

CONFÉDÉRATION EUROPÉENNE DU LIÈGE

**INTERNATIONAL CODE
OF CORK STOPPER
MANUFACTURING PRACTICE**

3^d EDITION



ENGLISH VERSION

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Cork Stopper Manufacturing Practices, may be reproduced.

Dépôt légal Septembre 1999

Introduction

The present edition of the Code of Cork Stopper Manufacturing Practice is the result of the impact made by the presentation of the first edition to the public in November 1996 in Paris.

To take account of the reactions and comments of the wine growing world, some amendments have been made which would facilitate the understanding of the Code and remove any ambiguity.

These include a better definition of the technical terminology and of the conditions under which certain stages of the process of manufacture may be carried out.

Moreover this edition has been enriched by a reference to the marking of stoppers as well as a new section concerning stoppers for sparkling, semi-sparkling and gasified wines.

C.E. LIÈGE has also considered that it is essential to make known the companies carrying out the different stages of production and commerce in stoppers, whose practices conform to the rules mentioned in this document. Our organisation is presently engaged in setting up a system of accreditation of these firms which will be the subject of wide publicity.

The different versions of the Code in each of the languages of C.E. LIÈGE members have been validated, the original French version being the reference text.

All the supplementary information on the Code can be obtained from the Secretariat of C.E. LIÈGE at the following address:

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We think that the International Code of Cork Stopper Manufacturing Practice, and with it the publication of common professional rules to ensure compliance by setting up a system of accreditation, will be the International Reference which can serve all the users of cork stoppers.

It is in this spirit that our efforts proceed.

SUMMARY

3^d EDITION
September 1999

PART A: DEFINITIONS:	p.6
PART B: PRACTICES AND TREATMENT:	p.8
I. RAW CORK:	p.8
1. Corkwood from the base of the tree	
2. Storage of planks	
3. Seasoning time	
4. Cork bark with yellow stain	
5. First boiling	
6. Post-boiling stabilisation	
7. Green cork	
II. PREPARED CORK BARK:	p.10
1. Selection	
2. Storage	
3. Second boiling	
III. NATURAL & COLMATED STOPPERS FOR STILL WINES:	p.11
1. Punching	
2. Washing	
2.1. Washing in water	
2.2. Washing in chlorine	
2.3. Washing in peroxides	
2.4. Washing in sulphamic acid	
2.5. Washing in sodium metabisulphite	
3. Colouring	
4. Colmation	
5. Coloured coating	
6. Selection	
7. Printing	
8. Paraffin wax coating	
9. Silicone coating	
10. Storage of cork stoppers	
11. Transport of cork stoppers	
IV. PERFORATION WASTE:	p.15
1. Storage	

V. AGGLOMERATED STOPPERS FOR STILL WINES:	p.15
1. Granulate	
2. Additives for agglomeration	
3. Glue for agglomeration	
4. Washing	
5. Colouring	
6. Coloured coating	
7. Printing	
8. Paraffin wax coating	
9. Silicone coating	
10. Storage of cork stoppers	
11. Transport of cork-stoppers	
VI. AGGLOMERATED STOPPERS AND DISCS OF NATURAL CORK FOR SPARKLING, SEMI-SPARKLING AND GASIFIED WINES:	p.17
1. Granulate	
2. Additives for agglomeration	
3. Glue for agglomeration	
4. Discs of natural cork	
5. Selection of the discs	
6. Glue for the discs	
7. Rectification	
8. Selection	
9. Printing	
10. Paraffin wax coating	
11. Surface treatment	
12. Storage of stoppers	
13. Transport of stoppers	
VII. METHODS OF CONTROL OF STOPPERS FOR STILL WINES:	p.20
1. Dimensional control	
2. Control of humidity	
3. Control of dust	
4. Control of sealing of liquids	
5. Control of the forces of extraction	
INDEX:	p.21

Stopper:

Product obtained from cork bark and/or agglomerated cork, made up from one or more pieces to ensure the sealing of bottles or other receptacles and to preserve their contents.

Agglomerated cork stopper:

Piece of agglomerated cork obtained by extrusion or moulding.

Agglomerated cork stopper for sparkling, semi-sparkling wines and gasified wines:

Agglomerated cork stopper with one or more discs of natural cork glued on one of its extremities.

Cork stopper manufacture:

Industry concerned with processing cork bark into stoppers for still and sparkling wine and for spirits.

