The (VP) Exakta, its History and Advantages **first half**

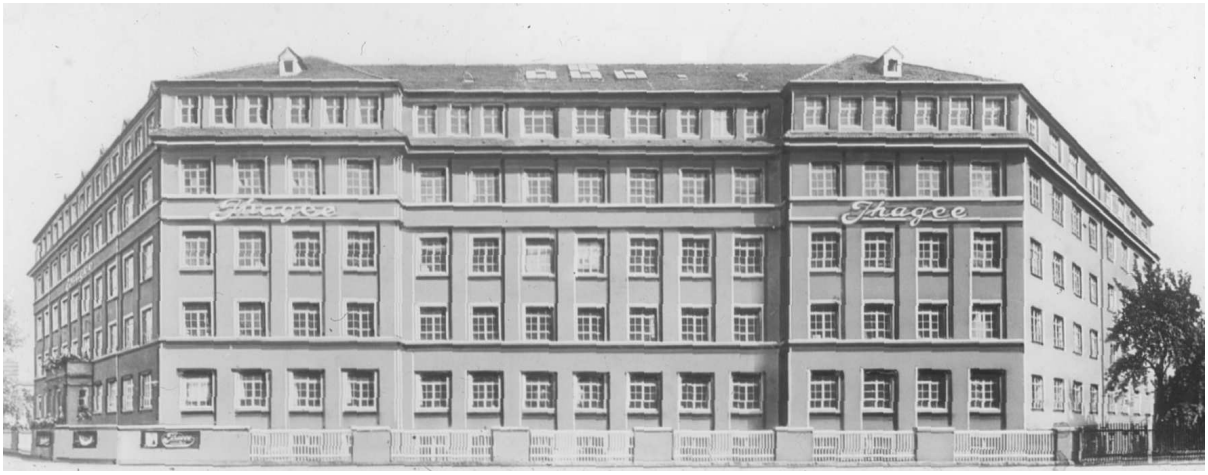
Introduction

This is a representation of a lecture that Mr. Heynderickx, Dutch importer for Ihagee, used to give in 1935 for photo clubs and customers of photo shops. It is based on 38 transparencies and the original German text, provided to Mr. Heynderickx by Ihagee.
I intend to reproduce a translation of this lecture on my site, together with the images, in two halves. This is the first halve. *Hugo Ruys*

Figure 1: City View Dresden.
Dresden on the Elbe, which is the capital of Saxony, not only has a special meaning as an art centre, but also stores within its walls various developed industry sectors. Dresden has always

been regarded as home of some companies that have already been active for decades in the construction of photographic equipment and for the propagation of amateur photography.
And even today we find in this city a number of important factories of photographic cameras, so Dresden can really be seen as the metropolis of the German photo industry. If the visitor guides his steps to the east of this city, at the gate of the Dresden Photo-quarter the massive building of Ihagee camera work, Steenbergen & Co will greet him. This company has occupied itself since its foundation with the manufacture of high-quality cameras, and has in recent years, as a top performance of manufacturing, put a number of world-famous plane shutter and reflex cameras on the market.

Figure 2: View on the Ihagee Factory.



Due to the quality of its products Ihagee Kamerawerk was classified soon in the ranks of leading factories. The successful development of this company is reflected purely externally in the large, architecturally well built factory building. As specialty Ihagee currently runs the production of the Exakta SLR camera, and to this model as well as its production process, the following words and pictures will be dedicated. They will hopefully give the viewer and listener a glimpse of the carefulness and precision with which these cameras are built. In the bright manufacturing halls of the works, one Exakta-part after the other is made, and we must limit ourselves in our spiritual walk through the factory by selecting the main aspects of Exakta production, because obviously Ihagee Kamerawerk produces other high-quality cameras and enlarger devices.

Figure 3: Large Image of the Exakta.

Before the tour around the work begins, this picture will first make you familiar with the Exakta camera. The special advantages of this model will get detailed assessment at the end. Now, let us be content with establishing that the Exakta purely externally has a really pleasing appearance, and this sympathetic feeling will deepen when you see and hear how carefully every single department works on this high-quality camera. May the promising exterior of the Exakta help you to follow this lecture with interest.

Figure 4: Ihagee front garden.

