



Rousselot® Gelatine



Improvement
by nature



A natural food

Gelatine is a natural and healthy ingredient that has been used for ages in a large number of applications either food, pharmaceutical or technical.

Some definitions of Gelatine...

American Pharmacopoeia-USP 33 NF 28

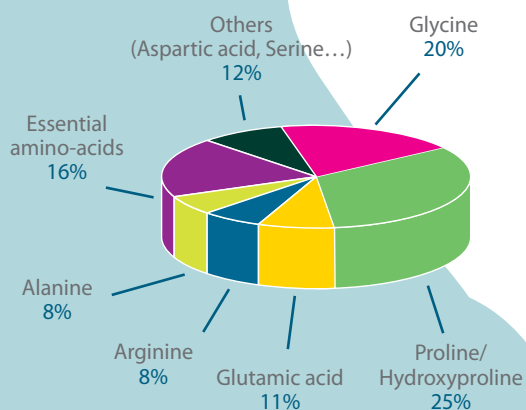
"...a product obtained by the partial hydrolysis of collagen derived from the skin, white connective tissue, and bones of animals."

European Pharmacopoeia EP7

"...a purified protein obtained either by partial acid hydrolysis (type A) or partial alkaline hydrolysis (type B) or partial enzymatic hydrolysis of collagen from animals including fish and poultry. It may also be a mixture of different types."

Food Chemical Codex 7

"...a product obtained from the acid, alkaline or enzymatic hydrolysis of collagen, the chief protein component of the skin, bones, and connective tissues of animals including fish and poultry."



Gelatine: a unique amino acid composition



Gelatine is a food ingredient, it has no e-number.

Nutritional value

Gelatine is a totally digestible protein of low calorific value (4 kcal/g). It is composed of more than 85 % protein, less than 13 % water and less than 2% minerals. It is fully digestible and contains 18 different amino acids, including 8 out of the 9 essential amino acids, the exception being tryptophan. It is particularly rich in glycine, proline and hydroxyproline, which together represent almost 50% of the composition of the molecule and give gelatine its unique properties. Hydroxyproline is an amino acid specific to gelatine.

Properties & Characteristics

Gelatine is a natural colloidal protein having gelling properties and a stabilizing effect. These depend on its type, its concentration and its pH, as well as on the conditions of temperature.

Compatible food

Gelatine is water-soluble and compatible with most other hydrocolloids, including vegetable colloids such as agar-agar, alginates, carrageenans or pectins. It is compatible with sugars, corn syrups, edible acids and flavors.

Characteristics

Bloom (gel strength)

A main characteristic used to describe gelatine is the bloom.

Bloom is linked to the mechanical elasticity of the gelatine gel. It is based on the re-arrangement of individual gelatine chains into an ordered network.

Bloom testing uses a standardized measurement. The bloom indicates the force required to depress a prescribed area of the surface of a 6.67% gelatine gel at 10°C (50°F) to a distance of 4 mm.

The values for Rousselot® gelatines range from 50 to 300-grams and gelatines are described as:

- High bloom (gel strength above 200)
- Medium bloom (gel strength between 120 and 200)
- Low bloom (gel strength less than 120). Bloom may be null for hydrolyzed gelatines.

Viscosity

Viscosity is an important factor regarding the rheological behavior of a gelatine solution.

Once dissolved in water above its setting temperature, gelatine will yield solutions typically ranging from 1.5 to 7.5 mPa.s.

Viscosity is measured by a standardized method and indicates the flow time of 100 ml of a 6.67% gelatine solution at 60°C (140°F) through a standard pipette.

Solubility

Solubilization of gelatine is easy and concentrations of 40 to 45% are attainable. Typically, gelatine needs to swell before it solubilizes in hot water, and various methods are available.

Setting point

The setting point corresponds to the temperature at which gelatine forms a gel.

Melting point

The melting point corresponds to the temperature at which gelatine melts into solution.

Residue on ignition (ash)

Percentage of residue after ashing at 550°C (1022°F).

