



Theme of the final qualifying work: Automation of the process powertrain testing

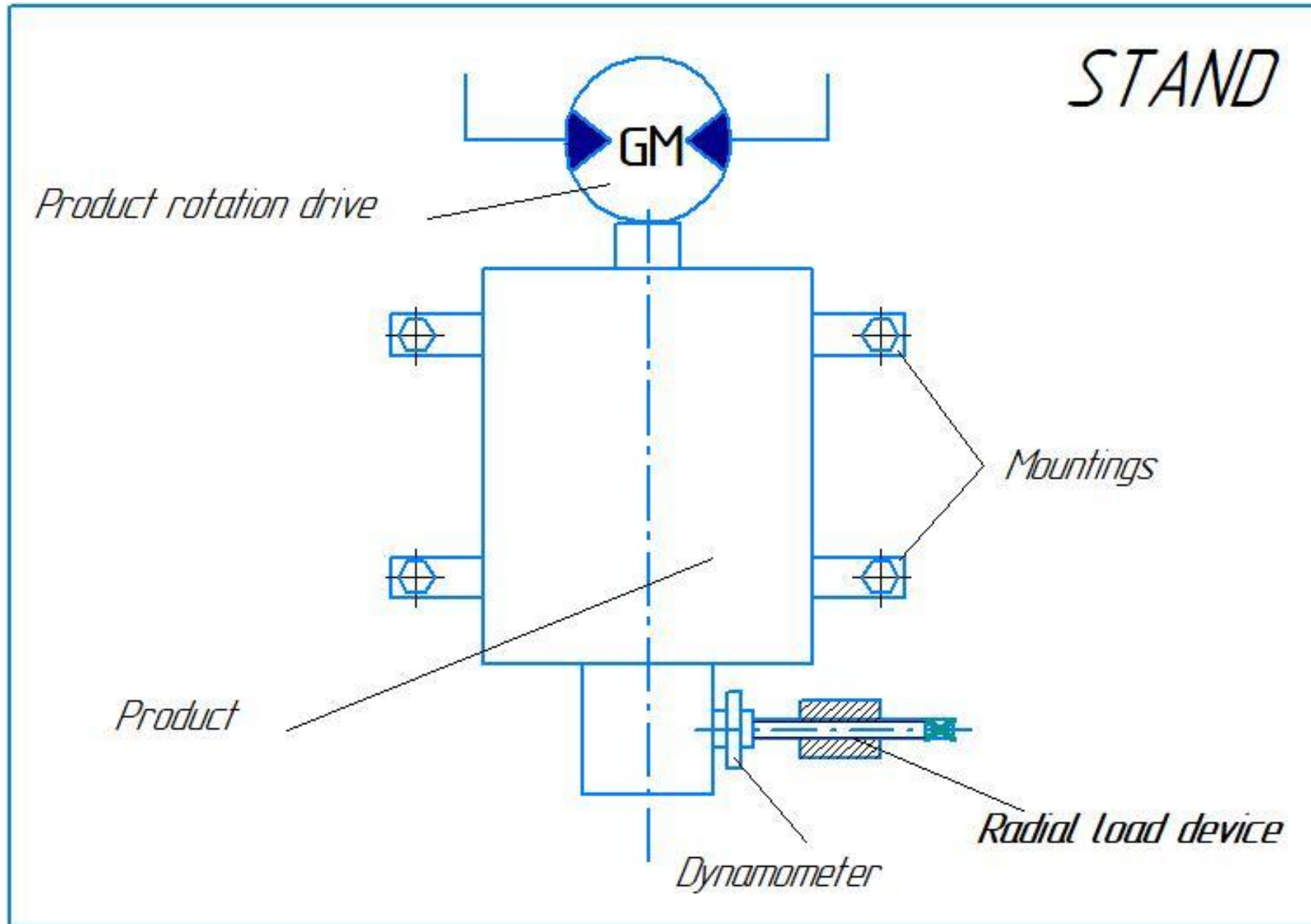


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The accuracy of the tests is of paramount importance for the reliability of quality control in the aviation industry!

