



# EURL-NRL-FCM Network: update on current activities

*Eddo Hoekstra*

*AESAN meeting, 14 June 2022*

# The Joint Research Centre at a glance

**2800 staff**

nearly 70% of whom are  
scientific/technical staff.  
Headquarters in Brussels  
and research sites  
located in five  
Member States.



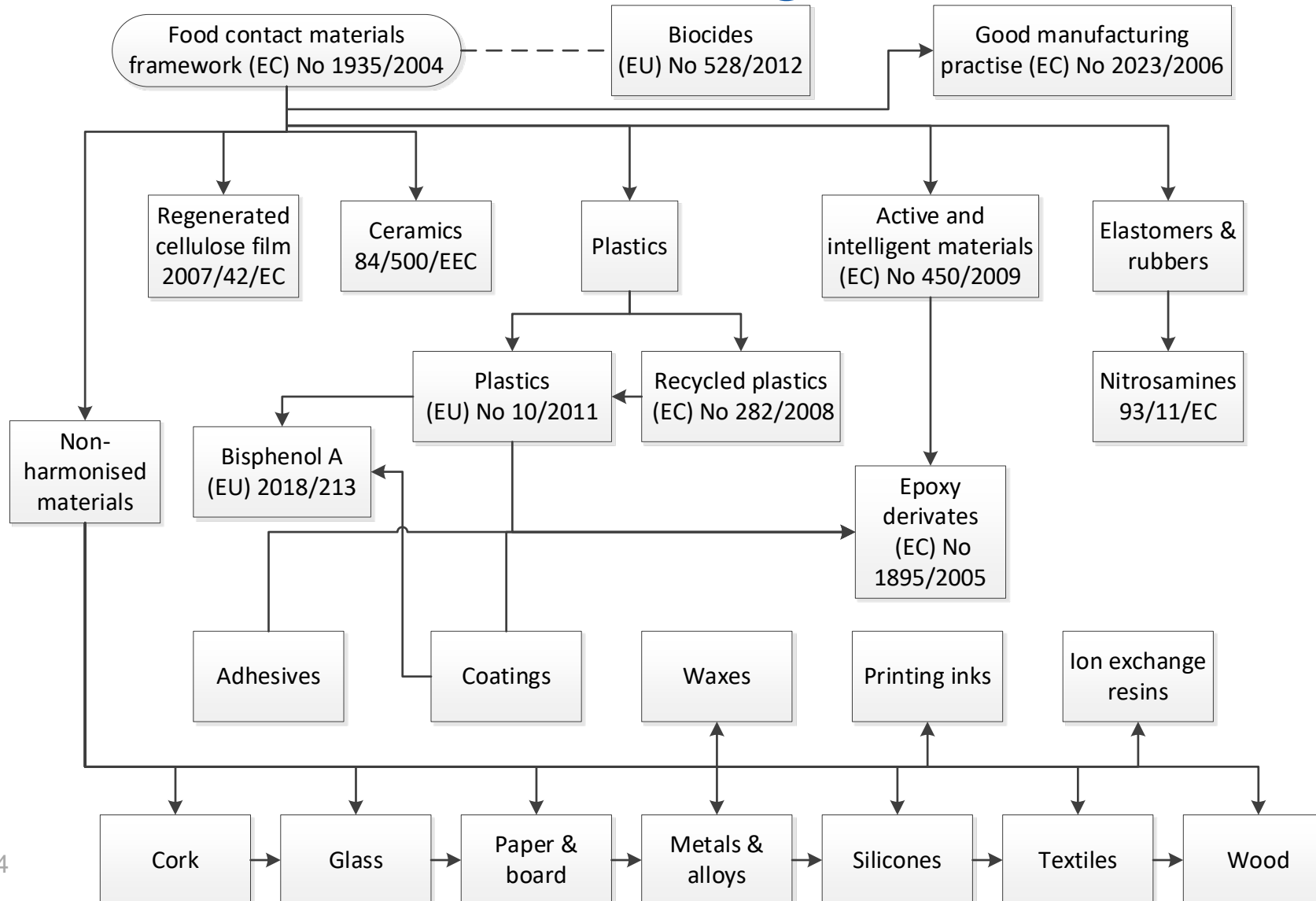
# Improving analytical controls



Official Control Regulation (EU) 2017/625

- Harmonisation and access to test methods
- Assess performance of NRLs by proficiency testing
- Training
- Anticipation work
- Drafting technical guidance documents