Waste:

Off-cuts resulting from processing of stoppers and /or punching.

Disc or rondelle:

Cylindrical piece of natural cork with variable diameter and thickness.

Granulate:

Pieces of cork whose dimensions are between 0.25 and 8.0 mm, classified by grain structure and volumetric mass.

Stopper cork bark:

Bark suitable for processing into stoppers.

Virgin cork bark:

Bark from the first stripping of the trunk and branches.

Reproduction cork:

Bark which is formed after stripping virgin cork.

Cork bark pieces:

Pieces of virgin or reproduction cork bark whose surface is smaller than 400 cm².

Raw cork waste:

Reproduction cork of low quality not suitable for transformation by cutting.

Raw cork bark:

Virgin or reproduction cork bark which has not been submitted to any treatment after stripping.

Prepared cork bark:

Reproduction cork which has been boiled, flattened, selected and trimmed (common definition of “race” and “traços”).

Lenticular canals:

Structures which pass through the cork tissue between the atmosphere and the living tissues.

Pore:

Lenticular canal in transversal section.

“Traços”:

Prepared cork bark, calibrated and free from wedges (cork bark growing near the ground), cork waste and cork bark pieces.

“Race”:

Boiled reproduction cork bark which is unclassified.

Cork wood from the base (wedges):

Part of the cork bark situated at the base of the trunk in direct contact with the soil.
Prepared cork bark whose quality and calibre is suitable for cutting.

Green cork:

Cork bark that shows in part of the belly cells with a translucent appearance containing water after drying.

Plank:

Prepared cork bark whose quality and calibre is suitable for cutting.

Yellow stain:

Stain which is found on dead cells with yellow stains and sometimes discoloration on the adjacent suberous tissue developing a characteristic smell.

INTERPRETATION DEFINITIONS:

Directives:

Rules of best manufacturing practice based upon past experience.

C.E. LIÈGE Recommendations:

Changes recommended by C.E. LIÈGE to reflect improvements to current practice.

Findings:

Investigation and practice results.

Process Accepted:

C.E. LIÈGE process accepted.



I. Raw cork:

Part: B

- **1. Corkwood from the base of the tree:**
 - 1.1. Directive:**
 - Do not use for the manufacture of stoppers, discs and in granulate for stoppers.
- **2. Storage of planks:**
 - 2.1. Definition:**

Period during which cork planks are stored outside to await processing.
 - 2.2. Directives:**
 - 2.2.1. Stacking in the forest:**
 - The piles should be constructed to facilitate the circulation of air and the run-off of water, the back of the bark uppermost and with a slope on the pile.
 - Do not use planks in contact with the soil for stopper manufacture.
 - Keep domestic animals away from the piles.
 - 2.2.2. Stacking in the factory:**
 - The piles should be constructed to facilitate the circulation of air and the run-off of water, the back of the bark uppermost and with a slope on the pile.
 - Assure a slope of the piles to avoid contact with the soil and with stagnant water.
 - Do not stack on musty or tarred soil.
 - 2.3. C.E. LIÈGE Recommendation:**
 - Eliminate contact of the planks with the soil.
 - Construct rectangular piles with a width of more than 6 metres on sloping ground, the length at right angles to the prevailing wind.
- **3. Seasoning time:**
 - 3.1. Definition:**

Period between stripping the bark and first boiling.
 - 3.2. Objective:**

Stabilisation of the raw-material, maturation.
 - 3.3. Directives:**
 - The seasoning time of the planks should not be less than six months after stripping.
 - 3.4. C.E. LIÈGE Recommendation:**
 - Season until the end of the Winter following the harvest.

►4. Cork bark with yellow stain:

4.1. Directives:

- Do not use in the manufacture of stoppers, discs and granulate.
- Separate cork bark affected by yellow stain before boiling.

4.2. Findings:

Stoppers carrying yellow stain can provoke organoleptic change in wines.

►5. First boiling:

5.1. Definition:

Immersion of cork planks in clean boiling water.

5.2. Objective:

To clean the cork, to extract water soluble substances from the surface, to increase the thickness, to reduce the density and improve the flexibility and elasticity.

5.3. Directives:

- Boil for at least one hour at a water temperature near to 100°C.
- Clean the heaters at least once per week and after each stoppage of 2 days.
- Store the boiled planks in a covered place.

5.4. C.E. LIÈGE Recommendation:

- Regularly change the water, at least twice a week when in continuous use and after each stoppage.
- Treat the effluents.