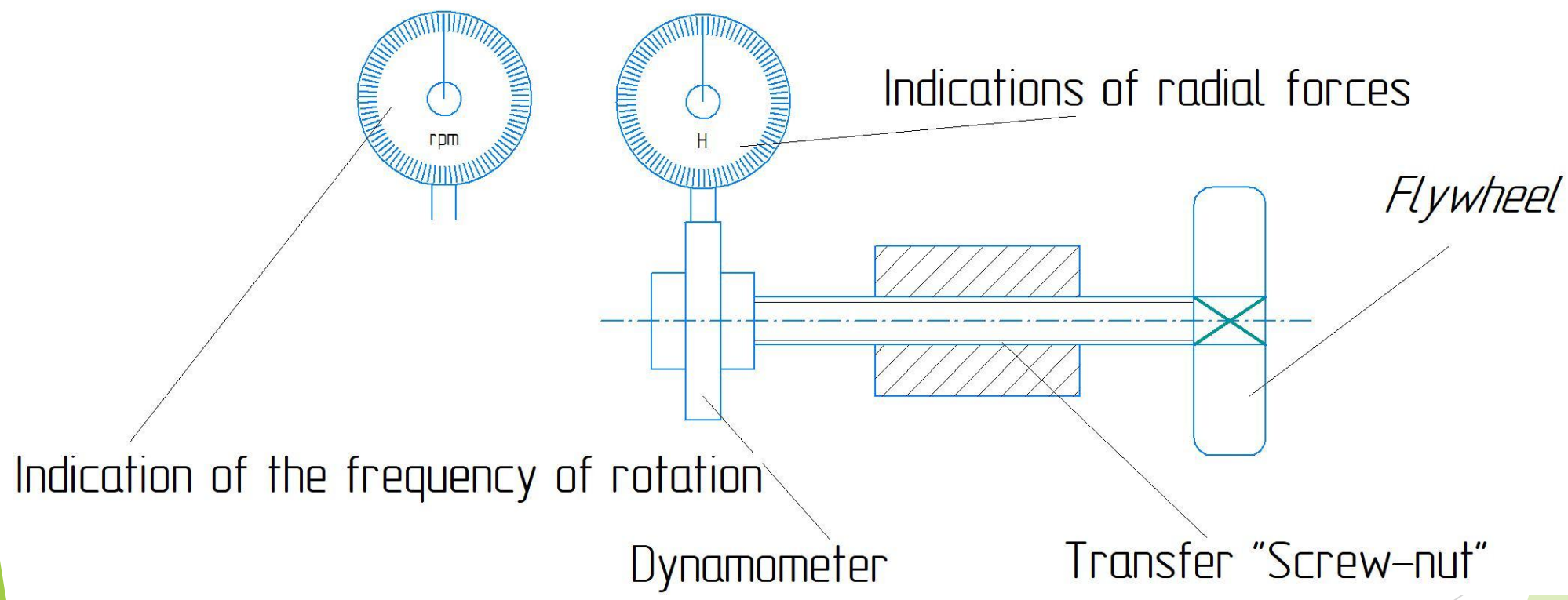


Power booster test bench



Management before the upgrade of the stand

MANUAL LOAD CONTROL

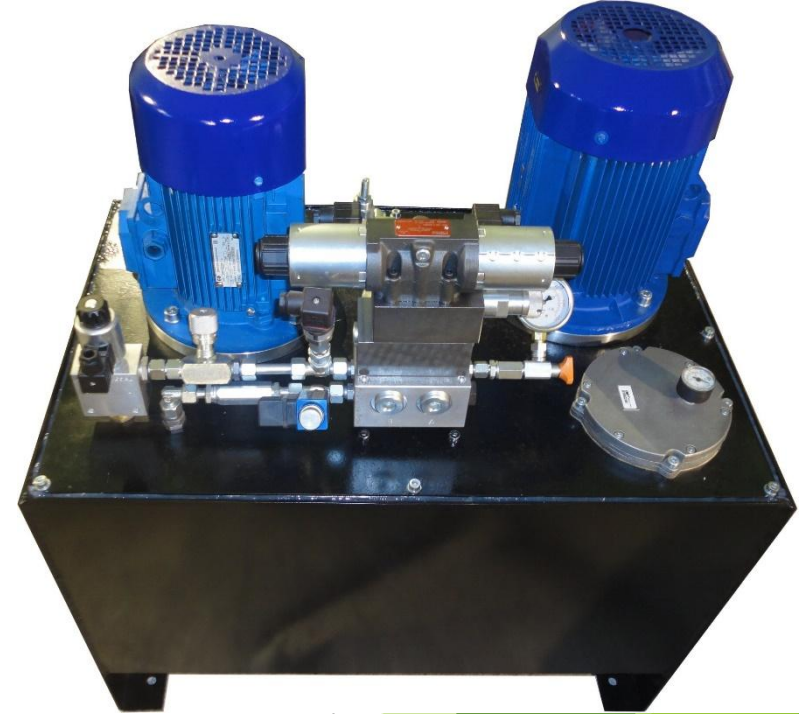


Advantages of hydraulic drive

The main advantage is the ability to develop a very large effort with compact parameters.