We enter the factory building from the garden and over the entrance greets us a symbol from the rear. The massive flue is designed to suck the sawdust from the machines in the woodworking departments.

Figure 5: Tools construction

What the designer devised on the drawing board gets in this department "Tools construction" its first rough form. For all fittings, camera and accessory parts the necessary manufacturing punching and drawing tools are constructed here. Each tool consists of two parts: a die and a punch. The die is fixed in the machine during punching or pressing, while the plunger is moved in a vertical direction up and down. On such a complete tool pair a locksmith works for one to three weeks.

The tool steel gets the required form for its task, according to the design drawing, by planing, milling and filing; individual sections of the tool are fitted together. As long as the steel is worked not hardened, it isn't useful for its subsequent use as a print or drawing tool. Therefore, the completely finished tool is then hardened by heating it up to about 8oo degrees Celsius. The red-hot steel shows the state of heating by discoloration, and at the right moment it is quenched by immersion in oil or cooled in air. This process reduces the carbon content of the steel and brings special hardening with it.

Figure 6: Tool storage.

For each camera part a special tool must be made, which is kept in the "tool storage" on large shelves ready to hand, so with each new camera series the tools are now available for punching and pressing machines.

Before the raw material used for the Exakta is supplied to the factory, it undergoes a thorough examination. Part of the metal (mostly brass, aluminium and stainless steel are used in the Exakta) are examined microscopically and also tested for hardness, tensile strength and other such properties. On large automatic shears the metals are cut into strips suitable for the production widths that correspond exactly to the width of the punching, stamping or pressing tool. This tailored material is transported to the punching department. The metal parts for the round parts comes in tubes and rods, and - sometimes also divided into smaller quantum - over to the lathe shop.

Figure 7: Punching.

In "Punching" we find the biggest punching and pressing machines. Classified according to the type we find eccentric and crank presses, manual presses as well as modern spindle and friction presses with a pressure load up to 80,000 kg. The raw metal strip runs through the machine, and by pressure on a foot lever the lowering punch punches part for part. This department already reflects the special characteristic of the camera manufacturing: immense number of small parts, of which the processing time is extremely short. In contrast, the machinery industry should perhaps be mentioned that produces re1atively fewer parts with long processing times. The helical screw mount of the Exakta is pressed in Punching, to be passed on to the "Lathe shop" for further processing. Easier stamping parts are produced by a rough-processing subdivision of the work room "Mechanics". Because incorrectly stamped parts are excluded from the outset of the further processing, all pieces are checked before transfer to another department.

Figure 8: Lath Shop.

The Lath Shop, equipped with modern machinery, is now up to the task of bringing the raw round parts in the accurate determined form.

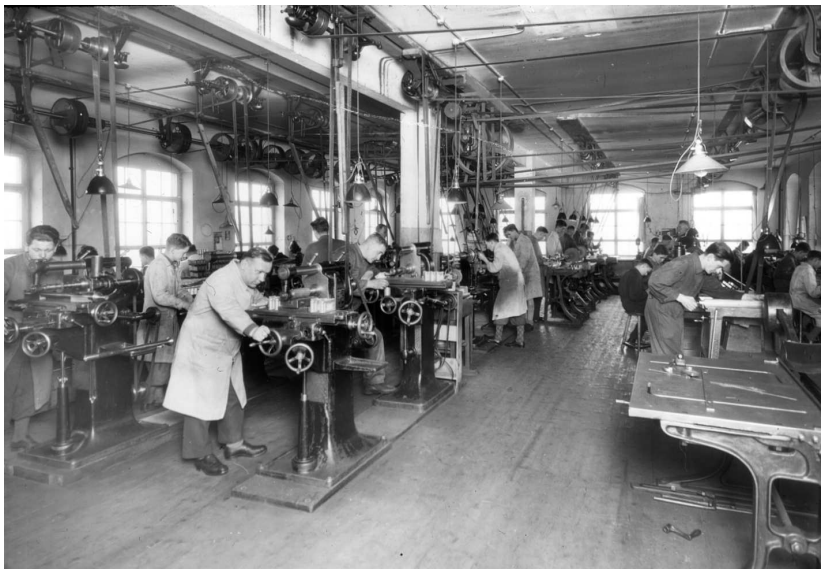
In a lathe the part in question is put into rotating movement, and turned off in the exact profile shape. For small screws and round parts fully automatic lathes (screw robots) are available to perform all operations without human help. Modern turret lathes facilitate the efficient fabricating extremely: the relevant Exakta part can be simultaneously processed, fixed in the lathe, with different tools at once. A special performance of this department is mainly the production of the patented Exakta helical screw mount, whose advantage is the fact that at relatively limited rotation already produces a strong movement .i.e. a significant extension of the camera is reached. The turns of the screw mount are "sharpened". The tube is mounted on a slowly rotating cartridge and the tip of a cutter engraves the windings, while the tube rotates slowly back and forth. For special purposes a modern spot welding department is positioned next to the Lath Shop.

