

## C21C

**PROCESSING OF PIG-IRON, e.g. REFINING, MANUFACTURE OF WROUGHT-IRON OR STEEL; TREATMENT IN MOLTEN STATE OF FERROUS ALLOYS (refining metals in general [C22B 9/00](#))**

### Definition statement

*This place covers:*

all treatments of molten iron or steel, including the apparatuses specifically related thereto, e.g. converter, electric furnace.

### References

#### Limiting references

*This place does not cover:*

Cast iron alloys	<a href="#">C22C 37/00</a>
Ferrous alloy compositions	<a href="#">C22C 38/00</a>

## C21C 1/02

**Dephosphorising or desulfurising**

### Definition statement

*This place covers:*

Also the specific treating agents

### References

#### Informative references

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

Dephosphorising or desulfurising of molten ferrous alloys	<a href="#">C21C 7/064</a>
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### Special rules of classification

In case the dephosphorising, desulfurising are more generally claimed and could also apply to ferrous alloys (incl. steel), [C21C 7/064](#) should be attributed as well.

If the method of introduction is specifically claimed, the corresponding class in [C21C 7/00](#) should be attributed

## C21C 1/04

**Removing impurities other than carbon, phosphorus or sulfur**

### References

#### Informative references

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

Removing impurities of ferrous alloys	<a href="#">C21C 7/04</a>
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General processes of refining metals	<a href="#">C22B 9/00</a> - <a href="#">C22B 9/22</a>
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### Special rules of classification

In case the treatments to remove other impurities are more generally claimed and could also apply to ferrous alloys (incl. steel), [C21C 7/04](#) or any appropriate class below should be attributed as well.

If the method of introduction is specifically claimed, the corresponding class in [C21C 7/00](#) should be attributed

## C21C 1/06

### Constructional features of mixers for pig-iron

#### References

##### Informative references

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

Stirring devices for molten metal	<a href="#">F27D 27/00</a>
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## C21C 1/08

### Manufacture of cast-iron

#### Definition statement

*This place covers:*

Treatment of pig iron to obtain non-spheroidal cast-iron.

#### References

##### Limiting references

*This place does not cover:*

Cast-iron alloys (composition)	<a href="#">C22C 37/00</a> - <a href="#">C22C 37/10</a>
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##### Informative references

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

Making of cast-iron alloys	<a href="#">C22C 33/08</a> , <a href="#">C22C 33/10</a>
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## C21C 1/10

### Making spheroidal graphite cast-iron

#### Definition statement

*This place covers:*

Also the nodularising agents

## References

### Informative references

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

Making of cast-iron alloys	<a href="#">C22C 33/08</a> , <a href="#">C22C 33/10</a>
Cast-iron alloys	<a href="#">C22C 37/00</a> - <a href="#">C22C 37/10</a>

## C21C 5/00

### Manufacture of carbon-steel, e.g. plain mild steel, medium carbon steel or cast steel {or stainless steel}

#### Definition statement

*This place covers:*

Also the manufacturing of stainless steels and ferro-alloys; apparatuses, in particular converters, which are specifically dedicated to the steel processing are classified within this group as well

#### References

##### Limiting references

*This place does not cover:*

Ferrous alloy compositions	<a href="#">C22C 38/00</a> - <a href="#">C22C 38/60</a>
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#### Special rules of classification

Indexing Codes [C21C 5/00](#) - [C21C 5/56](#) apply for additional information or in case no corresponding EC-subgroup exists.

## C21C 5/28

### Manufacture of steel in the converter {([C21C 5/005](#) takes precedence)}

#### Definition statement

*This place covers:*

Also the full plant lay-out.

## C21C 5/30

### Regulating or controlling the blowing

#### Definition statement

*This place covers:*

Converter processes in which the regulation or control of the blowing is claimed, be it from above, through the bath or a combination thereof, i.e. not specific to one of the methods ; the regulation or control can relate to the amount, the sequence, the composition etc of the gases.