►6. Post-boiling stabilisation:

6.1. Definition:

Period between boiling and selection of planks.

6.2. Objective:

To flatten the planks, to allow the cork bark to dry in order to reach consistency for cutting.

6.3. Directives:

- Eliminate direct contact with the ground.
- Avoid too rapid drying and immediate processing.

6.4. C.E. LIÈGE Recommendation:

- Stabilise a minimum of two weeks and a maximum of four weeks, in a covered place.

►7. Green cork:

7.1. Definition:

Refer part A.

7.2. Directives:

- Separate planks with green stain during preparation.

7.3. C.E. LIÈGE Recommendation:

- Do not use in the manufacture of stoppers, discs and granulate.



II. Prepared cork bark:

➤ **1. Selection:**

1.1. Definition:

Selection of cork bark according to intended use.

1.2. Objective:

To separate cork bark suitable for manufacture into stoppers according to thickness and quality.

1.3. C.E. LIÈGE Recommendation:

- Group together planks of cork wood defined by thickness and quality.

➤ **2. Storage:**

2.1. Definition:

Period following selection of planks.

2.2. Objective:

To avoid changing the characteristics of the planks.

2.3. Directives:

- Store the planks and the bales in covered ventilated conditions.
- Avoid contact of planks and bales with the ground.
- Do not use pallets made of treated wood.

➤ **3. Second boiling:**

3.1. Definition:

Immersion of planks in clean boiling water.

3.2. Objective:

To increase the thickness and flexibility of cork.

3.3. Directives:

- Boil at least 30 minutes at a temperature close to 100° C.
- Clean the heaters at least once per week.

3.4. C.E. LIÈGE Recommendation:

- Regularly change the water for boiling at least twice a week when in continuous use and after each stoppage of 2 days.
- The second boiling always occurs after a storage of four weeks or more.
- Treat the effluents.



III. Natural and colmated stoppers for still wines:

General Directives:

All products used in the manufacture and treatment of stoppers should conform to the rules for materials in contact with foodstuff.

➤ 1. Punching:

1.1. Definition:

Cutting cork bark by punching.

1.2. Objective:

To obtain a cylindrical stopper without deformity within the dimensional limits prescribed.

1.3. Directives:

- Cut from cork bark of sufficient thickness.
- Punch as near to the belly as possible.
- Keep a space between each perforation.

1.4. C.E. LIÈGE Recommendation:

- Do not punch two lines of holes from thick strips of cork wood.

➤ 2. Washing:

2.1. Washing in water:

2.1.1. Definition:

Soak in clean water without additives.

2.1.2. Objective:

To clean and remove dust from the stoppers.

2.1.3. Findings:

This washing is insufficient to clean and to limit the growth of micro-organisms.

2.1.4. C.E. LIÈGE Recommendation:

- Carry out a wash and complementary disinfection.

2.2. Washing in chlorine:

2.2.1. Definition:

The traditional process of washing stoppers in chlorine, followed with a bath of oxalic acid.

2.2.2. Objective:

To clean and disinfect the stoppers.

2.2.3. Findings:

This washing allows chlorides, TCP and oxalates to subsist on stoppers.

2.2.4. C.E. LIÈGE Recommendation:

- Avoid this method of preparation of stoppers.

2.3. Washing in peroxides:

2.3.1. Definition:

Process of washing using oxygenated water or paracetic acid.

2.3.2. Objective:

To clean and disinfect the stoppers.

2.3.3. Directives:

- On a finished product ready for use, the washing should not leave a residue of peroxide greater than 0,2 mg / stopper.

2.3.4. C.E. LIÈGE Recommendation:

- Process accepted.

2.4. Washing in sulphamic acid:

2.4.1. Definition:

Process of washing stoppers using sulphamic acid.

2.4.2. Objective:

To clean and disinfect the stoppers.

2.4.3. Findings:

Insufficient to ensure good cleaning. Not active against all micro-organisms.

2.4.4. C.E. LIÈGE Recommendation:

- Process accepted.

2.5. Washing in sodium metabisulphite:

2.5.1. Definition:

Process of washing stoppers using a solution of metabisulphite.

2.5.2. Objective:

To clean and disinfect the stoppers.

2.5.3. Findings:

Process insufficient to ensure good cleaning. Not active against all micro-organisms.

2.5.4. C.E. LIÈGE Recommendation:

- Process accepted.

