

Aesthetics of Eurometaal. Creative Destruction, Perpetual Progress and Efficient Violence as a Problem of Design.

I would like to share some of the materials we found during our 4 months research and observations about design in the history of Eurometaal, from the design of the products and the infrastructure of the factory, to the advertisements, internal publications and other types of visual communication. Through these examples I will reflect on the role of design in production of military-industrial complex, the aestheticization and aesthetics of the 'product', migration of technology between social and military sectors, and the role of design in perpetual progress. I will look at Eurometaal as a case study to observe how capitalist industrial production, consumerism, design and warfare come together.

Er zit muziek in metaal. Zeker weten. En dat hebben we het niet over heavy-metal maar over toekomstmuziek.¹
(translation: *There is music in metal. Sure. And we are not talking about heavy metal, but about the music of the future.*)

Metal as a source for the music of the future. But what is the product?

1 Efficient Violence as a Problem of Design (Fig. 1–4)

Design is often rightfully considered to be a force for good, a medium for creative production and improvement. And its role in creation and mediation of tools of violence often stays overlooked. Design is also rightfully considered to be a source for innovation and progress. But what happens when progress as we know it stops making sense? When the goal of this progress is progress itself? What is the moral responsibility and role of designers towards the outcomes of their work? Is a successful design of a weapon a good design, since it reached the maximum level of functionality? Do these objects have a place in cultural memory?

In the video-lecture titled *The Problem of Design. How to Kill People* from 1960, the American architect and designer George Nelson observed the evolution of weaponry and discussed effective violence as a design problem. Nelson traced the chronology of violent objects from prehistory to his present, presenting the objects from the American Museum of Natural History. He assigns the improvement of the lethal technology in its functionality, efficiency

and aesthetics to the designer, from a rock to the club, to the gun, to the atomic bomb. He observed how those improvements further distance between those who operate them and those who suffer the consequences. In his lecture Nelson pointed out that killing has an unquestionable support of society and is one of the most important areas of design, next to fashion and homemaking.

Nelson gave his lecture in the time of the Cold War and the time of the fetishisation of conspicuous consumption. According to Nelson, the product had replaced the human being at the centre of culture.

2 The Biography of the Object (Fig.5-9)

This thought echoes ideas expressed by the Soviet writer Sergei Tretiakov in his essay titled *Biography of the Object* from 1929.

Tretiakov suggests to subvert the traditional narrative structure and to place the object in the centre of the story, to make it the main protagonist, and observe its relationship with people through its biography, from the moment of creation to the moment of destruction. The object will tell us about its producers and users, travelling on a 'conveyor belt', where the raw material turns into the object through its interaction with people. Its biography will represent a profile of social relations. We can observe the class struggle on every stage of the object's development. The object becomes a prism which reflects social, political, cultural conditions of the time.

Let's look at the biography of the objects, produced at Eurometaal, and how their migration from the place of creation to the place of consumption or destruction reflected these conditions. Let's imagine the people they 'interacted' with on the way, from the moment of production, to the last moments of their existence and the victims of their purpose, precision and success of their design.

Object as a product. Object as an image, as a symbol, as a carrier of cultural memory and national identity. Its design, materiality, and aesthetics. The craftsmanship that goes into its production. Its potential transformation into something else. Its migration. Its impact. Its afterlife.

Eurometaal manufactured a wide range of ammunition and pyrotechnical products in the field of various types of tank, artillery and anti-aircraft rounds. According to their promotional brochure: 'A flexible organisation, modern installations and many years of experience and know-how make it possible that special requests can be fulfilled. The products are well known for their reliability and long storability'.²

Some of the more well-known and prominent products are AR10 rifle designed by the Armalite Division of Fairchild Engine and Airplane Corporation,

Los Angeles, and manufactured by then Artillerie Inrichtingen at Hembrug between 1958-1960. AR-10 is a predecessor of AR-15, which was redesigned to become M-16, one of the most widely used automatic rifles in the world together with AK-47 (Kalashnikov rifle).

.50 caliber bullet, is a cartridge developed for the Browning .50 caliber machine gun in the late 1910s, entering official service in 1921. It is a standard cartridge for NATO forces as well as many non-NATO countries. 'Eurometaal has developed a .50 cartridge with an armour piercing capacity far superior to that of the existing types'.³

Another example is a multipurpose hand grenade with controlled fragmentation, developed to a specific requirement of the Royal Dutch Army.

These and many other products were sold by Eurometaal all over the world legally and illegally, and according to the information we discovered during our research, occasionally ended up on both sides of conflicts.

3 Aesthetics of Eurometaal (Fig.10-27)

Eurometaal (or Artillerie Inrichtingen) for a long time was a semi-independent weapon producer. But in 1973 it has become completely independent from the government, this is the time when Eurometaal rebranded itself and increase its participation in the free market. Eurometaal sent sales people all over the world and participated in military fairs, advertising their products around the world.

It's interesting to observe how visual language was deployed in different ways for different purposes at Eurometaal. A serious tone used with precision in corporate identity and brochures concerning the technical aspects of production and safety, in contrast to the playful infantile cartoonish language at times used in the internal magazines and brochures intended for the workers, in order to obscure the seriousness of the matter and divert attention from it by turning the violent object into a playful character. This type of visual language is often used by big tech companies, when addressing the users, in order to break down the complexity of the mechanism, and to distract attention from important issues. The anthropomorphic bullet with a friendly face, as a mascot of the factory, is very different from the language directed at the customer.

In the context of resistance and anti-military and pacifist movements the target often appears as a subversive symbol. A symbol of Eurometaal's new identity often became weaponised against them by activists and pacifist groups. The target becomes a loaded symbol, deployed by both sides.

Other well-known signs used in the activism anti-militarist movements are a peace symbol and the symbol of broken rifle.

The Pacifist Socialist parties in the Netherlands and in other countries used the peace sign in their logo, sometimes in combination with the symbol of a broken rifle.

Sometimes these symbols reemerge outside of the direct military and antimilitary contexts.

4 Creative Destruction, Obsolescence of Technology (Fig. 27–44)

I would like to go back to George Nelson and his vision of design and theory of production. In his lecture he touches upon the polarity between creation and destruction, seeing this as a driving force of progress and innovation, and the disruptive process of transformation that accompanies it. He says: "Evolution and revolution, creation and destruction, are different names for the same thing. We use one or the other depending on our choice of a frame of reference."⁴

His ideas derived from the theory of 'creative destruction' introduced by the Austrian economist Joseph Schumpeter in his work on political economy titled *Capitalism, Socialism and Democracy* (1942). He sees the process of Creative Destruction as the essential fact about capitalism, which he describes as a system that constantly revolutionises the economic structure from within, constantly destroying the old one and at the same time creating the new one. This idea also appears in the earlier work of Marx, where it implies not only that capitalism destroys and reconfigures previous economic orders, but also that it must ceaselessly devalue existing wealth (whether through war, or economic crises) in order to clear the ground for the creation of new wealth. The evolution and subsequent obsolescence of technologies can be seen as the direct outcome of this process.

It's interesting to look at the history and destiny of Eurometaal in the context of the history of industrialisation, innovation of technology and its subsequent obsolescence. The paradox of creative destruction can be seen in the example of Eurometaal on two levels: on the level of the product, creative production of bullets meant to be destroyed by destroying others; and the process of creative destruction the factory itself went through, being an example of a modern and innovative factory, but at the same time destined to be destroyed by progress, having become obsolete.

Throughout the 20th century the factory was switching between production of ammunition to civil production multiple times, as a way to sustain itself in the times of low demand for ammunition. After the WW2

Eurometaal produced agricultural tools such as seed and weeding machines and potato sorting machines for the post-war mechanization of Dutch agriculture. In the 60s and 70s, there was a high demand for the company's ammunition and weapons production. In the 80s there was a decline in demand, and Eurometaal turned to civil production once again. In the 90s after the fall of the Berlin Wall, the amount of orders declined even more. Eventually the factory had to close in 2003, because of the "low need for ammunition in recent years and the expectation that this will not change in the coming years," according to the official statement.

Has the factory itself become a victim of technological progress, an example of creative destruction in action? Was it the result of the inability to keep up with the change in warfare?

To quote Harun Farocki, the german filmmaker and author: "Post-industrial products are characterised by a declining proportion of material components, meaning that they depreciate more slowly. In order to prevent them clogging the market they have to be artificially aged, or as Marx put it, morally depreciated. The same is true for monopolists: only through constant innovation can products age and lose value; competition is no longer needed."⁵ Automation and the removal of direct human engagement can be seen as a cause of the destruction of industrial military production of the 20th century. As George Nelson described in his lecture, the distance between those who operate the weapons and those who suffer the consequences has widened even more. The warfare has become mediated.

As theorist Paul Virilio writes in *War and Cinema*, "Since Antiquity, military institutions have continued to revolutionize science and technology, and to solve the most complex and varied technical problems."⁶ We can often see how technological achievements meant for warfare find their way into civil life and those designed for peaceful consumption become a weapon of destruction.

Arms production in the late 19th century had a great influence on manufacturing process and mass production. It was the catalyst of America's Industrial Revolution and what became known as "the American system" of manufacturing. Arms production was the first area of manufacturing that introduced interchangeable parts, which turned production line into a quicker, more predictable and more automated process. So guns were "the first truly mechanically-produced production line objects made anywhere". It was a revolutionary improvement in terms of cost, time, and labor over the existing "workshop system" in which skilled craftsmen formed and assembled parts by hand.

Throughout history the link between the technologies of war and culture is very present. Paul Virilio makes a connection between the evolution

of cinema and warfare, writing, "The industrial production of repeating guns and automatic weapons was thus followed by the innovation of repeating images..."⁷ In his essay, *The Work of Art in the Age of Mechanical Reproduction*, Walter Benjamin also draws a connection between mass produced images and the mass culture, and the American System of manufacturing.⁸

Here I want to go back to the quote from the pamphlet of the school of Eurometaal.

Er zit muziek in metaal. Zeker weten. En dat hebben we het niet over heavy-metal maar over toekomstmuziek.

(translation: *There is music in metal. Sure. And we are not talking about heavy metal, but about the music of the future.*)

Metal as a source for the music of the future. But what is the product?

At certain stages next to the production of ammunition Eurometaal manufactured agricultural tools, parts for cars, forklifts, milking robots, high-precision tools, sailboats, and durable locks. It also developed a press for the production of coins for the Dutch Mint, which produced guilders and later euro coins.

During peace time weapons are turned into objects of culture and agriculture. But the opposite situation also occurs when during the times of war monuments and objects of culture are turned into weapons. Collecting home appliances and church bells to be melted into ammunition was a common practice throughout centuries. Technologies and methods developed for war seeping into civil life and consumer market, military symbols reemerging in culture and everyday life. Are these examples of recycling of materials, technologies, memory and values, examples of creative destruction of history and culture?

5 Cultural Memory (Fig. 45–46)

In 2006 Hembrug complex was declared a national monument. According to the official document, "Hembrug site has a cultural, military and architectural-historical value".⁹

Precision and functionality were present everywhere on Hembrug terrain. The whole industrial complex was meticulously designed and thought through to be functional in every aspect and every situation. Every structure was designed to withstand a potential explosion, and to minimise the damage. The roof of the buildings designed as the weakest point in the structure in

order to be blown away in a result of an explosion, leaving the walls intact. The Shock forest and the earth walls were planted and built to absorb and withstand the impact of explosions. In the design department of the factory, a group of designers and engineers were working every day on the improvement of the products. Hembrug as a monument to the industrial past, design, functionality, ingenuity and precision.

