

## **11SMn30+BX**

The free-cutting steel that combines optimum performance and respect of the environment



**Swiss  
Steel**  
Group

# Green Steel

Swiss Steel Group is a market leader in sustainably produced steel (Green Steel). We exclusively produce steel using electric arc furnace technology, utilizing recycled scrap within the circular economy framework and energy from renewable resources. This results in significantly lower carbon emissions compared to the industry average.

With a broad portfolio of Green Steel at your disposal, you can select the most suitable product for your path to a sustainable future. We provide individual solutions for a wide range of customers, supporting many industries on their path to decarbonization.



\* Industry average: 1,910 kg CO<sub>2</sub>/t crude steel cast vs. Swiss Steel Group year 2022: 200 kg CO<sub>2</sub>/t crudesteel cast in Scopes 1+2 and Scope 3 ranging from 121 kg CO<sub>2</sub>/t (engineering steel) to 2,075 kg CO<sub>2</sub>/t. Scopes 1+2 (stainless steel); Source: Worldsteel Sustainability Indicators 2022. Figures Swiss Steel Group 2023.

# Optimum performance

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Advanced machining performance without environmentally relevant alloying elements



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Extraordinary productivity thanks to very good machining properties

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Wide cutting speed range

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Short cycle times

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Long tool life

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Short breaking chips

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High uniformity across batches

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Process-capable bar straightness

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Optimised part costs

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Te, Se, Bi, Pb-free

# Future- Proof

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Swiss Steel Group's free-cutting steel finds application wherever small and precision components are needed for which the machinability is the essential property required. These parts demand efficient and cost-effective production.

As the demands on steel evolve, our unwavering commitment to optimizing our processes persists, fueled by a passion that extends from the past through the present and into the future, driven not only by performance but also by environmental considerations.

The Swiss Steel Group is now able to offer you free cutting steel without Pb for your future projects. The free-cutting steel Swiss Steel Group portfolio has been enriched with the lead free 11SMn30+BX – the most machinable free-cutting steel without Te, Se, Bi and Pb.

# Chemical composition

## Chemical composition in mass % following DIN EN ISO 683-4:2018

| Element | C    | Si   | Mn   | P    | S    | B      |
|---------|------|------|------|------|------|--------|
| min.    |      |      | 0.90 |      | 0.27 | 0.0008 |
| max.    | 0.14 | 0.05 | 1.30 | 0.11 | 0.33 | 0.0100 |

## Conformity to standards and international designation

The material 11SMn30+BX can be assigned to material number 1.0715 and conforms to the standards DIN EN ISO 683-4:2018 and DIN EN 10277:2018. Boron is added by Steeltec AG in accordance with the agreement to improve machinability and is specified on the test certificate.

| Steel number | EN ISO 683-4<br>DIN EN 10277 | ASTM     | JIS    | GB/ISC |
|--------------|------------------------------|----------|--------|--------|
| 1.0715       | 11SMn30                      | ~SAE1215 | ~SUM22 | ~Y15   |

## Effect of boron on machinability

The addition of Boron to free-cutting steel improves machinability if the metallurgical processes in the steelworks are properly controlled using state-of-the-art process engineering and defined processes! Complex inclusions are formed that contain both Boron oxides and Boron nitrides, which have a lubricating effect.

# Manufacturing program

## Process, range capabilities

| Execution | Dim. range  | Tolerance |
|-----------|-------------|-----------|
| +C        | Ø 5 – 60mm  | h9        |
| +C        | Ø 10 – 32mm | h11       |
| +C +SL    | Ø 5 – 60mm  | ≥ IT6     |

## Bar straightness

- Cold-drawn
- Straightness  $\leq 0.3$  mm/m for round material
- Straightness  $\leq 1$  mm/m for hexagon material according to DIN EN 10278