➤ 3. Colouring:

3.1. Definition:

Immersion of stoppers in a bath of dye.

3.2. Objective:

To make the colour of stoppers more uniform.

3.3. Directive:

- Only use colouring E110.

3.4. C.E. LIÈGE Recommendation:

- Avoid the use of baths of dyes.

► 4. Colmation:

4.1. Definition:

Operation which seals the lenticels of stoppers with a mixture of cork powder and glue.

4.2. Objective:

To improve the appearance of the stoppers; to obtain a better seal on stoppers which have many lenticels.

4.3. Directive:

- Only use powder originating from the processing of natural cork stoppers.

4.4. C.E. LIÈGE Recommendation:

- Process accepted without other additives.
- The flammability of certain glues makes strict safety measures essential.

► 5. Coloured coating:

5.1. Definition:

Application of a coloured layer to the surface.

5.2. Objective:

To make the colour of the surface uniform and to improve the sealing of the stopper.

5.3. Directive:

- Ban copolymers in a medium of organic solvents (example: among others acrylic and vinyl resins on a base of organic solvent).

5.4. C.E. LIÈGE Recommendation:

- Process accepted with rubber base.

► 6. Selection:

6.1. Definition:

Operation to separate finished stoppers into a certain number of grades.

6.2. Objective:

To grade by eye according to visual quality and to eliminate stoppers with faults.

► 7. Printing:

7.1. Definition:

Operation which prints a text and/or logo onto the surface of the stopper.

7.2. Objective:

To personalise the stopper and to ensure its traceability.

7.3. Directive:

- Respect legislation on trade marks and labelling.

7.4. C.E. LIÈGE Recommendation:

- Ensure the traceability of cork stoppers ready for use.

► 8. Paraffin wax coating:

8.1. Definition:

Operation designed to deposit a layer of paraffin wax onto the surface of the stopper.

8.2. Objective:

To lubricate the surface of the stopper, to facilitate insertion and extraction into and out of the neck of the bottle, and to improve the sealing capacity of the stopper.

8.3. Directive:

- Use a paraffin wax conforming to the general directives.

8.4. C.E. LIÈGE Recommendation:

- Process accepted.
- Do not use this process for hot bottling or for sealing in corking machines with heated jaws.

► 9. Silicone coating:

9.1. Definition:

Operation designed to deposit a layer of silicone on the surface of the stopper.

9.2. Objective:

To lubricate the surface of the stopper, to facilitate insertion and extraction into and out of the neck of the bottle, and to improve the sealing capacity of the stopper.

9.3. Directive:

- Avoid silicones that are liable to migrate and anti-foaming products.

9.4. C.E. LIÈGE Recommendation:

- Process accepted.
- Use silicones with elastomer characteristics.

► 10. Storage of cork stoppers:

10.1. Definition:

Period of warehousing of stoppers, whatever their state of finish.

10.2. Objective:

To conserve the characteristics obtained during manufacture.

10.3. Directive:

- Store in clean, dry and ventilated conditions.
- Avoid places with pungent odours.
- Avoid pallets made of treated wood.

10.4. C.E. LIÈGE Recommendation:

- Avoid any microbial contamination.
- Store in conditions with a hygrometric range of 40-65%.

► 11. Transport of cork-stoppers:

11.1. Definition:

Movement of the stoppers by any means.

11.2. Objective:

Delivery of stoppers to processors and bottlers.

11.3. Directive:

- Limit the increase in humidity of semi finished stoppers.
- Avoid vehicles and containers with pungent odours as well as pallets made of treated wood.

11.4. C.E. LIÈGE Recommendation:

- Ensure the stability of the humidity of stoppers ready for use.
- Each participant should ensure the protection of the stoppers from any contamination.



IV. Perforation waste:

→ 1. Storage:

1.1. Definition:

The period between processing of stoppers and discs and granulation.

1.2. Objective:

To conserve the characteristics of cork in the waste.

1.3. Directives:

- It is obligatory that storage is under cover in well ventilated conditions.

1.4. C.E. LIÈGE Recommendation:

- The humidity of the waste should be controlled.



V. Agglomerated stoppers for still wines:

General Directives:

All products used in the manufacture and treatment of stoppers should conform to the regulations for materials in contact with foodstuffs.

→ 1. Granulate:

1.1. Definition:

Refer. Part A -Definitions.

