



Restorer's Workshop

FUEL CAN

Restorer Martynas Kosas

The collections of Kaunas Ninth Fort Museum have been enriched with valuable exhibits commemorating the Nazi occupation of Lithuania during WWII. They were donated by Algimantas Kinta from Panevėžys District, Ramygala Eldership. The exhibits were received by Janina Baršauskaitė, the leader of guided tours of Kaunas Ninth Fort Museum. Among the exhibits handed over to the museum, there was a fuel can, which undoubtedly took part in WW II and remained in Lithuania. Before being exhibited, it first went to the restorer's workshop.

The fuel can is an early model made in 1938. The manufacturer's marking on the bottom indicates that the fuel can was manufactured at the *Schwelmer Eisenwerk Müller u. Co.* company in Schwelm (Germany), where it had been designed. It was one of only three companies producing fuel cans for the German army in that year and accounted for more than half of the cans produced. During the conservation process, it was found out that the fuel can was painted in *feldgrau*, the most common greenish-grey colour at the time. The blue paint stripe visible on the artefact may have been applied during the war. Its true purpose can no longer be ascertained, but possibly the fuel cans were marked in various ways by the soldiers themselves in order to avoid mixing them with other fuel cans.

As the fuel can, which has been added to the museum collections, was used for its intended purpose of storing fuel, its condition could be considered good: there is no loss of elements, no deformation and no deep corrosion of the surface. The metal preservation has also been aided by the high quality priming and painting carried out more than 80 years ago. However, the effects of long use are evident: the fuel can has lost its original appearance, corrosion and dirt have affected it, and the paint colour could not be seen on the surface. It was decided to conserve the fuel can, i.e. to remove the corrosion products and the accumulated dirt, to expose the remaining paint layer, to consolidate and preserve it and to coat the surface with conservation materials.

The exhibit was cleaned with special restoration tools: the accumulated dirt was cleaned, the corrosion was softened and removed by mechanical means. The metal surface was smoothed and coated with restorative conservation materials. As a result, the WWII artefact has been conserved, the remains of the paint coating underneath the corrosion layer have been uncovered, the inside of the fuel can has been washed and the artefact has been restored to its display appearance. The exhibit is currently on display at Kaunas Ninth Fort Museum.

Historical context

In November 1936, the Nazi German army announced a competition to design a fuel can for storing and transporting petrol. The new fuel can was intended to replace the cumbersome fuel cans that had been used until then and to provide the newly developed motorised military units with a universal container for fuel transportation.

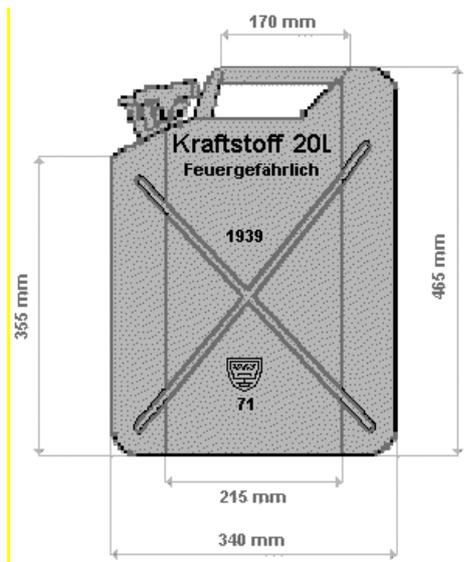
The company *Schwelmer Eisenwerk Müller u. Co.* in Schwelm, Germany, under the leadership of chief engineer Vinzenz Grünvogel, decided to enter the competition and started to develop a new fuel can design. A rectangular fuel can was designed and produced by welding two stamped steel plates. The new fuel can had a capacity of 20 litres and weighed 4 kilograms. The fuel can was

closed with a cork and had a handle with three handles. This handle design allowed one soldier to carry four empty fuel cans using the outer handles or two full ones using the central handles. The shape and robustness of the new fuel can made it possible to stack them on top of each other without fear of deformation. In order to protect the fuel can from corrosion, it was coated with orange-red primer and painted. The usual colours of the fuel cans were feldgrau (greenish grey), schwarzgrau (blackish grey), commonly known as tank grey, and dunkelgelb (dark yellow), the latter being the rarest. Inside the fuel can, just behind the cork, there was a tube which prevented the fuel in the fuel can from leaking when driving.

The production of the new fuel can started in 1937 in cooperation with the Ambi-Budd stamping factory in Berlin, which had the necessary equipment to start mass production. In 1938, Novak Bautzen joins Müller and the Ambi-Budd factory to start large-scale production of the fuel can for the army. For the first time, the new fuel can was used in military operations between 1938 and 1939, during the occupation of Austria and Czechoslovakia and in the Polish campaign. Until 1940, the Nazi German authorities kept the drawings and production documents for the fuel cans secret, and no one except German factories could produce them. Even Germany's allies could not receive the fuel cans. However, due to the outbreak of military conflicts, hundreds of thousands of them were used on the battlefield, and it was impossible to preserve them. Therefore, the long-hidden technology fell into the hands of Germany's adversaries and was started to be copied.

