

# Die Geschichte der Unterwasser-Kamera Siluro von Nemrod

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[Patent Siluro](#)

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## Nemrod Siluro History (English original by Andrés Clarós)

When my friend Franz Rothbrust asked me to collaborate and talk about the History of underwater cameras in the Taucher Historie journal I could not refuse for several reasons: the first one being my link with Franz and the German HDS (Historical Diving Society), the second, because of my great passion for the cameras and ultimately, the pride of being able to explain a great adventure that happened in Barcelona (my home city) more than 50 years ago. The Nemrod SILURO is the underwater camera manufactured in Spain, which has sold more units worldwide than any other Spanish camera.

Nemrod achieved international status by designing and producing complete spearfishing equipment (their suits and spears deserve special recognition), diving gear, tanks and regulators, professional diving equipment, helmets and military equipment, etc. which made Nemrod the preferred brand of armies, fire-fighters, police and rescue forces from various countries; amongst these, of course, the United States. It represents an example of initiative and ability to overcome difficulties at a time when Spain was beginning to emerge from a long post-war and economic isolation.

## Introduction

Contrary to the usual way of making waterproof cases for film cameras in the early 1950's, a small and simple underwater camera called "Aqua-Cam" appeared. The idea and design were made by E.E. Pedersen of California in 1954. It was produced in three different colour versions: grey (Mk1), green and black, (Fig 01. Aqua-Cam models.) each one had minor modifications and subsequent improvements. They were painted aluminium cameras with a handle on the left side. They were square-shaped, with a flat seal between the box and the lid with a motorcycle tyre valve as was normal at that time. The photographic camera system had the same principles as the Kodak Brownie. The camera used 620 roll film and came equipped with a viewfinder, was fixed focus and had a simple bulb flashgun, with its associated electrical circuitry, capacitor and battery. It did not have any more controls other than the shutter release and film advance. The shutter speed and focus were predetermined. In essence, it was the mechanism of the Kodak Brownie in a sealed metal box. (Fig 02. Inside view of an Aqua-Cam.)

At the same time, the Mako Company, founded and directed by Jordan Klein, was producing underwater sealed Plexiglas (LUCITE) boxes for cameras like the Rolleiflex 6x6, the Kodak Brownie and many more models. After about three years of collaborating with Kodak, Mr Klein had the idea of developing his own underwater camera. Thus, the Mako SHARK camera was born. In fact it was an economical waterproof case, designed with the engineer Robert Thompson, to accommodate an Eastman EYEHAWK camera inside, enabling pictures to be taken underwater. All mechanisms and lenses of the camera were embedded in an injection moulded plastic box. The different parts were supplied directly by Kodak. It was the year 1957.

Mako actually began in 1947, when Jerry Greenberg and Jordan Klein founded a company in the US called "Marine Enterprises". One year later the two partners decided to each found their own company being "Seahawk" (Jerry's) and "Mako" (Jordan's). Mako produced many waterproof cases, for both amateurs and professionals, until finally Jordan Klein sold the Mako SHARK patent to Healthways along with an 8mm movie camera which was never produced. Mako then continued its business producing only watertight boxes specialising in adaptations for professionals and large format cameras (35mm and 70mm film size) for sale and rental. Jordan himself acted as an underwater cameraman for major film companies. He was a disciple of Lamar

Boren and credit goes to him for many underwater film scenes, starting with “Creature from the Black Lagoon” (1954) to “Sea Quest” (1999) and most of the underwater shots for the James Bond movies. But let’s get back to our original story of the Mako SHARK.