Isoelectric point

The isoelectric point is defined at the pH at which positive charges (from NH₂ radical) equal negative charges (from COOH radical), and there is no movement in an electric field.

Turbidity/clarity

Clarity of the gelatine solution/gel is critical in a wide range of applications. It also indicates the efficiency of the filtration stage during the processing.

Color

Color depends on the raw materials, treatment and nature of the extracted gelatines. Color is evaluated by visual observation and comparison with a range of control color scale.

Microbial content

Rousselot® Gelatine quality is built and controlled on the production line. It conforms to the most stringent food standards and pharmacopoeias. Dry gelatine keeps its properties at least five years when stored at room temperature in closed packaging.



Bloom testing

A multi-talented ingredient

Rousselot® Gelatine is a multi-talented ingredient. Its gelling, foaming, emulsifying and binding functionalities are complemented by numerous characteristics that make it irreplaceable in many applications, either in the food, pharmaceutical or technical industries.

Because of all its functionalities, Gelatine has the capacity to fulfill all your applications.

Whether you are looking for one of the following functionalities, gelatine is the candidate of choice.

Gelling power and thermo-reversibility

What really makes gelatine unique in terms of functionalities is its thermo-reversible gelling power: a gelatine-based formulation gels when cooled and liquefies when subsequently heated.

This transformation occurs rapidly and can be repeated without significant changes in characteristics.

This is the most important functionality of gelatine and the key to a vast range of applications.

Foaming power

Gelatine has the property to form foam and to stabilize it. This is of particular value in foodstuffs such as aerated dairy products, mousses or whipped confections.

Colloidal protective power

This colloidal power prevents the formation of ice crystals in ice cream and plays an essential role in the photographic industry.



Film forming

When a gelatine solution is spread it has the property of forming a film on transition from the solution state to the gel state. This functionality is used in the manufacture of capsules and microcapsules.

Rousselot experts know how to address your specific requirement and are able to link a particular functionality of gelatine to your need.

Other functionalities include:

- Stabilizing
- Syneresis prevention
- Thickening agent
- Clarifying power
- Plasticizer
- Binding power
- Emulsifier
- Sticking agent
- Disintegration agent
- Dispersal agent

The widest range of gelatines

Based on its technical know-how, Rousselot's particular strength is to develop products and services in order to find new solutions, fitting international, local or individual environments and needs.

Rousselot is the only supplier to offer such a range of gelatines.

The wide variety of products goes with a strict naming system built to meet our customers' need for clarity.

Rousselot® Gelatine names are built as follows:

Rousselot® Gelatine "Bloom" "letter" "particle size" where:

- the Bloom is defined according to your application (from 30 to 250),
- the letter is defined according to the table below,
- the particle size may be chosen according to our standard particle size

For example: Rousselot® Gelatine 125 PS 30 refers to Rousselot® Gelatine of pig skin origin, acid process, 125 Bloom and 30 mesh.

For Peptan® collagen peptides range, see our specific brochure.



Rousselot® Gelatines Commercial names

Letter	Raw Material
P	Acid Porcine
B	Alkaline Bovine
H	Bovine Hides
SH	Soda Hides
PS	Acid Pig Skins
AP	Acid Pig Bones
LB	Lime Bovine Bones
AB	Acid Bovine Bones
LH	Lime Bovine Hides
AH	Acid Bovine Hides
LP	Lime Pig Bones
FG	Fish

Rousselot® Gelatine particle size

8 mesh	2,36 mm
18 mesh	1,00 mm
30 mesh	0,60 mm
60 mesh	0,25 mm

Production process

Rousselot® gelatines are obtained through partial hydrolysis of the collagen contained in the raw material. The goal is to render the naturally insoluble collagen into gelatine, soluble in warm water. To reach this objective a complex, multi-stage process, interspersed with numerous chemical, physical and bacteriological test operations has to be performed.

It all starts with raw materials...

The highest quality of Rousselot products are determined by the careful selection of the suppliers of raw materials and their swiftest collection and transport. These raw materials undergo the strictly controlled Rousselot process, a complex, multistage process, punctuated with numerous chemical, physical and bacteriological controls.