Monuments become physical manifestations of values, a part of cultural memory, collective consciousness and national identity. It is interesting to note that guns are usually absent from contemporary design museums, despite their role in the history of industry and culture in general. Pre-industrial arms often appear in art collections though as objects representing craft and tradition. Is there a place for an object perpetuating violence in a museum? Or in cultural memory? What gets to be commemorated and what gets to be forgotten? Is the question of killing a design problem? What is the responsibility of the designer in production of violence?

At the moment there is an exhibition at the Zaans museum in Zaandam called *The factory as a cathedral*, dedicated to the work of Artist Herman Heijenbroek and his fascination with progress and industrialisation of the late 19th century. He painted factories and machines around the world, including the Zaan region. He saw factories as modern cathedrals. It is an example of techno-optimism of the early industrialisation. Progress and innovation have been always considered a driving force of history. But what if progress as we know it stopped making sense? Can it be stopped? Can we start looking around, as Anna Tsing suggests, instead of looking ahead?¹⁰ What is the role of design in perpetual progress? Are "Green Bullets"¹¹, currently developed by U.S. military considered a design innovation? Is the new problem of design sustainable violence?

Today there is a growing understanding that innovation has become an inherently problematic notion, and can no longer be considered a self-evidently progressive or positive value. Innovation comes with conflict and disruption, and design plays a big part in it.

- 1 Pamphlet of the school of Eurometaal
- 2 Promotional brochure, *Eurometaal, Production Program*
- 3 Promotional brochure, *Eurometaal, Multipurpose Hand Grenade*
- 4 George Nelson, *Ends and Mean*, in *Problems of Design* (New York: Whitney Publications, 1957), 34, 37.
- 5 Harun Farocki, *A Way*, 2005
- 6 Paul Virilio, *War and Cinema: The Logistics of Perception*, 1989
- 7 Paul Virilio, *War and Cinema: The Logistics of Perception*, 1989
- 8 Walter Benjamin, *The Work of Art in the Age of Mechanical Reproduction*, 1935
- 9 Rijksdienst voor het Cultureel Erfgoed, Ministerie van Onderwijs, Cultuur en Weterschap, 2006
- 10 Anna L. Tsing, *The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins*, 2015
- 11 This environmentally-friendly bullet swaps out the traditional lead core for copper, ensuring that it does not contaminate the food chain or water supply; <https://dublin.sciencegallery.com/designandviolence/exhibits/green-bullets.html>

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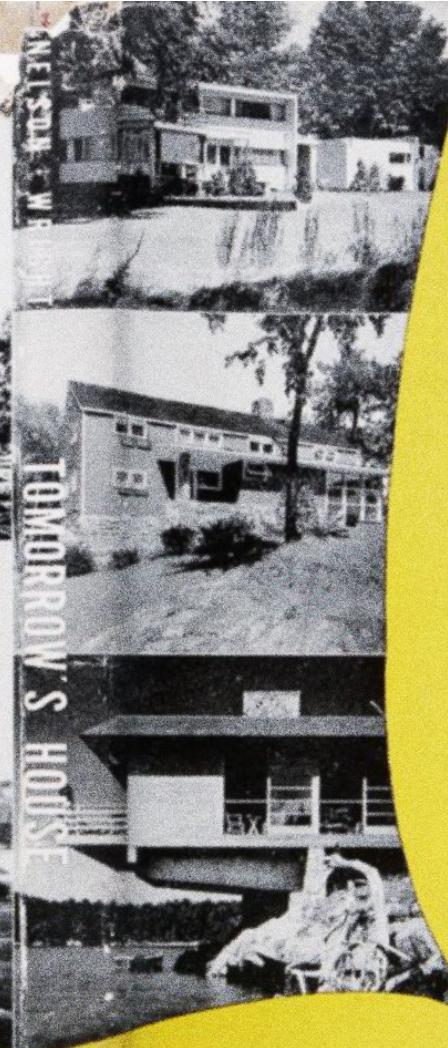
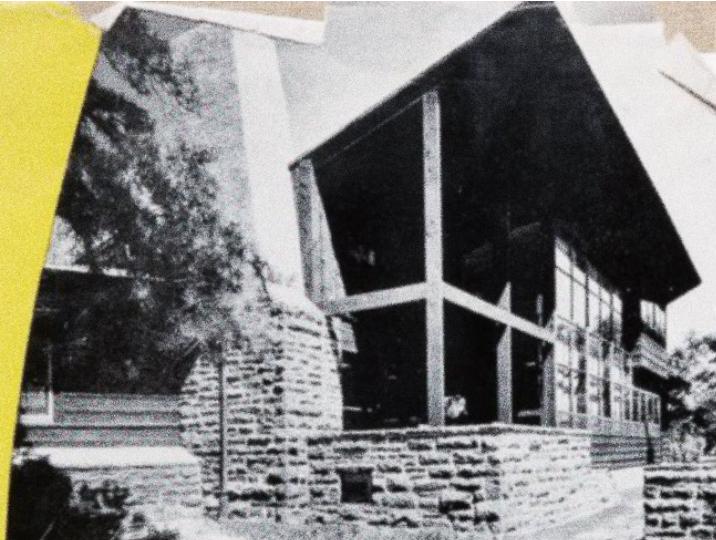
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A complete guide for the home builder

TOMORROW'S HOUSE

THIS BOOK TELLS YOU

1. How to plan your new home.
2. How to remodel your present home.
3. How to make the best use of the latest materials, equipment, and appliances.

GEORGE NELSON

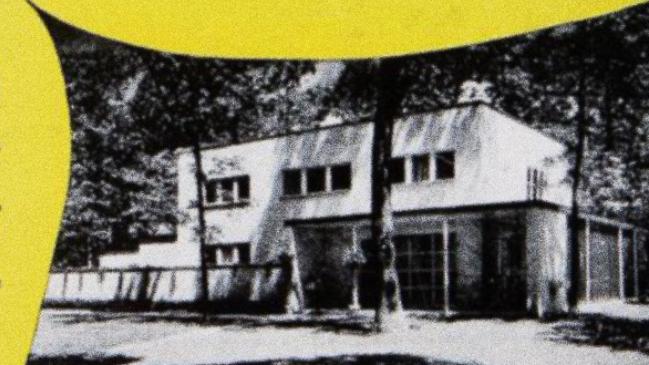
Consultant, Architectural Forum

HENRY WRIGHT

Managing Editor, Architectural Forum

SIMON AND SCHUSTER

A complete guide for
the home builder



TODAY'S STORAGE PROBLEM:

