**SUMMARY**

Name: Gipsz Jakab, GJBGKA

Title of diplom work: Progressive tool design

I chose to write about a progressive (punching) tool in my thesis. The workpiece is a typical sheet metal part used in furniture. I introduced the main aspects of designing such tools, emphasizing the importance of cutting tools.

In the first part of the thesis I introduced the sheet metal workshop of the company Bíró Ltd. Such as traditional mechanical and hydraulic presses, CNC bending machines, laser cutters and punch machines.

In the second part of the thesis I started to design the tool which will be able to manufacture the workpiece in question. The chosen value of the shearing gap on one side – considering the older machinery – is 0,2 mm. The cut profile is 655,3 mm long, but there are other shaping processes going on as well, so the total forming force required is 1530 kN. The work requirement of the forming is 2523,2 Nm and the required performance is 1509,1 W. The chosen LE 250 typed press has a nominal capacity of 2500 kN and 22kW. I calculated the manufacturing tolerances of the punches and dies. The centroid of the tool is located 17 and 21 mm-s away from the tool's geometrical center. I checked the punches against buckling.

In the third part of the thesis I designed the manufacturing process of the active elements (punches and dies). I heavily used 2,5D manufacturing and wire EDM. I also used lathe machining and 3D milling in a moderate amount and some EDM die sinking on a few parts.

In the fourth part of the thesis I made an approximate calculation on the tool's costs. This calculation was slightly distorted due to the fact that I had to use plates which are no longer available on the market, so I substituted their prices with those of the closest to their properties. Numerous parts were manufactured out of the same block, since there are more parts made of the same material. The overall cost of the tool was approximately 5000 EUR including a 27% VAT.