

## D21C

### PRODUCTION OF CELLULOSE BY REMOVING NON-CELLULOSE SUBSTANCES FROM CELLULOSE-CONTAINING MATERIALS; REGENERATION OF PULPING LIQUORS; APPARATUS THEREFOR

#### Definition statement

*This subclass/group covers:*

Production of cellulose by removing non-cellulose substances from cellulose containing material. This subclass also embraces the after treatment of cellulose pulp and the regeneration of pulp liquors. It further also covers different aspects of digesters for pulping cellulosic material.

#### Relationship between large subject matter areas

[D21B](#) covers fibrous raw material or their mechanical treatment.

[D21D](#) covers treatment of materials before passing to the paper-making machine.

[D21F](#) covers papermaking machines and methods for producing paper thereon.

[D21H](#) covers Pulp compositions (not covered by subclasses of [D21C](#) and [D21D](#)), impregnating or coating of paper, treatment of finished paper and paper not otherwise provided for.

#### References relevant to classification in this group

*This subclass/group does not cover:*

Production of cellulose by mechanical treatment	<a href="#">D21B</a>
Further preparation or after-treatment of the pulp	<a href="#">D21D</a>
De-watering in general	<a href="#">F26B</a>

#### Special rules of classification within this group

The main aspect(s) of the invention is/are given a class according to the classification scheme. The invention per se should be classified in the last appropriate class(es), if possible. Ideally, one class should be given for covering the main aspect of the invention per se. Exceptionally, the core of the invention may also be classified by using several classes (up to three)

## Classification of additional information

In this subclass, it is highly desirable to add Indexing Codes for secondary aspects of the invention (e.g. the features of the dependent claims) or for additional information, which is not considered to form the claimed invention per se, but which might be of interest for the search. For the Indexing Codes the "D" is replaced with an "N", e.g. to classify the additional information that the pulp is treated by an enzyme (or micro-organisms) should read [D21C 5/005](#) (instead of [D21C 5/005](#)).

## Glossary of terms

*In this subclass/group, the following terms (or expressions) are used with the meaning indicated:*

Pulp	A dispersion [e.g. a aqueous suspension] comprising cellulosic fibres and optional additives; it may also be referred to as "stock", furnish" or "slurry".
Lignocellulosic material	Cellulosic material which also comprises lignin.
Delignification	Treatment of the lignocellulosic material to remove a part of the lignin.
Bleaching	Treatment of the lignocellulosic material to obtain a pulp/paper having an increased brightness.

## Synonyms and Keywords

In patent documents the expression/word both "fibres" is often used with the meaning "fibers".

## D21C 1/00

### Pre-treatment of the finely divided materials before digesting (of waste paper D21C5/02 )

#### Definition statement

*This subclass/group covers:*

Different pre-treatments (e.g. impregnation) of finely divided cellulosic containing material using e.g. water, steam, acids, alkaline compounds, oxygen generating compounds or physical methods for facilitating

impregnation.

## References relevant to classification in this group

*This subclass/group does not cover:*

Working up waste paper	<a href="#">D21C 5/02</a>
Treatment of wood	<a href="#">B27K</a>

## Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Pre-treatment of the raw material by physical or chemical means	<a href="#">D21B 1/02</a>
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## D21C 3/00

### Pulping cellulose-containing material (digesters D21C7/00)

#### Definition statement

*This subclass/group covers:*

Pulping with inorganic bases or alkaline reacting compounds, e.g. the sulphate process

Pulping with acid, acid salts or acid anhydrides

Pulping with sulphur dioxide, sulphurous acid, bisulphites or sulphites

Pulping with nitrogen oxides, nitric acid, nitrates or nitrites

Pulping with organic solvents or in solvent environment

Other features of the pulping process

## References relevant to classification in this group

*This subclass/group does not cover:*

Digesters	<a href="#">D21C 7/00</a>
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## D21C 5/00

**Other processes for obtaining cellulose e.g. cooking cotton linters [N: Processes characterised by the choice of cellulose-containing starting materials].**

**Definition statement**

*This subclass/group covers:*

Other processes for obtaining cellulose such as

- cooking cotton linters
- processes characterised by the choice of cellulose-containing starting material
- treatment of cellulose-containing material with micro-organisms or enzymes
- working-up waste paper
- working-up waste paper, e.g.de-inking

**References relevant to classification in this group**

*This subclass/group does not cover:*

Mechanical part of working up waste paper	<a href="#">D21B 1/08</a>
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**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Pulp from non-woody plants or crops, e.g. cotton, flax, straw, bagasse	<a href="#">D21H 11/12</a>
Pulp from secondary fibres	<a href="#">D21H 11/14</a>
De-inking of waste paper using flotation	<a href="#">D21B 1/325</a>
Micro-organisms or enzymes added to the pulp or as a paper impregnating material	<a href="#">D21H 17/005</a>
Enzymes (generally)	<a href="#">C12N,C12R</a> ??

