Expression of migration test results

Annex III – Food simulants
- Table 1: List of food simulants
- Table 2: Food category specific assignment of food simulants
- Table 3: Food simulant assignment for demonstrating compliance with the overall migration (OM) limit

Annex V – Compliance testing
- Table 1: Selection of test time
- Table 2: Selection of test temperature
- Table 3: Standardised conditions for testing the overall migration (OM)

Table 1 - Kitchenware examples

Main Class	Subclass	Examples
Food Preparation Wear	FPW/CA1	Apron, Bib
	FPW/CA2	Glove
	FPW/CA3	Towel, Wipe, Napkin, Tablecloth, Placemat, Kitchen roll
Food Preparation Utensil for Cold/Ambient use	FPU/CA1	Utensils used at ambient temperature for short time: Rolling pin, Lettuce cutter, Grater, Garlic press, Zester, Vegetable peeler, Apple peeler, Food scale, Apple corer, Apple cutter, Biscuit press, Cherry pitter, Egg separator, Fish scaler, Flour sifter, Herb chopper, Squeezer, Reamer, Mandolin, Wire, Meat tenderiser, Fruit baller, Nutmeg grater, Pastry blender, Mortar and pestle, Roller docker, Pasta cutter, Salad spinner, Julienne peeler, Avocado slicer, Ravioli maker, Vegetable cutter with container, Hamburger press, Coconut scraper, Empanadilla mould type, Meat grinder, Vegetable brush, Cake measuring tape, Cocktail shaker, Coffee measuring spoon
Food Preparation Utensils for Cold/Ambient or Hot use	FPU/CAH1	Utensils used at ambient or hot temperature for short time: Baster, Bottle Top Baster, Pastry spatula, Pastry scraper, Pastry brush, Pastry bag, Egg piercer, Pastry mat, Salad/omelette/fitness shaker, Marinade Syringe, Funnel, Potatoes slicer, Dessert/appetizers ring, Measuring spoon, Measuring cup, Tea net, Filter, Ricer, Food mill, Chocolate thermometer, Chocolate form
	FPU/CAH2	Cutting board (not for storage)
	FPU/CAH3	Kitchen countertop, Worktop, Bench
	FPU/CAH4	Colander, Drum sieve, Chinois, Gravy strainer, Cooling rack
	FPU/CAH5	Bowl
	FPU/CAH6	Microwave materials (only warming up or defrosting)
	FPU/CAH7	Puree masher, Potato masher, Whisk, Tongs-not foreseeable use at temperatures above 100 °C
	FPU/CAH8	Cheese cloth (dairy product), Mat for cheese draining
Food Preparation Utensils for Hot use	FPU/H1	Articles that could be used during cooking/frying/grilling: Spoon, Ladle, Spatula, Tongs, Fondue fork
	FPU/H2	Cookware , Cooking items, Microwave cookingware: Cooking/frying pan, Cooking pot, Steamer basket, Lid (sold alone), Spice/fragrance bag, Boil over preventer, Frying pan splatter screen, Bourguignon fork, Cooking ring, Susceptor, Skewer, Microwave cooker
	FPU/H3	Bakeware and Ovenware items used up to 1 hour: Cake pan, Gratin dish, Cookie sheet, Muffin pan, Muffin cup, Cooking tray, Oven liner
	FPU/H4	Bakeware and Ovenware items used more than 1 hour: Casserole, Roasting bag, Baking foil, Elastic net, Ring for meat
Food Serving Utensils for Cold/Ambient use	FSU/CA1	Bread Bag, Basket (not for storage)
	FSU/CA2	Decanter, Fitness/bicycle/drinking bottle, Baby food pouch
	FSU/CA3	Dispenser: Candy dispenser, Honey dispenser, Oil dispenser, Sauce dispenser
Food Serving Utensils for Cold/Ambient or Hot use	FSU/CAH1	Cup, Glass, Drinkware
	FSU/CAH2	Open flask, Carafe, Can, Jug
	FSU/CAH3	Bottle
	FSU/CAH4	Baby bottle, Teats
	FSU/CAH5	Tableware, Plate, Dishware, Serving stand
	FSU/CAH6	Food tray, Serving board, French fries box, Finger food bag, Snack box, Popcorn box
	FSU/CAH7	Thermos flask, Isothermic drinking beaker
Food Serving Implements for Cold/Ambient use	FSI/CA1	Ice cream scoop, Ice tongues, Ice cube tray
	FSI/CA2	Specific use Cutlery and wine accessories: Cheese knife, Cheese slicer, Grapefruit knife, Salad cutlery, Tomato knife, Oyster knife, Butter curler, Honey dipper, Bar pestle, Wine tester, Bottle pourer, Wine chiller
	FSI/CA3	Salt mill, Spice mill, Pepper mill, Herb mill, Salt shaker

Food Serving Implements for Cold/Ambient or Hot use	FSI/CAH1	Cutlery: Fork, Knive , Spoon, Rice spoon, Sauce spoon, Lobster cracker, Lobster pick, Chopsticks, Teabag squeezer, Pizza cutter, Bread knife, Fillet knife, Pie knife, Cake and pie server, Party picks, Straw
	FSI/CAH2	Bottle stopper, Cap, Gasket
Food Containers for Cold/Ambient or Hot use	FC/CAH1	Lunchbox, Takeaway box, Pizza box
	FC/CAH2	Container: Pasta container, Cheese cellar, Butter cellar, Can cover, Garlic/onion keeper, Egg to go box, Bread box, Biscuit box, Storage box, Bag/textile for storage, Foil (not for baking), Jar, Ice cream container
Kitchen Small Appliances for Cold/Ambient use	KSA/CA1	Fridge, Cooler: Koolatron cooler, Frozen Beverage Maker, Mini fridges, Ice box, Kegerator
	KSA/CA2	Grater, Grinder: Coffee grinder, Electric grater, Vegetable chopper, Mini chopper, Peanut and nut butter maker, Wet grinder, Potato peeler
	KSA/CA3	Meat grinder and slicer: Sausage stuffer, Meat slicer, Meat grinder, Slicer
	KSA/CA4	Butter churner, Milk shake maker
	KSA/CA5	Pasta maker, Noodles maker, Electric or manual Roller, Strip Cutter
	KSA/CA6	Squeezer, Juicer, Juice Extractor, Smoothie maker
	KSA/CA7	Yogurt maker
	KSA/CA8	Ice cream maker
Kitchen Small Appliances for Cold/Ambient or Hot use	KSA/CAH1	Water dispenser, Water purifier, Water filter, Beverage dispenser, Soda maker, Spare carbonator
	KSA/CAH2	Baby formula maker/warmer, Milk frother
	KSA/CAH3	Blade
	KSA/CAH4	Still spirit
	KSA/CAH5	Blender, Agitator, Hand blender, Drink mixer, Mixer, Hand mixer, Electric mill
	KSA/CAH6	Melting pot, Food warmer, Chocolate maker
	KSA/CAH7	Heated and Bain-Marie dispenser: Chocolate fountain, Heated sauce dispenser, Soup kettle, Buffet server, Chafing dish, Wet bain marie
	KSA/CAH8	Dehydrator
Kitchen Small Appliances for Hot use	KSA/H1	Coffee maker, Moka
	KSA/H2	Immersion heater (used for water)
	KSA/H3	Tea pot and boiler: Kettle, Teapot, Eggs Boiler, Water boiler, Tea maker, Samovar, Soy milk maker, Boiler
	KSA/H4	Sous vide cooker
	KSA/H5	Popcorn maker, Cotton candy machine, Gummy and candy maker
	KSA/H6	Steamer, Baby food maker
	KSA/H7	Toaster, Hot dog griller, Waffle maker, Mini cupcake maker, Crepe/pancake maker, Quesadilla Maker
	KSA/H8	Fryer, Deep fryer, Fondue/Raclette/Raclette-Pizza set
	KSA/H9	Cooker and food processor: Slow cooker, Stirrer, Pressure cooker, Cheese maker, Bread machine, Soup maker, Food processor
	KSA/H10	Grill and oven: Indoor/Outdoor Grill, Infrared oven, Air Fryer, Electric skillet, Electric Griddle , Hotplate, Contact grill, Barbecue grid, Roaster, Combi steamer, Halogen cooking pot, Rotisserie, Electric wok, Meat-grill thermometer
	KSA/part	Parts of assembled Kitchen Small Appliances; Note: parts of the equipment used for storage should be tested separately as containers under appropriate conditions (e.g. FSU/CA2 or FC/CAH1)

