

INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ

Second School Year

SEMI-PRODUCTS

1. **Semi-products** are materials used for *further* processing. We produce them from *incoming* materials, for example from *ingots*, *powders* and other materials. We most often produce *semi-products* for the production of mechanical *components*.

2. The basic classification of *semi-products* is:

- ✓ *standardized semi-products*
- ✓ *non-standardized semi-products*

2.1 *Standardized semi-products* are produced in *certain standardized* sizes. For example:

- *Semi-finished products* – *blooms* and *billets*
- *Bars*
- *Sheets* – thin, thick
- *Tubes*
- *Wires*

2.2 *Non-standardized semi-products* are produced according to *order*. For example:

- *Castings*
- *Forgings*
- *Pressings*

3. According to material type, *semi-products* are divided into:

- *metallic* materials - which are *ferrous*, or *non-ferrous*
- *non-metallic* materials – which are plastics or wood and other materials

4. *Standardized semi-products* can be mostly produced by:

a) *forming*

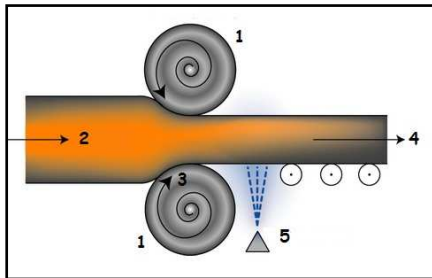
They are produced with various profiles and in various *dimensions* and geometrical *accuracies*. They are produced from *steel* and *non-ferrous metals*.

b) *rolling*

It is *shaping metals* between rotating *rollers* – see Picture 1. The formed metal is *drawn* in between the *rollers* where it is *compressed* and *extended*.

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Picture 1



1. Upper and lower roller
2. Ingot inlet
3. Roller station direction
4. Rolled product
5. Water spray

5. Tube production

Tubes are very often used *semi-products*. We produce *tubes* using hot or cold *rolling*, such as *seamless* or *seamed (welded)*.

5.1 Welded tubes are produced from *steel strips* using *welding* technology. This production is cheaper for good quality *tubes*.

5.2 Seamless tubes are produced:

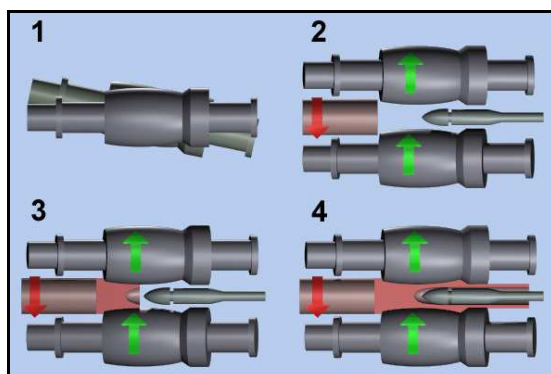
a) by the Mannesmann method

Material goes between two *off-track rollers* with the same sense of rotation. The acting forces create a *cavity*. We can *smooth* it with a *mandrel* – see Picture 2.

b) by the Stiefel method

This method is similar to the Mannesmann method. Only *rollers* have the *shape* of disks.

Picture 2



1. Off-track rolls
2. Roll semi-product sense of rotation
3. Cavity formation – cracks changing with tension
4. Expansion and cavity smoothing

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VOCABULARY

accuracy	přesnost	off-track roll	mimoběžný válec
bar	tyč	order	zakázka
billet	sochor	powder	prášek
bloom	blok	pressing	výlisek
casting	odlévání, odlitek	rolled product	vývalek
cavity	dutina	roll	válec
certain	určitý	rolling	válcování
component	součástka	seamless	bezešvý
compressed	stlačený	seamed	se švem
dimension	rozměr	semi-product	polotovar
drawn	tažený	semi-finished product	předvalek
extended	prodloužený	shape	tvar
ferrous	železný	shaping	tváření
forging	výkovek	sheet	plech
forming	tváření	smooth	vyhladit, hladký
further	další	standardized	normalizovaný
incoming	vstupní, výchozí	steel	ocel
ingot	ingot	steel strip	pás oceli
mandrel	trn	tube	trubka
metal	kov	welded	svařovaný
non-ferrous	neželezný	welding	svařování
non-standardized	nenormalizovaný	wire	drát

COMPREHENSION QUESTIONS

1. What are semi-products?
2. How do we produce semi-products?
3. Can you name some standardized semi-products?
4. What is rolling?
5. What is the difference between welded tubes and seamless tubes?

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KEY – for teachers only

1.

1 upper and lower roller 2 Ingot inlet 3 Roller station direction 4 rolled product 5 water spray

2.

1	casting	<i>odlévání</i>
2	non-ferrous	<i>neželezný</i>
3	drát	<i>wire</i>
4	steel	<i>ocel</i>
5	roll	<i>válec</i>
6	sheet	<i>plech</i>
7	trubka	<i>tube</i>
8	incoming	<i>vstupní, výchozí</i>
9	součástka	<i>component</i>
10	přesnost	<i>accuracy</i>

3.

A		B	
1	cold	e	rolling <i>válcování za studena</i>
2	geometrical	g	accuracy <i>geometrická přesnost</i>
3	standardized	d	semi-product <i>normalizovaný polotovár</i>
4	seamless	f	tubes <i>bezešvé trubky</i>
5	incoming	b	material <i>vstupní materiál</i>
6	semi-finished	a	products <i>předvalky</i>
7	non-ferrous	c	metals <i>neželezné kovy</i>