# Overview EU FCM legislation

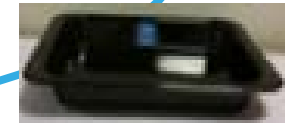


# Topics covered by the JRC and EURL-FCM

**Training**

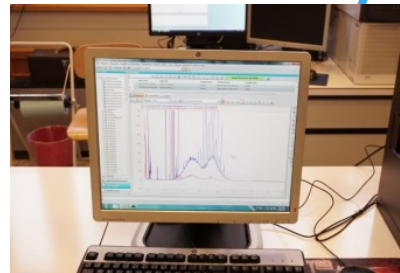


**Migration test methods**  
 Ceramics, vitreous materials  
 Kitchenware test guideline  
 (Migration modelling)

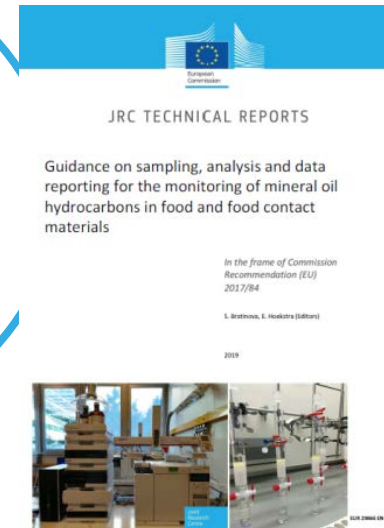
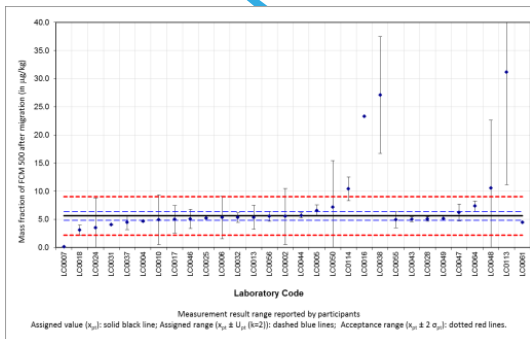


**Analytical methods**  
 Method collection  
 Reference substances  
 Multi-analyte ((N)IAS)  
 Performance guideline  
 revision  
 Proficiency testing

**Mineral oil in food/FCM**  
 Towards SOP for  
 MOAH in infant  
 formula



**Recycling of plastics**  
 Monitoring input-output



# Technical issues with analysis

- Many regulated substances **Multi-analyte methods**
- Availability of calibrants
- Availability of validated analytical methods
- Accessibility of analytical methods from applicant dossiers
- Accreditation
- Non-intentionally added substances (NIAS)

# Kitchenware guidelines

2019 – Guideline on "Testing conditions for kitchenware articles in contact with foodstuffs - Part 1: Plastics;

2020 – Guideline on "Testing conditions for kitchenware articles in contact with foodstuffs - Part 2: Plastics and Metals;

2021 – Guideline on "Testing conditions for kitchenware articles in contact with foodstuffs - Part 3: Plastics , Metals, Silicone & Rubber