Figure 9: Engraving machine.

The already repeatedly processed and painted parts are provided with text and numbers in a sub-division of the Lathe Shop, the "Engraving Department". For example, the sweeping name "Exakta" is engraved in the front of the body that already has been painted, and also the shutter-knobs and the scales receive their markings by the engraving machines. A mask - made of metal - shows in depressions the text to be engraved. Through a "stork's beak", the characters are transferred into a small size. While one side of the stork's beak with a pen is drawn through the wells of a template, the rapidly rotating engraving gouge digs into the metal of a little part on the Exakta. This script, engraved through the paint, can be made more clearly visible by nickel or white colour.

Figure l0: Department of Mechanics.

To better understand the following explanations, is now mentioned before all that the body of the Exakta is already completely produced by light alloy die casting. The departments mentioned in the following discussion are faced with two tasks: firstly further worked is necessary on the shape and the finish of the housing, and secondly it is necessary to process and perfect the individual Exakta parts that were already discussed several times.



Our picture shows the department "Mechanics" where the ready Exakta rough bodies are transported to, after passing through a sand blast department and after repeated checking. The body is in the "mechanics department " liberated of all unevenness and grounded rough, so that it can then take either nickel, paint or cover.

When the departments' Nickel Plating" or "Paint Shop", which will be discussed in detail later, return the Exakta body, in the department" Mechanics " completely finished parts are installed to begin with. So, the Exakta obtains in this hall spool holders, film rollers, the entire back, the film guide down in the spool chamber and more. The materials used in these assembly parts are also already nickel plated and painted. The Exakta body can thus be brought directly from the Department of Mechanics into the Covering Dept, and get there, as will be also shown yet, its leather cover.

Figure 11: Part of "Mechanics".
The second task of the department "Mechanics" is, as said before, the further processing of the Exakta-parts. Smaller machines are used to drill, mill and cut the levers, screws and rings of the Exakta. In the foreground in this picture a modern multi-spindle drilling machine is shown. For the production of many of the gears of the Exakta shutter, modern rolling mills are available. Individual Exakta parts, coming from the Lath shop, will be brought even closer to their final form by drilling, milling or countersinking in the Department of Mechanics. After leaving the department "Mechanics" these Exakta parts only miss nickel or lacquer. Therefore, we now turn our attention to the "Grinding" and "Nickel Plating" departments.

Figure 12: Grinding.
Before the products of metal processing

departments are brought to the nickel bath or paint oven, they must be pre-ground in "Grinding" on sanding machines and polished as required thereafter on twill disks. Some parts won't get either paint or nickel, so that already are in their final form after the grinding and polishing. The bodies of the Exakta also go through the hands of the metal grinder. Again, the edges are sanded and individual areas polished.

Figure 13: Nickel Plating.
The Exakta housing, along with the separate parts, are brought to the nickel bath, after they have been previously washed and degreased. Strung on long wires the parts are suspended in the nickel bath. In distilled water with nickel salt and acid supplements, pure nickel plates are hung and connected with one pole of the electric current. The other pole is connected to the parts to be nickel plated, and by galvanizing the nickel is deposited on the parts. If a strong nickel layer is desired, one should allow the respective metal part correspondingly longer time to stay in the nickel bath. If nickel sheen is required, a fresh nickel polishing process is necessary. If the

nickel is intended only as a base for paint, these parts are now transported to the Paint Shop. Before that however they are checked carefully, so that defective parts can be fed again to the nickel plating process. So, each Exakta owner can be sure that these parts of his camera are covered by a nickel layer protecting them against all temperature and climatic influences. The department "Nickel Plating" is also connected to a modern chromium plating installation.

