

ITEM No. 21
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GERMAN DIE-CASTING PLANTS

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COMBINED INTELLIGENCE OBJECTIVES
SUB-COMMITTEE

LONDON: H.M. STATIONERY OFFICE

SUMMARY OF VISITS MADE TO GERMAN DIE-CASTING PLANTS

18 May - 2 June 1945

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CICS ITEM No. 21

METALLURGY

COMBINED INTELLIGENCE OBJECTIVES SUB-COMMITTEE
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Personnel of Team

- J. J. Lowe, U. S. Ord.
- A. T. Billegren, U. S. Ord.

SUMMARY OF VISITS MADE TO GERMAN DIE-CASTING PLANTS

I. General Observations.

The findings of the investigators have proved that the German die-casting industry is chiefly confined to two (2) areas, namely Berlin and Stuttgart-Munich, and as it was not possible to inspect the Berlin district all subsequent general remarks should be considered as referring to the latter area.

Die-Casting Machines

The plant is mainly of the Polak type, and with one exception is of an age which gives uneconomic production. An outstanding feature was the absence of heat temperature control in the holding pots in most plants.

Die Design

While the workmanship was good, it was uninspired and not up to U.S.A. or Gt. Britain standards. Due to shortage of alloying elements inferior steels were being used. Core pulling was conventional - angle pins and hydraulic.

Finishing Equipment

This was very ordinary and far below U.S.A. & Gt. B. standard. X-Ray apparatus for inspection was struck on only two (2) occasions and then it was doubtful whether the apparatus would be suitable for all castings and materials. The only inspection appeared to be of visual nature, even weight testing was not employed.

Production Rates

These were low in comparison with U.S.A. or Gt.B. The output per machine also seemed low.

Die-Cast Materials

These were confined to three (3), namely Magnesium (Elektron), Aluminum and Zinc. The results on magnesium were good, but no better than U.S.A. or Gt.B.,

and the reason for Germany's fairly high production in this material was probably controlled by supply.

Ancillary Contributions to Production

Nothing in the way of new alloys, die steels or hydraulic mediums was seen. Hydraulic systems were usually water and soluble oil.

Conclusions

The German industry is far behind U.S.A. and Gt.B. Only one (1) firm would be considered first-class in either country, and that firm is Mahle K.G. - Fellbach (near Stuttgart).

II. REPORT ON MAHLE K. G. (FELLBACH)

Target No. Opportunity

Full Title of Target: Mahle K. G. (Fellbach)

Location: Fellbach - Suburb of Stuttgart

Condition of Contents: Building and Machinery intact.

Description of Contents: 33 Die-Casting machines; 1 Large Mahle Built Vertical size E -- 8 Mahle Vertical size D -- 12 Mahle Vertical size C -- 4 Polak 900 -- 2 Polak 2285 -- 1 Polak 4-8 -- and 7 machines built by Mahle but copies from the Polak design approx. similar to Polak 900.

Full Tool Room Equipment and machine shop tools and equipment, etc.

Items Guarded: Nil.

Priority Assessment: Nil.

Other Remarks: Personnel interviewed were: Oberingenieur, Mayer -- Obermaster, Kempf -- Kontrollleur, Rossle and Betriebsleiter, Kohler. (Oberingenieur A. Bauer, the most important person connected with this plant and leading force in the Die Casting industry in Germany was not available. He was said to be a prisoner of the French.)

This the most important Die Casting plant in Germany. They claimed to do 65% of the Mag. die casting and 35% of the Al. die casting. Their monthly tonnage of various alloys in metric tons was said to be 200 Mag., 80 Al. and 20 Zn.

Mag. Alloy used: 90 Mag. 10 Al. -- Al. Alloy used: 89 Al. 9 Mag. 1 Zn and 1% all others -- Zn. Alloy -- Standard Zamak.

Our general conclusions were that the plant does very good work especially in large Mag. castings but that their processes were not new and there was no sign of any unusual developments. Their large machine on which their most spectacular castings were made is not safe and their fatal and other accident record is high. The operators must remain in a closed room while shot is made. (Electrical switches on door are connected with limit switches on machine so machine cannot be shot until door is closed.)