Hydraulic actuators can be removed from the pump station for a long distance, but with a congruity of power (max 250-300 m).

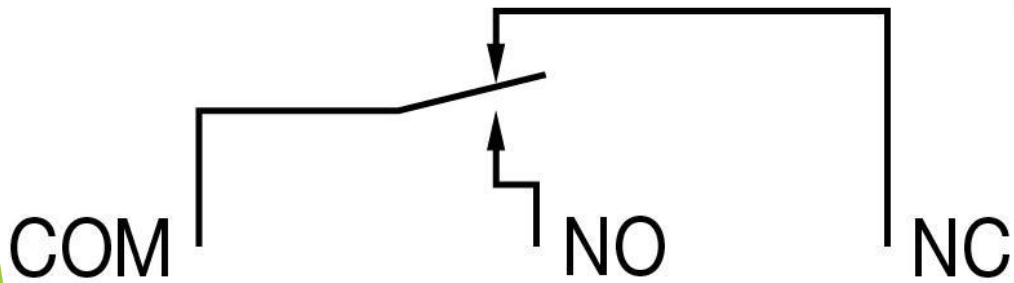
A short time for the development of a significant effort and its smooth regulation
Quite high efficiency, but not higher than electromechanical gears



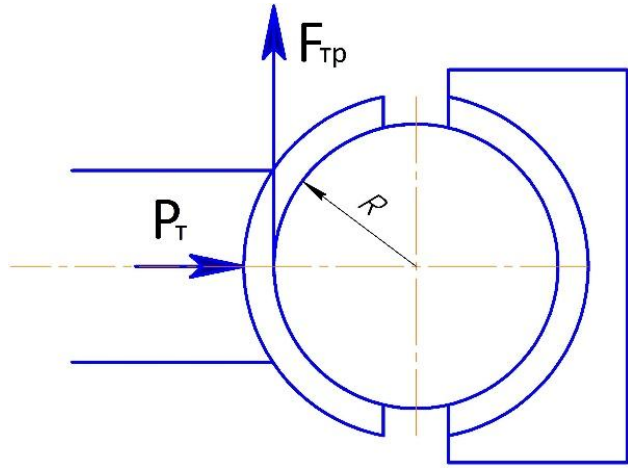
Type of sensor monitoring product availability

Limit switch

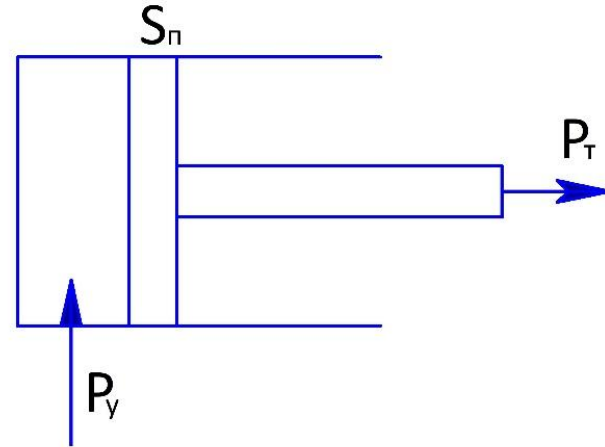
Connection diagram



Z-15GW-B



$$\begin{cases} M_{mp} = F_{mp} \cdot R \\ F_{mp} = P_m \cdot \int_{mp} \end{cases}$$



$$P_m = p_y \cdot S_n$$

M_{mp} - Frictional moment

F_{mp} - Friction force

\int_{mp} - Coefficient of friction (0.35) of phosphorous bronze (friction)

