Agnelli
SINCE 1907

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Baldassare Agnelli S.p.a.

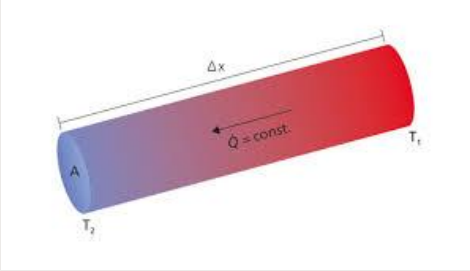
AI

In the food industry

Physical Aluminium properties

- Low specific weight 2,7 Kg/dm^3

- High heat conductivity 225 W/m °K



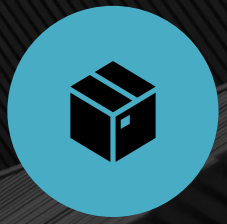
First large and «strategic» use of aluminium for cooking and food transportation

Aluminium use in food industry

Food preparation

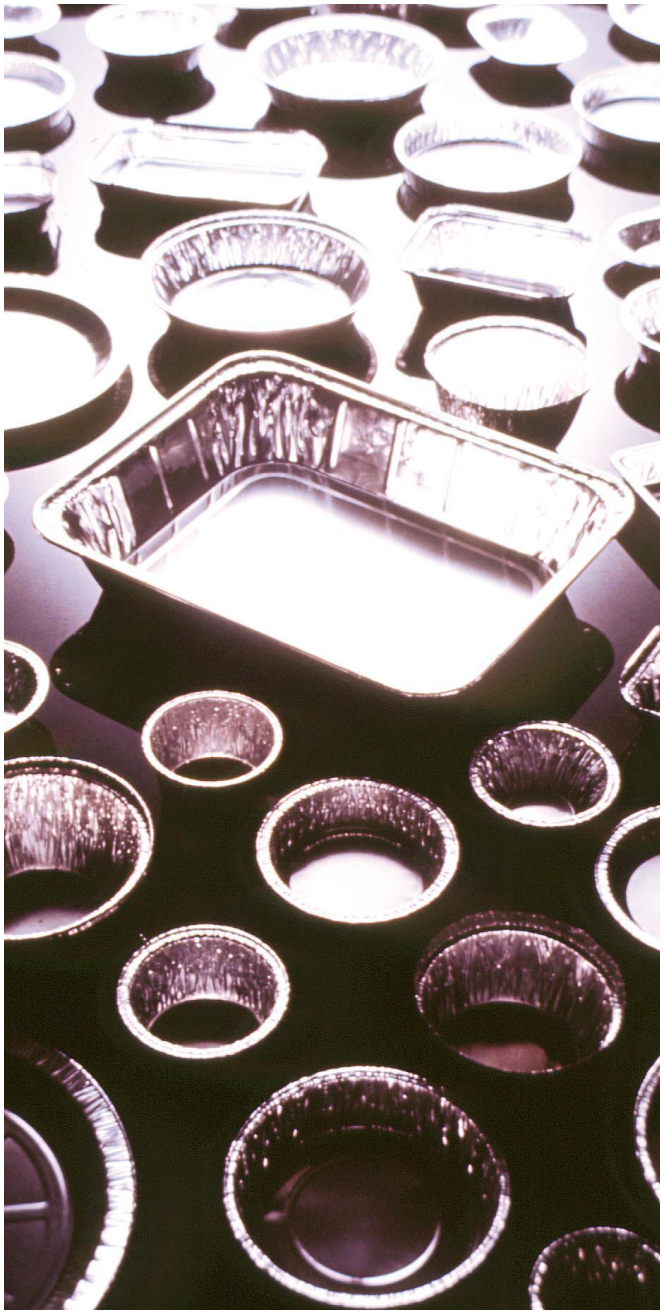
Food storage
finished product

Food
Transportation



Packaging

Food preparation



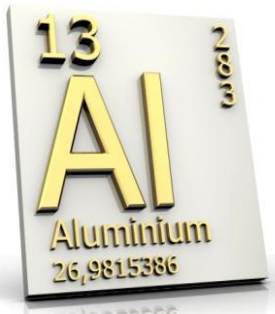
Food storage finished product

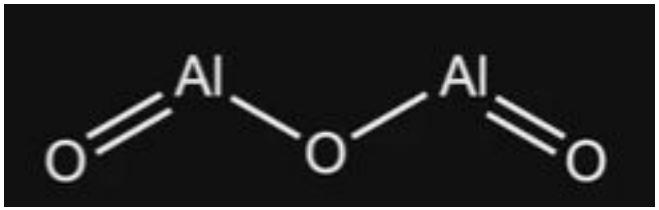
Food transportation

Food Packaging

Storage area

- Aluminum guarantees the preservation of food products and their protection from light, water and air.
- Ensuring its quality and consumer protection.