2022 – paper & board planned





# Test conditions in Regulation (EU) No 10/2011

Selection of test temperature

Worst foreseeable contact temperature	Contact temperature to be selected for testing
$T \leq 5 \text{ }^{\circ}\text{C}$	5 °C
$5 \text{ }^{\circ}\text{C} < T \leq 20 \text{ }^{\circ}\text{C}$	20 °C
$20 \text{ }^{\circ}\text{C} < T \leq 40 \text{ }^{\circ}\text{C}$	40 °C
$40 \text{ }^{\circ}\text{C} < T \leq 70 \text{ }^{\circ}\text{C}$	70 °C
$70 \text{ }^{\circ}\text{C} < T \leq 100 \text{ }^{\circ}\text{C}$	100 °C or reflux temperature
$100 \text{ }^{\circ}\text{C} < T \leq 121 \text{ }^{\circ}\text{C}$	121 °C (*)
$121 \text{ }^{\circ}\text{C} < T \leq 130 \text{ }^{\circ}\text{C}$	130 °C (*)
$130 \text{ }^{\circ}\text{C} < T \leq 150 \text{ }^{\circ}\text{C}$	150 °C (*)
$150 \text{ }^{\circ}\text{C} < T < 175 \text{ }^{\circ}\text{C}$	175 °C (*)
$175 \text{ }^{\circ}\text{C} < T \leq 200 \text{ }^{\circ}\text{C}$	200 °C (*)
$T > 200 \text{ }^{\circ}\text{C}$	225 °C (*)

(\*) This temperature shall be used only for food simulants D2 and E. For applications heated under pressure, migration testing under pressure at the relevant temperature may be performed. For food simulants A, B, C or D1 the test may be replaced by a test at 100 °C or at reflux temperature for duration of four times the time selected according to the conditions in Table 1.

Selection of test time

Contact time in worst foreseeable use	► <u>M7</u> Time to be selected for testing ◀
$t \leq 5 \text{ min}$	5 min
$5 \text{ min} < t \leq 0,5 \text{ hour}$	0,5 hour
$0,5 \text{ hours} < t \leq 1 \text{ hour}$	1 hour
$1 \text{ hour} < t \leq 2 \text{ hours}$	2 hours
$2 \text{ hours} < t \leq 6 \text{ hours}$	6 hours
$6 \text{ hours} < t \leq 24 \text{ hours}$	24 hours
$1 \text{ day} < t \leq 3 \text{ days}$	3 days
$3 \text{ days} < t \leq 30 \text{ days}$	10 days
Above 30 days	See specific conditions

+ Specific conditions for contact times above 30 days at room temperature and below



# Test conditions

- **Plastics:** based on **expert judgement** on the “worst case” foreseeable conditions of use
  - not on the use intended by the producer
  - following principles of sections 2.1.3 and 2.1.4 (SM) and 3.1 (OM) of Annex V of Regulation (EU) No 10/2011
- Consumers use specific utensils **independently of the material**
  - Other materials: test conditions generally based on those for plastic FCM
- **Metals and alloys, silicone and rubber:** no material specific EU legislation
  - Except Art. 3 of Regulation (EC) No 1935/2004
  - **National legislation shall apply**
  - in absence, the test conditions in EURL guidelines apply

# Test conditions

- **Plastics:** based on **expert judgement** on the “worst case” foreseeable conditions of use
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  - following principles of sections 2.1.3 and 2.1.4 (SM) and 3.1 (OM) of Annex V of Regulation (EU) No 10/2011
- Consumers use specific utensils **independently of the material**
  - Other materials: test conditions generally based on those for plastic FCM
- **Metals and alloys, silicon** **potential non-harmonised situation** material specific EU legislation
  - Except Art. 3 of Regulation (EC) No 1831/2003
  - **National legislation shall apply**
  - in absence, the test conditions in guidelines apply

# Food simulants

- Plastics: Regulation (EU) No 10/2011
- Metals and alloys, silicone and rubber: follow national legislation and in absence
  - Other guidance may be used, e.g. the practical guideline of the Council of Europe or recommendations and in absence of those
  - Food simulants for plastics
  - Metals: if tested with a food simulant for acidic foods ( $\text{pH} \leq 4.5$ ), additional testing in artificial tap water is not required.
- If for any reason the indicated food simulants are not appropriate, testing with food should be considered
- NOTE: results in food prevail over the results obtained in food simulant.