## D21C 7/00

### Digesters

#### Definition statement

*This subclass/group covers:*

This group refers to structural features of the digester, i.e. defining different types or parts of the digester, e.g. rotary digesters, linings, feeding devices, discharge devices, heating devices, devices for regulating or controlling, means for circulating the lye (e.g. white or black liquor) or safety devices.

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Continuous (pulping) processes	<a href="#">D21C 3/24</a>
Multistage (pulping) processes	<a href="#">D21C 3/26</a>
Processes or apparatuses for adding material to the pulp or paper; controlling or regulating not limited to any particular process or apparatus	<a href="#">D21H 23/78</a>

## D21C 9/00

**After-treatment of cellulose pulp, e.g. of wood pulp, or cotton linters [N: Treatment of dilute or dewatered pulp or process improvement taking place after obtaining the raw cellulosic material and not provided for elsewhere (polysaccharides, derivatives thereof C08B; paper-making D12D to D12H)]**

#### Definition statement

*This subclass/group covers:*

Modification of pulp properties

Washing

Displacing cooking or pulp-treating liquors contained in the pulps by fluids, e.g. wash water or other pulp treating agents

Removal of fats, resin pitch or waxes

Chemical or physical purification i.e. refining of crude cellulose by removing non-cellulose contaminants, optionally in combination with bleaching

Bleaching, e.g with halogen or halogen containing compounds, with ClO<sub>2</sub> or chlorites, with oxygen or its allotropic modifications, with ozone, with per compounds such as peroxides or peracids

Apparatus for bleaching

De-watering

Elimination of cooking or pulp-treating liquors from the pulp

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Modification of the pulp properties by a particular after treatment	<a href="#">D21H 11/16-D21H 11/22</a>
Agents for preventing deposition on paper mill equipment, e.g. pitch or slime control	<a href="#">D21H 21/02-D21H 21/04</a>
De-watering in general	<a href="#">F26B</a>
Natural resins	<a href="#">C09F 1/00</a>
Hemicellulose	<a href="#">C08B 37/14</a>
Purification by mechanical means	<a href="#">D21D 5/00</a>

## D21C 11/00

### Regeneration of pulp liquors [N: or effluent waste waters]

#### Definition statement

*This subclass/group covers:*

Aspects concerning the production and the treatment of green and white liquors, e.g. causticizing green liquor

Combustion of pulp liquors

Concentration spent liquors by evaporation

Deodorisation or elimination of malodorous compounds, e.g. sulphur compounds such as hydrogen sulphide and mercaptans, for gas streams

Introduction of auxiliary substances into the regenerating system in order to improve the performance of certain steps of the latter, the presence of these

substances being confined to the regeneration cycle

Recovery of by-products, i.e. compounds other than those necessary for pulping

Regeneration of alkali lye, of pulp liquors or effluent waste waters, of acid, neutral or alkaline sulphite lye

Treatment of pulp gases or of gases arising from various sources in pulp and paper mills

Recovery of the heat content in the gases

Regeneration of gaseous SO<sub>2</sub>, e.g. arising from liquors containing sulphur compounds

Wet combustion

Treatment of pulp liquor without previous evaporation, by oxidation of liquors remaining at least partially in the liquid phase, e.g. by application of pressure

### References relevant to classification in this group

*This subclass/group does not cover:*

Water treatment	<a href="#">C02F</a>
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### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Evaporation in general	<a href="#">B01D</a>
Hemicellulose	<a href="#">C08B 37/14</a>
Macromolecular compounds derived from lignin	<a href="#">C08H 6/00</a>
Macromolecular compounds derived from lignocellulosic material	<a href="#">C08H 8/00</a>
Production of biofuel, i.e. ethanol	<a href="#">C10L 1/02</a>