Early model of the fuel can (1937-1941)

The original fuel can model had a cross-shaped reinforcement stamped in it in order to prevent deformation (see photos). The early fuel can model and its dimensions:



The early model had the following markings from top to bottom:

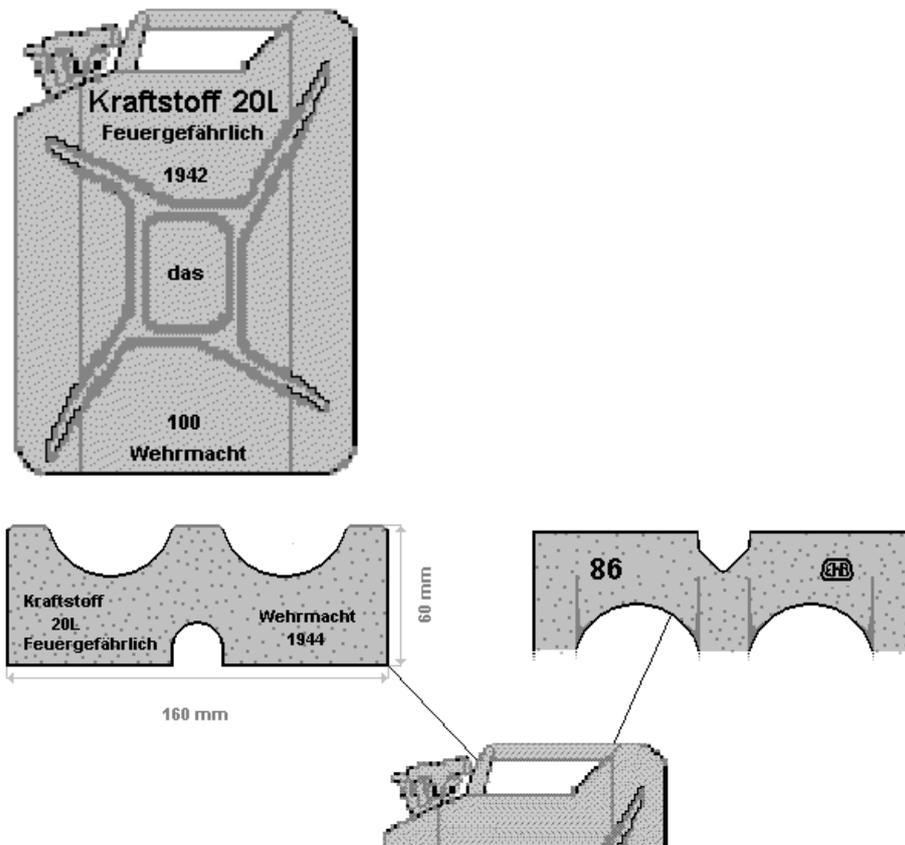
- *Kraftstoff 20 l* - "Fuel 20 litres" (stamping or painting);
- *Feuergefährlich* – "Fire danger" (stamping or painting);
- 1939 - year of manufacture;
- manufacturer's logo;
- a number, which may mean the supplier's code for the metal of the fuel can body.

Some models were marked Heer – "Army" (pressed or painted).

Second model of the fuel can (1939-1945)

In 1939, an improved fuel can model was introduced, following the war experience and in order to facilitate and speed up its production. The main difference from the previous model was a more complex stamping, which led to a slight change in marking. It was essentially the same as of the early model, except that *Heer* was replaced by *Wehrmacht*, the armed forces. Some fuel can manufacturers discontinued the marking on the side of the fuel can and moved it to the handle. The fuel cans were marked simply by applying the numbers 20 and 24 in paint. This meant that a full fuel can weighed 20 kilograms with petrol and 24 kilograms with water.

Images of a standard fuel can and its handle (dimensions the same as the early model):

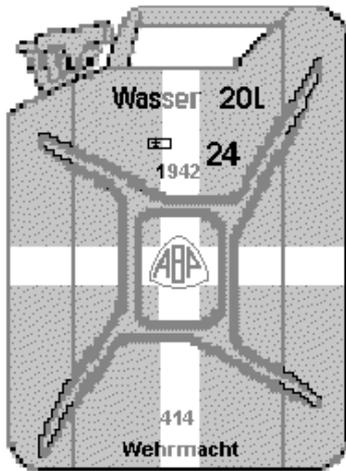


Special model of a water can (1940-1944)

The success of the new can led to the development of a special model for water in 1940. It should be taken into consideration that the army also needed water. The Wehrmacht had large motorised divisions that used water to cool engines; this was particularly topical for units fighting in Africa.

The new can did not have the markings *Kraftstoff* and *Feuergefährlich*, which were replaced by the marking *Wasser* (water) and a large white cross identifying the contents. It was also often simply marked with a black stamp, with the number 24 painted red (the weight in kilograms when the can was filled with water) and the number W painted white. As well as the fuel can, the water can was marked on the handle rather than on its sides.

Image of a water can (dimensions the same as the early model):



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