13
Al
Aluminium
26,9815386


Al
Al
O
O
O

Oxide	Common name	Percentage %
SiO_2	Silicon	59,71
Al_2O_3	**Alluminium oxide**	**15,41**
CaO	Calcium oxide	4,90
MgO	Magnesium oxide	4,36
Na_2O	Sodium oxide	3,55
FeO	Iron oxide	3,52
K_2O	Potassium oxide	2,80
Fe_2O_3	Ferric oxide	2,63
H_2O	Water	1,52
TiO_2	Titanium dioxide	0,60
P_2O_5	Phosphoric Anhydride	0,22
Total		**99,22**

(PROTECTIVE)

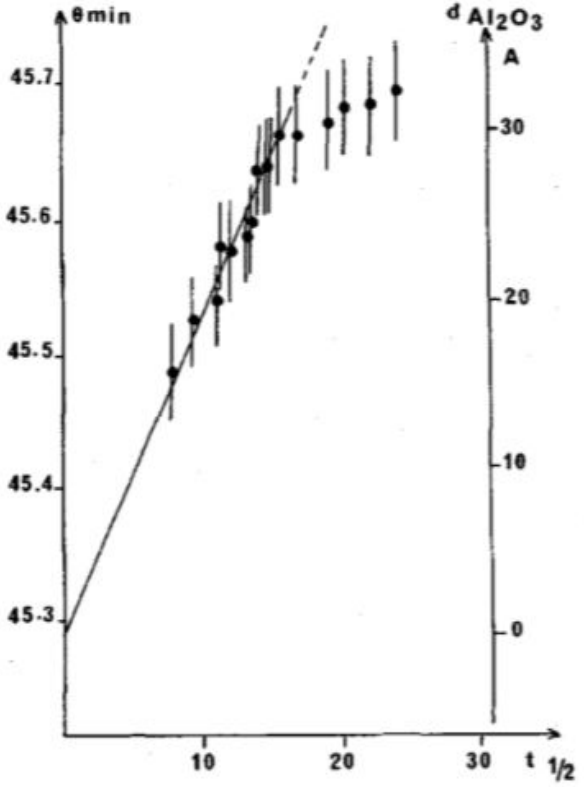


Fig. 3- Plot of θ_{min} versus $t^{1/2}$. Note the fast increase of the alumina thickness during the first stage of the oxidation process, and the linear dependence of θ_{min} with $t^{1/2}$ up to about 7 mn. The corresponding calculated values of $d_{Al_2O_3}$ are also reported (see text)

ALUMINUM (AND COMPOUNDS) PRESENT IN FOODS

Product	*n*	Minimum[a]	Maximum[b]	Mean value[c]	Median value[d]
Dates	18	1.23	6.72	3.39	2.57
Pine nuts	9	12.0	38.6	26.1	23.8
Wheat	65	1	19	4	3
Baking mixes	37	1	737	51	6
Bread	107	1	14	3	2
Spelt	28	<BG	3.0	0.63	0.37
Loaf-shaped yeast fruit cakes	60	3	22	10	9
Fine pastries in aluminum trays	38	1	537	19	3
Salt pretzels and similar savory biscuits	185	2	218	13	4
Pasta	24	1	76	10	4
Herbal-teas	12	14	67	40	45
Cocoa powder	37	80	312	165	160
Chocolate	84	6	150	48	39
Confectioneries	115	1	184	17	8
Malt	50	1	12	7	7
Evaporated milk	49	0.08	0.66	0.290	0.205
Soft cheese	13	0.3	5.39	1.68	1.37
Harz cheese	22	0.15	0.78	0.400	0.438
Milk curd	53	0.03	1.73	0.224	0.109
Beer and mixed drinks containing beer, draught beer	237	0.4	4.2	0.5	0.4
Fruit juice and fruit juice drinks	59	0.4	47	3	1
Wine and fruit wine	65	0.4	15	2	1
Mineral water, spring water and table water	171	0.1	0.07	0.01	0.006
Ready-cooked meals in aluminum trays	31	1	13	3	1
Soups	16	1	15	5	3
Pork (canned)	8	0.76	1.35	1.23	1.08
Beef (canned)	6	0.52	1.1	0.634	0.669
Game	149	<BG	1.1	0.110	0.025
Herring (canned)	32	0.16	5.99	1.99	1.60
Crustaceans	45	0.07	40.0	4.47	2.54

