

NC AND CNC MACHINES 2

The application of numerical control in other *branches* of engineering production

1. *Handling equipment*

They are machines, which can **handle** something.

They can move with tools, semi-products or workpieces.

1.1 *Universal handling equipment*

They are machines which are **independent** of machine tools.

They are classified into:

- a) Programmable **handling equipment**. They use an inserted programme.
- b) Industrial robots. It is the highest level of **handling equipment**. It has CNC control.

1.2 *Shelf stacker*

It is a machine that goes along a **rail track**. It is controlled by the NC system.

2. *Measuring equipment*

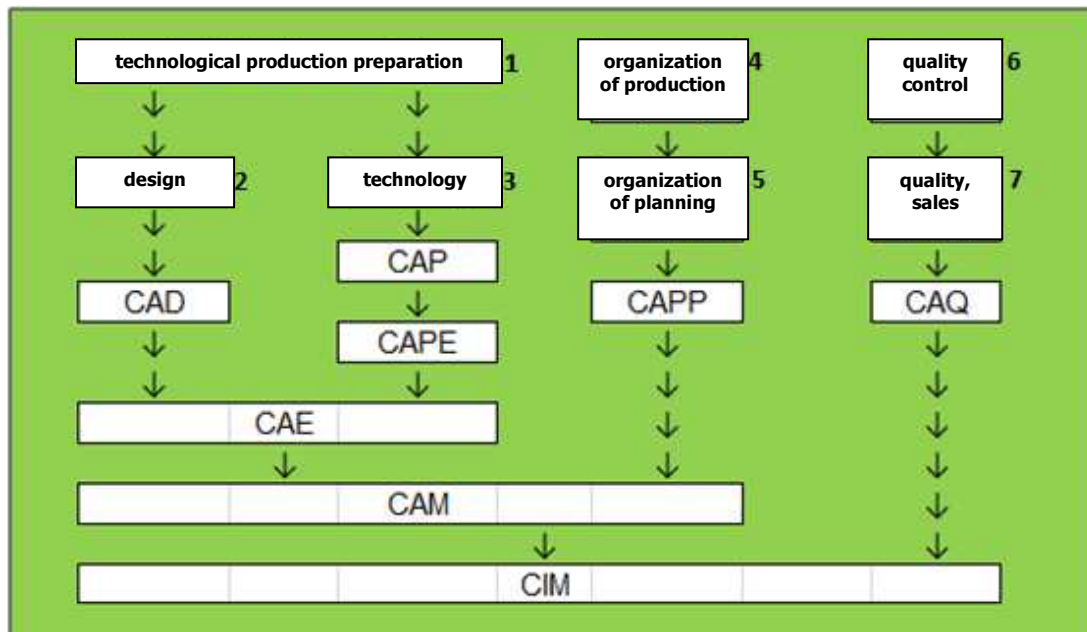
A probe is the basis of NC measuring equipment.

The most **up-to-date** measuring equipment is controlled by a CNC system.

3. *Computer equipment in production – important abbreviations*

In the following diagram you can see a description of the use of computer equipment in production.

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Some of the abbreviations are:

- CAD (Computer Aided Design) – It is a computer *supported* design. It makes drawings using a computer.
- CAM (Computer Aided Manufacturing) – It uses a computer for production control.

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VOCABULARY

branch	odvětví
handle	manipulovat
handling equipment	manipulátor
independent	nezávislý
probe	sonda
rail track	kolejová dráha
shelf stacker	regálový zakladač
support	podpora
up-to-date	moderní, nejnovější

COMPREHENSION QUESTIONS

1. What is handling equipment?
2. What do you know about universal handling equipment?
3. What is the basis of NC measuring equipment?
4. What do the abbreviations CAD and CAM mean?

EXERCISES

1. Translate the words in Czech or English:

1	handle	_____
2	move	_____
3	shelf stacker	_____
4	měřit	_____
5	obrobek	_____
6	rail track	_____
7	semi-product	_____
8	zkratka	_____
9	popis	_____
10	support	_____

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2. Hidden message - 12 words were placed into the puzzle. And then find the hidden message.

S	H	E	L	C	F	S	T	E	I	A	C	K	E	R
K	A	M	M	O	I	A	U	N	B	T	T	A	N	Q
A	M	E	O	M	P	M	D	L	G	O	V	O	L	K
L	R	A	O	P	B	U	P	B	O	Q	R	N	W	V
C	F	S	S	U	S	J	R	O	D	O	D	P	Y	G
H	S	U	O	T	N	H	O	H	R	E	T	T	S	B
W	Y	R	R	E	L	G	D	L	H	T	L	D	L	T
T	Z	I	W	R	W	N	U	O	O	A	A	L	G	I
R	A	N	Z	G	P	B	C	G	K	R	N	N	J	D
L	B	G	F	T	X	L	T	D	X	B	T	D	T	N
V	J	T	N	E	M	P	I	U	Q	E	H	N	L	B
S	L	C	S	U	P	P	O	R	T	R	T	W	O	E
L	E	V	E	L	Q	E	N	K	T	R	B	X	X	C
G	K	W	E	D	Y	Y	E	U	J	W	G	M	X	S
R	R	E	L	B	T	G	R	G	T	Y	S	Z	P	O

COMPUTER
HANDLE
LEVEL
PRODUCTION

CONTROL
IMPORTANT
MEASURING
SUPPORT

EQUIPMENT
INDUSTRIAL
PROBE
TOOL

Hidden message

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EXERCISES – KEY FOR TEACHERS

1. Translation

1	handle	manipulovat
2	move	pohyb, pohybovat
3	shelf stacker	regálový zakladač
4	měřit	measure
5	obrobek	workpiece
6	rail track	kolejová dráha
7	semi-product	polotovár
8	zkratka	abbreviation
9	popis	description
10	support	podpora

2. Hidden message - shelf hacker

Solution

S H E L C F S T E I A C K E R
+ + M + O I + + N B + + + + +
+ + E + M + M D L + O + + + +
+ + A + P + U P + O + R + + +
+ + S + U S + R O + O + P + +
+ + U + T + + O + R + T + + +
+ + R R E + + D L H T + + + +
+ + I + R + + U + O A A + + +
+ A N + + + + C + + R N N + +
L + G + + + + T + + + T D T +
+ + T N E M P I U Q E + N L +
+ + + S U P P O R T + + + O E
L E V E L + + N + + + + + C
+ + + + + + + + + + + +
+ + + + + + + + + + + +

(Over, Down, Direction)

COMPUTER(5,1,S)

CONTROL(15,13,NW)

EQUIPMENT(11,11,W)

HANDLE(10,7,SE)

IMPORTANT(6,2,SE)

INDUSTRIAL(10,1,SW)

LEVEL(5,13,W)

MEASURING(3,2,S)

PROBE(13,5,NW)

PRODUCTION(8,4,S)

SUPPORT(4,12,E)

TOOL(12,6,NW)