Mako’s concept was a novelty, in which Jordan Klein and the engineer Robert Thompson applied their experience as manufacturers of sealed plastic cases, which were designed as a hard casing and were able to bear the pressure and prevent flooding thanks to an O-ring used as a method of sealing. There were no closures with screws or poppers or nuts, just a simple screw on its back cover. The water pressure would do the rest and keep the two halves of the waterproof case pressed tightly together. It had no security locks to guarantee the cohesion of the two halves. Their experience with the old and vulnerable sealed plastic housings for cameras was applied in this revolutionary concept. It ruled out the possibility of breaks and cracks in the waterproof case caused by small imperfections or sand and excessive force when tightening screws and nuts. Also fragile viewfinders and protruding elements from additional external controls on the case, which could break, were excluded. Shutter release and film advance were simplified, focus and shutter speed were fixed, so there was a reduced risk of flooding. They used rolls of 620 film. By definition, an easy to use and affordable camera for those who did not know about underwater photography.

Three models were manufactured (Fig 03. Original Mako camera box tag.), the first was grey (Model #1951), which did not have the ability to use a flash - although it had been designed in the plastic molding - and sold for US \$19.95 in 1957. The second was black, a camera made of better and tougher quality plastic (Model #1960) with no flash although a battery capacitor unit was built in. These were sold for US \$29.95. The third one was sold complete with the battery capacitor unit and bulb flash attachment (Model #1950). Both camera and flash were presented in an attractive display box with instructions for US \$36.90. The bulb flash system could be purchased separately at a price of US \$9.95 by those owners who wanted to progress further with their Model #1960. (Fig 04. The #1951, #1960 and #1950 Mako SHARK models.)

The success of the camera production surprised Jordan Klein himself, who in 2014 confirmed to me that a total of about 55,000 units were sold. Consistency, ease of use and affordable price were the foundation of their success. We can say that this was the first substantial sale of underwater cameras in history. The sale of watertight enclosures and underwater cameras before the Mako SHARK was very limited. Despite the fact that during the sixties Calypso and Nikonos were the ultimate cameras in underwater photography, the production of the Calypsophot (1962-1968) did not reach 9,000 units and the Nikonos I (1963-1968) did not exceed 30,700 units. Later Nikonos II (1968-1976) sold 92,935 units and Nikonos III (1975-1983) sold 79,309 cameras... but these were from a later period and since then underwater photography has become an increasing global phenomenon.

## Origin of Nemrod

This Catalan company was founded in 1939, some months after the end of the Spanish Civil War, by the brothers Juan and Pedro Vilarrubís, beginning in their own home (Pasaje Vilaret, Barcelona) with handmade toys and roller skates under the name of “Industrias Vilarrubís”. (Fig 05. Nemrod Toys – advertisement.) They become specialists in the manufacturing of toys, orthopedics, sports and leisure goods for use in the sea and rivers. (Fig 06. Nemrod fishing reel.)

Their first underwater products were the “Asteria” goggles and masks ca. 1941. (Fig 07. Asteria mask types - advertisement.) When the business evolved and they expanded production lines, they moved to a small factory in Garcilaso Street and then to a larger one at 44-58 La Sagrera Street in Barcelona. The trademark of this company was Nemrod the Archer. At first only known as Nemrod by Industrias Vilarrubis, (Fig 08. Early Vilarrubis brochure.) they later incorporated their logo with the image of the Mesopotamian archer. (Fig 09. Early Nemrod Archer – advertisement.) But where they achieved international recognition was with articles for professional and amateur divers with the logo and the text “Nemrod the Hunter, King of Babylon”. (Fig 10. Original Nemrod logo and text.)

Consumer demands were increasing and so, in order to improve quality, they decided to look for an expert partner in rubber products. In the past they had sometimes collaborated with Mr. Ricardo Sagué, a member of their family, who later became a major shareholding partner. Ricardo Sagué merged his rubber vulcanization factory, established in 1914, with Industrias Vilarrubís in 1957, changing the name to Vilarrubís y Sagué S.A. (Fig 11. Nemrod by Vilarrubis y Sagué S.A. - advertisement.) His contribution and knowledge of the process of rubber production permitted Nemrod to improve the manufacturing of diving goods such as suits, fins, tubes, masks and other elements of daily life such as orthopedic items, for instance, hot water bottles, etc. under the brand Sigma Orthopedics.