Table 2 – Test conditions for plastic kitchenware

Main Class	Subclass	Use				Sample prep			Test type				Food/Food simulant							SM Conditions (only food simulants)			S/V				OM conditions	Notes
		cold (< 20 °C)	Room Temperature	hot (> 40 °C)	storage (in months)	cut test specimen	intact article	part of it	actual use	article fill	migration cell	(total) immersion	food	A[S]	B	C	D1	D2	E	time	Temp (°C)	label/instructions	Real	Real (infant/young)	6 (V < 0.5L or V > 10L)	6 impractical s/v		
Food Preparation Wear	FPW/CA1	x	x			x	x			x	x	x	x	x	x			x		0.5 h	40			x		x	0	
	FPW/CA2	x	x				x[#]			x		x	x	x	x			x		0.5 h	40					x	0	[#] or turn inside out
	FPW/CA3	x	x			x					x	x	x	x	x			x		0.5 h	40			x		x	0	
Food Preparation Utensils	FPU/CA1	x	x			x	x	x		x		x	x	x	x			x		0.5 h	40		x		x	x	0	
	FPU/CAH1	x	x	x		x	x	x		x		x	x	x	x			x		0.5 h	70		x		x	x	3	
	FPU/CAH2	x	x	x		x	x				x	x	x	x	x			x		2 h	70					x	3	
	FPU/CAH3	x	x	x		x	x				x	x	x	x	x			x		2 h	70					x	3	
	FPU/CAH4	x	x	x		x	x					x	x	x	x			x		2 h	70		x		x	x	3	
	FPU/CAH5	x	x	x			x			x			x	x	x			x		2 h	70		x		x		2	followed by 24 h at 40°C
		x	x	x	@		x			x			x	x	x			x		10 d	40		x		x		2	
	FPU/CAH6	x	x	x			x	x		x		x	x	x	x					2 h	100 or Reflux		x		x	x	5	[1] time set as 4*0.5 h
		x	x	x			x	x		x		x	x					x		0.5 h	121		x		x	x	5	
	FPU/CAH7	x	x	x		x	x					x	x	x	x			x		2 h	70					x	3	
	FPU/CAH8	x	x	x	@	x	x					x	x		x		x			10 d	40		x		x	x	2	if used to cook herbs go to FPU/H2
	FPU/H1			x		x	x					x	x	x	x					2 h	100 or Reflux					x	6	[1] time set as 4*0.5 h
				x		x	x					x	x					x		0.5 h	175					x	7	
	FPU/H2			x		x	x			x		x	x	x	x					2 h	100 or Reflux		x		x	x	6	[1] time set as 4*0.5 h
				x		x	x			x		x	x					x		0.5 h	175		x		x	x	7	
	FPU/H3			x		x	x			x		x	x	x	x					4 h	100 or Reflux		x		x	x	6	[1] time set as 4*1 h
				x		x	x			x		x	x					x		1 h	200		x		x	x	7	
	FPU/H4			x		x	x			x		x	x	x	x					8 h	100 or Reflux		x		x	x	6	[1] time set as 4*2 h
				x		x	x			x		x	x					x		2 h	200		x		x	x	7	
Food Serving Utensils	FSU/CA1	x	x				x	x		x		x	x	x	x			x		24 h	40		x	x	x	x	2	
	FSU/CA2	x	x				x	x		x		x	x		x		x			24 h	40		x	x	x		2	if hot fill go to FSU/CAH2
	FSU/CA3	x	x		@		y	x		y ; x		x	x	x	x			x		10 d	40		x		x		2	
		x	x		≤ 6		y	x		y ; x		x	x	x	x			x		10 d	50		x		x		2	[2]
		x	x		> 6		y	x		y ; x		x	x	x	x			x		10 d	60		x		x		2	[2]
	FSU/CAH1	x	x				y	x		y ; x		x	x	x	x			x		24 h	40		x	x	x		2	
			x	x			y	x		y ; x		x	x	x	x			x		2 h	70		x	x	x		3	followed by 24 h at 40 °C, if used for storage [OM2]
	FSU/CAH2	x	x				x			x			x		x		x			24 h	40		x		x		2	
			x	x			x			x			x		x		x			2 h	70		x		x		3	followed by 24 h at 40 °C, if used for storage [OM2]
	FSU/CAH3		x	x			x			x			x	x	x			x		2 h	70		x		x		3	followed by 24 h at 40 °C, if used for storage [OM2]
		x	x		@		x			x			x	x	x			x		10 d	40		x		x		2	
		x	x		≤ 6		x			x			x	x	x			x		10 d	50		x		x		2	[2]
		x	x		> 6		x			x			x	x	x			x		10 d	60		x		x		2	[2]
	FSU/CAH4		x	x			x	x		x		x	x		x		x			2 h	70			x			3	followed by 24 h at 40 °C, if used for storage [OM2]
		x	x		@		x	x		x		x	x				x			10 d	40			x			2	for milk only
			x	x			x	x		x		x	x		x		x			1 h	40			x			3	for teats only, (if sold individually, refer to Reg. 10/2011 Art. 17 § 3 and 4)
	FSU/CAH5	x	x	x			x			x		x	x	x	x			x		2 h	70		x	x	x	x	3	
	FSU/CAH6	x	x	x			x	x		x		x	x	x	x			x		2 h	70		x	x	x	x	3	
	FSU/CAH7	x	x	x			x			x			x	x	x			x		24 h	100		x	x	x		4	fill with food simulant at 100 °C and keep the container closed for 24 h at room temp.