Aluminium in foodstuffs (milligrammes per kilogramme or milligrammes per litre)

FOOD ADDITIVES CONTAINING ALUMINIUM

In I**taly** the ministry of health considers the following food additives safe:

E520 Aluminum sulphate

E521 Sodium aluminum sulphate E522 Sulphate of aluminum and ammonium

E541 Sodium and aluminum phosphate

E555 Slicate of potassium and aluminum

E556 Calcium and aluminum silicate E559 aluminum silicate

In the **USA**, the "Food and Drug Administration" (FDA) considers the following food additives generally safe (GRAS):

Aluminum sulphate

Aluminum sulphate and ammonium

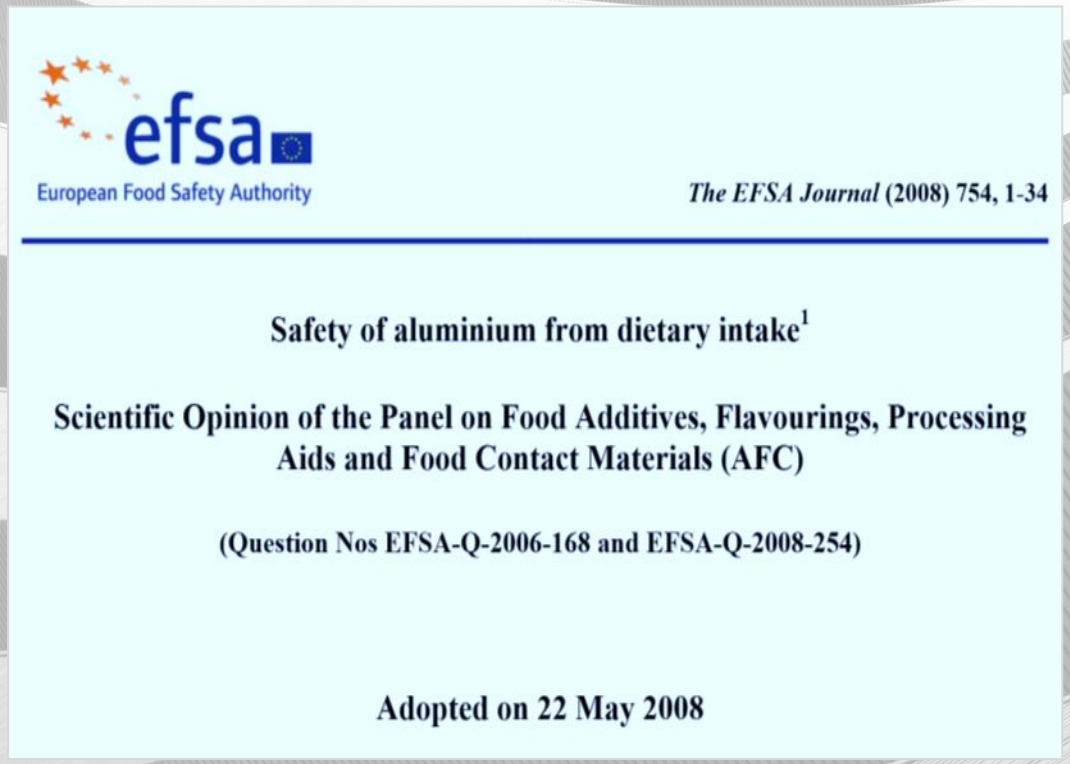
Calcium and aluminum silicate

Aluminum Stereate

Sodium and aluminum acid phosphate

Aluminum nicotine

EFSA



efsa
European Food Safety Authority

The EFSA Journal (2008) 754, 1-34

Safety of aluminium from dietary intake[1]