In 1959 they signed a contract for the distribution of their products in the USA with the Seamless Rubber Company (a filial of Rexall Drugs). In 1964 an agreement with the Zodiac Company to start the representation and production of their rubber boats in Spain was signed.

In 1965 Nemrod suffered a serious crisis and was progressively associated with Metzeler Kautschuk until it was completely absorbed in the early eighties. Years later, the Metzeler group had financial problems and, as Bayer

was its main creditor, Bayer become the owner of the Metzeler group. The Nemrod-Metzeler company, based in Barcelona, entered into debt and about two years later was sold to Pirelli. The Italian company soon took hold of the reins; however, they were interested in acquiring the importation quotas of rubber and some technical details in order to improve their production of underwater rubber products (fins, masks, etc.). Shortly afterwards, around 1990, Nemrod went bankrupt and went into liquidation.

For a long time, up to 2012, the Nemrod archives were believed to be lost until a former Nemrod employee, José María Zapata, was found by members of the Spanish HDS and made an honorary member. A part of Nemrod's history was then recovered, especially when he wrote a book about it in 2015, which was published by the Spanish HDS. (Fig 12. Mr. Zapata's book about Nemrod.)

## The History of SILURO

Our story begins in 1957 when Nemrod, which was always aware of the American market and to which they often exported diving equipment, decided to enter the world of underwater photography as all other brands in this sector did. They asked the Registry of Industrial Property of Spain for an "Introduction Patent" to grant them 10 years of manufacturing and exploitation rights exclusively for Spain for the camera manufactured in the US by Mako and marketed by Healthways. It was the grey Mako SHARK camera whose licence was approved in February 1959, with the number 247376. (Fig 13. Mako SHARK license to Nemrod.)

We do not know if it was as a result of disagreements with Healthways, because of the enormous economic success in the US of the Mako model, or more likely, due to a problem of trade margins. The fact is that Vilarrubís and Sagué thought it was better to develop their own camera and so, in 1961, the Nemrod Company decided to start in the production of underwater cameras.

In 1961 a young mechanical engineer from Barcelona, who had occasionally collaborated with Nemrod, went to work for the company. Our Nemrod historian, Mr. José Maria Zapata, is the man who had participated in virtually all designs and manufacture of the most important Nemrod products. He was born in 1934 and is now 82 years old, and has the ability to memorize and file much of the historical information used in this article. Mr. Zapata explained that in 1961 Juan Vilarrubís gathered his design team and showed them a grey Mako SHARK camera and proposed to develop an underwater camera with similar characteristics to that produced by Mako in the USA. Whilst the design phase was ongoing, Mr Pedro Vilarrubís proposed a name for the camera. It would be called "SILURO". It was the name of an electric fish, which tied in with the additional electrically powered flash of the camera. The new name sounded good in all languages and by association of ideas, implied that it was for underwater use.

There were obviously a lot of design problems to be solved together with economic problems such as invalid patents and lack of availability of the camera parts. However, they decided to follow the idea and design concept of the economical Mako underwater camera, applying the technical improvements made possible by the knowledge and experience of the Nemrod team.

## SILURO production

The camera consultant (Nemrod had never made a camera until then) was Herr Dürsteler, a German who lived in Barcelona and was a specialist in Voigtländer cameras. Nemrod designers were clever enough to develop and provide themselves with all the necessary mechanisms similar to those used in the Kodak Brownie camera, which allowed them to avoid royalties and licences. They designed a new film pressure plate, which allowed the film to be completely flat during exposure. The result was a great improvement to the image focus and sharpness. Initially, a series number "0" (Zero) SILURO was made, consisting of about 10 units which were given to the team of advisors, collaborators and testers among whom was Eduard Ametlla, (Fig 14. Juan Vilarrubís & Eduard Admetlla.) Roberto Diaz, (Fig 15. Roberto Diaz checking a Nemrod SILURO underwater.) Raimundo Sagué and José María Zapata. (Fig 16. Mr Zapata checking his camera at the seaside ca. 1961-1962.) The whole process would last for just over a year. The first units bore the name of "SILURO" and "Nemrod" moulded on the front of the camera, below the lens. (Fig 17. First SILURO model with "Nemrod" moulded on the NOVODUR case.)