## End design

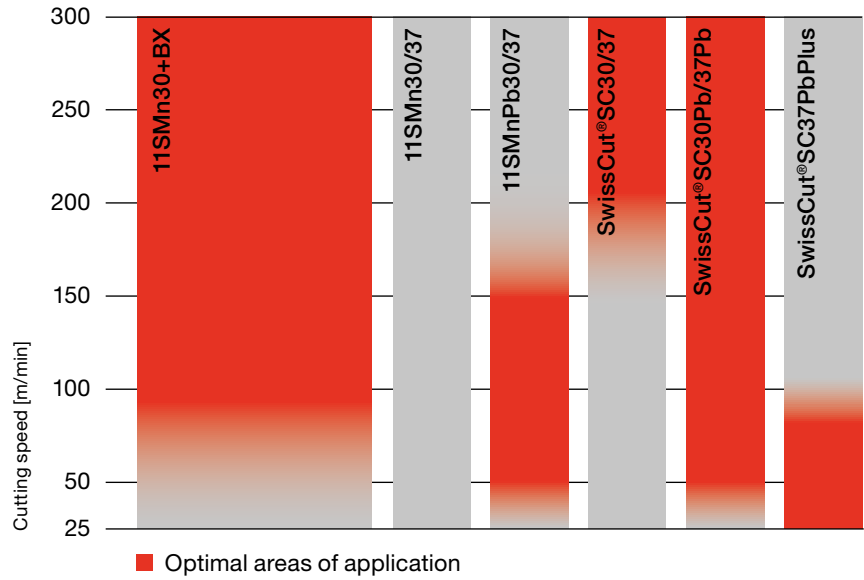
Planned and chamfered on both sides  
max. 1 – 2 mm x 45°

## Mechanical-technological properties

The strengths correspond to the requirements of the standard for the respective diameter in the corresponding condition for the material 11SMn30.