Through the organization of these stages, Rousselot ensures a complete traceability of its products.

Traceability

Rousselot has always provided complete transparency to its customers. Our traceability system is built on two principles:

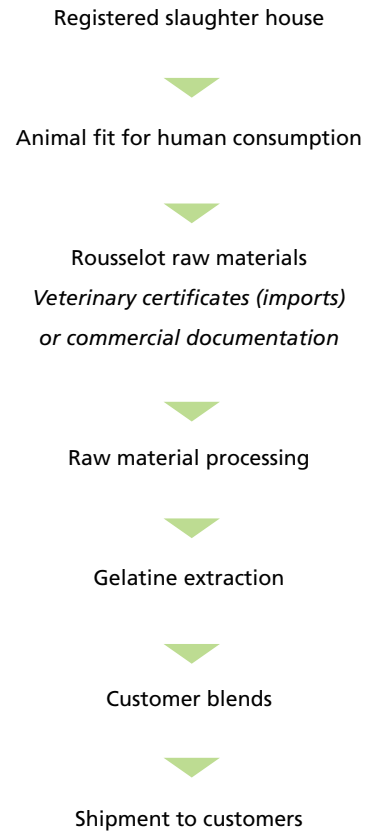
- Rousselot® Gelatines are manufactured exclusively from strictly selected raw materials,
- Traceability of Rousselot® gelatines allows any lot to be traced to its raw materials and its process conditions.

Controlled production steps




Two possible production processes can be used, the acid process or the alkaline process depending on the raw material used and the characteristics required for the end product.

Whatever the process used, gelatine production process follows six very specific steps: raw material pre-treatment, gelatine extraction, gelatine purification, semi-finished product recovery, blending of commercial lots release.

All these production steps are always strictly and carefully controlled to meet specifications.



Traceability of raw materials used for the production of Rousselot® Gelatines

Raw materials		Process	
		Acid	Alkaline
	Bones	•	•
	Skins	•	
	Bones	•	•
	Hides	•	•
	Fish	•	

The above table lists Rousselot range of raw materials and processes.

Quality

Pre-selection of raw materials, control of production parameters, expertise of staff, and systematic testing and inspection of semi-finished and finished products, combine to guarantee the reliability of our gelatines and the reproducible characteristics of these products.

The use of leading edge technologies is associated with the development of a stringent Quality Assurance System. All Rousselot manufacturing facilities are ISO certified.

Rousselot also depends on the Food Safety System and is involved in a voluntary quality policy to respect all national and international regulations, norms and quality standards including GMP/GHP, HACCP and IFS.

All these standards and practices are essential to guarantee quality to customers.

The table below describes the different steps needed to produce gelatines.



Pre-treatment (in case of bones)

- Bone demineralization



Preparation of raw materials

- Alkaline or acid treatment
- Washing

Extraction

- Cooking



Purification

- Filtration
- Concentration with steam
- Sterilization with steam



Gelation

- Gelling at low temperature
- Drying with filtered air
- Crushing-Screening

Finished products

- Blending
- Packaging
- Shipment

Regulation update and compliance

The evolution of various regulations significantly impacts the gelatine business. Rousselot is constantly in contact with the main regulatory bodies throughout the world, either directly or through the various gelatine manufacturers' associations such as the GME, GMIA, GMJ, SAGMA and GMAP.

In doing so, Rousselot permanently scrutinizes all major regulatory evolution (EU: DG SANCO, EMEA; USA: USDA, FDA; Japan: MHWL) and consequently adjusts in order to ensure full compliance and maximize the availability of its products on a global basis.