Some years later (ca. 1966) "Nemrod" came to be written on a distinctive blue label (instead of being moulded) underneath SILURO. (Fig 18. Second SILURO model with a "Nemrod" blue tag glued on the case.) The most probable reason for doing that was the possibility of producing the SILURO for third party "own brands" or distributors (such as Seamless) or selling the licence to them as Mako did with Healthways. "Made in Spain", marked on the back part of the body, was always present.

The test was a success and they proceeded with the mass production at La Sagrera factory in Barcelona. Each of the cameras was verified and checked by Antonio Escobosa, the assembly technician assuring quality control, with a label where his initials appear as "A.E." on the bottom. The quality control took into account four different points: objective lens quality, shutter release, water tightness and the electrical flash system. Nemrod set a global

precedent when performing this methodical quality control on their SILURO camera. (Fig 19. Quality Card signed "A.E." by Antonio Escobosa.)

On the quality control label, the camera number is indicated as from the moment they began to be numbered. The serial numbers of the first cameras are unknown as they were produced without these. From the last numbered ones we can deduce that probably 25,000-30,000 SILURO cameras were made.

In addition to the manufacturing control, Nemrod improved some features such as correcting the excessive buoyancy of the Mako SHARK by adding lead weights. To control leaks, a motorcycle pneumatic tyre valve was placed in the upper part of the front half. The camera was designed for an external pressure of 60psi/4 atmospheres/120ft (for a working depth up to 100ft - 30 meters), so it was only necessary to pressurise just a little with a bicycle pump. If the pressure was exceeded the clips would bend and the front of the camera would pop off with an explosive force. The valve was also useful to avoid opening problems after plane journeys. The quality of the material used for the housing was improved with an injected ABS (NOVODUR by Bayer) and made thicker than the Mako SHARK. The fastening system was secured by four clips and a watertight seal was guaranteed by using the ingenious system of the O-ring.

The optical system for SILURO was provided by the INDO Company from Barcelona. Mr Pedret, their technician, was responsible for the optical calculations of the lens. The focal length of the lens was 70mm for the 6x6 film. The focus of the SILURO is fixed, set to between 1.0m and 2.5m, the distance range recommended for underwater photography, and the aperture is fixed at f16. (Fig 20. Nemrod SILURO first model.)

The shutter speed of the SILURO is fixed at 1/55 sec, perfect in order to synchronize with the flash bulbs. The system uses No. 5 or No. 25 size flash bulbs or M-2, M-3 or XM bulbs with an adapter. For colour photography above the water blue bulbs were recommended and clear bulbs for underwater black and white and colour photography. The electrical system was powered by a 22.5v battery and was fitted with a 100  $\mu$ F, 25/30v capacitor.

Dimensions: 16,5 cm (d) x 27 cm (l) x 20 cm (h) and weighing 1.550 kg (including flash). The price in 1969 was about 2185 Pesetas, which means, once converted to the current rate of exchange, the purchase price of one digital GoPro camera in 2016.

During the period of its manufacture there were minor modifications to the outer shape of the housing up until the arrival of the SILURO "S" (Sporting) in the middle of the 1970's when the German Metzeler company absorbed Nemrod. The overall design was maintained but he wanted to give it a more modern and sporty look, so it was launched in black with red handles or in red with black handles. The idea was to make it an amphibious camera. (Fig 21. The complete series of SILURO Cameras. Front row from left to right: the oldest type of SILURO, the second model with the blue label, the transitional prototype between SILURO and SILURO "S". In the back row from left to right: the SILURO "S" in black and in red.)