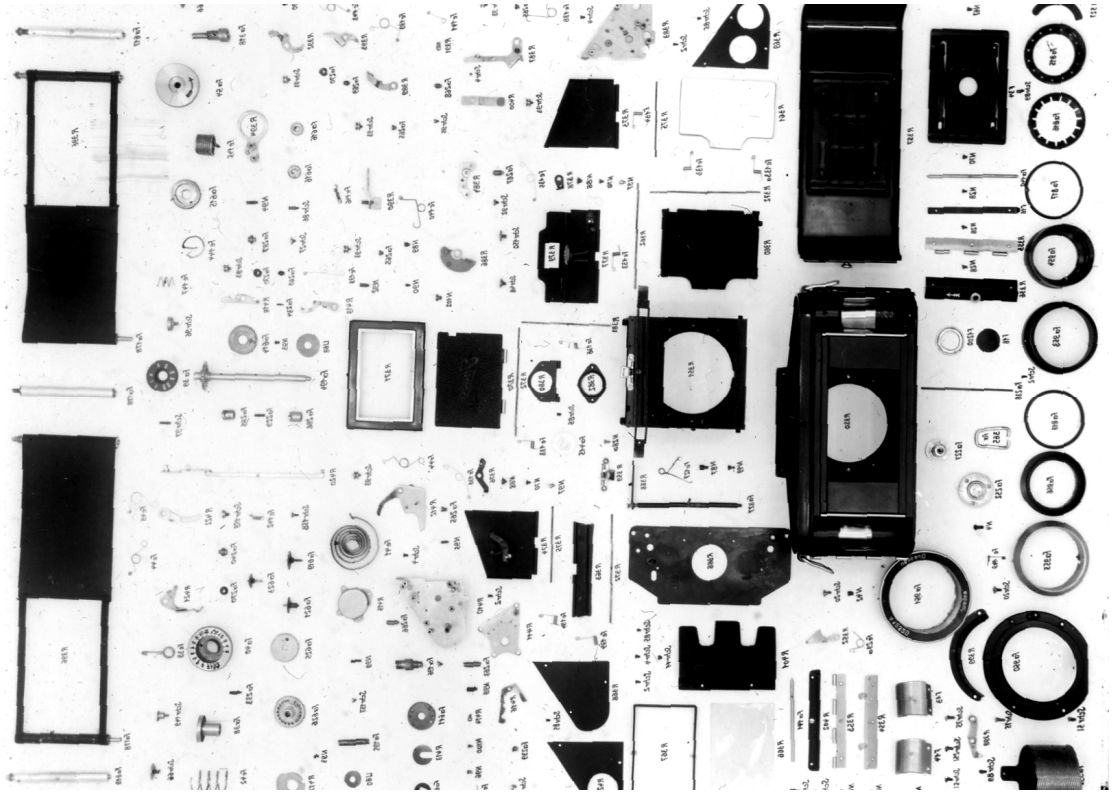
Figure 14: Paint shop.

After all parts have been dusted off in special installations, they get a uniform and permanent coating layer by a spraying method. By compressed air, the paint is atomized, transferred and dried in hot air with a temperature of around 160° Celsius and also burned in. Often multiple layers of paint are applied over each another, because one first applies primer and then sprays the gloss paint. Also, we meet the Exakta housing again in the paint shop. Once it has received the beautiful jet black coat, only the engraving of the name-plate and the leather cover are required to complete the exterior elegant shape.

Figure 15: Parts warehouse.

All Exakta components are transported after repeated preliminary checks to the "parts warehouse", where they undergo a further check to assure that really any defective part is excluded. Most screws, springs, cams and levers are kept in the parts warehouse until they are ordered by the assembly departments. But in this room some sub-assemblies are already set together; they are stored in clearly laid out compartments, just as the separate parts, and later transported to the assembly department for further assembly.

Figure 16: Parts Overview.
To give you an overview how many springs, screws, shafts and gears, and major parts such as worm gears, adapters, film pressure plates, mirrors and body parts are actually required for a complete Exakta, this figure shows a compilation of all Exakta parts.



Now that you have heard and seen, with how much care all departments of the Exakta are working, you will undoubtedly feel a little awe for this fine precision.