Scientific Opinion of the Panel on Food Additives, Flavourings, Processing Aids and Food Contact Materials (AFC)

(Question Nos EFSA-Q-2006-168 and EFSA-Q-2008-254)

Adopted on 22 May 2008

In consideration of the presence of Al and its compounds in foods, preservatives, drugs ,the Panel considered it appropriate to establish a Tolerable Weekly Intake (TWI) rather than a Tolerable Daily Intake and established a **TWI of 1 mg / kg of body weight / week.**

Regulatory requirements

(Materiali Oggetti Contatto Alimentare)

The regulatory requirements that MOCAs must meet are:

-Place of production and sale

-Materials of composition

–Type of food to be packaged

They are distinguished in:

Mandatory provisions
General nature
Specific character

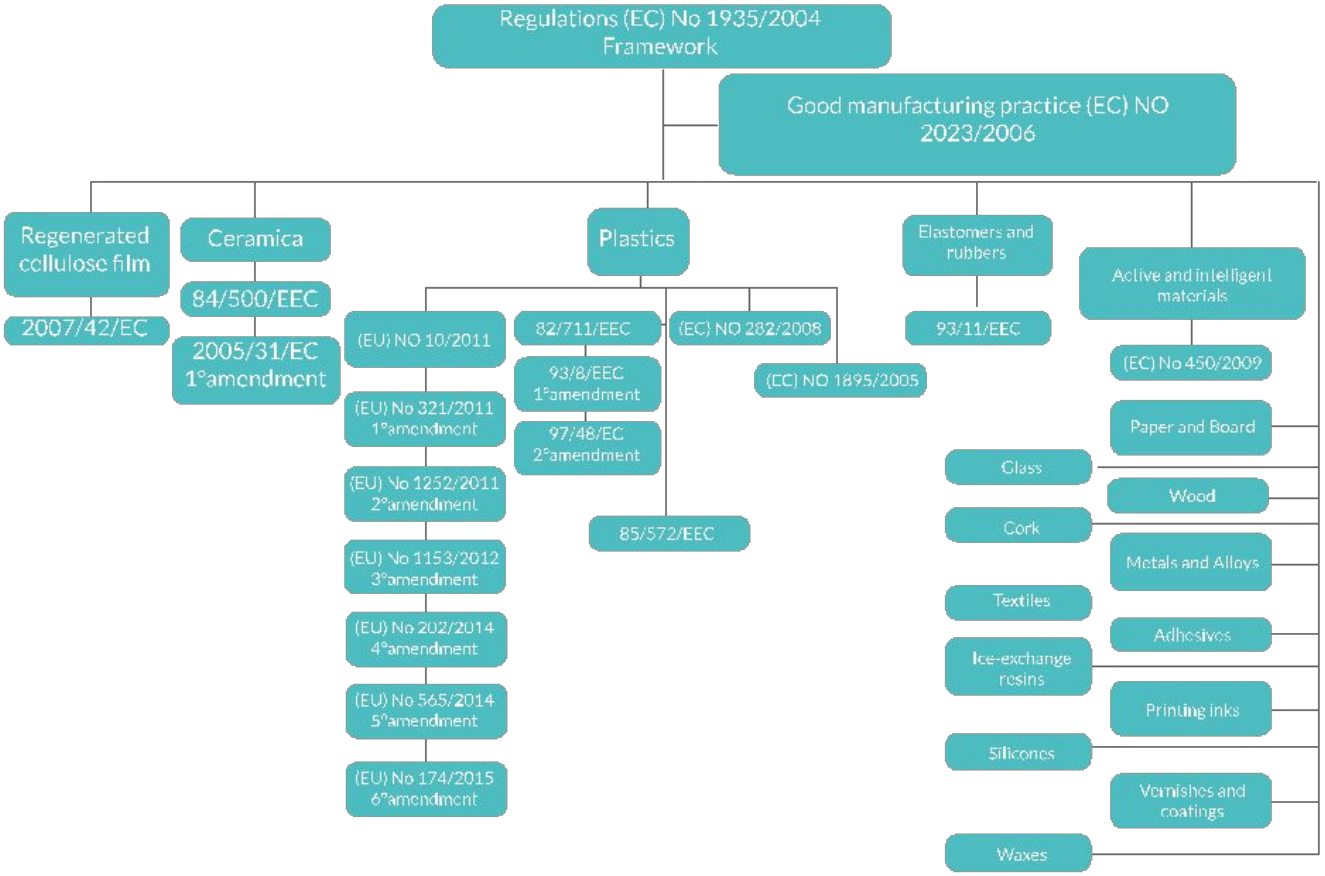
VOLUNTARY provisions (recommendations, technical standards, guidelines)