Food Serving Implements	FSI/CA1	x				x	x			x		x	x			x				0.5 h	20		x		x	1	
		x			@	x	x			x		x	x			x				10 d	20		x		x	1	if used for storage
	FSI/CA2	x	x			x	x			x		x	x	x	x			x		0.5 h	40				x	0	
		x	x		@	x	x			x		x	x	x	x			x		24 h	40				x	2	
	FSI/CA3	x	x		≤ 6		x	x		x		x	x						x	10 d	50		x	x			[2]
		x	x		> 6		x	x		x		x	x						x	10 d	60		x	x			[2]
	FSI/CAH1	x	x	x		x	x	x				x	x	x	x			x		0.5 h	70				x	3	
		x	x	x		x	x	x				x	x	x	x			x		2 h	70				x	3	for spoons only
	FSI/CAH2		x	x			x			x		x	x	x	x			x		2 h	70		x	x		3	followed by 24 h at 40 °C, if used for storage [OM2], Refer to Reg. 10/2011 Art. 17 § 3 and 4
		x	x		@		x			x		x	x	x	x			x		10 d	40		x	x		2	Refer to Reg. 10/2011 Art. 17 § 3 and 4
		x	x		≤ 6		x			x		x	x	x	x			x		10 d	50		x	x		2	[2], Refer to Reg. 10/2011 Art. 17 § 3 and 4
		x	x		> 6		x			x		x	x	x	x			x		10 d	60		x	x		2	[2], Refer to Reg. 10/2011 Art. 17 § 3 and 4
Food Containers	FC/CAH1	x	x	x			y	x		y ; x		x	x	x	x			x		2 h	70		x	x		3	followed by 24 h at 40 °C, if use for storage [OM2]
		x	x	x	@		y	x		y ; x		x	x	x	x			x		10 d	40		x	x		2	
	FC/CAH2	x					y	x		y ; x		x				x				10 d	5		x	x		2	
		x	x		@		y	x		y ; x		x	x	x	x			x		10 d	40		x	x		2	
		x	x	x	≤ 6		y	x		y ; x		x	x	x	x			x		10 d	50		x	x		2	[2]
		x	x	x	> 6		y	x		y ; x		x	x	x	x			x		10 d	60		x	x		2	[2]
Kitchen Small Appliances	KSA/CA1	x	x				x		x				x		x	x	x		x			x					
	KSA/CA2	x	x				x		x				x	x	x			x				x					
	KSA/CA3	x	x				x		x				x	x				x				x					
	KSA/CA4	x	x				x		x				x		x		x	x				x					
	KSA/CA5	x	x				x		x				x				x	x				x					
	KSA/CA6	x	x				x		x				x		x		x					x					
	KSA/CA7	x	x				x		x				x		x		x					x					
	KSA/CA8	x	x				x		x				x			x						x					
	KSA/CAH1	x	x	x			x		x				x		x	x	x					x					
	KSA/CAH2	x	x	x			x		x				x		x		x					x					
	KSA/CAH3	x	x	x			x	x				x	x	x	x			x		0.5 h	70				x	3	cf. FSI/CAH1
	KSA/CAH4	x	x	x			x		x				x		x*		x					x					* if pH less than 4.5
	KSA/CAH5	x	x	x			x		x				x	x	x			x				x					
	KSA/CAH6	x	x	x			x		x				x	x	x			x				x					
	KSA/CAH7	x	x	x			x		x				x	x	x			x				x					
	KSA/CAH8	x	x	x			x		x				x	x	x			x				x					
	KSA/H1			x			x		x				H_2O			x						x					H_2O: artificial tap water EN16889:2016
	KSA/H2			x			x		x				H_2O			x						x					H_2O: artificial tap water EN16889:2016
	KSA/H3			x			x		x				x		x	x						x					
	KSA/H4			x			x		x				x	x	x			x				x					
	KSA/H5			x			x		x				x	x	x			x				x					
	KSA/H6			x			x		x				x	x	x			x				x					
	KSA/H7			x			x		x				x	x	x			x				x					
	KSA/H8			x			x		x				x					x				x					
	KSA/H9			x			x		x				x	x	x			x				x					
	KSA/H10			x			x		x				x	x	x			x				x					
	KSA/part	x	x	x			x			x	x	x	x	x	x			x				x					[3]

[1] cf. Table 2 of Annex V
[2] use (10d, 40°C) if equilibrium is reached [cf. Reg. 10/2011 Annex V, Chapter 2 § 2.1.4.e & Amendment 2016/1416]
[3] select test time and temperature according to worst foreseeable condition use (described in the instructions when availlable)
@: see Table: Rational
"y;x": "(total) immersion" applies to "part of it" (x) only, while "article fill" applies to "intact article" (y) and "part of it" (x)
SM, OM: Specific Migration, Overall Migration
s/v: surface-to-volume ratio to calculate final migration result
Food Simulants: A (Ethanol 10 % v/v); B (Acidic acid 3 % w/v); C (Ethanol 20 % v/v); D1 (Ethanol 50 % v/v); D2 (Vegetable oil); E (poly(2,6-diphenyl-p-phenylene oxide)) [cf. Reg. 10/2011 Annex III]
§: Distilled water can be used instead of food simulant A for Overall Migration

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EURL European Union Reference Laboratory for Food Contact Materials

Contact: **Eddo Hoekstra**
JRC-EURL-FCM@ec.europa.eu

Table 3 - Test conditions for metal kitchenware

Main Class	Subclass	Use: cold (< 20 °C)	Use: Room Temperature	Use: hot (> 40 °C)	Use: storage (in months)	Sample prep: cut test specimen	Sample prep: intact article	Sample prep: part of it	Test type: actual use	Test type: article fill	Test type: migration cell	Test type: (total) immersion	check national legislation*	Food/Food simulant: food	Food/Food simulant: simulant for acidic foods (pH ≤ 4.5)	Food/Food simulant: artificial tap water (cf. EN 16889:2016)	Specific Migration (*Release*) Conditions (only food simulants): time	Specific Migration (*Release*) Conditions (only food simulants): Temp (°C)	Specific Migration (*Release*) Conditions (only food simulants): label/instructions	S/V: Real	S/V: 6 impractical s/v	S/V: Envelope method (CoE, Metals & Alloys)	OM - check national legislation*	Notes
Food Preparation Wear	FPW/CA1	x	x			x	x			x	x	x	x	x	x		0.5 h	40			x		x	
	FPW/CA2	x	x				x			x		x	x	x	x		0.5 h	40			x		x	
	FPW/CA3	x	x			x					x	x	x	x	x		0.5 h	40			x		x	
Food Preparation Utensils	FPU/CA1	x	x			x	x	x		x		x	x	x	x		0.5 h	40		x	x	x	x	
	FPU/CAH1	x	x	x		x	x	x		x		x	x	x	x		0.5 h	70		x	x	x	x	
	FPU/CAH2	x	x	x		x	x				x	x	x	x	x		2 h	70			x		x	
	FPU/CAH3	x	x	x		x	x				x	x	x	x	x		2 h	70			x		x	
	FPU/CAH4	x	x	x		x	x					x	x	x	x		2 h	70		x	x	x	x	
	FPU/CAH5	x	x	x			x			x			x	x	x		2 h	70		x			x	followed by 24 h at 40 °C
		x	x	x	@		x			x			x	x	x		10 d	40		x			x	
	FPU/CAH6	x	x	x			x	x		x		x	x		x		2 h	100 or Reflux		x	x	x	x	
		x	x	x			x	x		x		x	x	x					x	x	x	x	x	
	FPU/CAH7	x	x	x		x	x					x	x	x	x		2 h	70			x	x	x	
	FPU/CAH8	x	x	x	@	x	x					x	x	x	x		10 d	40		x	x		x	if used to cook herbs go to FPU/H2
	FPU/H1			x		x	x					x	x		x		2 h	100 or Reflux			x	x	x	
				x		x	x					x	x	x					x		x	x	x	
	FPU/H2			x		x	x			x		x	x		x		2 h	100 or Reflux		x	x	x	x	
				x		x	x			x		x	x	x					x	x	x	x	x	
	FPU/H3			x		x	x			x		x	x		x		2 h	100 or Reflux		x	x	x	x	
				x		x	x			x		x	x	x					x	x	x	x	x	
	FPU/H4			x		x	x			x		x	x		x		2 h	100 or Reflux		x	x	x	x	
				x		x	x			x		x	x	x					x	x	x	x	x	
Food Serving Utensils	FSU/CA1	x	x				x	x		x		x	x	x	x		24 h	40		x	x		x	
	FSU/CA2	x	x				x	x		x		x	x	x	x		24 h	40		x			x	if hot fill go to FSU/CAH2
	FSU/CA3	x	x		@		y	x		y ; x		x	x	x	x		10 d	40		x			x	
		x	x		≤ 6		y	x		y ; x		x	x	x	x		10 d	50		x			x	
		x	x		> 6		y	x		y ; x		x	x	x	x		10 d	60		x			x	
	FSU/CAH1	x	x				y	x		y ; x		x	x	x	x		24 h	40		x			x	
			x	x			y	x		y ; x		x	x	x	x		2 h	70		x			x	followed by 24 h at 40 °C, if used for storage
	FSU/CAH2	x	x				x			x			x	x	x		24 h	40		x			x	
			x	x			x			x			x	x	x		2 h	70		x			x	followed by 24 h at 40 °C, if used for storage
	FSU/CAH3		x	x			x			x			x	x	x		2 h	70		x			x	followed by 24 h at 40 °C, if used for storage
		x	x		@		x			x			x	x	x		10 d	40		x			x	
		x	x		≤ 6		x			x			x	x	x		10 d	50		x			x	
		x	x		> 6		x			x			x	x	x		10 d	60		x			x	
	FSU/CAH4		x	x			x	x		x		x	x	x	x		2 h	70		x			x	followed by 24 h at 40 °C, if used for storage
		x	x		@		x	x		x		x	x	x		x	10 d	40		x			x	for milk only
	FSU/CAH5	x	x	x			x			x		x	x	x	x		2 h	70		x	x		x	
	FSU/CAH6	x	x	x			x	x		x		x	x	x	x		2 h	70		x	x		x	
	FSU/CAH7	x	x	x			x			x			x	x	x		24 h	100		x			x	fill with food simulant at 100 °C & keep the container closed for 24 h at RT