R - Radius of the product

P_m - Pressure acting on the rod

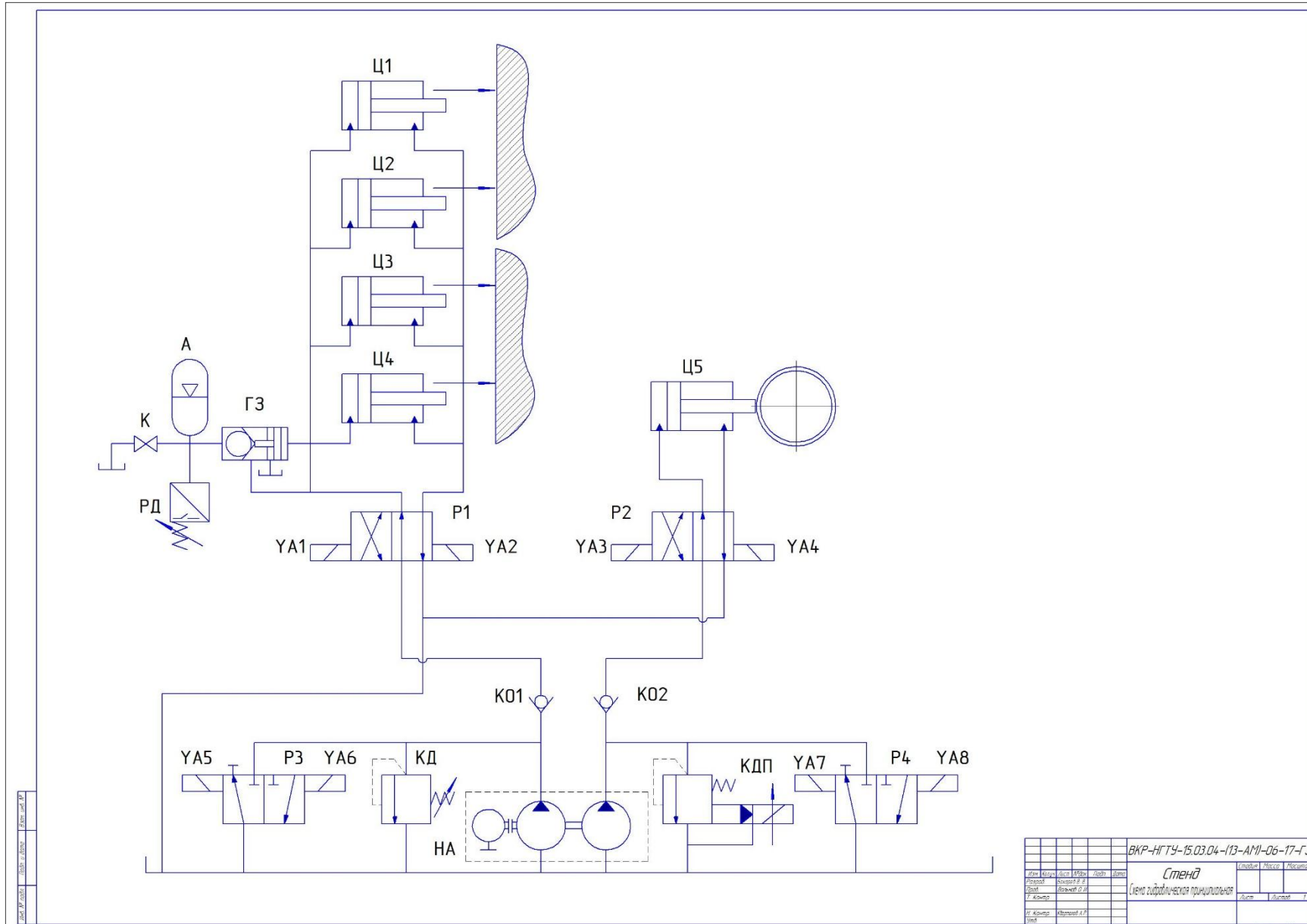
p_y - Pressure in the piston chamber

Programmable controller

Siemens S7-300



Scheme of hydraulic clamping and load products



The results of the load mechanism

Calculation	Notation	Result
Piston area	S	0,0022 м ²
Diameter of the piston	D	0.053 м
Stem diameter	d	0.01 м
Equal force	R	2860 Н
Stem Seals	F _s	721 Н
Piston Seal	F _p	1249Н
Oil pressure in the piston	Q	3 л/мин
Diameter of drainage pipe	dd	0.02 м
Diameter of the pipeline pressure	dpp	0.015 м

Thank you for attention!

The slide features a white background with a decorative graphic on the right side. This graphic consists of several overlapping, semi-transparent green shapes in various shades, ranging from light lime green to dark forest green. These shapes are primarily triangular and polygonal, creating a dynamic, layered effect. A thin, light gray line also extends from the bottom right towards the center of the slide.