Also post-combustion is considered as a means to control the blowing

## Synonyms and Keywords

In patent documents, the following abbreviations are often used:

Post-combustion	after burning
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## C21C 5/32

Blowing from above ([C21C 5/35](#) takes precedence)

### Definition statement

*This place covers:*

Regulation or control of blowing ONLY from above, i.e. through a lance

### References

#### Limiting references

*This place does not cover:*

Lance details	<a href="#">C21C 5/46</a> , <a href="#">F27D 3/16</a> , <a href="#">F27D 3/18</a>
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## C21C 5/34

Blowing through the bath ([C21C 5/35](#) takes precedence)

### Definition statement

*This place covers:*

Regulation or control of blowing only through the melt, i.e. through a tuyere or bottom

### References

#### Limiting references

*This place does not cover:*

Tuyere details	<a href="#">C21C 5/48</a> , <a href="#">B22D 1/005</a>
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## C21C 5/38

Removal of waste gases or dust

### Definition statement

*This place covers:*

The treatment of the off-gas

### References

#### Informative references

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

Separation	<a href="#">B01D</a>
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In particular of solids from gases or vapours by gravity, inertia or centrifugal forces	<a href="#">B01D 45/00</a> - <a href="#">B01D 45/18</a>
By filters	<a href="#">B01D 46/00</a> - <a href="#">B01D 46/54</a>
By liquids	<a href="#">B01D 47/00</a> - <a href="#">B01D 47/18</a>
By other means	<a href="#">B01D 49/00</a> - <a href="#">B01D 49/02</a>
Purifying or modifying the chemical composition of combustible gases containing CO	<a href="#">C10K 1/00</a> - <a href="#">C10K 1/34</a> , <a href="#">C10K 3/00</a> - <a href="#">C10K 1/06</a>

## **C21C 5/40**

### **Offtakes or separating apparatus for converter waste gases or dust**

#### **Definition statement**

*This place covers:*

The installation required for capturing and treating of the off-gas.

#### **References**

##### **Informative references**

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

Preventing escape from fumes from the area where they are produced, collecting or removing fumes therefrom	<a href="#">B08B 15/00</a> - <a href="#">B08B 15/04</a>
Devices for conducting smoke or fumes for factories or large buildings	<a href="#">F23J 11/12</a>
Arrangements for using waste heat, using or disposing of waste gas	<a href="#">F27D 17/00</a>

## **C21C 5/44**

### **Refractory linings**

#### **Definition statement**

*This place covers:*

Apart from the lining itself, the equipment to make, apply or repair the lining, both of the vessel and of the taphole in particular.

#### **References**

##### **Informative references**

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

Linings for furnaces in general, incl. making and repairing	<a href="#">F27D 1/00</a> , <a href="#">F27D 1/16</a>
Tapholes	<a href="#">F27D 3/15</a>

## C21C 5/46

### Details or accessories

#### Definition statement

*This place covers:*

Lances, means for their handling; supporting means for the converter; cooling arrangements; tapholes, their opening and sealing; charging devices; measuring and sampling devices; support and transport devices for the converter; cleaning and skull removal.

#### References

##### Informative references

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

Measuring the weight of the converter	<a href="#">C21C 2005/468</a>
Trunnions in general bearings and accessories in general	<a href="#">F16C 11/02</a> , <a href="#">F16C 17/00</a> - <a href="#">F16C 43/00</a>
Charging of furnaces	<a href="#">F27D 3/00</a> - <a href="#">F27D 3/18</a>
Travelling or movable supports for the charge	<a href="#">F27D 3/12</a>
Tapholes, opening and sealing	<a href="#">F27D 3/15</a> , <a href="#">C21B 7/12</a>
Lances injecting a gas jet; injecting particulate material using a fluid jet	<a href="#">F27D 3/16</a> , <a href="#">F27D 3/18</a>
Devices or methods for removing incrustations	<a href="#">F27D 15/00</a>
Arrangements of controlling devices	<a href="#">F27D 19/00</a>
Arrangement of monitoring devices in furnaces, kilns, ovens or retorts	<a href="#">F27D 21/00</a>
Measuring, testing in general of weight of vibrations or ultra-, infra- or sonic waves radiation pyrometry other temperature measurements	<a href="#">G01</a> , <a href="#">G01G</a> , <a href="#">G01H</a> , <a href="#">G01J 5/00</a> - <a href="#">G01J 5/0805</a> , <a href="#">G01K</a>
Specific techniques for measuring or analysing materials by determining their chemical or physical properties	<a href="#">G01N</a>

## C21C 5/48

### Bottoms or tuyéres of converters

#### Definition statement

*This place covers:*

Porous plugs and tuyeres

#### References

##### Informative references

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

Treatment of fused masses in a ladle, incl. with gases	<a href="#">B22D 1/00</a>
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## C21C 5/50