# How to select the test conditions (1)

## 1. Select the main and subclass of the kitchenware article

### Example

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

# How to select the test conditions (2)



Embossed; 260°C

2. If a **permanent label on the article** (e.g. embossed or engraved) defining limiting conditions of use or providing operating instructions, then adapt the test conditions accordingly **BUT** ...
3. If instructions are **ONLY** on the packaging of the article (can be discharged) or not present at all, then select the test condition for that type of article from this guide
4. When this guideline assigns several possible test conditions for the same type of article, then select the **most severe** test conditions appropriate for the specific article



Not fixed; 232°C

# Selection of most severe test conditions

Table 2 for plastic:

Subclass	Use			Sample prep	Test type				Food/Food simulant						SM Conditions (only food simulants)			S/V			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)	label/instructions	Real	Real (infant/young)	6 (V < 0.5L or V > 10L)	6 impractical s/v
FSU/CAH1	x	x			y	x		y	x	x		x	x	x			x		24 h	40		x	x	x		N	
		x	x		y	x		y	x	x		x	x	x			x		2 h	70		x	x	x		N	followed by 24 h at 40 °C, if used for storage [OM2]
FSU/CAH2	x	x			x			x				x			x				24 h	40		x		x		N	
		x	x		x			x				x			x				2 h	70		x		x		N	followed by 24 h at 40 °C, if used for storage [OM2]

Cup, glass, drinkware  
Open flask, carafe, can, jug,

Most severe

2 h	70	x	x	x	3	followed by 24 h at 40 °C, if used for storage [OM2]
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## How to select the test conditions (3)

5. If the prescribed test conditions may physically damage the test specimen, the migration tests shall be carried out under the “worst foreseeable conditions of use” to avoid these changes
6. If a food simulant causes changes to the test specimen, e.g. swelling, that does not occur with food, this food simulant is not suitable.
  - Perform the migration test using food or another equivalent food simulant not causing such changes
7. For articles used only under specific time, temperature conditions and/or for specific foods the selected test conditions and food simulants should comply with those specific conditions of use



# Ceramics, glass, enamel

- Support revision Ceramic Directive 84/500/EEC
- More elements than Cd, Pb
- Realistic test conditions
  - compared to current 22°C for 24 h using 4% v/v acetic acid
- Repeated use
- Replacement of acetic acid for elevated temperatures



# Revision method performance guideline

JRC Scientific and Technical Reports



## Guidelines for performance criteria and validation procedures of analytical methods used in controls of food contact materials

Stefanka Bratinova, Barbara Raffael, Catherine Simoneau



# Mineral oil



JRC TECHNICAL REPORT

Determination of MOSH/MOAH in Shell SN500\*  
mineral oil

*JRC IF 2021-03 - The third  
interlaboratory comparison*

Bratinova S, Robouch P., Goncalves C.,  
Karasek L., Beldi G., Senaldi C., Valzacchi S.,  
Hoekstra E.

2022



Joint  
Research  
Centre

EUR 30990 EN



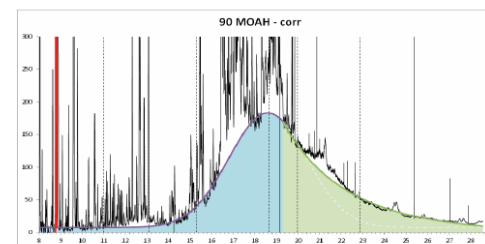
JRC TECHNICAL REPORT

Mineral oil in infant formulas  
- guidelines for integrating chromatograms

*JRC IF 2021-04: a virtual  
inter-laboratory comparison*

Robouch P., Bratinova S., Goncalves C., Karasek L.,  
Beldi G., Senaldi C., Valzacchi S. and Hoekstra E.