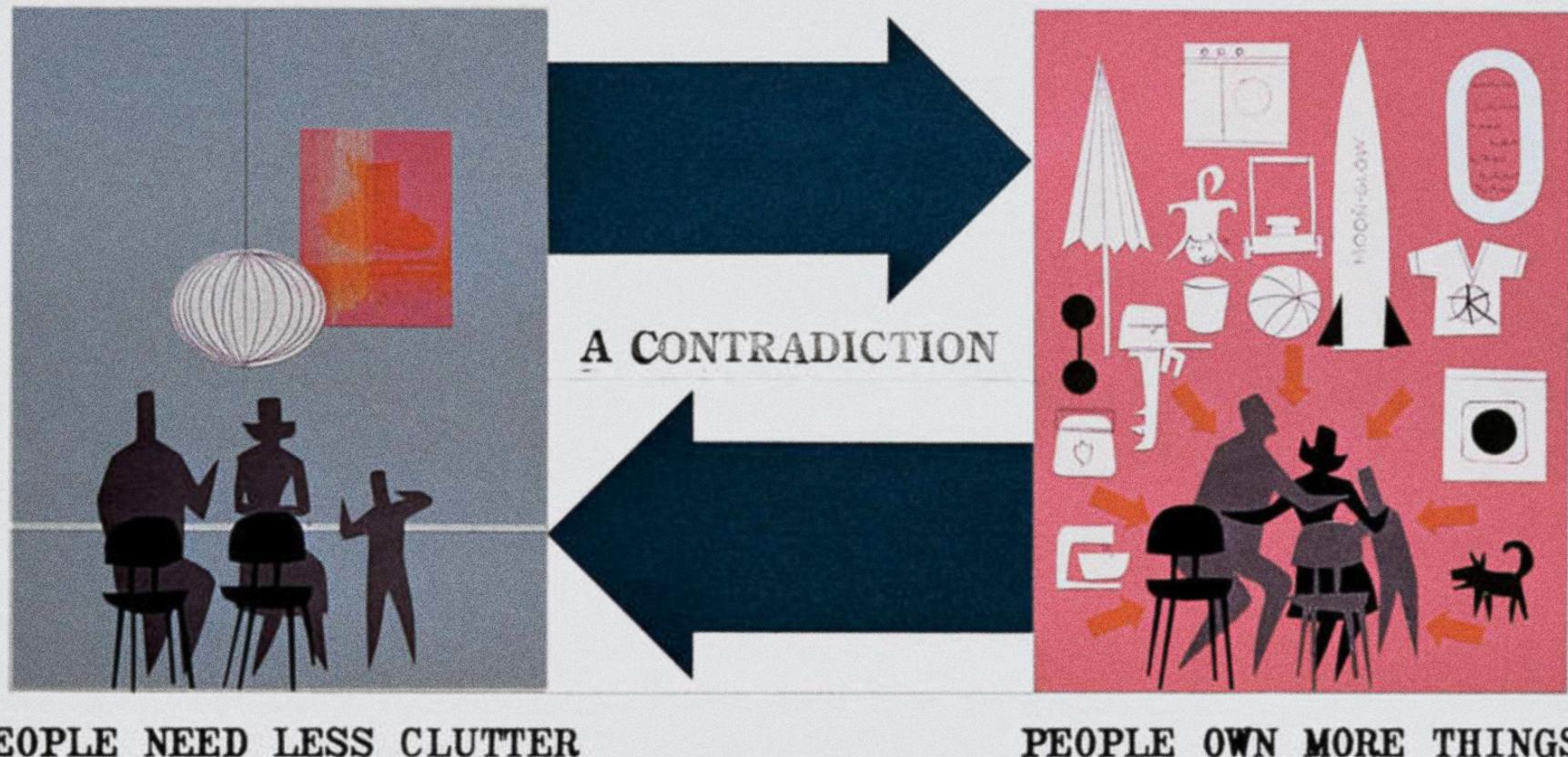




Fig. 3 George Nelson, *The Storagewall*, Life magazine, 1945

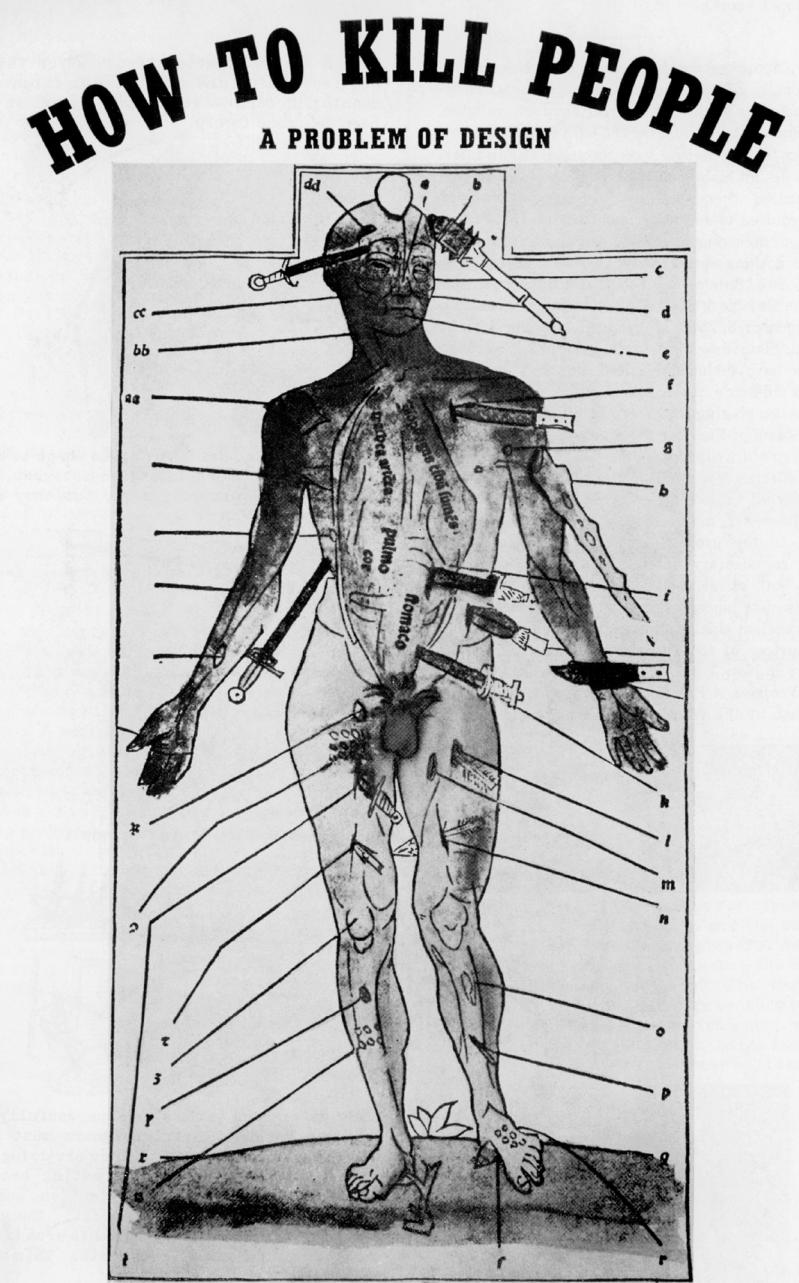


Fig. 4 Medieval illustration used in the CBS/Camera Three short film *How to Kill People: A Problem of Design*, 1960. Image courtesy of the George Nelson Foundation/Vitra Design Museum Archives.



Fig. 5 Still from the movie Lord of War, 2005 (depicting the perspective of the bullet)

EUROMETAAL

PRODUCTION PROGRAM

GENERAL

Eurometaal manufactures a wide range of ammunition and pyrotechnical products for the Army, Navy and Air Forces.

The company has current production experience in the field of the various types of tank, artillery and anti-aircraft rounds.

A flexible organization, modern installations and many years of experience and know-how do make it possible that special requests can be fulfilled. For many years already Eurometaal is awarded with the AQAP-1 certificate, the highest distinction within NATO for quality assurance. The products are well known for their reliability and long storability.



ARMA-LITE

AR-10



mfd by  Nederland



.50" Ammunition

General information.

Eurometaal has more than 20 years of production experience with the manufacture of different types of .50 ammunition. A modern and automated equipment in both the metal sector and the field of pyrotechnics guarantee a high valued product meeting the strictest quality requirements.

The types manufactured are:
Ball (functionally according to US type M33)
Dim-Tracer (functionally according to US type M17)

AP (functionally according to US type APM2)

API (functionally according to US type M8)

APIT (functionally according to US type M20)

APHC Armour Piercing Hard Core

APHCI Armour Piercing Hard Core

Incendiary

The types mentioned are all ballistically interchangeable and can be supplied in different mixtures.

Weapons.

The .50 ammunition is suitable for aircraft, anti-aircraft and ground machineguns of the following types: M2 HB, AN, M3, M85.

Fig. 8 Eurometaal promotional material

EUROMETAAL

eurometaal nv
p.o. box 419, 1500 ek zaandam - holland
telephone (075) 504 911
telex 19303 emz nl
cables: eumet-zaandam

**multipurpose
hand grenade**
with controlled
fragmentation



Fig. 9-10 Eurometaal promotional material



Fig. 11–12 Eurometaal promotional material



Fig. 13–14 Eurometaal promotional material



Fig. 15 Eurometaal promotional material

EUROMETAAL

EUROMETAAL



Eurometaal is specialised in the production of conventional and improved conventional ammunition. Its products consist of 12,7mm machine gun up to 203mm Howitzer ammunition. Besides this Eurometaal also produces several handgrenades, landmines, rocket system components as small firearms. Development can...

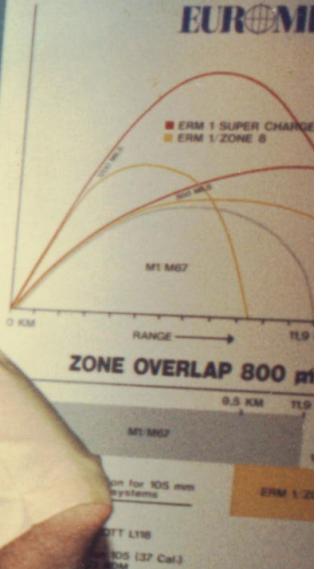


Fig. 16 Eurometaal promotional material



Fig. 17 Eurometaal promotional material





Fig. 20 Poster, anti-nuclear weapon campaign, dutch PSP party, 1985

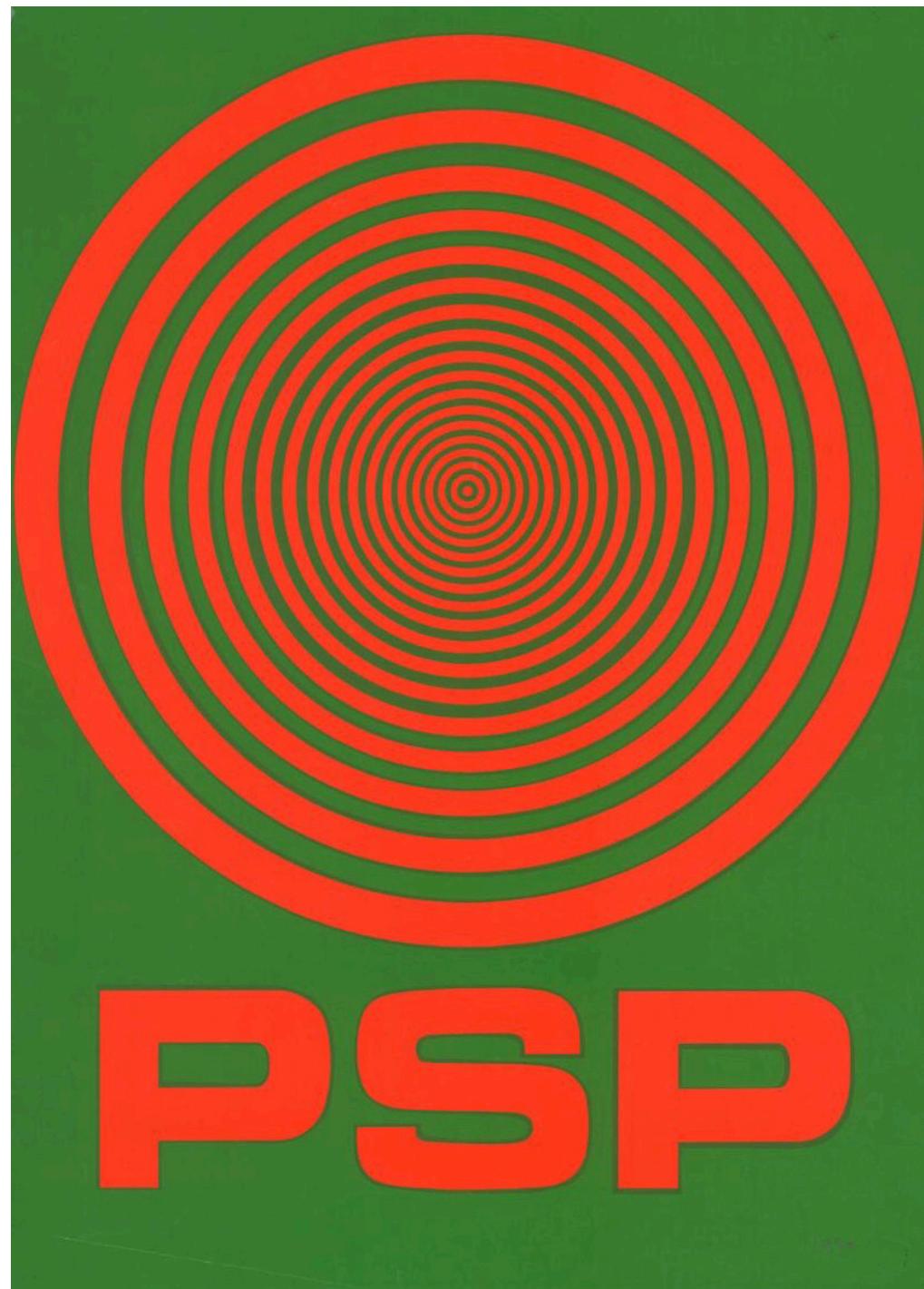


Fig. 21 George Noordanus, poster for the dutch PSP party, 1970



Fig. 20 Jan Wolkers, poster, campaign in support of the release of political prisoners in Indonesia, 1970

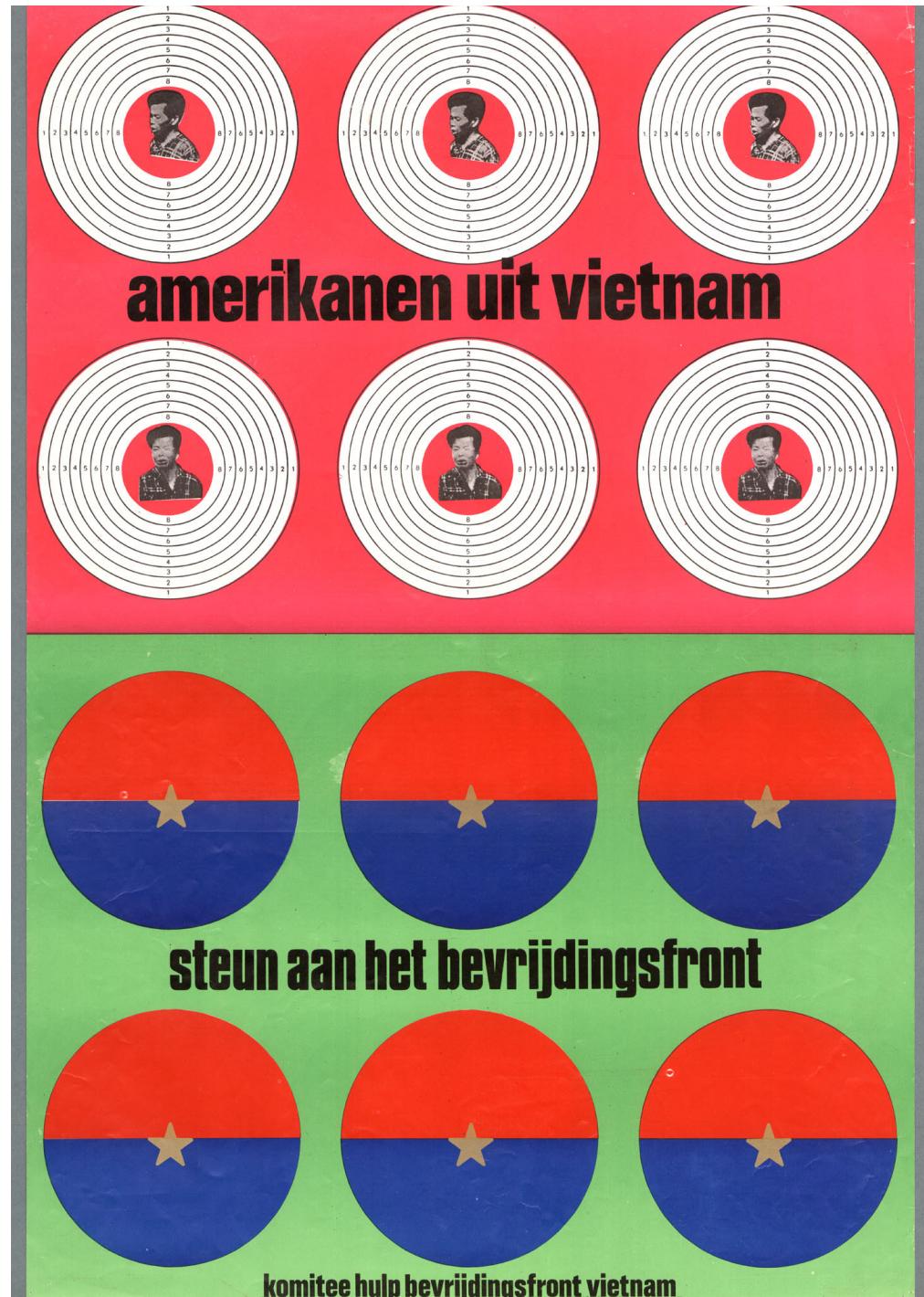


Fig. 21 Jan Wolkers, poster, Americans from Vietnam. Support on the liberation front, 1968