### Tilting mechanisms for converters

#### References

##### *Informative references*

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

Pivotal connections in general ;	<a href="#">F16C 11/00</a> - <a href="#">F16C 11/12</a>
Bearings and accessories in general	<a href="#">F16C 17/00</a> - <a href="#">F16C 43/08</a>

## C21C 5/52

### Manufacture of steel in electric furnaces ([C21C 5/005](#) takes precedence); electric heating per se [H05B](#))

#### Definition statement

*This place covers:*

Any type of electric heating : AC, DC, induction or plasma, incl. accessories as burners.

The manufacturing of alloyed steels, incl. ferro-alloys.

The charging of the electric furnace.

Multiple hearth furnaces.

The general lay-out of the melt shop.

#### References

##### *Informative references*

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

Methods or apparatus for combustion using fluent fuel	<a href="#">F23C</a>
Burners	<a href="#">F23D</a>
Electrically heated hearth furnaces hearth furnaces in general and their accessories	<a href="#">F27B 3/08</a> , <a href="#">F27B 3/00</a> - <a href="#">F27B 3/26</a>
Arrangements of elements for electric heating in or on furnaces	<a href="#">F27D 11/00</a> - <a href="#">F27D 11/12</a>
Electric heating elements or system	<a href="#">F27D 99/00</a>
Electric heating in general	<a href="#">H05B</a>

#### Special rules of classification

specific Indexing Codes exist for the presence/absence of a foam or a molten heel in the electric furnace

## C21C 5/56

**Manufacture of steel by other methods (making liquid steel by direct processes [C21B 13/00](#) {; [C21C 5/005](#) takes precedence)}**

### Definition statement

*This place covers:*

Also methods starting from scrap (with/without preheating) not treated in electric (arc) furnaces

## C21C 7/00

**Treating molten ferrous alloys, e.g. steel, not covered by groups [C21C 1/00](#) - [C21C 5/00](#) (treating molten metals during moulding [B22D 1/00](#), [B22D 27/00](#); remelting ferrous metals [C22B](#))**

### Definition statement

*This place covers:*

Treatments of refining or alloying by means of the treatment agents, the form thereof, purpose or the circumstances.

Metallic, carbonaceous or exothermic treatment agents.

Loose or compacted agents or cored wires.

Treatments in a ladle, under pressure or in a current of streaming metal;

special treatments of the slag.

### References

#### Limiting references

*This place does not cover:*

Treating molten metals during moulding	<a href="#">B22D</a>
Remelting of ferrous alloys	<a href="#">C22B</a>

#### Informative references

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

Making tubes by bending sheet	<a href="#">B21D 5/00</a>
Cored wires for welding, soldering	<a href="#">B23K</a>

## C21C 7/04

**Removing impurities by adding a treating agent**

### References

#### Informative references

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

Removal of impurities from pig iron other than carbon, sulfur or phosphor	<a href="#">C21C 1/04</a>
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## C21C 7/064

### Dephosphorising; Desulfurising

#### Definition statement

*This place covers:*

Including specifically disclosed agents for desulfurising and dephosphorising

#### References

##### *Informative references*

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

Removal of phosphor or sulfur from pig iron	<a href="#">C21C 1/02</a>
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## C21C 7/068

### Decarburising

#### Definition statement

*This place covers:*

Including stainless steels

#### References

##### *Informative references*

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

Control and regulation of blowing in a converter	<a href="#">C21C 5/30</a> - <a href="#">C21C 5/35</a>
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## C21C 7/072

Treatment with gases ([C21C 7/06](#), [C21C 7/064](#), [C21C 7/068](#) take precedence)

#### References

##### *Informative references*

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

Refining metals by treating with gases	<a href="#">C22B 9/05</a>
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## C21C 7/076

Use of slags or fluxes as treating agents ([C21C 7/06](#), [C21C 7/064](#), [C21C 7/068](#) take precedence)

#### References

##### *Informative references*

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

Refining metals by treating with fluxes	<a href="#">C22B 9/10</a>
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## C21C 7/10

### Handling in a vacuum

#### References

##### *Informative references*

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

Refining of metals by applying a vacuum	<a href="#">C22B 9/04</a>
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