European regulaments

- 1935/2004: Products
- 2023/2006: Process

First one has harmonized just a certain number of materials

Doesn’t exist a specific regulamentation for aluminium (and other metals)



Regulatory Framework (EU regulaments)

Each country can adopt its law Reg. 1935/2004

Article 6

National specific measures

In the absence of specific measures referred to in Article 5, this Regulation shall not prevent Member States from maintaining or adopting national provisions provided they comply with the rules of the Treaty.

Europe: voluntary provisions

COUNCIL OF EUROPE
CONSEIL DE L'EUROPE
COUNCIL OF EUROPE

Resolution CM/Res(2020)9 on the safety and quality of materials and articles for contact with food

(Adopted by the Committee of Ministers on 7 October 2020
at the 1385th meeting of the Ministers' Deputies)

https://search.coe.int/cm/pages/result_details.aspx?objectid=09000016809fe04a

Resolution CM/Res(2013)9
on metals and alloys used in food contact materials and articles

(Adopted by the Committee of Ministers on 11 June 2013
at the 1173rd meeting of the Ministers' Deputies)

https://search.coe.int/cm/Pages/result_details.aspx?ObjectID=09000016805c8094

Metals and alloys used in food contact materials and articles

A practical guide for manufacturers and regulators

European Directorate for the Quality of Medicines & HealthCare

Committee of Experts on Packaging Materials for Food and Pharmaceutical Products • P-SC-EMB

2013

1st Edition

edqm European Directorate for the Quality of Medicines & HealthCare

COUNCIL OF EUROPE
CONSEIL DE L'EUROPE

Aluminium (Al)

Aluminium is the third most abundant element in the Earth's crust and is widespread in minerals. Aluminium does not occur in nature in a free element state because of its reactive nature (Beliles, 1994). Many of its naturally occurring compounds are insoluble at neutral pH and thus concentrations of the element in both fresh and sea water are usually low, less than 0.1 mg/L. Inorganic compounds of aluminium normally contain Al(III). Pure aluminium has good working and forming properties and high ductility, its mechanical strength being low. Therefore, aluminium is often used in alloys (Beliles, 1994).

Sources and levels of intake

The main source of aluminium is the naturally occurring content in foodstuffs. The measured levels of aluminium in unprocessed foodstuffs range from less than 0.1 mg/kg in eggs, apples, raw cabbage, corn and cucumbers to 4.5 mg/kg in tea (Pennington and Jones, 1989; Pennington and Schoen, 1995; MAFF, 1993). Much higher values are found in some industrially processed foods where aluminium salts have been added as a food additive. However, in the EU the use of aluminium salts as a food additive is limited to certain products, such as scones, and aluminium itself is accepted as a decoration in confectionery (Directive 95/2/EC).

Mean dietary exposure from water and food in non-occupational exposed adults showed large variations between the different countries and, within a country, between different surveys. It ranges from 0.2 to 1.5 mg/kg body weight/week. In children, estimated exposure at the 97.5th percentile ranges

Europa: voluntary provisions

UNI EN 601:2007

Aluminum and aluminum alloys - Castings - Chemical composition of castings intended for contact with food

UNI EN 602:2007

Aluminum and aluminum alloys - Semi-finished products - Chemical composition of semi-finished products used in the manufacture of objects intended for contact with food

UNI EN 14287:2004

Aluminum and aluminum alloys - Specific requirements for the chemical composition of products intended for the manufacture of packaging and packaging components