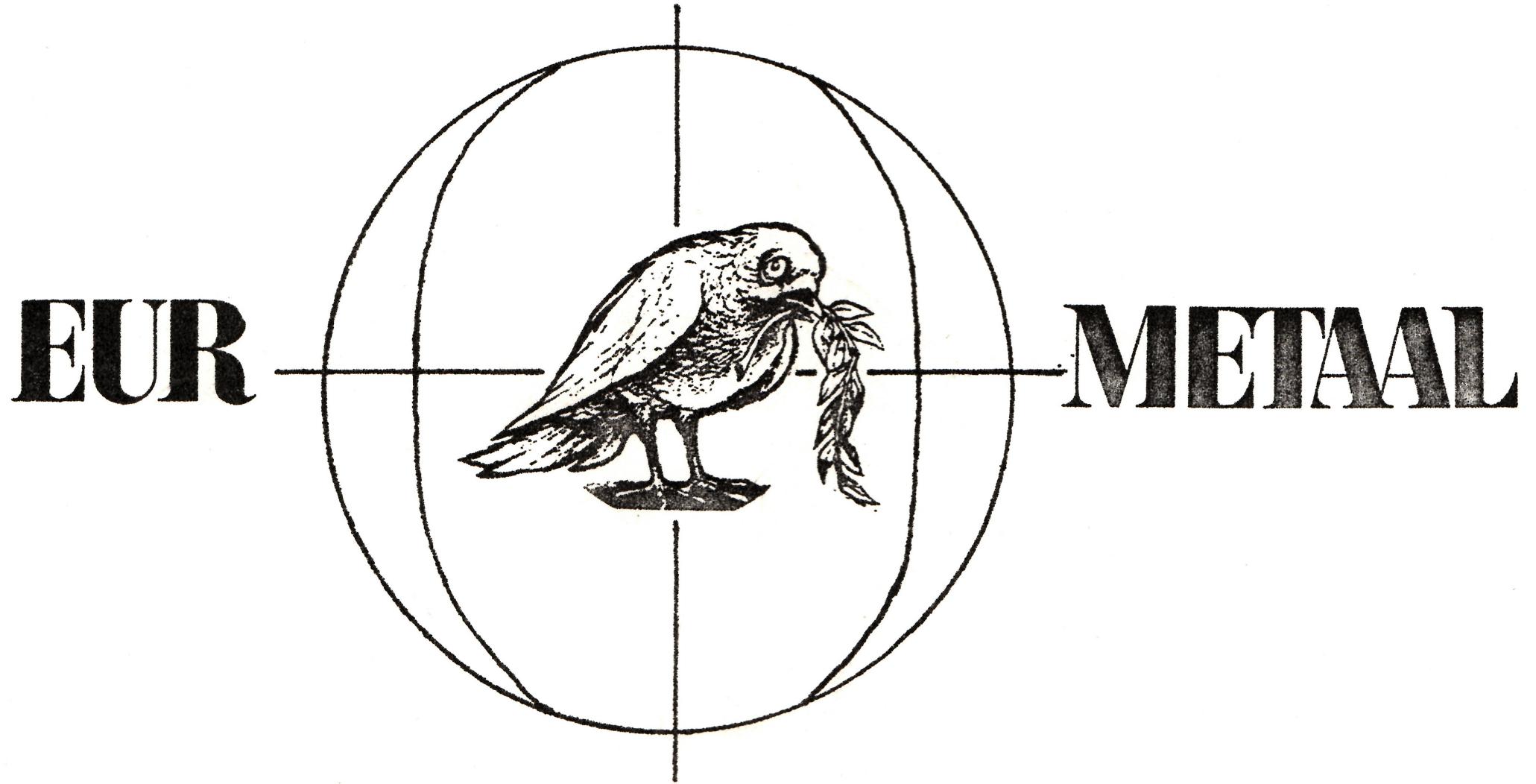


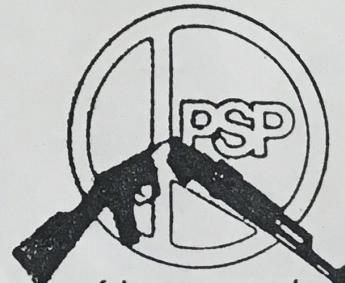
Fig. 24 Werkgroep Eurometaal (anti-military activist group), publication *Blood on the Pole*

(Op)schietschijf...



Fig. 25 Fire! The target painted by the Eurometaal Zaandam farewell committee on the Eurometaal complex)
Newspaper clipping, 1986

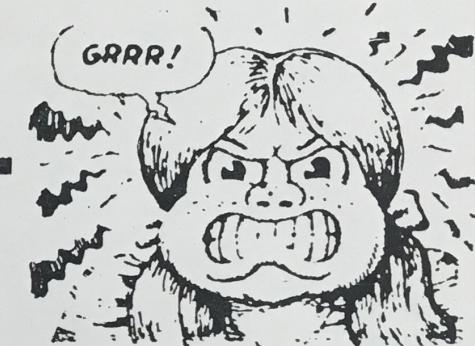
Pacifistisch Socialistische Partij



afd. zaanstad
075-156609/313819

EUROMETAAL MUURKRANT

MAART '89



DOORZETTERS GEZOCHT

Er zit muziek in metaal.
Zeker weten. En dan hebben we
het niet over heavy-metal maar
over toekomstmuziek. Want als
je straks van school komt met
een MAVO- of LTS-diploma kan
je op de bedrijfsschool bij
Eurometaal in Zaandam verder
bouwen aan je toekomst.
Een toekomst in de metaal.
Onderhoudsbankwerker,
reizer. De kennis di-

(18 STUKS M/V) VOOR DE BEDRIJFSSCHOOL- OPLEIDING VAN EUROMETAAL

het diploma LTS-C hebben, of
MAVO-4 met wis- en natuurkunde.
ook LTS-B met goede cijfers

lessen op de bedrijfsschool, één dag
per week theorielessen op de
school Zaanstreek Waterland.

de praktijk.
De lessen worden gegeven door
deskundige leermeesters, die de
stages van

ieder geval binnen ons hele bedrijf
leeft. Wat overigens niet wegneemt
dat er een prettige en collegiale
werksfeer heerst.

JE LEERT NIET VOOR NIETS
Nee, je leert voor je toekomst.
Een toekomst met werk. Niet voor
niets wordt de kern van ons bedrijf
en de gehele bedrijfstak gevormd
door mensen die ook ooit de bedrijfs
opleiding hebben gevolgd.
Voor de

