

## C25C

### PROCESSES FOR THE ELECTROLYTIC PRODUCTION, RECOVERY OR REFINING OF METALS; APPARATUS THEREFOR

#### Definition statement

*This place covers:*

Electrolytic production or recovery (electrowinning) of metals and alloys from solutions or melts.

Electrorefining of metals and alloys in solutions or melts.

Constructional parts, cells or assemblies of cells for the electrolytic production, recovery or refining of metals or alloys.

Servicing or operating of cells for the electrolytic production, recovery or refining of metals or alloys.

#### Relationships with other classification places

- Multi-step processes for surface treatment of metallic material involving at least one process provided for in class [C23](#) and at least one process provided for in class [C25](#) are classified in group [C23F 17/00](#)
- Compounds of particular interest are also classified in the relevant classes, [C01](#) (inorganic chemistry), [C07](#) (organic chemistry) and [C08](#) (organic macromolecular compounds).
- The electrolytic or electrophoretic purification of materials is classified according to the nature of the liquid in the relevant places, e.g. [A01K 63/00](#), [C02F 1/46](#), [C25B 15/08](#), [C25D 21/16](#), [C25F 7/02](#)
- The electrolytic deposition of coatings (electroplating), the electrophoretic production of coatings and electroforming is classified in [C25D](#).
- Production and refining of metals by non-electrolytic processes is classified in [C22B](#), [C21B](#), [C21C](#). An electrothermal treatment ([C22B 4/00](#)) does not involve an electrolytic process.
- Alloys as such, prepared by electrolytic methods are classified in [C22C](#).

#### References

##### Limiting references

*This place does not cover:*

Removing metallic impurities from waste water or sewage by electrolytic methods	<a href="#">C02F 1/461</a>
Inhibiting corrosion of metals by anodic or cathodic protection	<a href="#">C23F 13/00</a>
Single crystal growth	<a href="#">C30B</a>

##### Informative references

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

Catalysts comprising metals, metal oxides or hydroxides	<a href="#">B01J 21/00</a> , <a href="#">B01J 23/00</a>
Processes for preparing catalysts	<a href="#">B01J 37/00</a>
Refining molten metal during a continuous casting process	<a href="#">B22D 11/116</a>
General processes of refining metals	<a href="#">C22B 9/00</a>
Composition of alloys	<a href="#">C22C</a>
Multistep processes for surface treatment of metallic material	<a href="#">C23F 17/00</a>
Electrodes, membranes for fuel cells	<a href="#">H01M 4/86</a> , <a href="#">H01M 8/10</a>

**Special rules of classification**

Classify each metal mentioned in the document, if too many are mentioned, then classify the examples and for the rest of the metals use [C25C 1/00](#) or [C25C 3/00](#), respectively.

**C25C 1/00**

**Electrolytic production, recovery or refining of metals by electrolysis of solutions ([C25C 5/00](#) takes precedence)**

**Special rules of classification**

Classify also in [C25C 5/02](#), when applicable.

**C25C 3/00**

**Electrolytic production, recovery or refining of metals by electrolysis of melts ([C25C 5/00](#) takes precedence)**

**Special rules of classification**

Classify also in [C25C 5/04](#), when applicable.

**Glossary of terms**

*In this place, the following terms or expressions are used with the meaning indicated:*

Melt	molten salt or ionic liquid or fused bath
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**C25C 3/08**

**Cell construction, e.g. bottoms, walls, cathodes**

**References****Limiting references**

*This place does not cover:*

Constructional parts, or assemblies thereof, of cells; servicing or operating of cells for the production of alloys or metals other than aluminium	<a href="#">C25C 7/00</a>
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**C25C 3/12**

**Anodes**

**References****Informative references**

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

Electrodes used in cells for the electrolysis of melts, other than aluminium production	<a href="#">C25C 7/025</a>
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## C25C 3/125

{based on carbon}

### References

#### Informative references

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

Electrodes used in cells for the electrolysis of melts, other than aluminium production	<a href="#">C25C 7/025</a>
Carbon masses	<a href="#">C04B 35/52</a>
Electrodes used for heating by electrical discharge, electrodes mainly consisting of carbon, self-baking type (e.g. Söderberg anodes)	<b>H01B7/09</b>
Heating by electrical discharge, electrodes mainly consisting of carbon	<a href="#">H05B 7/085</a>

### Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Söderberg anode	An electrode used in metallurgy, which continuously forms in an electrical furnace when a mixture of coke and coal-tar pitch is added to a heated steel casing and is baked as it passes through. It emerges into the furnace where it is continuously consumed.
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## C25C 3/20

**Automatic control or regulation of cells (controlling or regulating in general [G05](#))**

### References

#### Informative references

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

Controlling or regulating in general	<a href="#">G05</a>
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## C25C 3/26

**of titanium, zirconium, hafnium, tantalum or vanadium**

### Definition statement

*This place covers:*

Electrolytic production of the metal (titanium, hafnium, tantalum, vanadium) by the direct reduction of the metal ion at the electrode.

Reduction of the metal oxide by another metal (usually calcium) which is itself electrolytically reduced from the electrolyte (usually calcium chloride), although the reduction step of the metal ions is chemical rather than electrolytic.

### Relationships with other classification places

Documents involving the latter reaction should also be considered by a classifier in [C22B 34/00](#).

### Special rules of classification

Classification should also be made in [C25C 5/04](#), when applicable.

## C25C 3/28

### of titanium

#### Definition statement

*This place covers:*

Electrolytic production of titanium by the direct reduction of the metal ion at the electrode.

Reduction of titanium oxide by another metal (usually calcium) which is itself electrolytically reduced from the electrolyte (usually calcium chloride), although the reduction step of the titanium ions is chemical rather than electrolytic.

#### Relationships with other classification places

Documents involving the latter reaction should also be considered by a classifier in [C22B 34/12](#).

## C25C 7/00

### Constructional parts, or assemblies thereof, of cells; Servicing or operating of cells (for the production of aluminium [C25C 3/06](#) - [C25C 3/22](#))

#### References

##### Limiting references

*This place does not cover:*

Constructional parts, or assemblies thereof, of cells; servicing or operating of cells for the production of aluminium	<a href="#">C25C 3/06</a> - <a href="#">C25C 3/22</a>
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## C25C 7/007

{of cells comprising at least a movable electrode ([C25C 7/002](#), [C25C 7/02](#) - [C25C 7/06](#) take precedence)}

#### Definition statement

*This place covers:*

Movable electrodes, be it electrodes that move in space or electrodes that move around an axis, such as rotary electrodes.

## C25C 7/04

### Diaphragms; Spacing elements

#### References

##### Informative references

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

Diaphragms used in the electrolytic or electrophoretic production of compounds or non-metals	<a href="#">C25B 13/00</a>
Membranes for fuel cells	<a href="#">H01M 8/0289</a>

## Synonyms and Keywords

*In patent documents, the following words/expressions are often used as synonyms:*

- "diaphragm" and "membrane"

## C25C 7/06

### Operating or servicing

#### Definition statement

*This place covers:*

Operating or servicing of cells, when generally applied to a cell or in a process of [C25C](#).

#### References

##### *Informative references*

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

Controlling or regulating in general	<a href="#">G05</a>
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