Food Serving Implements	FSI/CA1	x				x	x			x		x	x			x		0.5 h	20		x	x	x	x	
		x			@	x	x			x		x	x			x		10 d	20		x	x	x	x	if used for storage
	FSI/CA2	x	x			x	x			x		x	x	x				0.5 h	40			x	x	x	
		x	x		@	x	x			x		x	x	x				24 h	40			x	x	x	
	FSI/CA3	x	x		≤ 6		x	x		x		x	x			x		10 d	50		x			x	
		x	x		> 6		x	x		x		x	x			x		10 d	60		x			x	
	FSI/CAH1	x	x	x		x	x					x	x	x				0.5 h	70			x	x	x	
		x	x	x		x	x					x	x	x				2 h	70			x	x	x	for spoons only
	FSI/CAH2		x	x			x	x		x		x	x	x				2 h	70		x			x	followed by 24 h at 40 °C, if used for storage
		x	x		@		x	x		x		x	x	x				10 d	40		x			x	
		x	x		≤ 6		x	x		x		x	x	x				10 d	50		x			x	
		x	x		> 6		x	x		x		x	x	x				10 d	60		x			x	
Food Containers	FC/CAH1	x	x	x			y	x		y ; x		x	x	x				2 h	70		x			x	followed by 24 h at 40 °C, if used for storage
		x	x	x	@		y	x		y ; x		x	x	x				10 d	40		x			x	
	FC/CAH2	x					y	x		y ; x		x	x			x		10 d	5		x			x	
		x	x		@		y	x		y ; x		x	x	x				10 d	40		x			x	
		x	x	x	≤ 6		y	x		y ; x		x	x	x				10 d	50		x			x	
		x	x	x	> 6		y	x		y ; x		x	x	x				10 d	60		x			x	
Kitchen Small Appliances	KSA/CA1	x	x				x		x			x	x	x					x					x	
	KSA/CA2	x	x				x		x			x	x	x					x					x	
	KSA/CA3	x	x				x		x			x	x			x			x					x	
	KSA/CA4	x	x				x		x			x	x	x					x					x	
	KSA/CA5	x	x				x		x			x	x			x			x					x	
	KSA/CA6	x	x				x		x			x	x	x					x					x	
	KSA/CA7	x	x				x		x			x	x	x					x					x	
	KSA/CA8	x	x				x		x			x	x	x					x					x	
	KSA/CAH1	x	x	x			x		x			x	x	x					x					x	
	KSA/CAH2	x	x	x			x		x			x	x	x					x					x	
	KSA/CAH3	x	x	x			x	x			x	x	x	x								x	x	x	cf. FSI/CAH1
	KSA/CAH4	x	x	x			x		x			x	x	x					x					x	
	KSA/CAH5	x	x	x			x		x			x	x	x					x					x	
	KSA/CAH6	x	x	x			x		x			x	x	x					x					x	
	KSA/CAH7	x	x	x			x		x			x	x	x					x					x	
	KSA/CAH8	x	x	x			x		x			x	x	x					x					x	
	KSA/H1			x			x		x			x				x			x					x	Food corresponds to artificial water
	KSA/H2			x			x		x			x				x			x					x	Food corresponds to artificial water
	KSA/H3			x			x		x			x	x	x					x					x	
	KSA/H4			x			x		x			x	x	x					x					x	
	KSA/H5			x			x		x			x	x	x					x					x	
	KSA/H6			x			x		x			x	x	x					x					x	
	KSA/H7			x			x		x			x	x	x					x					x	
	KSA/H8			x			x		x			x	x			x			x					x	
	KSA/H9			x			x		x			x	x	x					x					x	
	KSA/H10			x			x		x			x	x	x					x					x	
	KSA/part	x	x	x			x			x	x	x	x	x					x					x	[1]

* **When no national legislation is available, national recommendations, or Council of Europe recommendations, or other relevant guidelines shall be taken into account for compliance assessment.**

[1] select test time and temperature according to worst foreseeable condition use (described in the instructions when availlable)

"y;x": "(total) immersion" applies to "part of it" (x) only, while "article fill" applies to "intact article" (y) and "part of it" (x)

@: see Table: Rational

s/v: surface-to-volume ratio to calculate final release result

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Contact: **Eddo Hoekstra**
JRC-EURL-FCM@ec.europa.eu