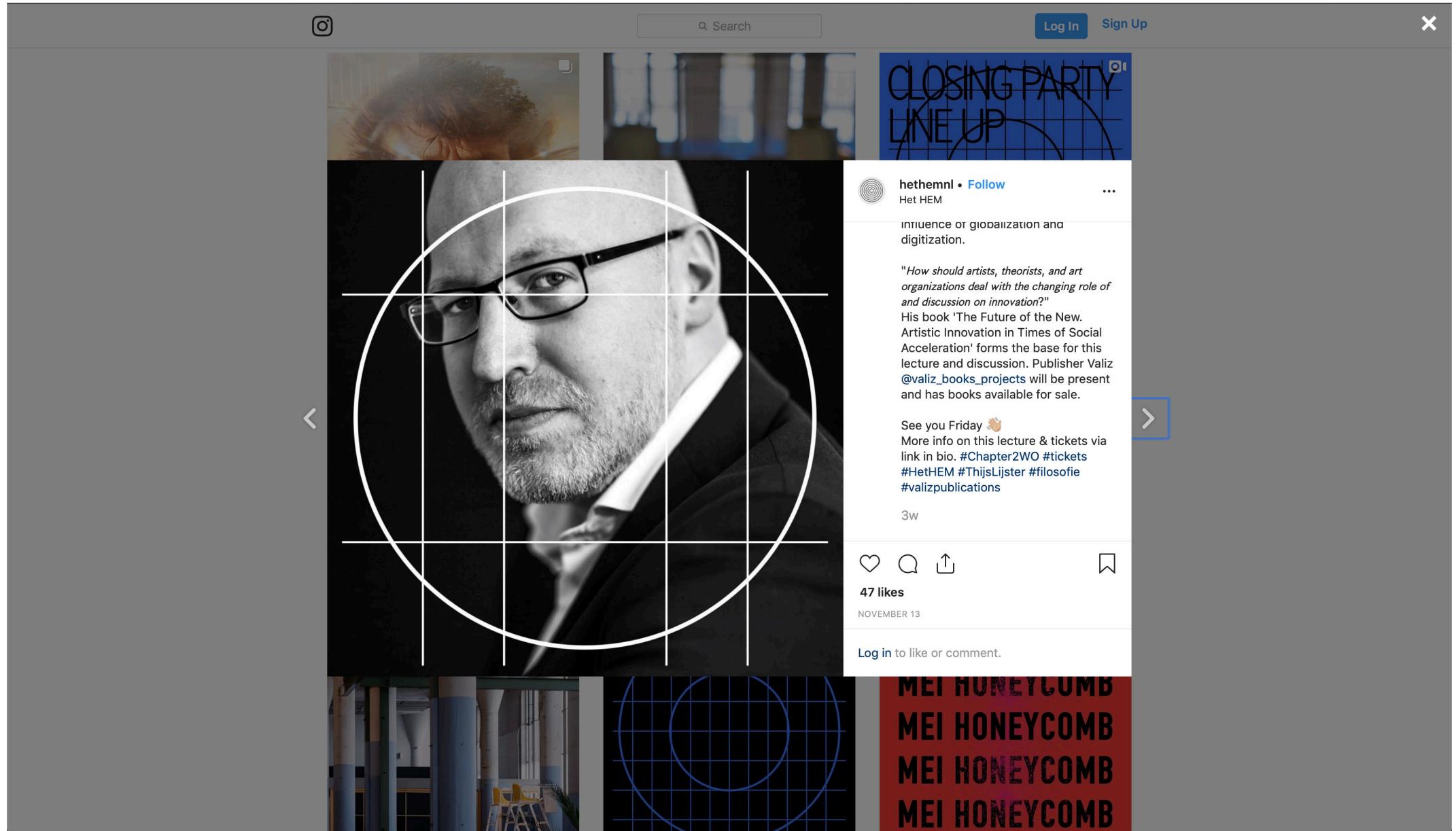


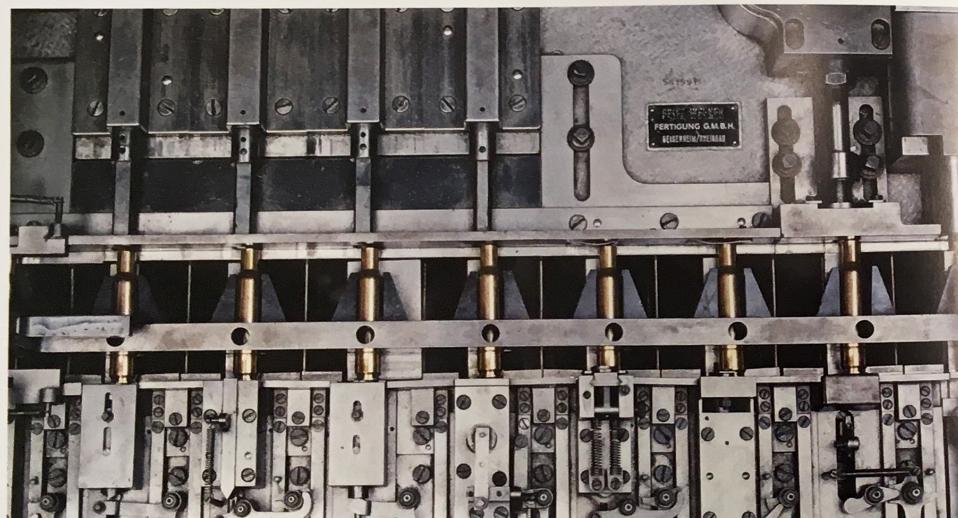
Fig. 27 The symbol of the target used in the new identity of Het Hem, 2019

Powerful new cartridge the API hard core

with superior armour piercing capacity

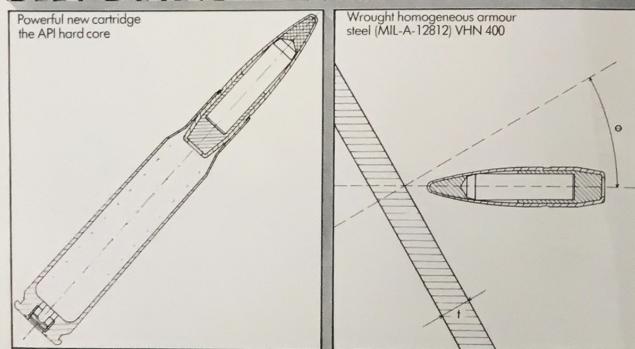
One of the main tasks of the .50 machinegun is to fight enemy armoured personnel carriers. Extensive tests have shown that the existing .50 AP ammunition and others derived from it (API M8 and API M20) is insufficiently effective against modern enemy light armoured vehicles. In fact, no perforation at all can be expected of the front armour, even when fired from short distances. Perforation of the side armour plates will only take place when fired at distances less than 600 yards.

Eurometaal has developed a .50 cartridge with an armour piercing capacity far superior to that of the existing types. The design and production of this armour piercing bullet has been patented.



Powerful new cartridge
the API hard core

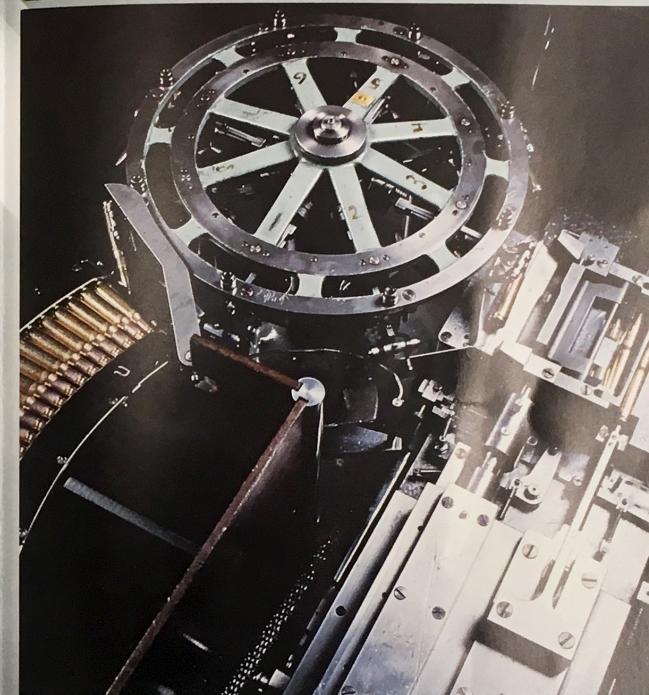
Wrought homogeneous armour
steel (MIL-A-12812) VHN 400



Comparison in performance of
.50 AP cartridges

Distance with 50% perforation

	.50	.50
APM2	about 100 mtr	about 850 mtr
t = 11 mm = .43"	110 yds	930 yds
Θ = 46°	about 200 mtr	about 850 mtr
t = 16 mm = .63"	220 yds	930 yds



Basic characteristics

The essential features of this new type of ammunition are: very effective armour piercing capacity. Ballistic identical with the existing .50 cartridges now being used. No modification of the .50 weapons or sights required mixable with other types of .50 ammunition. Normal life endurance of the weapon and barrel. Normal length of bursts. Relative low cost.

Bullet

The bullet of the cartridge has a tungsten carbide core as a penetrator and a filler of incendiary mixture in front of the core. The bullet is therefore of the armour piercing incendiary type. 'On special request an inert filler can be used instead of an incendiary mixture'.

Good penetration

The .50 API hard core penetrates an 11 (.43 inch) armour plate at a distance of more than 850m (900 yards) at an angle of impact of 46° (Nato) while the APM2 bullet only penetrates this target at a distance below 135m (150 yards). The Eurometaal .50 API hard core cartridge is even more effective than the US 20mm shot APT M95.

Post armour effect

After penetration of the armour plate, the hard core will often break into two or more pieces. Together with the spalling effect of the armour plate, a significant post-armour effect can be guaranteed.

Hit probability

Mixing the dim-tracer cartridge (with its great light intensity) and the API hard core (with its spotting effect) in one belt has a favourable effect on the hit probability.

Mixing possibilities

Because of its goods ballistic conformity the .50 API hard core may be mixed in one belt with other types of .50 cartridges, such as: Ball M2, AP M2, Ball M33, API M8, API M20, I-M1, M10, M17 and M21.

Weapon use

The cartridge can be fired from all .50 weapons that are suitable for the existing .50 ball cartridge. This means that no changes of any kind are necessary in either the weapon or the sights already in use. The rate of fire is about equal to that obtained with the .50 ball M33.

Technical data of .50 AP-bullets

Ballistic data of .50 cartridges

	.50	.50	.50		.50	.50
	HC	APM2	API M8		HC (I)	API M8
complete bullet weight	grammes	50	46	42	V0 m/s in 45" barrel	870 ±10
bullet weight	grains	770	710	648	ft/s	920 ±10
core weight	grammes	31	26	26	P max bar	2854±33
	grains	478	400	400	psi	3018±32,8
jacket weight	grammes	15	16,4	15	50.000	3350
	grains	231	253	231		48.400
weight point	grammes	0,5	3,8	0,85	Rate of fire in .50 HBM2	
filler	grains	8	59	13	at 10°C rounds/min	500±50
core diameter	mm	9	10,8	10,8	Max dispersion at	475±50
	inches	.35	.34	.43	550m (600yds)	
				Max mean radius cm	27	27
				inches	10.6	10.6



Propellants, explosives and especially the casting of explosives were specialized professions throughout the last three centuries. Eurometaal has been able to preserve and enlarge its know-how and expertise in this field and will be a reliable partner and supplier.



Filling and assembling

The final operations in the production of ammunition are loading and assembling the various components and the filling of the cartridge cases with propellant and the shells with explosives.

In order to perform these tasks Eurometaal has two facilities: one in Zoondam for medium calibre and training ammunition and one in Liebenau, Federal Republic of Germany for large calibre ammunition propelling charges and pyrotechnical products such as illuminating and smoke shells.

Filling of shells with explosives takes place after surface-treatment and painting operations. Greatest precision and care are required in these processes. Strict quality control throughout an extensive series of operations includes the use of X-ray inspection to ensure a high standard of quality of the explosive casting in fitting to the main structure and shell-wall adherence.

Special knowledge op propellants, TNT, composition B and others are essential in order to achieve and maintain the desired high criteria and performance. Throughout the years Eurometaal has gained an international reputation in this field and is frequently approached for outside consultation.



Eurometaal's production program consists of medium calibre ammunition (.50" up to 40 mm), tank ammunition and large calibre artillery ammunition (105 up to 203 mm), large cartridge cases and pyrotechnical products such as smoke and illuminating shells, handgrenades, mines, tracers, igniters etc. Also extended-range, improved armour piercing and training ammunitions are developed and produced by the company.

The ammunition is well-known for its high quality, endurance, reliability and long storability. Through strict quality control and long experience with explosive filling and loading Eurometaal's ammunition has proved to be one of the safest products in the field.

The company's policy, technology and investments in up-to-date machinery has made Eurometaal into one of the most modern plants in Western Europe. Fully mechanized installations and specially designed production lines - some by its own engineers and technicians - guarantee that the requirements of modern armed-forces can be met and delivery commitments strictly adhered to. Flexibility in the organisation as well as in the production and development facilities make it possible for new products, special manufacturing methods or product modifications requested by the customer, to be fulfilled within short time.

Fig. 30 Eurometaal promotional material

Large caliber ammunition

The program consists of a complete range of large caliber ammunition such as 105 mm, 155 mm, 175 mm and 203 mm for artillery weapons, a great variety of 105 mm tank ammunition, 120 mm mortar ammunition and 120-152 mm naval shells.

In the forging department, massive steel blocks are heated by induction up to 3200° F, after which they are pressed on a 1200 ton combined cup and draw press to shell-bodies.

This department also has a fully mechanized heat-treatment installation for hardening the shells and two heavy ogiving presses.

The machining department is equipped with programmed automatic rough and finish turning lines with mechanized loading and unloading equipment specially designed and built for Eurometaal.

These production lines ensure a constantly high output and quality level with short production times and low percentage of rejects.

In addition to the automatic machining lines, this department is equipped with conventional lathes and machinery for medium sized orders of shell bodies ranging from 105 mm up to 203 mm. Also trial series of newly developed artillery and tank ammunition are run on this equipment.



After fixing and machining the copper driving bands, the shell bodies are phosphated and painted. Special attention is given to the dimensional and weight tolerances of the shells, so that their ballistic results and performance of the shells consistently meet the highest requirements and standards. Many armed forces have Eurometaal's tank and artillery ammunition in use. The company guarantees its products in most cases for ten years. By doing this we assure the customer of products which meet the highest requirements.