1.2. Directive:

- The specific weight of the granulate should be between 50 and 90 Kg/m³.
- Only use granulate originating from the processing of stoppers and discs or from boiled cork waste stored in the conditions described in IV.1.

➤ 2. Additives for agglomeration:

2.1. Definition:

Additives to the mixture of granules and glue designed to ensure lubrication of the mixture and therefore the elasticity of the cork stopper.

2.2. Objective:

To facilitate manufacture and to add specific qualities to the stoppers.

2.3. Directive:

- Refer. general directives.

➤ **3. Glue for agglomeration:**

3.1. Definition:

Binder to ensure the adhesion and cohesion of the granules.

3.2. Objective:

To permit the agglomeration of granules ensuring the performance of the stopper.

3.3. Directives:

- Refer general directives.
- Follow the time limits for polymerisation set out by the suppliers of glues.

3.4. C.E. LIÈGE Recommendation:

- Use only polyurethane glues.

4. Washing: See chapter III.2.

5. Colouring: See chapter III.3.

6. Coloured coating: See chapter III.5.

7. Printing: See chapter III.7.

8. Paraffin wax coating: See chapter III.8.

9. Silicone coating: See chapter III.9.

10. Storage of cork stoppers: See chapter III.10.

11. Transport of cork-stoppers: See chapter III.11.



VI. Agglomerated stoppers and discs of natural cork for sparkling, semi-sparkling and gasified wines:

General Directives:

All products used in the manufacture and treatment of stoppers should conform to the regulations for materials in contact with foodstuffs.

➤ 1. Granulate:

1.1. Definition:

Refer. Part A- Definitions

1.2. Directives:

- The specific weight of the granulate should be between 50 and 90 Kg/m³.
- Only use granulate originating from the processing of stoppers and discs or from boiled cork waste stored in the conditions described in IV.1.

➤ 2. Additives for agglomeration:

2.1. Definition:

Additives to the mixture of granules and glue designed to ensure lubrication of the mixture and therefore the elasticity of the cork stopper.

2.2. Objective:

To facilitate manufacture and to add specific qualities to the agglomerate shank (body of the cork stopper).

2.3. Directive:

- Refer. general directives.

➤ 3. Glue for agglomeration:

3.1. Definition:

Binder to ensure the adhesion and cohesion of the granules.

3.2. Objective:

To permit the agglomeration of granules ensuring the performance of the stopper.

3.3. Directive:

- Refer. general directives.
- Follow the time limits for polymerisation set out by the suppliers of glues.

3.4. C.E. LIÈGE Recommendation:

- Use only polyurethane glues.

➤ **4. Discs of natural cork:**

4.1. Definition:

Cylindrical constituent of varying thickness and diameter.

4.2. Objective:

To allow a large area of contact between the natural cork and the wine.

4.3. Directives:

- Use cork prepared conforming to chapter II.

➤ **5. Selection of the discs:**

5.1. Definition:

Operation to separate the discs into a certain number of grades.

5.2. Objective:

To grade by eye according to visual quality and to eliminate stoppers with faults.

➤ **6. Glue for the Discs:**

6.1. Definition:

Binder which assures the adhesion of the disc to the agglomerate shank or to other discs.

6.2. Objective:

To assemble the discs one to another and to assemble the discs onto the agglomerate shank.

6.3. Directives:

- See general directives.

➤ **7. Rectification:**

7.1. Definition:

Operation designed to obtain final dimensions of the stopper and to regularise the surface.

7.2. Objective:

To obtain a cork stopper of exact cylindrical within the limits of the prescribed dimensions.

7.3. C.E. LIÈGE Recommendation:

- Extract the powdered material during processing.

➤ **8. Selection:**

8.1. Definition:

Operation to separate finished stoppers into a certain number of grades.

8.2. Objective:

To grade by eye according to visual quality and to eliminate stoppers with faults.

► 9. Printing:

9.1. Definition:

Operation designed to print a text and/or logo onto the surface of the stopper.

9.2. Objective:

To personalise stoppers and to ensure their traceability.

9.3. Directives:

- Respect legislation on trade marks and labelling.

9.4. C.E. LIÈGE Recommendation:

- Ensure the traceability of cork stoppers ready for use.

► 10. Paraffin Wax Coating:

10.1. Definition:

Operation designed to deposit a layer of paraffin wax onto the surface of the stopper in a band with the dimensions and position specified by contract, generally 16-18 mm high.