Table 4 – Test conditions for silicone & rubber kitchenware

Main Class	Subclass	Use: cold (< 20 °C)	Use: Room Temperature	Use: hot (> 40 °C)	Use: storage (in months)	Sample prep: cut test specimen	Sample prep: intact article	Sample prep: part of it	Test type: actual use	Test type: article fill	Test type: migration cell	Test type: (total) immersion	check national legislation*	Food/Food simulant: food	A	B	C	D1	D2	E	SM Conditions (only food simulants): time	Temp (°C)	label/instructions	S/V: Real	S/V: Real (infant/young)	S/V: 6 (V < 0.5L or V > 10L)	S/V: 6 impractical s/v	OM - check national legislation*	Notes
Food Preparation Wear	FPW/CA1	x	x			x	x			x	x	x	x	x	x	x			x		0.5 h	40			x		x	x	
	FPW/CA2	x	x				x#			x		x	x	x	x	x			x		0.5 h	40					x	x	# or turn inside out
	FPW/CA3	x	x			x					x	x	x	x	x	x			x		0.5 h	40			x		x	x	
Food Preparation Utensils	FPU/CA1	x	x			x	x	x		x		x	x	x	x	x			x		0.5 h	40		x		x	x	x	
	FPU/CAH1	x	x	x		x	x	x		x		x	x	x	x	x			x		0.5 h	70		x		x	x	x	
	FPU/CAH2	x	x	x		x	x				x	x	x	x	x	x			x		2 h	70					x	x	
	FPU/CAH3																													
	FPU/CAH4	x	x	x		x	x					x	x	x	x	x			x		2 h	70		x		x	x	x	
	FPU/CAH5	x	x	x			x			x			x	x	x	x			x		2 h	70		x		x		x	followed by 24 h at 40°C
		x	x	x	@		x			x			x	x	x	x			x		10 d	40		x		x		x	
	FPU/CAH6	x	x	x			x	x		x		x	x	x	x	x					2 h	100 or Reflux		x		x	x	x	[1] time set as 4*0.5 h
		x	x	x			x	x		x		x	x	x					x		0.5 h	121		x		x	x	x	
	FPU/CAH7	x	x	x		x	x					x	x	x	x	x			x		2 h	70					x	x	
	FPU/CAH8	x	x	x	@	x	x					x	x	x		x		x			10 d	40		x		x	x	x	if used to cook herbs go to FPU/H2
	FPU/H1			x		x	x					x	x	x	x	x					2 h	100 or Reflux					x	x	[1] time set as 4*0.5 h
				x		x	x					x	x	x					x		0.5 h	175					x	x	
	FPU/H2			x		x	x			x		x	x	x	x	x					2 h	100 or Reflux		x		x	x	x	[1] time set as 4*0.5 h
				x		x	x			x		x	x	x					x		0.5 h	175		x		x	x	x	
	FPU/H3			x		x	x			x		x	x	x	x	x					4 h	100 or Reflux		x		x	x	x	[1] time set as 4*1 h
				x		x	x			x		x	x	x					x		1 h	200		x		x	x	x	
	FPU/H4			x		x	x			x		x	x	x	x	x					8 h	100 or Reflux		x		x	x	x	[1] time set as 4*2 h
				x		x	x			x		x	x	x					x		2 h	200		x		x	x	x	
Food Serving Utensils	FSU/CA1	x	x				x	x		x		x	x	x	x	x			x		24 h	40		x	x	x	x	x	
	FSU/CA2	x	x				x	x		x		x	x	x		x		x			24 h	40		x	x	x		x	if hot fill go to FSU/CAH2
	FSU/CA3	x	x		@		y	x		y ; x		x	x	x	x	x			x		10 d	40		x		x		x	
		x	x		≤ 6		y	x		y ; x		x	x	x	x	x			x		10 d	50		x		x		x	[2]
		x	x		> 6		y	x		y ; x		x	x	x	x	x			x		10 d	60		x		x		x	[2]
	FSU/CAH1	x	x				y	x		y ; x		x	x	x	x	x			x		24 h	40		x	x	x		x	
			x	x			y	x		y ; x		x	x	x	x	x			x		2 h	70		x	x	x		x	followed by 24 h at 40 °C, if used for storage
	FSU/CAH2	x	x				x			x			x	x		x		x			24 h	40		x		x		x	
			x	x			x			x			x	x		x		x			2 h	70		x		x		x	followed by 24 h at 40 °C, if used for storage
	FSU/CAH3		x	x			x			x			x	x	x	x			x		2 h	70		x		x		x	followed by 24 h at 40 °C, if used for storage
		x	x		@		x			x			x	x	x	x			x		10 d	40		x		x		x	
		x	x		≤ 6		x			x			x	x	x	x			x		10 d	50		x		x		x	[2]
		x	x		> 6		x			x			x	x	x	x			x		10 d	60		x		x		x	[2]
	FSU/CAH4		x	x			x	x		x		x	x	x		x		x			2 h	70			x			x	followed by 24 h at 40 °C, if used for storage
		x	x		@		x	x		x		x	x	x				x			10 d	40			x			x	for milk only
			x	x			x	x		x		x	x	x		x		x			1h	40			x			x	for teats only, (if sold individually, refer to Reg. 10/2011 Art. 17 § 3 and 4)
			x	x			x	x		x		x	x	AS							24 h	40			x			x	additionally, for teats, FS = Artificial saliva (AS); (Directive 93/11/EEC; EN 12868:2017)
	FSU/CAH5	x	x	x			x			x		x	x	x	x	x			x		2 h	70		x	x	x	x	x	
	FSU/CAH6	x	x	x			x	x		x		x	x	x	x	x			x		2 h	70		x	x	x	x	x	
	FSU/CAH7	x	x	x			x			x			x	x	x	x			x		24 h	100		x	x	x		x	fill with food simulant at 100 °C and keep the container closed for 24 h at room temp.

Food Serving Implements	FSI/CA1	x				x	x			x		x	x	x			x				0.5 h	20		x			x	x	
		x			@	x	x			x		x	x	x			x				10 d	20		x			x	x	if used for storage
	FSI/CA2	x	x			x	x			x		x	x	x	x	x			x		0.5 h	40					x	x	
		x	x		@	x	x			x		x	x	x	x	x			x		24 h	40					x	x	
	FSI/CA3	x	x		≤ 6		x	x		x		x	x	x						x	10 d	50		x		x		x	[2]
		x	x		> 6		x	x		x		x	x	x						x	10 d	60		x		x		x	[2]
	FSI/CAH1	x	x	x		x	x	x				x	x	x	x	x			x		0.5 h	70					x	x	
		x	x	x		x	x	x				x	x	x	x	x			x		2 h	70					x	x	for spoons only
	FSI/CAH2		x	x			x			x		x	x	x	x	x			x		2 h	70		x		x		x	followed by 24 h at 40 °C, if used for storage , Refer to Reg. 10/2011 Art. 17 § 3 and 4
		x	x		@		x			x		x	x	x	x	x			x		10 d	40		x		x		x	Refer to Reg. 10/2011 Art. 17 § 3 and 4
		x	x		≤ 6		x			x		x	x	x	x	x			x		10 d	50		x		x		x	[2], Refer to Reg. 10/2011 Art. 17 § 3 and 4
		x	x		> 6		x			x		x	x	x	x	x			x		10 d	60		x		x		x	[2], Refer to Reg. 10/2011 Art. 17 § 3 and 4
Food Containers	FC/CAH1	x	x	x			y	x		y ; x		x	x	x	x	x			x		2 h	70		x		x		x	followed by 24 h at 40 °C, if use for storage [OM2]
		x	x	x	@		y	x		y ; x		x	x	x	x	x			x		10 d	40		x		x		x	
	FC/CAH2	x					y	x		y ; x		x	x				x				10 d	5		x		x		x	
		x	x		@		y	x		y ; x		x	x	x	x	x			x		10 d	40		x		x		x	
		x	x	x	≤ 6		y	x		y ; x		x	x	x	x	x			x		10 d	50		x		x		x	[2]
		x	x	x	> 6		y	x		y ; x		x	x	x	x	x			x		10 d	60		x		x		x	[2]
Kitchen Small Appliances	KSA/CA1	x	x				x		x				x	x		x	x	x		x			x					x	
	KSA/CA2	x	x				x		x				x	x	x	x			x				x					x	
	KSA/CA3	x	x				x		x				x	x	x				x				x					x	
	KSA/CA4	x	x				x		x				x	x		x		x	x				x					x	
	KSA/CA5	x	x				x		x				x	x				x	x				x					x	
	KSA/CA6	x	x				x		x				x	x		x		x					x					x	
	KSA/CA7	x	x				x		x				x	x		x		x					x					x	
	KSA/CA8	x	x				x		x				x	x			x						x					x	
	KSA/CAH1	x	x	x			x		x				x	x		x	x	x					x					x	
	KSA/CAH2	x	x	x			x		x				x	x		x		x					x					x	
	KSA/CAH3	x	x	x			x	x				x	x	x	x	x			x		0.5 h	70					x	x	cf. FSI/CAH1
	KSA/CAH4	x	x	x			x		x				x	x		x*		x					x					x	* if pH less than 4.5
	KSA/CAH5	x	x	x			x		x				x	x	x	x			x				x					x	
	KSA/CAH6	x	x	x			x		x				x	x	x	x			x				x					x	
	KSA/CAH7	x	x	x			x		x				x	x	x	x			x				x					x	
	KSA/CAH8	x	x	x			x		x				x	x	x	x			x				x					x	
	KSA/H1			x			x		x				x	H_2O			x						x					x	H_2O: artificial tap water EN16889:2016
	KSA/H2			x			x		x				x	H_2O			x						x					x	H_2O: artificial tap water EN16889:2016
	KSA/H3			x			x		x				x	x		x	x						x					x	
	KSA/H4			x			x		x				x	x	x	x			x				x					x	
	KSA/H5			x			x		x				x	x	x	x			x				x					x	
	KSA/H6			x			x		x				x	x	x	x			x				x					x	
	KSA/H7			x			x		x				x	x	x	x			x				x					x	
	KSA/H8			x			x		x				x	x					x				x					x	
	KSA/H9			x			x		x				x	x	x	x			x				x					x	
	KSA/H10			x			x		x				x	x	x	x			x				x					x	
	KSA/part	x	x	x			x			x	x	x	x	x	x	x			x				x					x	[3]