UNI EN 16773:2016

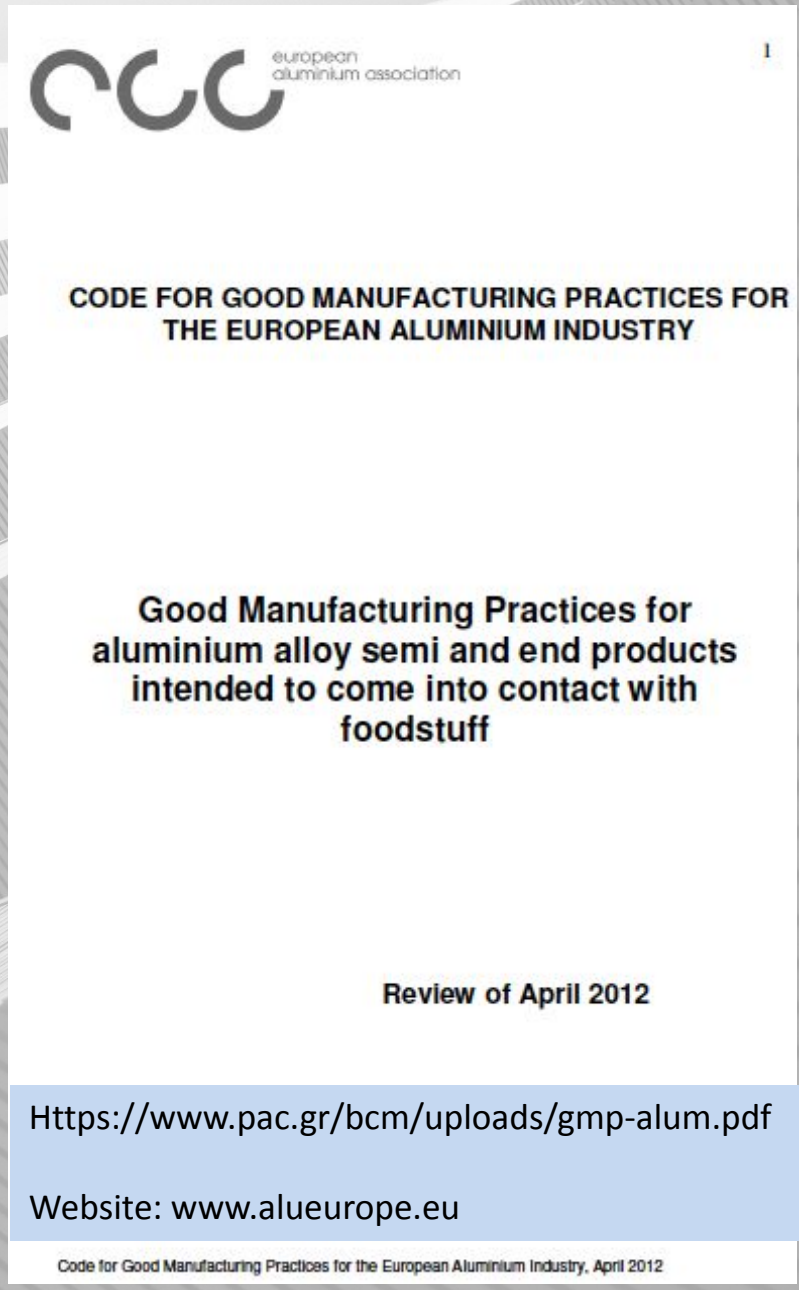
Guideline for the production of the semi-thin sheet intended for the production of trays and lids for food

Europe: voluntary provisions

Good Manufacturing Practices for alumnium alloy semi and end products intended to come into contact with foodstuff.
EAA – European Aluminium Association that is representing the aluminum industry in Europe, issued in 2012 the code for good manufacturing practices for the European aluminum industry.

The guidelines contain:

- legislative and regulatory references
- GMP rules for manufacturing processes
- System requirements quality
- Assurance quality control
- Requirements documentation



Https://www.pac.gr/bcm/uploads/gmp-alum.pdf

Website: www.alueurope.eu

Europe: voluntary provisions

alufoil
European Aluminium Foil Association

Manufacturers of household aluminum foil and aluminum containers, organized in the European Aluminum Foil Association (EAFA), have decided to harmonize labeling as described in a recommendation. Objectives of a harmonized labeling: correct information about the safe use of aluminum products, without coating for food clear information without creating alarmism towards the consumer possibility of labeling in multiple languages on the package

Italy: general mandatory provisions

Decree of the President of the Republic n. 777 of 23 August 1982 and subsequent updates and modifications Implementation of Directive (EEC) no. 76/893 relating to materials and objects intended to come into contact with food products.