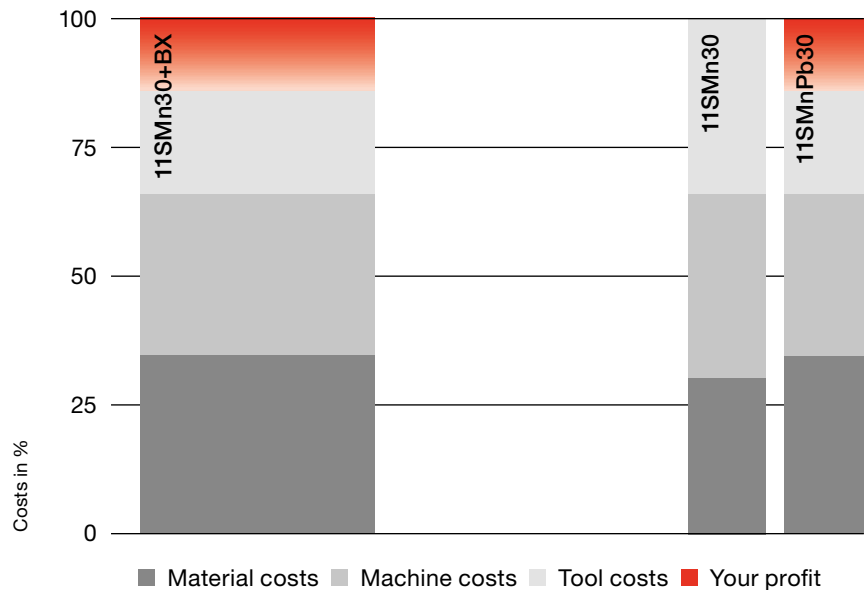
# Wide cutting speed range

Material and areas of application



# Low parts cost

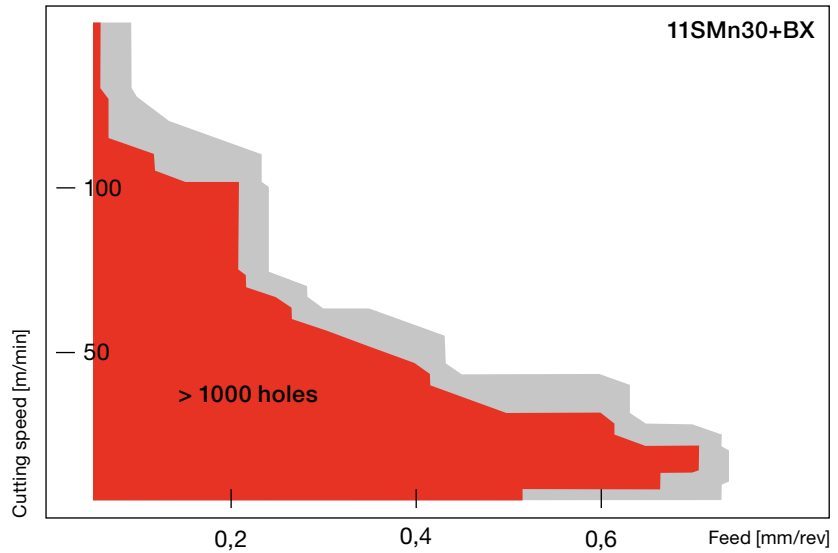
Potential for cost savings



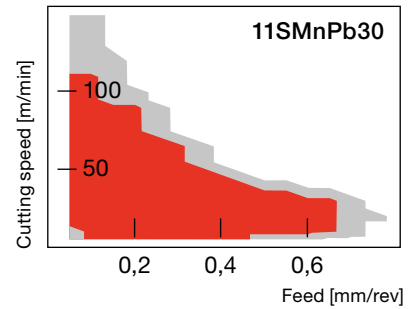
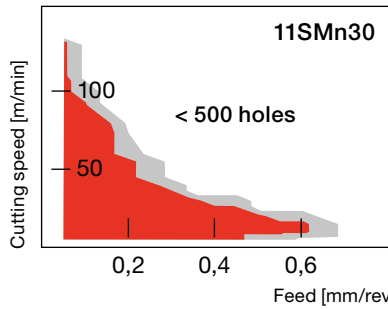
# Low tool wear

## Machining results

Drilling tests

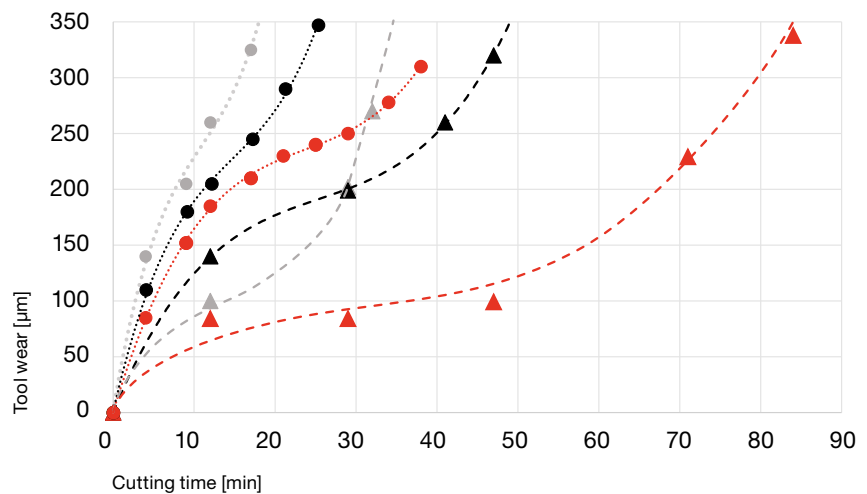


Service life criterion: Red area at least 1140 holes possible with the same drill bit; white area less than 500 holes possible, grey area: transition area between 500 and 1140 holes possible.



■ Recommended conditions    ■ Critical conditions  
 Not recommended conditions

## External turning



100 m/min    ● 11SMn30    ● 11SMn30+Pb    ● 11SMn30+BX  
 200 m/min    ▲ 11SMn30    ▲ 11SMn30+Pb    ▲ 11SMn30+BX



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