Date of Assessment: 20 and 21 May 1945.

Assessors' Names: A. T. Lillegren and C. M. Butler

Documents or Equipment Removed: A few typical samples of die castings and blue prints of a typical die.

APPENDAGE TO REPORT ON MAHLE K.G. FELLBACH

9 Die castings machines dispersed to Eichart Co. said to be Mahle owner and located in the factory of Zeller und Gmelin -- Eislingen near Goppingen.

Equipped with 1 Larhe Mahle Vertical size E
6 Mahle Vertical size D
2 Mahle Vertical size C

Date of Assessment: 23 May 1945

Assessors' Names: A. T. Lillegren and C. M. Butler

III. REPORT ON ALUMINUM AND METALLGIESSEREI MOSSNER & THURNER

Target No. Opportunity

Full Title of Target: Aluminum and Metall-
gieesserei, Mossner & Thurner

Location: Unterbibererstrasse 38 (Post Office:
Perlach) Munich 56.

Condition of Contents: Building not too badly
damaged. Machinery in excellent condition including
Tool Room. Office records and die drawings etc., said
by Thurner to have been destroyed by (Nazi) partner
Kosser. Some die drawings available but they were of
little importance.

Description of Contents: Die Casting machines
all manufactured by Josef Polak, Prag:

5 Type 2255 - Large Machines
2 Type 900 - Medium
2 Type 1220 - Medium
2 Type 600 - Medium to small
6 Type 400 - Small
1 Type 100/100 Vertical which they reported
could not be made to work properly in
6 years.

Tool room equipment included the ordinary type of
lathes and millers and grinders, all of which seemed to
be fairly new and in good condition. Cleaning room
machinery was of small size and consisted of rotary
files and other similar equipment for rough cleaning of
castings. They apparently did not do complete
secondary machining of castings.

Items Guarded: Nil

Priority Assessment:

Other Remarks: Personnel interviewed were Franz
Thurner, Mgr. and George Mach, Gen. Mgr (who said he
had worked for some years at Thormann - N.W. 5 Perren
St. London and who spoke English very well). They
produced 2,000,000 die castings per month in Al. Zinc
and Brass. Some of their important jobs were cast in
Hydronalium. Total tonnage given was 40 tons of all
above metals per month.

Lacking Foldi steel they used a similar steel
for dies called Styria and made in Austria. Die con-
structions was conventional, as well as casting
pressures. They did not have metal temperature control
and used cast-iron pots for Al. and Steel pots for
Brass. Their hydraulic system was the standard Polak

system using water and soluble oil for hydraulic fluid. They had no lab. equipment and used only standard pre-alloyed metals. Brass was 58 Cu. 42 Zn (Yellow Brass). Most of their Al. jobs were cast in Silium or 9 to 13% Silicon Al. Corresponding it Alcoa No. 13 or class 1 or 2 Federal Spec. QQA 591 USA.

Composition of Hydronalium - referred to in this report

89	percent	Al.
9	"	Mag.
1	"	Zn
1	"	All Others

Composition of Poldi Steel referred to in this report

.25	Carbon	.50	Man.	1.50	Ni.
2.50	Chrom.	.25	Vanadium		
.25	Silicon	9.50	Tungsten		
.10	Moly.				

Date of Assessment: 18 May 1945

Assessors' Names: A. T. Lillegren, assisted by
Clark and Allen
Army Group 6th Item Group 2

Documents or Equipment Removed: Box of sample casting, including a gate of Al. castings identified by Robinson as being the Spring Vale Frame for the VI Bomb, - several thin sectioned large rings made of Hydronalium and other misc. samples.

IV. REPORT ON ROBERT BOSCH METALLWERK, FEUERBACH

Target No: Opportunity

Full Title of Target: (This report applies to the Die Casting Plant only) Robert Bosch Metallwerk

Location: Feuerbach near Stuttgart
(Part of plant dispersed to Aalan)

Condition of Contents: Intact

Description of Contents: 25 Old style Doehler and Polak die casting machines -- 10 machines at Feuerbach and 15 at Aalan.