Main gelatine pharmacopoeia

Parameters	European Pharmacopoeia 7	United States Pharmacopoeia 33 NF 28	Japanese Pharmacopoeia 15
Identification description	Conforms to tests	Conforms to tests	Conforms to tests
Odor and water-insoluble substances	-	-	Conforms to tests
Gel strength (6.67 % - 10° C)	Gelling or non gelling gelatine AOAC method (80 to 120 % of labelled nominal value for gelling gelatine)	AOAC method	AOAC method
pH (1 % - 55°C)	3.8 - 7.6	-	-
Isoelectric Point (IEP)	Typically A : 6.0 - 9.5 B : 4.7 - 5.6	A : 7.0 - 9.0 B : 4.7 - 5.2	A : 7.0 - 9.0 B : 4.5 - 5.0
Residue on ignition (550° C)	-	≤ 2 %	≤ 2 %
Conductivity (1 %, 30°C)	≤ 1 mS.cm-1	-	-
Loss on drying	≤ 15 %	-	≤ 15 %
Sulfur dioxide (SO2)	≤ 50 mg/kg	≤ 40 mg/kg or 1500 mg/kg for capsules and tablets	≤ 60 mg/kg or 1000 mg/kg for capsules and tablets
Arsenic (As)	-	≤ 0.8 mg/kg	≤ 1 mg/kg
Mercury (Hg)	-	-	≤ 0.1 mg/kg
Heavy metals	-	≤ 50 mg/kg	≤ 50 mg/kg
Iron (Fe)	≤ 30 mg/kg	-	-
Chromium (Cr)	≤ 10 mg/kg	-	-
Zinc (Zn)	≤ 30 mg/kg	-	-
Peroxides (H2O2)	≤ 10 mg/kg	-	-
Microbial limits			
Aerobic microbial count (TAMC)	≤ 1000 CFU/g	≤ 1000 CFU/g	-
Salmonella	Absence in 10 g	Absence in 1 g	-
E. coli	Absence in 1 g	Absence in 10 g	-
Total yeast and molds (TYMC)	≤ 100 CFU/g	≤ 100 CFU/g	

Main gelatine edible requirements

Parameters	Food Chemical Codex 7	European Regulation (EC) N°853 / 2004 and further amendments
Definition	Partial hydrolysis of collagen the chief protein component of the skin, bones and connective tissues of animals	Natural, soluble protein, gelling or non gelling, obtained by the partial hydrolysis of collagen produced from bones, hides, skins,
Loss on drying	≤ 15 % (105°C)	-
Ashes	≤ 3 % (550°C)	-
Sulfur dioxide (SO2)	≤ 50 mg/kg	≤ 50 mg/kg
Peroxides (H2O2)	-	≤ 10 mg/kg
Cadmium (Cd)	-	≤ 0.5 mg/kg
Arsenic (As)	-	≤ 1 mg/kg
Copper (Cu)	-	≤ 30 mg/kg
Lead (Pb)	≤ 1.5 mg/kg	≤ 5 mg/kg
Zinc (Zn)	-	≤ 50 mg/kg
Chromium (Cr)	≤ 10 mg/kg	≤ 10 mg/kg
Mercury (Hg)	-	≤ 0.15 mg/kg
Pentachlorophenol	≤ 0.3 mg/kg	
Microbial limits		
Salmonella	Absence in 25 g	Absence in 25 g
E. coli	Absence in 25 g	

The right
Gelatine,
whatever your
application

Rousselot® Gelatine for pharmaceutical applications



Rousselot® Gelatine is an excipient tailored for pharmaceutical use. It is specifically developed and manufactured to meet customer constraints and requirements. The highest quality raw materials are chosen to go through Rousselot's strictly controlled and fully traceable process. Hygiene, selection and control is our motto for repeatable Rousselot® pharmaceutical gelatines.

Hard capsules

In hard capsules, Rousselot® Gelatine provides a strong and flexible film for tamper-evident dosage form.

These gelatines have been developed to meet the most stringent parameters. Along with excellent disintegration and gliding properties, Rousselot® gelatines meet the highest microbiological standards

Soft capsules

Rousselot applies its pharmaceutical methodology to all gelatines used for soft gelatine capsules, whether they are for pharmaceutical, nutraceutical or cosmeceutical use.



Tablets

In tablets, Rousselot® Gelatine is a natural binding and disintegration agent that meets the requirements of those consumers concerned about the use of synthetic or chemically modified ingredients.