*** When no national legislation is available, national recommendations, or Council of Europe recommendations, or other relevant guidelines shall be taken into account for compliance assessment.**

[1] cf. Table 2 of Annex V

[2] use (10d, 40°C) if equilibrium is reached [cf. Reg. 10/2011 Annex V, Chapter 2 § 2.1.4.e & Amendment 2016/1416]

[3] select test time and temperature according to worst foreseeable condition use (described in the instructions when availlable)

@: see Table: Rational

"y;x": "(total) immersion" applies to "part of it" (x) only, while "article fill" applies to "intact article" (y) and "part of it" (x)

SM, OM: Specific migration, Overall Migration

s/v: surface-to-volume ratio to calculate final migration result

Food Simulants: A (Ethanol 10 % v/v); B (Acidic acid 3 % w/v); C (Ethanol 20 % v/v); D1 (Ethanol 50 % v/v); D2 (Vegetable oil); E (poly(2,6-diphenyl-p-phenylene oxide)) [cf. Reg. 10/2011 Annex III]

Contact: **Eddo Hoekstra**
JRC-EURL-FCM@ec.europa.eu

Table 5A – Migration test conditions for paper & board kitchenware

Main Class	Subclass	Use				Sample prep			Test type				check national legislation*	Food/Food simulant							SM Conditions (only food simulants)		S/V				OM - check national legislation*	Notes
		cold (< 20 °C)	Room Temperature	hot (> 40 °C)	storage (in months)	cut test specimen	intact article	part of it	actual use	article fill	migration cell	(total) immersion		food	A	B	C	D1	D2	E	time	Temp (°C)	Real	Real (infant/young)	6 (V < 0.5L or V > 10L)	6 impractical s/v		
Food Preparation Wear	FPW/CA1	x	x			y	x			x	y		x	x	x	x			x		0.5 h	40		x		x	x	
	FPW/CA2																											
	FPW/CA3	x	x			x					x		x	x	x	x			x		0.5 h	40		x		x	x	
Food Preparation Utensils	FPU/CA1																											
	FPU/CAH1	x	x	x		y	x			x	y		x	x	x	x			x		0.5 h	70	x		x	x	x	
	FPU/CAH2																											
	FPU/CAH3																											
	FPU/CAH4																											
	FPU/CAH5	x	x	x		y	x			x	y		x	x	x	x			x		2 h	70	x		x		x	followed by 24 h at 40°C
		x	x	x	@	y	x			x	y		x	x	x	x			x		10 d	40	x		x		x	
	FPU/CAH6	x	x	x		y	x			x	y		x	x	x	x					2 h	100 or Reflux	x		x	x	x	[1] time set as 4*0.5 h
		x	x	x		y	x			x	y		x	x					x		0.5 h	121	x		x	x	x	
	FPU/CAH7																											
	FPU/CAH8																											
	FPU/H1																											
	FPU/H2			x		y	x			x	y		x	x	x	x					2 h	100 or Reflux	x		x	x	x	[1] time set as 4*0.5 h
				x		y	x			x	y		x	x					x		0.5 h	175	x		x	x	x	
	FPU/H3			x		y	x			x	y		x	x	x	x					4 h	100 or Reflux	x		x	x	x	[1] time set as 4*1 h
				x		y	x			x	y		x	x					x		1 h	200	x		x	x	x	
	FPU/H4			x		y	x			x	y		x	x	x	x					8 h	100 or Reflux	x		x	x	x	[1] time set as 4*2 h
				x		y	x			x	y		x	x					x		2 h	200	x		x	x	x	

Food Serving Utensils	FSU/CA1	x	x			y	x		x	y		x	x	x	x		x		24 h	40	x	x	x	x	x	
	FSU/CA2																									
	FSU/CA3	x	x		@	y	x	x	x	y		x	x	x	x		x		10 d	40	x		x		x	
		x	x		≤ 6	y	x	x	x	y		x	x	x	x		x		10 d	50	x		x		x	[2]
		x	x		> 6	y	x	x	x	y		x	x	x	x		x		10 d	60	x		x		x	[2]
	FSU/CAH1	x	x			y	x	x	x	y		x	x	x	x		x		24 h	40	x	x	x		x	
			x	x		y	x	x	x	y		x	x	x	x		x		2 h	70	x	x	x		x	followed by 24 h at 40 °C, if used for storage
	FSU/CAH2																									
	FSU/CAH3																									
	FSU/CAH4																									
	FSU/CAH5	x	x	x		y	x		x	y		x	x	x	x		x		2 h	70	x	x	x	x	x	
	FSU/CAH6	x	x	x		y	x	x	x	y		x	x	x	x		x		2 h	70	x	x	x	x	x	
	FSU/CAH7																									
Food Serving Implements	FSI/CA1																									
	FSI/CA2																									
	FSI/CA3	x	x		≤ 6		x	x	x		x	x	x					x	10 d	50		x		x	x	[2]
		x	x		> 6		x	x	x		x	x	x					x	10 d	60		x		x	x	[2]
	FSI/CAH1	x	x	x		x	x	x			x	x	x	x	x		x		2 h	70				x	x	
	FSI/CAH2																									
Food Containers	FC/CAH1	x	x	x		y	x	x	x	y		x	x	x	x		x		2 h	70	x		x		x	followed by 24 h at 40 °C, if use for storage [OM2]
		x	x	x	@	y	x	x	x	y		x	x	x	x		x		10 d	40	x		x		x	
	FC/CAH2	x				y	x	x	x	y		x				x			10 d	5	x		x		x	
		x	x		@	y	x	x	x	y		x	x	x	x		x		10 d	40	x		x		x	
		x	x	x	≤ 6	y	x	x	x	y		x	x	x	x		x		10 d	50	x		x		x	[2]
		x	x	x	> 6	y	x	x	x	y		x	x	x	x		x		10 d	60	x		x		x	[2]