The sanctions not expressly released and the parts that are not incompatible with Community legislation still remain in force.

Legislative Decree n. 29 of 10 February 2017 Discipline of sanctions for the violation of the provisions of regulations (EC) no. 1935/2004, n. 1895/2005, n. 2023/2006, n. 282/2008, n. 450/2009 and n. 10/2011, regarding materials and objects intended to come into contact with food products.

Discipline regarding: - Sanctions in case of violation of the regulations -Communication to the ATS (Territorial Health Authority) of competence of its activity by the manufacturers of MOCA.

Italy: specific mandatory provisions

Specific provisions for aluminum. Decree of the Ministry of Health No. 76 of 18 April 2007. Regulation containing the legal discipline of materials and objects made of aluminum and aluminum alloys intended to come into contact with food.

Art. 1 Scope. 1. The regulation governs materials and articles made of aluminum and aluminum alloys intended to come into contact with food. 2. The regulation does NOT apply to coated aluminum materials and objects, as long as the layer in direct contact with food has a barrier effect.

Discipline regarding:

Definitions - Aluminum, aluminum alloy, coated aluminum
Purity requirements
Characteristics of composition
Terms of use
Labeling
Controls and obligations
Declaration of conformity
Foods (12) suitable for direct contact

Italy: specific mandatory provisions

Specific provisions for aluminum foil complexes D.M. 21/03/1973 Hygienic regulation of packaging, containers, tools intended to come into contact with foodstuffs or substances for personal use.

It regulates: plastics, rubber, regenerated cellulose, paper and cardboard, glass, stainless steel in terms of: Positive lists of constituents, Migration limits, Migration test conditions, Identification of specific substances, Purity requirements, Declaration of conformity, Indications for use, labeling.

The D.M. mentioned above, is a pillar of the food contact legislation, although it is almost 50 years old, thanks to over 50 updates and changes it is still relevant today.

Italy: specific mandatory provisions

Guidelines for aluminum and coated aluminum. Higher Health Institute. As part of the CAST project (food contact safety and technology), 5 guidelines published by the ISS as ISTISAN Reports have been developed.

-ISTISAN 09/93 Report Guidelines for the application of regulation 2023/2006 / EC of the MOCA chain (English version ISTISAN 11/37)