Fig. 31 Eurometaal promotional material

ERFB-HE

General

Ammunition for 155 mm weapon systems

M109	FH 77B	GCT
M109A1	FH 70	TR 155
M109G	M198	GC 45
M109A2/A3		GHN 45

Technical data

Length (fuzed)	938 mm
Weight	45.3 kg
Weight of explosive	8.2 kg (Comp.B) 8.6 kg (TNT)

Fuze	Propelling charges
Point Detonating	M572 M3A1 - zones 5-4-3
Time fuze MT5Q	M582 M4A2 - zones 7-6-5-4-3
Proximity fuze	NINA M119 A1 - zone 8 M203 - zone 9 M11 - zone 10*

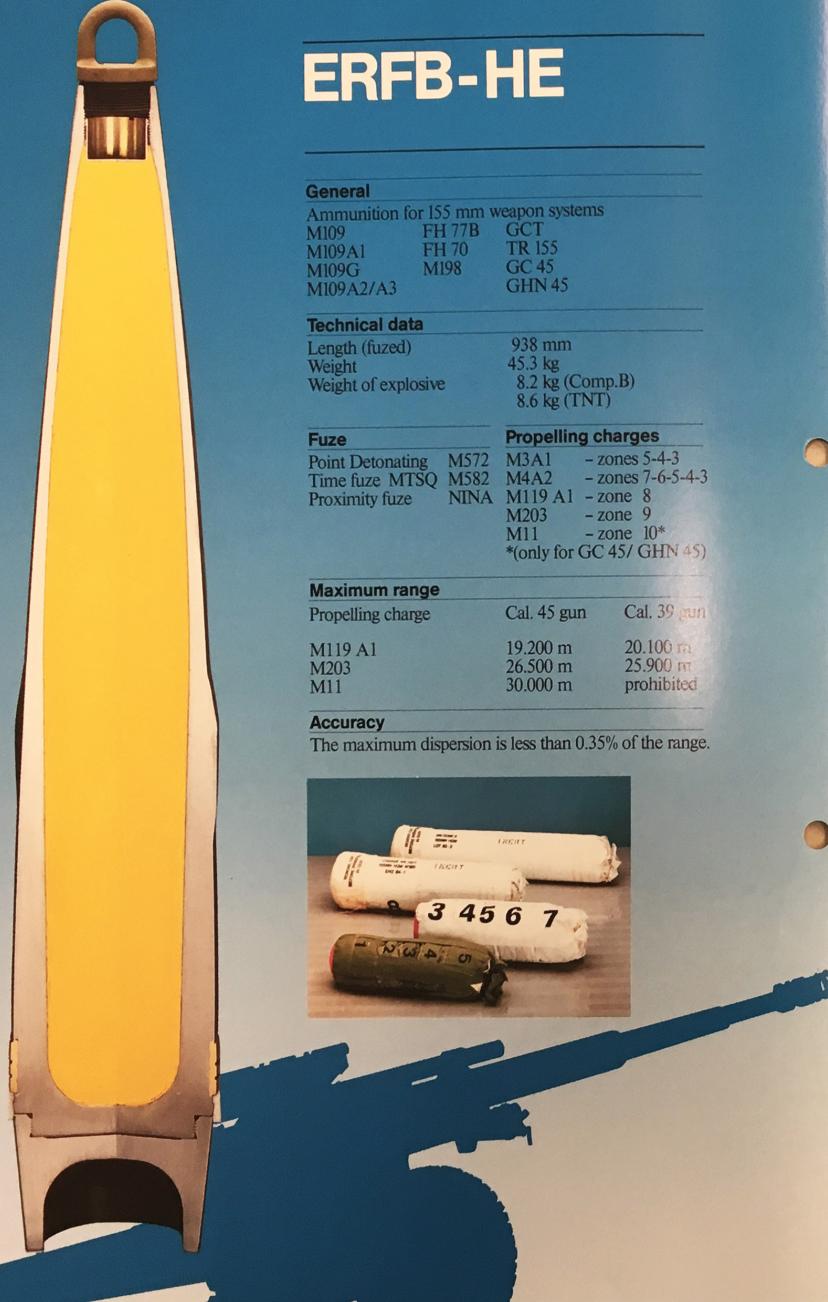
*(only for GC 45/ GHN 45)

Maximum range

Propelling charge	Cal. 45 gun	Cal. 39 gun
M119 A1	19.200 m	20.100 m
M203	26.500 m	25.900 m
M11	30.000 m	prohibited

Accuracy

The maximum dispersion is less than 0.35% of the range.




ERFB-HE Base Bleed Unit

General

Ammunition for 155 mm weapon systems

M109	FH 77B	GCT
M109A1	FH 70	TR 155
M109G	M198	GC 45
M109A2/A3		GHN 45

Technical data

Length (fuzed)	958 mm
Weight	47.6 kg
Weight of explosive	8.2 kg (Comp.B) 8.6 kg (TNT)

Fuze	Propelling charges
Point Detonating	M572 M3A1 - zones 5-4-3
Time fuze MT5Q	M582 M4A2 - zones 7-6-5-4-3
Proximity fuze	NINA M119 A1 - zone 8 M203 - zone 9 M11 - zone 10*

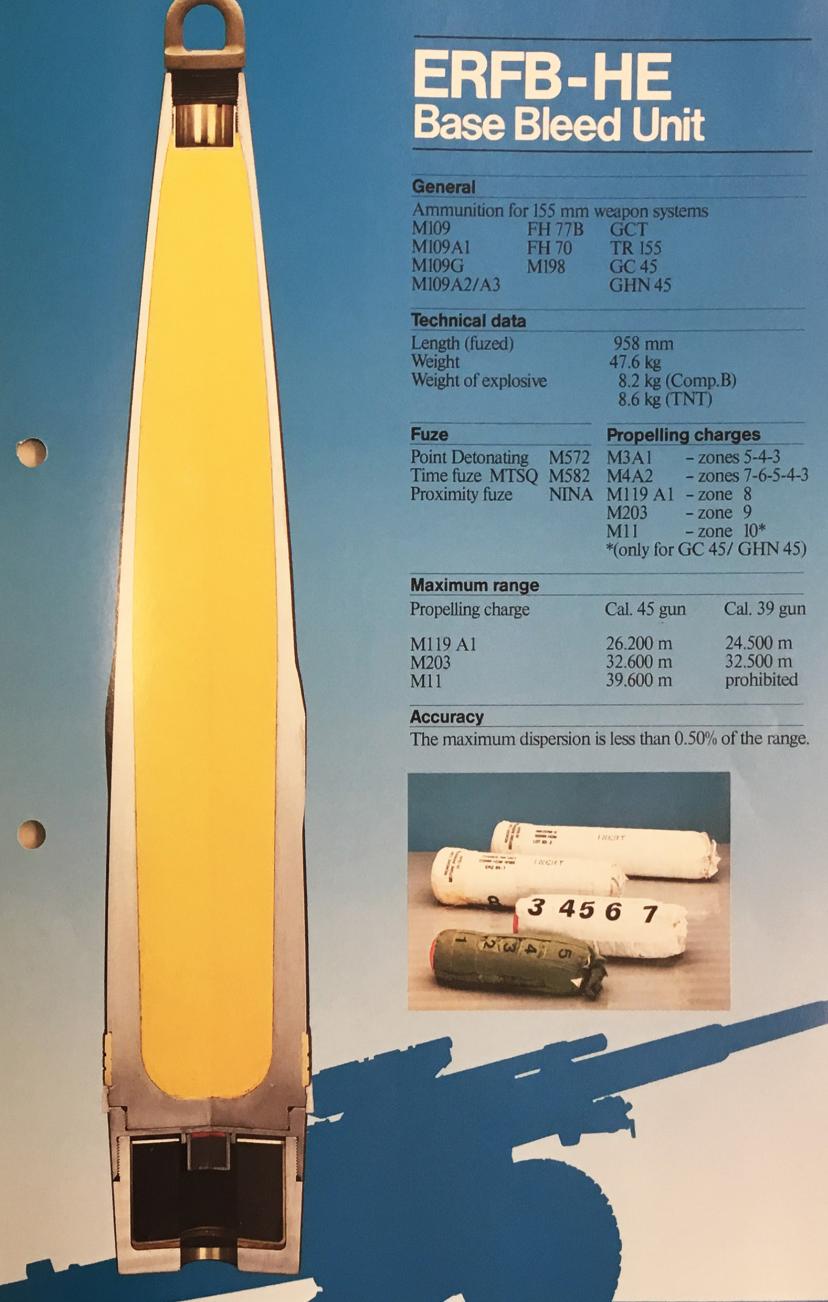
*(only for GC 45/ GHN 45)

Maximum range

Propelling charge	Cal. 45 gun	Cal. 39 gun
M119 A1	26.200 m	24.500 m
M203	32.600 m	32.500 m
M11	39.600 m	prohibited

Accuracy

The maximum dispersion is less than 0.50% of the range.




