International Steel Standardisation

Steel standards are instruments that are used for the classification, specification and evaluation of the different types of steel. The standards provide information about the metallurgical, mechanical and chemical properties of steels and are important for industries that deal with the production or processing of steel.

There are different steel standards in a lot of countries, which sometimes leads to confusion, as one type of steel can be classified in different ways. Manufacturing methods, microstructure, carbon content, product form, chemical composition, finishing process, heat treatment performed and required strength level are all characteristics that are used to classify steel, but most widely used are standards that use chemical properties of steel as the basis for their standardization.
Looking at the product form of steel, you can for example distinguish bar plate, sheet, strip and tubing steel. According to its microstructure, there are ferritic, pearlitic and martensitic steels, according to the finishing process the steel underwent, we distinguish hot rolled and cold rolled steel. If we take the chemical composition of steel as the main criterion, we distinguish carbon steels, alloy steels and stainless steels. Based on its carbon content, we divide steels into three main groups: low carbon steel grades, middle carbon steel grades and high carbon steel grades.
Worldwide there are a number of international or national steel standards, which are more or less common. Among the most common steel standards worldwide is the Euronorm EN, which is used in all European countries. It classifies steel into the following six groups:

- non alloy steel grades
- alloy steel grades
- stainless steel grades
- tool steel grades
- steel grades for sheet and strip
- steel grades for electrical sheet and strip.

Furthermore, there are several American standards, which are often used in international trade. The most common standards among them are the ASTM (American Society for Testing and Materials) standards and the AISI (American Iron and Steel Institute) standards. Over the last years the ASTM standards have become more and more important, as the AISI standards have gone out of date. Besides there are the SAE (Society of Automotive Engineers) standards which classify steel grades with the help of four digit numbers representing the chemical composition standards for the single steel grades. In Asia the JIS (Japanese Industrial Standards) is widely used. JIS specifications begin with the prefix JIS. For example, the prefix is followed by the letter G. G stands for carbon and low-alloy steels.
Great Britain employs the BS (British Standards). In the past, the traditional British standards system was adapted to the European specification structure. This resulted in the existence of (out-dated) BS specifications, BS EN specifications and BS EN ISO specifications.
In German companies you may still come across the out-dated DIN standards, which specify 10 different steel groups. DIN standards can easily be recognized by the letters DIN which are followed by either a numerical or an alphanumerical code.

F O R T H E T E A C H E R

SUGGESTED PROCEDURE FOR WORKING WITH THE TEXT

Step 1: Make the students think why it might be useful to define standards for the different types of steel. Set them a time limit.

Step 2: Make students exchange their opinions with their partner.

Step 3: Let students in pairs substantiate their ideas by finding possible criteria for standards.

Step 3: Collect all the different ideas students have come up with on a flipchart.

Step 4: Give the definition of steel standards (first two sentences of the text) to the class. Discuss it with the class (comparison with students' ideas on the flipchart).

Step 5: Tell the students that they are going to find out more about steel standards and let students form pairs again. Give the text to each student.

Step 6: Give the different worksheets (AB2_Steel_standards.pdf) to the students and set them a time limit for the tasks.

Step 7: Let students present their findings to their respective partners with the help of the overviews they have prepared. (Students should take notes.)

Step 8: Now let students either sum up either all the information from the text or the information they got from their partners in their mother tongue.