Other beneficial modifications were made to the SILURO "S", such as incorporating the selector on the top of the camera enabling variable focus, which was changeable from 0.8m to infinity. In reality, it would be more useful for above water photography. Also a selector on the front right hand side of the camera let the diver choose between f16 and f22.

The SILURO "S" maintains the same original bulb flash.

The SILURO and SILURO "S" could use black and white and colour film in both 120 rolls (12 exposures of 6x6 ) and 220 (24 exposures of 6x6 ). Both cameras were water-resistant up to 40 metres.

A special device requested by Victor de Sanctis was the SILURO aluminium Long Arm Flash. It had a very short production run. (Fig 22. SILURO long arm flash as suggested by Victor de Sanctis.)

## SILURO Graphic Material

It is very curious because although there were only two camera models, the SILURO and the SILURO "S", there were a number of different designs of packaging boxes made for the SILURO, which gives us an idea as to the many trials and changes over time. Until now I have found four different models of packaging:

1) The first version of the box corresponds to the period from 1962 to the first half of the 1970's. The black and white photograph on the cover of the box belongs to Margarita, the teenage daughter of Eduard Admetlla, the best known Spanish diver and personal friend of the Vilarrubís family. The box had the logo of Nemrod the Archer. (Fig 23. First Nemrod SILURO camera box.) The content of the initial text on Nemrod's logo slowly disappeared to adapt to changing times and exports, as it was very difficult to apply to rubber products and the ever smaller accessories. The flash boxes, the instruction manual and the exploded diagrams went through the same logo changes. There were three subtypes of logo during this time: (Fig 24. The evolution of the brand logo during the Nemrod period.)

A) The initial packaging corresponding to the first units, bore the stamp of the company with the image of the Archer Nemrod with the phrase: "Nemrod el Cazador Rey de Babilonia" ("Nemrod the Hunter, King of Babylon"). Probably 1962-1966.

B) In the second subtype the stamp remains with the archer and the phrase "Equipos Nemrod" ("Nemrod Equipment") Probably 1966-1970.

C) In the third subtype only the stamp with the Nemrod archer in the water appears without any text. The face and shape of the archer is more modern. The estimated period was from 1970.

2) The second version of the box corresponds to entering the American market. In the USA, the original Nemrod SILURO was marketed by the Seamless Rubber Company (New Haven, Connecticut) with a special display box. The stamp depicts the Nemrod archer and the phrase "Nemrod by Seamless" appears. Probably 1966-1975. (Fig 25. Nemrod logo as it was sold in USA by Seamless).

3) The third version corresponds to the SILURO "S" marketed as NEMROD-Metzeler. (Fig 26. NEMROD-Metzeler Display case for the SILURO "S" - closed.) & (Fig 27. NEMROD-Metzeler Display case for the SILURO "S" - open.) In the display case, the logo of the Archer is in blue and white, without any text, as it was in the third subtype of the first series. Estimated time ca. 1975 (Fig 28. Nemrod archer logo in the last days before the Metzeler's absorption .)

4) The Fourth model corresponds to the display box of the SILURO "S" at the time of Metzeler (Fig 29. Nemrod display case for the SILURO "S" in Metzeler's time - closed.) & (Fig 30 Nemrod display case for the SILURO "S" in Metzeler's time - open.) [this is the box before Metzeler – should be Fig 27] where the Nemrod archer was replaced by the Metzeler elephant, obviously without any text, probably at the beginning of 1980's. (Fig 31. Nemrod logo when owned by Metzeler.)

The Nemrod employees weren't very happy with the Metzeler takeover, so they hoped that one day the Archer would overpower the Elephant. They even made jokes about the logos. (Fig 32. Nemrod logo was killing the Elephant.)

## Summary

The SILURO camera was on sale for more than 25 years and still today, there are advertisements for secondhand ones and many units are offered for sale to collectors on the Internet. It's interesting and almost unbelievable how a project that emerged from a copy of one American camera ended up improving the performance of the original one and even sold in the USA for many years.

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