2022



Joint  
Research  
Centre

EUR 51101 EN

# Proficiency tests



JRC TECHNICAL REPORT

Determination of the mass fraction of Cd and Pb released from ceramic bowls

*Proficiency Testing Report  
FCM-20/02 (Part 1)*

Fernando Cordeiro, Silvia Garcia-Ruiz, James Snell,  
Geert Van Britsom, Pieter Dehouck, Aneta Cizek-Stroh,  
Piotr Robouch, Eddo Hoekstra

2021



JRC125776



JRC TECHNICAL REPORT

Determination of the mass fraction of nine selected elements in a food simulant solution

*Proficiency Testing Report  
FCM-20/02 (Part 2)*

Fernando Cordeiro, James Snell, Geert Van Britsom,  
Aneta Cizek-Stroh, Piotr Robouch, Eddo Hoekstra

2021



EUR 30805 EN



JRC TECHNICAL REPORT

Determination of MOSH and MOAH in muesli and paperboard

*Proficiency Test Report  
JRC FCM-20/01*

Stefanka Bratinova, Pieter Dehouck,  
Piotr Robouch, Giorgia Beldi,  
Natalia Jakubowska, Eddo Hoekstra

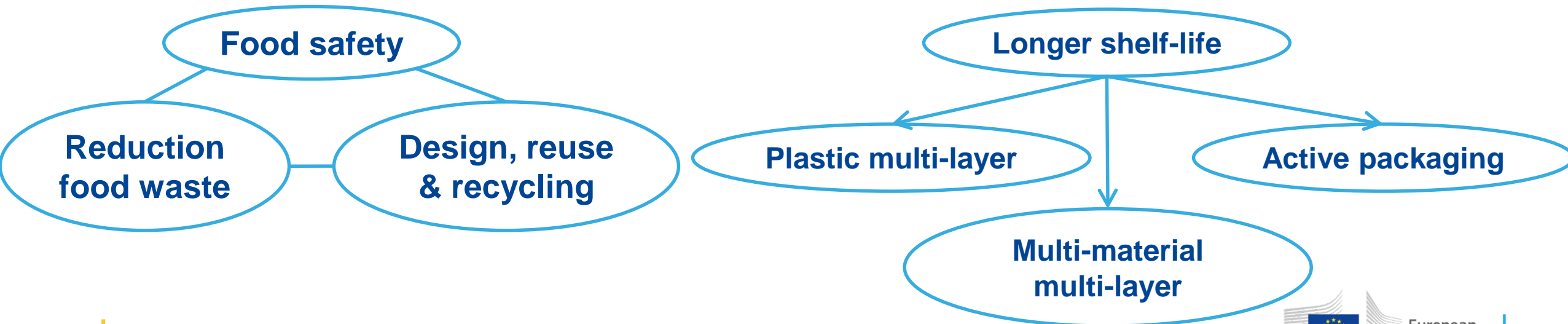
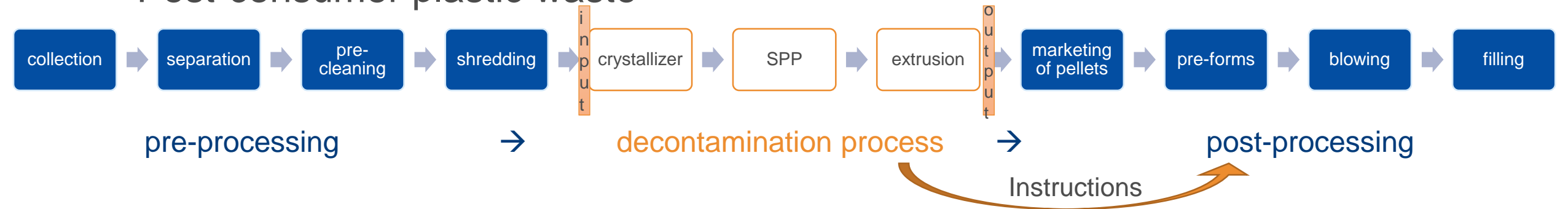


EUR 30787 EN



# Recycling

## Post-consumer plastic waste



# Drinking water contact materials



JRC TECHNICAL REPORT

Review of standards related to materials  
in contact with drinking water

*In view of the implementation  
of the Drinking Water  
Directive (EU) 2020/2184*

Senaldi C., Crutzen H., Hoekstra E.

2021



# Acknowledgements

- National Reference Laboratories
- Commission (DG SANTE, DG ENV)
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# Thank you



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