**VAKMAN
WORDEN
EN GOED
LOON**



**VERDIENEN
DAT
KAN.....**



OP DE BEDRIJFSSCHOOL VAN HET
STAATSBEDRIJF ARTILLERIE-INRICHTINGEN

**Welkom bij
Eurometaal**

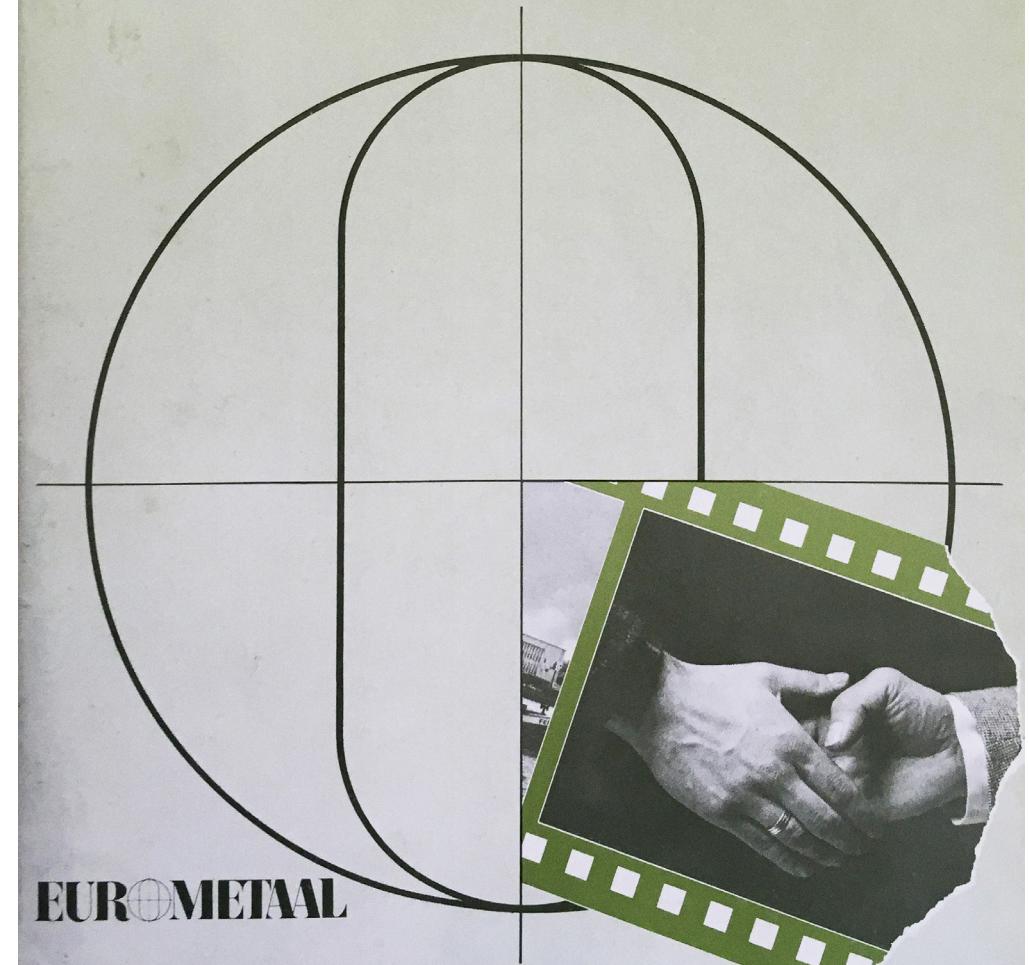


Fig. 33–34 Eurometaal promotional material

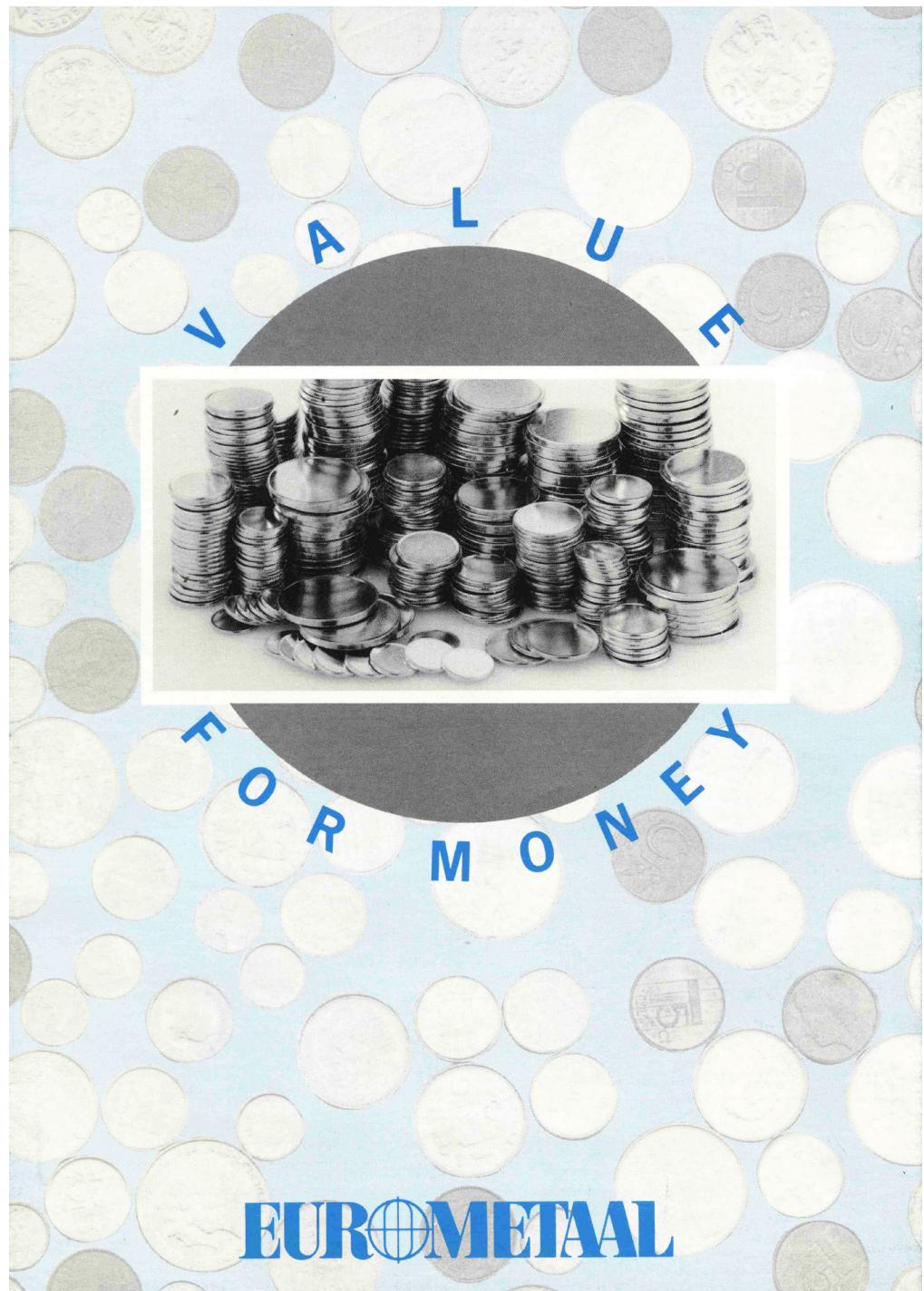


Fig. 35–36 Eurometaal promotional material

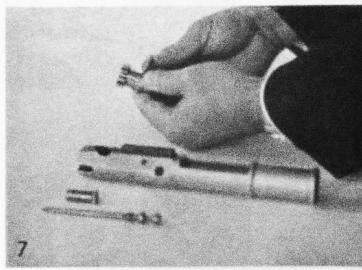
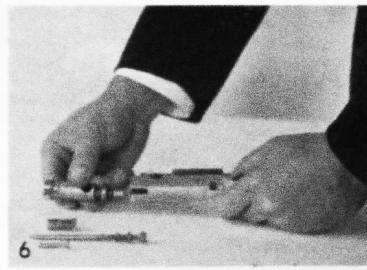
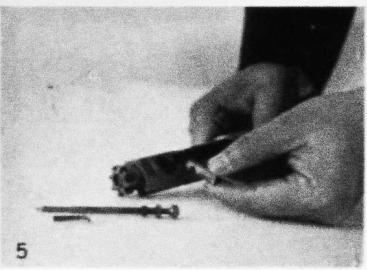
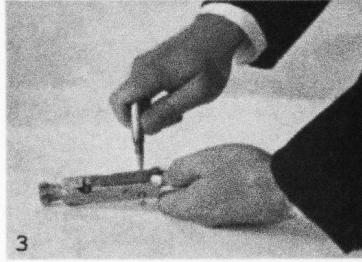
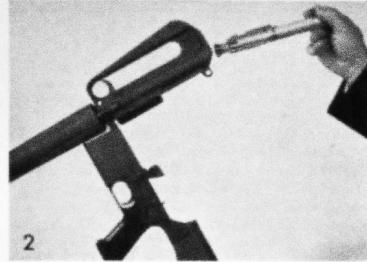
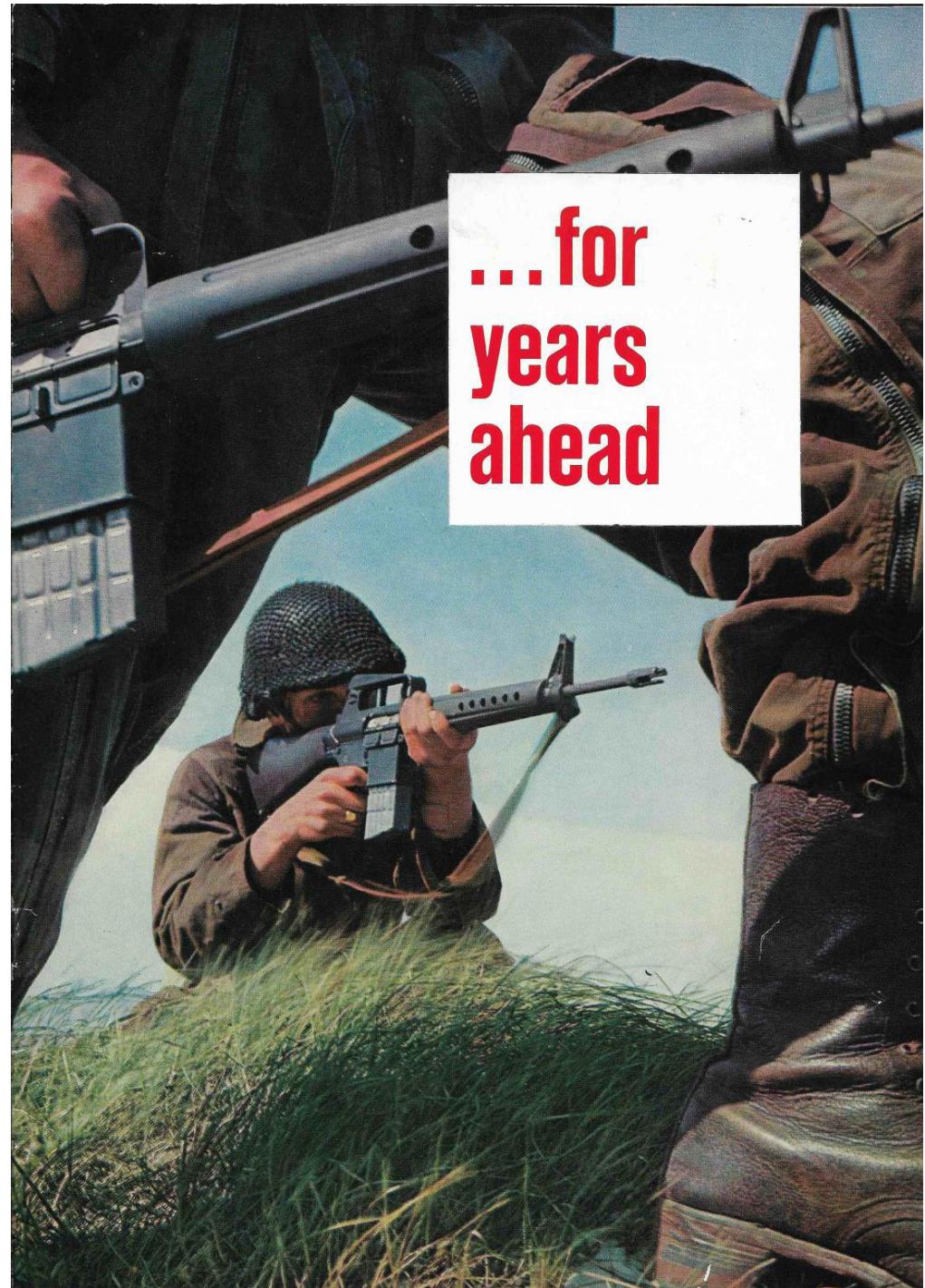




Fig. 38–39 Eurometaal promotional material



A collage of various military hardware and personnel. It includes a fighter jet in flight, a tank on land, a missile launching from a ship at sea, and several soldiers standing near tanks and missile racks. The top of the image features the word "EUROMETAAL" in large, bold letters next to a globe icon.

The Eurometaal product range covers standard ammunition, for heavy machine-guns, cannons, tanks, guns/howitzers and mortars, as well as special rounds for navel, air and land force applications. Components for missiles, torpedo's, sea-ground mines and anti-tankmines are also part of the manufacturing program.