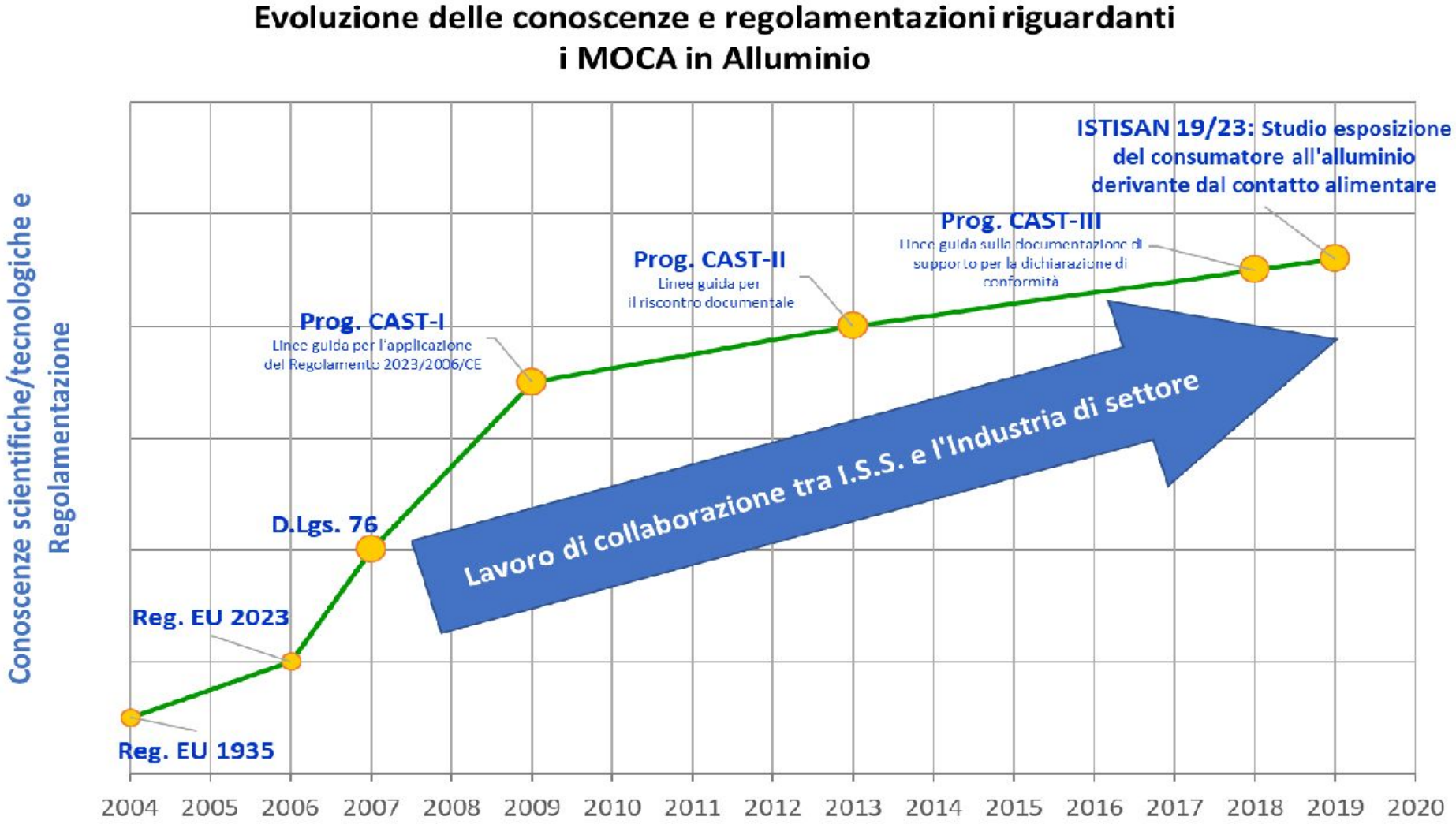
-ISTISAN 13/14 Report Guidelines for documentary feedback on the application of regulation 2023/2006 / EC

-ISTSAN 18/24 Report Guidelines on supporting documentation for declarations of compliance with the MOCA legislation

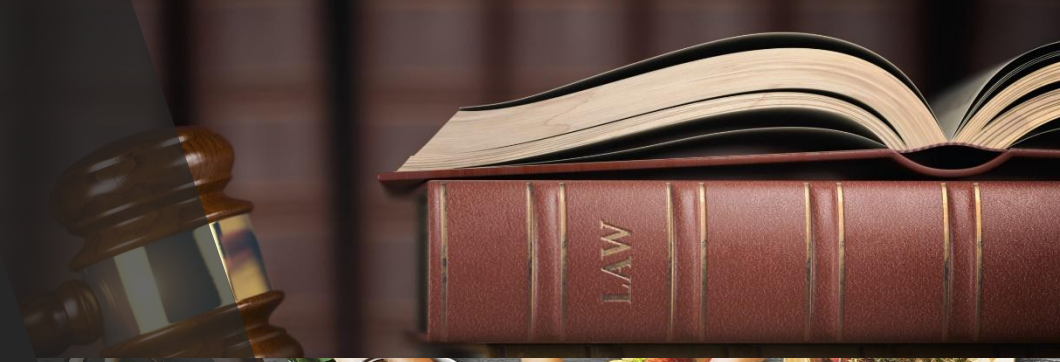
-ISTSAN reports 16/42 and 16/43 Guidelines for the application and documentary verification of Reg. 2023/2006 / EC for paints, adhesives and inks.

The guidelines are structured in a part of general application and in a part of specific application, distinct for the supply chains of materials and objects aluminum, paper and cardboard, flexible packaging, plastics, wood, metals and metal alloys coated and uncoated, cork , glass.

Scientific approach, collaboration and mutual esteem between institutions and the industrial world



What should be the new goal for the aluminium packaging?



Grazie!
Спасибо!

PENTOLE AGNELLI
PROFESSIONAL COOKWARE
MADE IN ITALY

Contact: danilo.amigoni@agnelli.net