Blood plasma substitute

The quality and purity of Rousselot® Gelatine has made it the material of choice as an ingredient in the preparation of blood plasma substitute.

Micro-encapsulation

For micro-encapsulation, Rousselot® Gelatine's emulsifying and filming properties allow the preparation of a coating that will protect the active ingredient from reacting with oxygen or water.

	Gel Strength (bloom)	Viscosity (mPa.s)	Other characteristics
Hard capsules	220 LB	3.5-5.0 (6.67%, 60°C)	<ul style="list-style-type: none"> · Loss of viscosity · Loss on drying · Iron content · Peroxides
	200 LB		
	280 PS		
Soft capsules	160 LB	2.5-4.2 (6.67%, 60°C)	<ul style="list-style-type: none"> · Loss on drying · Iron content · Peroxides · Microbial limits
	200 PS		
Tablets	150 .PS	2.5-4.2 (6.67%, 60°C)	<ul style="list-style-type: none"> · Loss on drying · Bacteriology
	150 LB		
Granulation	Hydrolyzed gelatine	3.5-5.5 (20%, 25°C)	<ul style="list-style-type: none"> · Binding power
Suppositories	The gelatine is selected in order to be compatible with the active ingredients to be released.		<ul style="list-style-type: none"> · Microbial limits
Plasma substitute	250 LB gelatine suited to manufacture plasma expander.		<ul style="list-style-type: none"> · Microbial limits



The right
Gelatine,
whatever your
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Rousselot® Gelatine for edible applications

A versatile and unmatched ingredient, Rousselot® Gelatine offers multiple functionalities that make it irreplaceable in many food applications such as sweets, dairy products, desserts, meat or fish preparations...

Confectionery

Gelatine is an important ingredient to the confectionery industry. It can be characterized in different ways and primarily by its gelling power and thermoreversibility. Gelatine may be considered as a:

- gelling agent: jelly confectionery,
- whipping agent: aerated confectionery,
- stabilizer: anti-crystallizer,
- emulsifier: fruit chews,
- thickening agent: filled confectionery
- binder: sugar paste, liquorice,
- coating agent: dragées, coated chewing gums...

Water jellies/Gelatine desserts

The powder mix prepared with gelatine, sugar, acids, salts, colors and flavors is a very common preparation around the world using water or milk.

Dairy products

Gelatine and milk are an ideal combination for many formulations of aerated and low fat products. With the strong influence of fat replacement, interest in gelatine is growing, and it is compatible with polysaccharides for the best texture and functionality.

Meat, fish and aspics

As a natural ingredient of these products, Rousselot® Gelatine is used to improve the presentation, the conservation and the protein content of meat emulsions, cooked injected hams, aspics and salted jellies, sauces and canned meat products.

For instance in sauces, gelatine improves the creaminess and avoids phase separation even after thermal shocks.

Wine fining and fruit-juice clarification

Rousselot® Gelatine is particularly suited for red wine, cider and apple juice clarification where it reduces the turbidity and decreases the astringency of final beverages without negative impact on suitable flavor components.