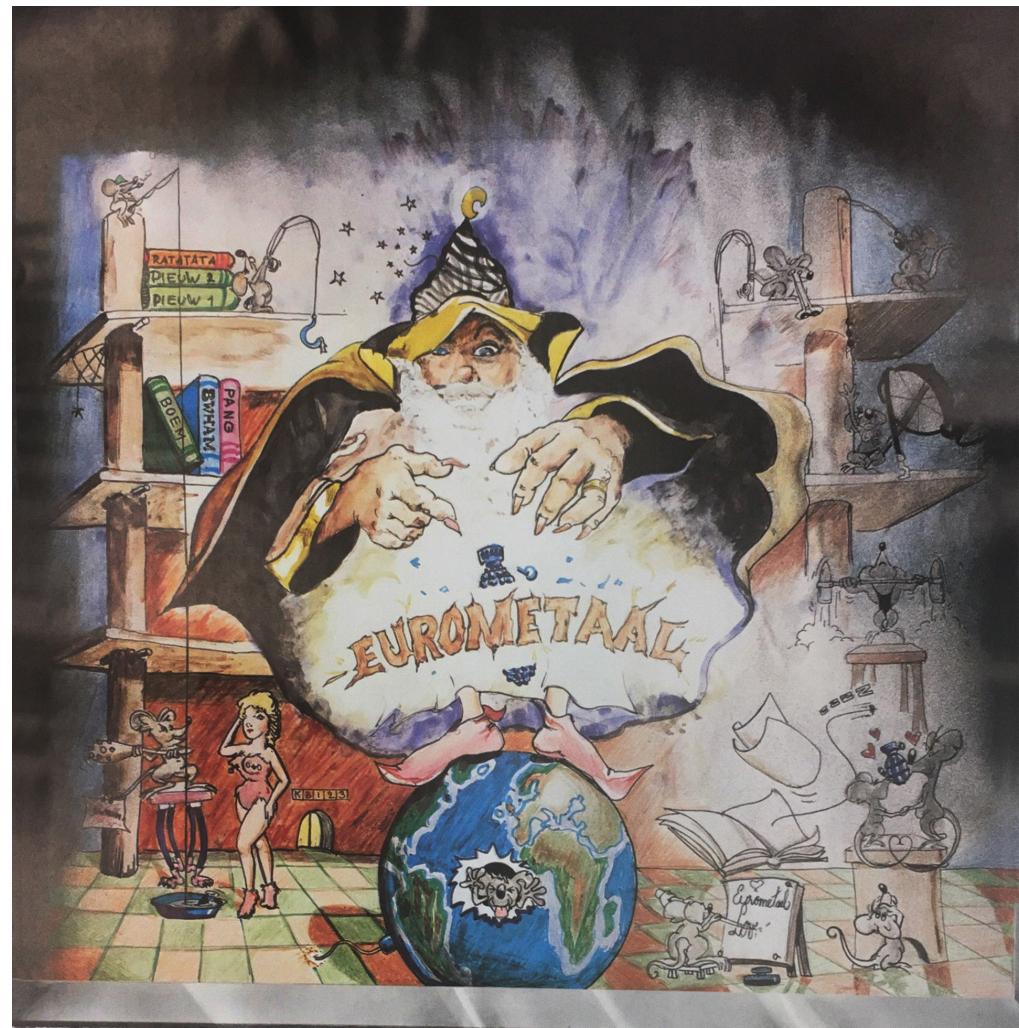
EUROMETAAL PO BOX 419, NL-1500 EX HAAZENDAM, THE NETHERLANDS, PHONE: (31) 75 6504267, FAX: (31) 75 6504261, E-MAIL: sales@eurometaal.nl



October

mon	tue	wed	thu	fri	sat	sun	mon	tue	wed	thu	fri	sat	sun
1	2	3	4	5	6	7	8	9	10	11	12	13	14
15	16	17	18	19	20	21	22	23	24	25	26	27	28
29	30	31											

EUROMETAAL



November

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				1	2		3	4	5	6	7	8	9
12	13	14	15	16	17	18	19	20	21	22	23	24	25
26	27	28	29	30									

EUROMETAAL

Fig. 42-43

Eurometaal, calendar for the 300 year anniversary of Eurometaal, 1979
Illustrations made by the workers of Eurometaal

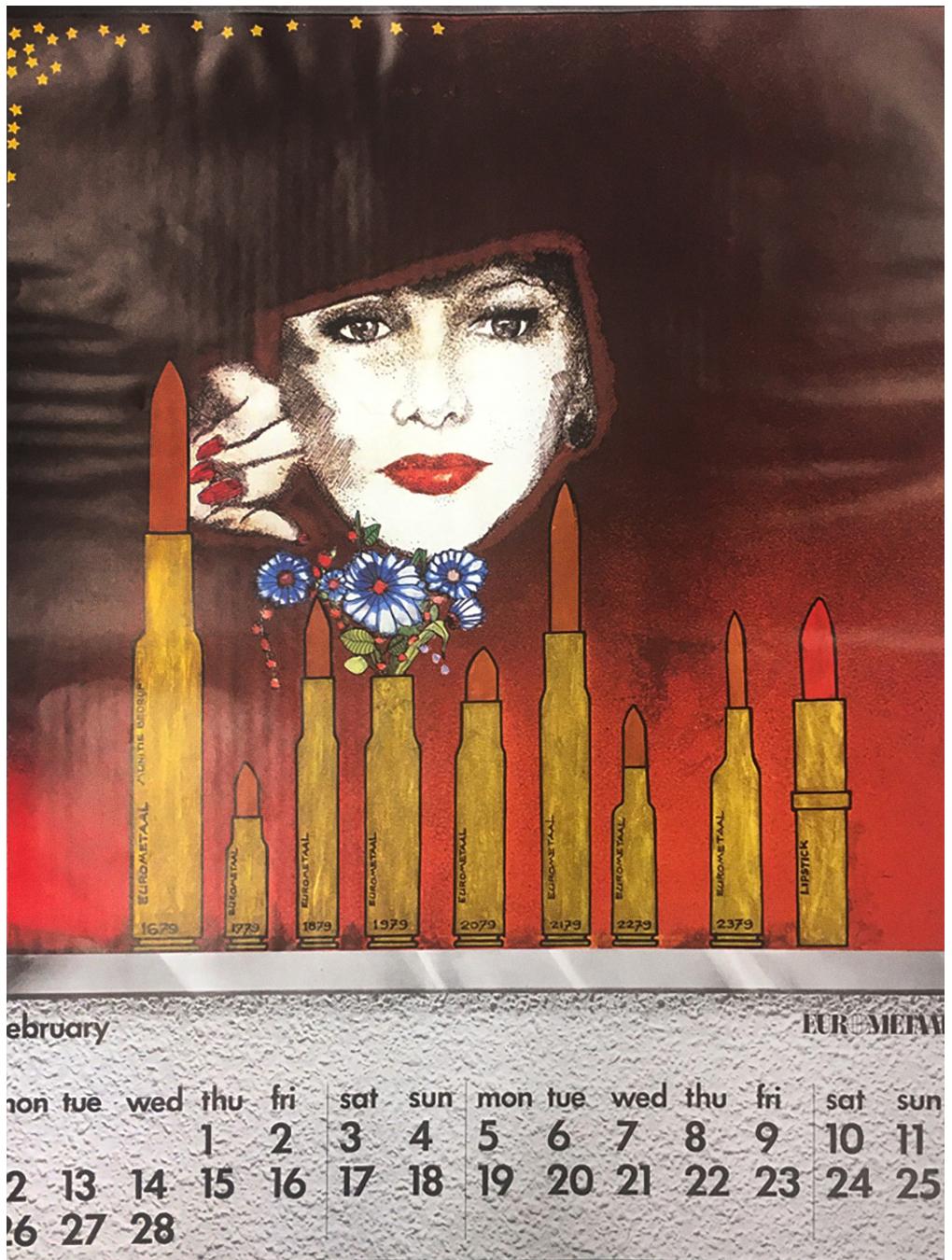
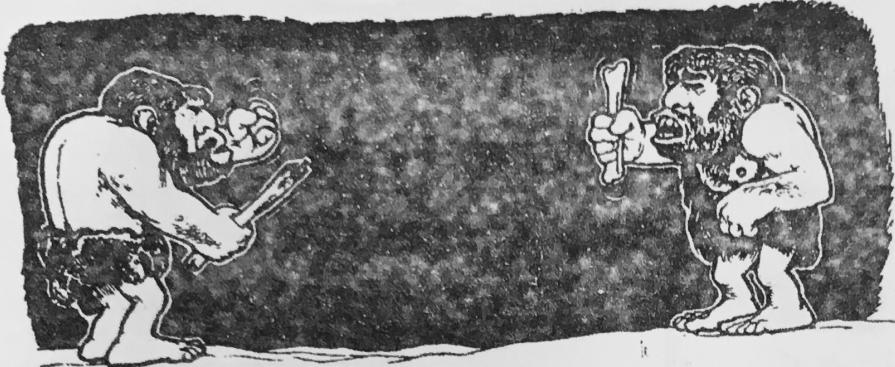


Fig. 44 Eurometaal, calendar for the 300 year anniversary of Eurometaal, 1979
Illustrations made by the workers of Eurometaal

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VOORUITGANG...

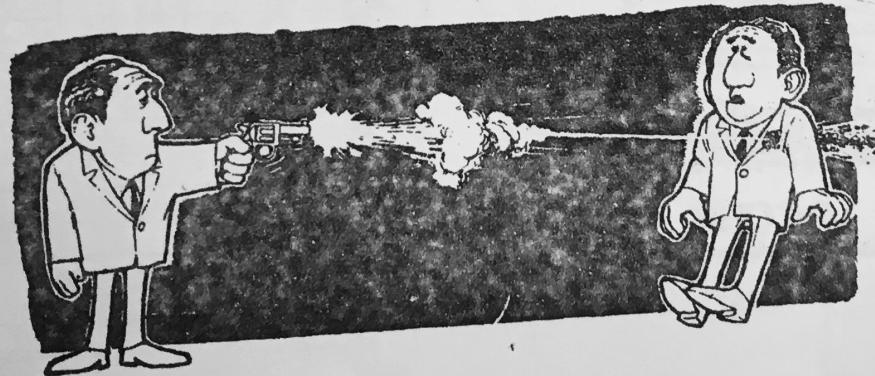
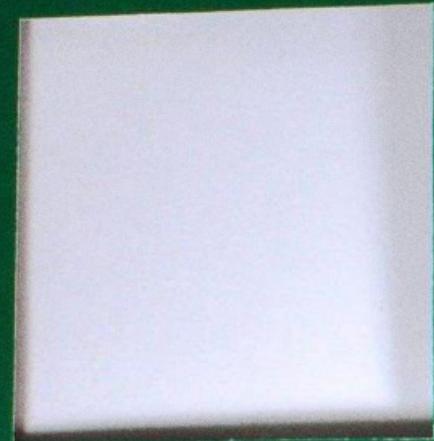
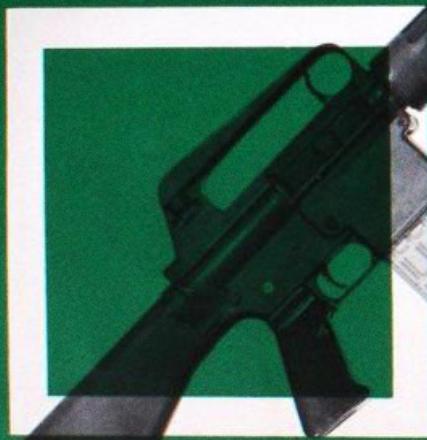


Fig. 45 Calendar, issued to mark the 300th anniversary of Eurometaal, activist publication



Lightweight Basic Infantry Rifle



The Most Modern Combat Rifle

ArmaLite



Manufactured in Europe
under License Agreement
by
„Artillerie-Inrichtingen“
Hembrug - Zaandam
The Netherlands

AR-10

...for
years
ahead

In any armed conflict the infantry – the Queen of the Battle – has borne the brunt of the fighting, and always will do so. Therefore, even in the most modern combat conditions and in which way you may imagine the development of armament, the infantryman always and under all circumstances must have at his disposal an accurate, highly efficient weapon, which he can rely on at any time. A weapon to protect him and to give him superiority. A weapon adjusted to the most severe requirements of military fire-arms application. A 'rifleman's best friend', combining the accuracy of a sniping rifle with the fire power of a machinegun, designed for today and tomorrow. Such a trustworthy, such a protective, such a superior weapon for years ahead is the ArmaLite AR-10, the modern lightweight combat rifle. The only weapon in the world to fulfil all small arms requirements.

...for
today
and ...
tomorrow