* **When no national legislation is available, national recommendations, or Council of Europe recommendations, or other relevant guidelines shall be taken into account for compliance assessment.**

[1] cf. Table 2 of Annex V

[2] use (10d, 40°C) if equilibrium is reached [cf. Reg. 10/2011 Annex V, Chapter 2 § 2.1.4.e & Amendment 2016/1416]

@: see Table: Rational

"y": "migration cell" applies to "cut test specimen" only

SM, OM: Specific migration, Overall Migration

s/v: surface-to-volume ratio to calculate final migration result

Food Simulants: A (Ethanol 10 % v/v); B (Acidic acid 3 % w/v); C (Ethanol 20 % v/v); D1 (Ethanol 50 % v/v); D2 (Vegetable oil); E (poly(2,6-diphenyl-p-phenylene oxide)) [cf. Reg. 10/2011 Annex III]

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EURL European Union Reference Laboratory for Food Contact Materials

Contact: **Eddo Hoekstra**
JRC-EURL-FCM@ec.europa.eu

Table 5B – "Extraction" test conditions for paper & board kitchenware

Main Class	Subclass	Use: cold (< 20 °C)	Use: Room Temperature	Use: hot (> 40 °C)	Use: storage (in months)	Sample prep: cut test specimen	Sample prep: intact article	Test type: migration cell	Test type: (total) immersion	check national legislation*	Solvent/Food simulant: pure water type 1 (ISO 3696:1987)	Solvent/Food simulant: isooctane	Solvent/Food simulant: 95 % ethanol	Solvent/Food simulant: E	t/T Conditions: time	t/T Conditions: Temp (°C)	Real	Real (infant/young)	6 (V < 0.5L or V > 10L)	6 impractical s/v	Notes
Food Preparation Wear	FPW/CA1	x	x			x			x	x	x				24 h	23		x		x	
		x	x			x			x	x		x	x		2 h	20		x		x	
	FPW/CA2																				
	FPW/CA3	x	x			x			x	x	x				24 h	23		x		x	
		x	x			x			x	x		x	x		2 h	20		x		x	
Food Preparation Utensils	FPU/CA1																				
	FPU/CAH1	x	x	x		x			x	x	x				24 h	23	x		x	x	
		x	x	x		x			x	x		x	x		2 h	20	x		x	x	
				x		x			x	x	x				2 h	80	x		x	x	For filters and tea bags only
		x	x	x		x		x		x				x	0.5 h	70	x		x	x	
	FPU/CAH2																				
	FPU/CAH3																				
	FPU/CAH4																				
	FPU/CAH5	x	x	x		x			x	x	x				24 h	23	x	x			
		x	x	x		x			x	x		x	x		2 h	20	x	x			
		x	x	x		x		x		x				x	2 h	70	x	x			followed by 24 h at 40 °C, if used for storage
		x	x	x	@	x			x	x	x				24 h	23	x	x			
		x	x	x	@	x			x	x		x	x		24 h	20	x	x			
		x	x	x	@	x		x		x				x	10 d	40	x	x			
	FPU/CAH6	x	x	x		x			x	x	x				24 h	23	x		x	x	
		x	x	x		x			x	x		x	x		2 h	20	x		x	x	
		x	x	x		x		x		x				x	0.5 h	121	x		x	x	
	FPU/CAH7																				
	FPU/CAH8																				
	FPU/H1																				
	FPU/H2			x		x			x	x	x				2 h	80	x		x	x	
				x		x			x	x		x	x		2 h	60	x		x	x	
				x		x		x		x				x	0.5 h	175	x		x	x	
	FPU/H3			x		x			x	x	x				2 h	80	x		x	x	
				x		x			x	x		x	x		2 h	60	x		x	x	
				x		x		x		x				x	1h	200	x		x	x	
	FPU/H4			x		x			x	x	x				2 h	80	x		x	x	
				x		x			x	x		x	x		2 h	60	x		x	x	
				x		x		x		x				x	2 h	200	x		x	x	

	FSU/CA1	x	x			x			x	x	x						24 h	23	x	x	x	x	
		x	x			x			x	x			x	x			2 h	20	x	x	x	x	
		x	x			x		x		x						x	24 h	40	x	x	x	x	
	FSU/CA2																						
	FSU/CA3	x	x		x	x			x	x	x						24h	23	x		x		all storage periods included
		x	x		x	x			x	x			x	x			24h	20	x		x		all storage periods included
		x	x		@	x		x		x						x	10 d	40	x		x		
		x	x		≤ 6	x		x		x						x	10 d	50	x		x		
		x	x		>6	x		x		x						x	10 d	60	x		x		
Food Serving Utensils	FSU/CAH1	x	x	x		x			x	x	x						24 h	23	x	x	x		
		x	x	x		x			x	x			x	x			2 h	20	x	x	x		
	FSU/CAH2																						
	FSU/CAH3																						
	FSU/CAH4																						
	FSU/CAH5	x	x	x		x			x	x	x						24 h	23	x	x	x	x	
		x	x	x		x			x	x			x	x			2 h	20	x	x	x	x	
		x	x	x		x		x		x						x	2 h	70	x	x	x	x	
	FSU/CAH6	x	x	x		x			x	x	x						24 h	23	x	x	x	x	
		x	x	x		x			x	x			x	x			2 h	20	x	x	x	x	
		x	x	x		x		x		x						x	2 h	70	x	x	x	x	
	FSU/CAH7																						
Food Serving Implements	FSI/CA1																						
	FSI/CA2																						
	FSI/CA3	x	x		≤ 6	x		x		x						x	10 d	50	x		x		
		x	x		> 6	x		x		x						x	10 d	60	x		x		
	FSI/CAH1	x	x	x		x			x	x	x						24 h	23				x	
		x	x	x		x			x	x			x	x			2 h	20				x	
	FSI/CAH2																						
Food Containers	FC/CAH1	x	x	x		x			x	x	x						24 h	23	x		x		
		x	x	x		x			x	x			x	x			2 h	20	x		x		
		x	x	x		x		x								x	2 h	70	x		x		followed by 24 h at 40 °C, if used for storage
		x	x	x	@	x			x	x	x						24 h	23	x		x		
		x	x	x	@	x			x	x			x	x			24 h	20	x		x		
		x	x	x	@	x		x		x						x	10 d	40	x		x		
	FC/CAH2	x	x	x	x	x			x	x	x						24 h	23	x		x		all storage periods included
		x	x	x	x	x			x	x			x	x			24 h	20	x		x		all storage periods included
		x	x	x	@	x		x		x						x	10 d	40	x		x		
		x	x	x	≤ 6	x		x		x						x	10 d	50	x		x		
		x	x	x	> 6	x		x		x						x	10 d	60	x		x		

* **When no national legislation is available, national recommendations, or Council of Europe recommendations, or other relevant guidelines shall be taken into account for compliance assessment**

@: see Table: Rational

s/v: surface-to-volume ratio to calculate final result

Food Simulants: E (poly(2,6-diphenyl-p-phenylene oxide)) [cf. Reg. 10/2011 Annex III]