Items Guarded: Nil

Priority Assessment: Nil

Other Remarks: Type of machines and processes not up to usual Bosch standards freely admitted by personnel interviewed; Dr Lippart -- Mr. Dipper, Tech. Liaison executive between all Bosch plants and foreign companies -- Richard Ludwig, Tech. Works Manager -- Mr. Kraus, Works Manager.

They do not attempt to die cast their own fuel pump body but purchase them from Mahle K.G. (They permanent mold this same body and have been doing so for ten years and consider the permanent mould parts superior to the die cast parts).

Date of Assessment: 22 May 1945.

Assessors' Names: A. C. Lillegren and G. M. Butler

Documents or Equipment Removed: None.

V. REPORT ON J. DUDERSTADT METALLGIESSEREI, ESSLINGEN

Target No: Opportunity

Full Title of Target: J. Duderstadt Metallgiesserei

Location: Esslingen -- (Neckar)
Berkheimer Str. 1

Condition of Contents: Building and machinery intact.

Description of Contents: 10 old style Doehler machines (air goose neck die casting machines) 2 Home made Vertical machines for manufacturing large Zinc radiator grilles -- 1 Polak 408 die casting machine -- 1 No. 600 Polak die casting machine -- 1 Polak 2255 die casting machine.

Other misc. machines for cleaning and plating die castings.

Items Guarded: Nil

Priority Assessment: Nil

Other Remarks: Decidedly unimpressive plant making small and relatively unimportant parts.

Date of Assessment: 21 May 1945

Assessors' Names: A. T. Lillegren and G. M. Butler

Documents and Equipment Removed: None

VI. REPORT ON VERENIGTE DEUTSCHE METALLWERKE A.G.,
HEDDERNHEIM

Target No. Opportunity

Full Title of Target: Verenigte Deutsche
Metallwerke A. G.

Location: Heddernheim, Hasse Strasse,
Frankfurt A.M.

Condition of Contents: Buildings badly bombed.
Machines require renovation but capable of
being used.

Description of Contents: Two (2) Polak 900
Five (5) Polak 600
One (1) Vert MC Cold
chamber type made VDM
Nine (9) hot chamber
type made by VDM

All machines were at least ten (10) years old and apart from the Polaks it was doubtful whether it would be economic to renovate them.

Items Guarded: Nil

Priority Assessment: Nil

Other Remarks: Tool equipment was quite good but finishing plant for castings was just ordinary. The X-Ray Dept. contained five (5) installations (Seiffert type) but whilst these could be used for magnesium and light alloy castings they were no use for zinc due to the comparatively low voltage. Die design showed good workmanship but no outstanding feature. Output when fully running were 30 Mg., 25 Al and 20 Zn tons per month. The Dept. had not

been operating since December 1944. Officials interviewed were Mr. Kraft, Asst. Director; Dr. Frey, Chief Metallurgist; Mr. Jaeger, Departmental Manager.

To summarize, the firm was not impressive and would rank just below medium according to British Standards.

Date of Assessment: 23 May and 2 June 1945.

Assessors' Names: A. T. Lillegren and J. J. Lowe

Documents or Equipment Removed: None.

VII. REPORT ON A VISIT TO METALLGIESELISCHAFT -
FRANKFURT

Date: 2 June 1945

Officials Interviewed: Dr. Deleroy - Industrial
Director
Dr. Plesse - Head of Sales

This company is not a manufacturing die-caster, but is the largest supplier of die-casting metals in Germany, and it was therefore visited with a view to obtaining a list of leading consumers.

All records had been blitzed, but questioning confirmed Mr. Lillegren's findings from his Stuttgart area tour, that apart from these die-casting firms in the Berlin area, Mahle is far and away the leading die-caster in Germany.

The fact that VDM was quoted as the fourth largest supplier is indicative of the standing of the industry in Germany.