10.2. Objective:

To lubricate the part of the stopper in contact with the neck of the bottle, to allow the introduction into the bottle neck, to regulate insertion, and to improve the sealing of stoppering.

10.3. Directives:

- See general directives.
- Use a paraffin wax with a melting point of 50/54° C.

10.4. Findings:

During the sealing process excessive heat may cause the stopper to bond itself onto the inside of the neck of the bottle, after cooling.

10.5. C.E. LIÈGE Recommendation:

- Process accepted.

► 11. Surface treatment:

11.1. Definition:

Operation designed to deposit a layer of silicone on the surface of the stopper.

11.2. Objective:

To lubricate the surface of the stopper, to facilitate its introduction into the bottle neck, to allow extraction and to improve the sealing of stoppering.

11.3. Directives:

- Use silicones with elastomer characteristics.
- Avoid silicones susceptible to migrate and anti-foaming products.
- Respect the time limit of reticulation stated by the manufacturer of the silicone.

11.4. C.E. LIÈGE Recommendation:

- Process accepted.

➤ **12. Storage of stoppers:**

12.1. Definition:

Period of warehousing of stoppers, whatever their state of finish.

12.2. Objective:

To conserve the characteristics obtained during manufacture.

12.3. Directives:

- Store in clean, dry and ventilated conditions.
- Avoid places with pungent odours.
- Avoid pallets made of treated wood.

12.4. C.E. LIÈGE Recommendation:

- Avoid any microbial contamination.
- Store in conditions with a hygrometric range of 40-65%.

➤ **13. Transport of stoppers:**

13.1. Definition:

Movement of the stoppers by any means.

13.2. Objective:

Delivery of stoppers to processors and bottlers.

13.3. Directives:

- Limit the increase in humidity of semi finished stoppers.
- Avoid vehicles and containers with pungent odours as well as pallets made of treated wood.

13.4. C.E. LIÈGE Recommendation:

- Ensure the stability of the humidity of stoppers ready for use.
- Each participant should ensure the protection of the stoppers from any contamination.



VII. Methods of control of stoppers for still wines:

-
- 1. Dimensional control.
 - 2. Control of humidity.
 - 3. Control of dust.
 - 4. Control of sealing of liquids.
 - 5. Control of forces of extraction.

Refer to respective ISO Standards for some of these methods. Make sure that it attends to the last editions (note particularly that ISO 9727 Standard is being reviewed at the present edition date).

- A**
 Agglomerated Stopper p. 15, 17
- B**
 Back p. 8
 Boiled Cork Waste p. 15, 17
- C**
 Chlorids p. 11
 Chlorine p. 11
 Colmated Stoppers p. 11
 Colmation p. 13
 Coloured Coating p. 13, 16
 Colouring p. 12, 16
 Copolymers p. 13
 Cutting p. 6, 7, 9, 11
- D**
 Discs p. 6, 8, 9, 15, 17
 Drying p. 7, 9
- E**
 Effluents p. 9, 10
- F**
 First Boiling p. 8, 9, 10
- G**
 Glue p. 13, 16, 17, 18
 Granulate p. 6, 8, 9, 15, 17
 Green Cork p. 7, 9
- H**
 Heater p. 9, 10
 Humidity p. 15, 20
- M**
 Maturation p. 8
 Metabisulphite p. 12
 Moulding p. 6
- N**
 Natural Stopper p. 11
- O**
 Oxalates p. 12
 Oxalic Acid p. 11
 Oxyginated Water p. 12
- P**
 Peroxide p. 12
 Planks p. 7, 8, 9, 10
 Polyurethane p. 16, 18
 Powder p. 13
 Prepared Cork Bark p. 6, 7, 8, 10, 18
 Punching p. 11
- R**
 "Race" p. 6
 Raw Cork p. 6, 8
 Rectification p. 18
 Reproduction Cork p. 6
 Rubber p. 13
- S**
 Selection p. 10, 13, 18
 Silicone p. 14, 19
 Stabilisation p. 8, 9
 Stain p. 17, 18
 Stopper p. 6
 Stopper Cork Bark p. 6, 10, 16, 17
 Storage p. 10, 14, 15, 16, 17, 19
- Stripping p. 6
 Sulphamic Acid p. 12
 Surface p. 6, 11
- T**
 TCP - Triclorofenol p. 12
- W**
 Washing p. 11, 12, 16
 Waste p. 6, 15
 Wedges p. 6
- Y**
 Yellow Stain p. 7, 9

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