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EURL European Union Reference Laboratory for Food Contact Materials

Contact: **Eddo Hoekstra**
JRC-EURL-FCM@ec.europa.eu

Rational for the selection of test time and temperature (Specific Migration)

time	temperature	Sub-class	Rational/justification
0.5 h	20 °C	FSI/CA1	According to Regulation 10/2011, for utensils in contact with food for a short time (≤ 0.5 h) at cold temperature (refrigerated), these test conditions apply: 20 °C for 0.5 h.
0.5 h	40 °C	FPW/CA1-3 FPU/CA1 FSI/CA2	According to Regulation 10/2011: - for utensils in contact with food for a short time (≤ 0.5 h) at ambient temperature; or - for gloves, placemats and tablecloths, used for ≤ 2 h at ambient temperature, having a short contact time (≤ 0.5 h) with the same portion of food; these test conditions apply: 40 °C for 0.5 h.
0.5 h	70 °C	FPU/CAH1 FSI/CAH1 KSA/CAH3	According to Regulation 10/2011, for utensils in contact with hot food (≤ 70 °C) for a short time (≤ 0.5 h) these test conditions apply: 70 °C for 0.5 h.
1 h	40 °C	FSU/CAH4	Foods may be in contact with these articles for short periods of time at temperatures up to 40 °C.
2 h	70 °C	FPU/CAH2-4 FPU/CAH7 FSU/CAH3-6 FSI/CAH1-2	Accorging to Regulation 10/2011, for utensils in contact with food for short periods of time at temperatures between 70 and 100 °C (cf. "hot fill"), these test conditions apply: 2 hours at 70 °C.
	2 h at 70 °C followed by 24h at 40 °C	FPU/CAH5 FSU/CAH1-4 FSI/CAH2 FC/CAH1	Foods may be in contact with these utensils for short periods of time at temperatures between 70 and 100°C. The food/beverage could then be stored in the same "container" for a day at room temperature or colder. According to Regulation 10/2011 these test conditions apply: 2 h at 70 °C (cf. hot fill) followed by 24 h at 40 °C.
24 h	40 °C	FSU/CA1-2 FSU/CAH1-2 FSI/CA2	According to Regulation 10/2011, for utensils in contact with food (drinkware, tableware and cutlery used for cold and RT purpose ONLY) for up to 1 day at ambient temperature,these test conditions apply: 24 h and 40 °C.
24 h	100 °C	FSU/CAH7	Fill with food simulant @ 100 °C and keep the container closed for 24 h - as real use for thermos
10 d	5 °C	FC/CAH2	According to Regulation 10/2011, - for articles in contact with any food at frozen and refrigerated conditions.
10 d	20 °C	FSI/CA1	According to Regulation 10/2011, - for utensils in contact with food for more than 30 days at frozen temperature.
10 d	40 °C	FPU/CAH5 FPU/CAH8 FSU/CAH3-4 FSU/CA3 FSI/CAH2 FC/CAH1-2	According to Regulation 10/2011, - for utensils in contact with food for more than 30 days at refrigerated or frozen temperature, including hot-fill conditions and/or heating up to 70 °C ≤ T ≤ 100 °C for maximum t = 120/2^((T-70)/10) minutes; - for utensils in contact with food for up to 30 days at room temperature.
10 d	50 °C	FSU/CA3 FSU/CAH3 FSI/CA3 FSI/CAH2 FC/CAH2	According to Regulation 10/2011, for utensils in contact with food for more than 30 days but less than 6 months at room temperature, including hot-fill conditions and/or heating up to 70 °C ≤ T ≤ 100 °C for maximum t = 120/2^((T- 70)/10) minutes, these test conditions apply.
10 d	60 °C	FSU/CA3 FSU/CAH3 FSI/CA3 FSI/CAH2 FC/CAH2	According to Regulation 10/2011, for utensils in contact with food for more than 6 months at room temperature, including hot-fill conditions and/or heating up to 70 °C ≤ T ≤ 100 °C for maximum t = 120/2^((T- 70)/10) minutes, these test conditions apply.
2 h	100 °C or Reflux	FPU/CAH6 FPU/H1-2	**Plastics:** According to Regulation 10/2011, for utensils used for a maximum of 0.5 h at temperatures above 100 °C, the following test conditions in aqueous simulants apply: 100 °C or at reflux temperature for a duration of four times the time selected according to the general test conditions, resulting in contact times of 2 h (=4x0.5h). **Metals and Alloys:** According to the CoE guide conditions for use with boiling contents, articles should be tested for 2 h at the respective boiling temperature of the food simulant. This applies also to FPU/H3 and FPU/H4.
4 h	100 °C or Reflux	FPU/H3	**Plastics:** According to Regulation 10/2011, for utensils used for a maximum of 1 hour at temperatures above 100 °C the following test conditions in aqueous simulants apply: 100 °C or at reflux temperature for a duration of four times the time selected according to the general test conditions, resulting in contact times of 4 h (=4x1h).
8 h	100 °C or Reflux	FPU/H4	**Plastics:** According to Regulation 10/2011, for utensils used for a maximum of 2 hour at temperatures above 100 °C the following test conditions in aqueous simulants apply: 100 °C or at reflux temperature for a duration of four times the time selected according to the general test conditions, resulting in contact times of 8 h (=4x2h).
0.5 h	121 °C	FPU/CAH6	**Plastics:** According to Regulation 10/2011, for utensils used for up to 0.5 h at temperatures up to 121 °C in a microwave the following test conditions apply: 0.5 h at 121 °C for food simulant D2 (suitable vegetable oil needs to be selected) and E (for specific use).
0.5 h	175 °C	FPU/H1-2	**Plastics:** According to Regulation 10/2011, for utensils (other than bakeware) used for up to 0.5 h at temperatures up to 175 °C, the following test conditions apply: 0.5 h at 175 °C using food simulant D2 (suitable vegetable oil needs to be selected) and E (for specific use).
1 h	200 °C	FPU/H3	**Plastics:** According to Regulation 10/2011, for utensils used less than 1 h at temperatures up to 200 °C, the following test conditions apply: 1 h at 200 °C using food simulant D2 (suitable vegetable oil needs to be selected) and E (for specific use).
2 h	200 °C	FPU/H4	**Plastics:** According to Regulation 10/2011, for utensils used for more than 1 h at temperatures up to 200 °C, the following test conditions apply: 2 h at 200 °C using food simulant D2 (suitable vegetable oil needs to be selected) and E (for specific use).

Implemented modifications vs previous edition

Table 1: Kitchenware examples	
FPW/CA3	Kitchen roll added
FPU/CAH1	Filter added
FPU/H2	Filter removed
FPU/H3	Muffin cup added
FSI/CA3	Salt shaker added
FC/CAH1	Pizza box added
Table 2: Testing conditions for plastic kitchenware	
Column description	Food/Food simulant ; A [§]
Table 3: Testing conditions for metal kitchenware	
Food/Food simulant	(cf. EN 16889:2016), year added
Table 4: Testing conditions for silicone and rubber	
FSU/CAH4	Note modified: Additionally, for teats, FS = Artificial saliva (AS); (Directive 93/11/EEC; EN 12868:2017)
Table 5A: Migration test conditions for paper & board kitchenware	
Paper and Board	New table of testing conditions added
Table 5B: "Extraction" test conditions for paper & board kitchenware	
Paper and Board	New table of testing conditions added

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