	Gel strength (Bloom)	Rousselot® Gelatine type	Viscosity (6.67 % - 60°C)	Other important characteristics	Gelatine content (%)
CONFECTIONERY					
Jelly item to be oiled/not boiled or sugar sanded	200	PS, AH	medium-low	Color, clarity	6-9
Gum	150	PS, AH	low	Clarity	10-15
Wine gum	125	PS, AH, SH	medium-low	Clarity	4-8
Liquorice	100	PS, AH, SH	medium-low		3-8
Marshmallow	250	PS	medium	Foaming power	2-5
Meringues	100	PS, AH, SH	medium	Foaming power	2-5
Extruded aerated items	125	PS, AH, SH	high-medium	Foaming power	3-7
Chewy candy	125	PS, AH, SH	medium	Foaming power	0.5-2.5
	Hydrolyzed gelatine		medium	Foaming power	
Caramels	100	PS, AH, SH	medium		0.2-1
Toffees	100	PS, AH, SH	medium		0.2-1
SWEET DESSERTS					
Water jellies/gelatine desserts	250	PS, SH	medium	Color, clarity	1.5-3
DAIRY PRODUCTS*					
Cream for long storage	150	SH, PS	medium		0.2-0.5
Whipped cream	150	SH, PS	medium		0.2-0.6
Reduced-fat butter-type spreads	250	PS, AH	medium	Melting point	0.5-3
Home-made dessert mixes					
Custards, puddings	150	SH, PS	medium	Foaming power	0.2-2
	Hydrolyzed gelatine				
Pastry custards	150	SH, PS	medium		0.2-3
Industrial dairy desserts					
Flavored milk jellies	150	SH, PS	medium		0.2-2
Mousses, aerated dessert	150	SH, PS	medium	Foaming power	0.2-3
	Hydrolyzed gelatine				
Cream custards	150	SH, PS	medium		0.2-1
Acidified milk products					
Yogurts (yogurt-based products), fermented milks	150	SH, PS	medium		0.2-2
Dessert	150	SH, PS	medium		0.2-2
Fresh cheese-based products	150	SH, PS	medium		0.2-2
Ice creams and sorbets	150	SH, PS	medium	Foaming power	0.2-1
	Hydrolyzed gelatine				
MEAT INDUSTRY					
Jellies	200	PS, AH, SH	high-medium	Color, clarity	3-15
Binder for meat emulsions	200	PS, AH, SH	high-medium		0.5-3
Hams, meat preserves	200	PS, AH, SH	high-medium	Clarity	1-2
Coating	200	PS, AH, SH	high-medium	Clarity	5-20
FISH AND SHELLFISH					
Binder	200	PS, AH, SH	medium		0.5-3
Aspic	200	PS, AH, SH	medium	Color, clarity	3-15
WINE AND FRUIT-JUICE CLARIFICATION					
	75		low		
	Hydrolyzed gelatine				

These qualities of gelatine are linked to stock availability.



Rousselot® Gelatine for technical applications

Photographic applications

Rousselot imaging technology, with its tradition of innovation and perfection, has adapted to the recent gelatine developments including in the field of holography and ink-jet technology. Rousselot fit-for-use gelatines give to these new products an unbeatable gloss, a traditional photographic touch and a protection against adverse environments or effects of time.

Hydrolyzed or low bloom gelatines increase setting time without changing the mechanical characteristics of plaster.

In cement, the addition of hydrolyzed gelatines fluidifies mortar.

Other technical applications

In addition to these two applications, Rousselot® Gelatine is widely used in other numerous "technical" applications, including match heads, paintballs, ballistics gels and many more.

It can also be used to restore old book.

Building industry

Machine-applied plasters have longer setting times than standard methods of application. Specific adjuvants are necessary such as swelling agents, water retainers, products to enhance adhesion and setting retainers like gelatine.

	Gel Strength (Bloom)	Viscosity (mPa.s)	Other characteristics
Imaging technology			
Including silver halide photography, Ink jet, Holography....	In this specific, high-technology field, each application is thoroughly developed in cooperation with each client, in order to adjust the gelatine varieties to the customer's process and/or to final specifications.		
Technical applications			
Micro-encapsulation	Preservation in acid-type gelatines with gel strength, viscosity and pH characteristics adjusted to the user's process.		
Buildings	Hydrolyzed gelatine		Binding power

VION

With two international divisions Food and Ingredients, the company is active in the field of high quality foodstuffs and health products for humans and animals. Rousselot is part of the Ingredients division. VION has annual sales of EUR 8,9 billion and provides employment for 27,000 people worldwide. VION's head office is in Eindhoven, The Netherlands.
www.vionfood.com

Rousselot®

Rousselot is the leading manufacturer of Gelatine and hydrolyzed collagen to the food, pharmaceutical and technical industries.
 With a staff of 2.400 people, the company benefits from a global sales and production network of 13 plants and 10 sales offices located in Europe, North America, South America and Asia. Rousselot is part of VION N.V., an international food company with production and sales facilities on all continents.

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