

OC D 25X1

CLASSIFICATION SECRET, SECURITY INFORMATION

CENTRAL INTELLIGENCE AGENCY  
INFORMATION REPORT

REPORT

CD NO.

COUNTRY

East Germany

DATE DISTR. 13 January 1953

SUBJECT

Zeiss Ultrasonic Testing Device

NO. OF PAGES 2

PLACE ACQUIRED

NO. OF ENCLS. (LISTED BELOW)

DATE OF INFO

SUPPLEMENT TO REPORT NO.

REFERENCE COPY

25X1

25X1

THIS DOCUMENT CONTAINS INFORMATION AFFECTING THE NATIONAL DEFENSE OF THE UNITED STATES, WITHIN THE MEANING OF TITLE 18, SECTIONS 793 AND 794, OF THE U. S. CODE, AS AMENDED. ITS TRANSMISSION OR REVELATION OF ITS CONTENTS TO OR RECEIPT BY AN UNAUTHORIZED PERSON IS PROHIBITED BY LAW. THE REPRODUCTION OF THIS FORM IS PROHIBITED.

THIS IS UNEVALUATED INFORMATION

1. The ultra-sonic device for material testing (Ultraschall-werkstoffprüfgerät) now being developed at Carl Zeiss Jena\* is based on the ultra-sonic relief picture method. Its purpose is to test relatively thick metal bodies such as rails, cables, crank shafts, pistons, connecting rods, etc. The testing power of the Zeiss model is to be adequate for iron plates of up to 15 centimeter thickness and for aluminum plates up to 30 centimeters thick. It is, however, also to test very thin metal sheets.
2. The main body of the device is a cast aluminum cylindrical frame with a diameter of about one meter and a height of two meters; the top of the frame is dome-shaped. A large aluminum tub is partially inserted into the lower part of the frame in such a way that it takes up about two thirds of the frame's width and half of its height. The tub contains water. About midway between the bottom of the frame and the upper edge of the tub, a tube 10 centimeters in diameter leads from the frame into the tub. The testing object is placed in the water opposite the tube opening. The object, thus, is between the opening and an ultra-sound source on the far side of the tub at the same height. Ultra-sound waves emanating from the source will pass through the testing object and through the opening into the interior of the frame; there they will meet, still under water, a plate glass mirror suspended at an angle of 45 degrees in the middle of that part of the tub which is inside the frame. From there, the waves are reflected onto a thin cellophane foil placed above the mirror at some distance from it. Passing through the foil, the waves reach the water surface where they form a relief picture. This picture is lighted by an incandescent lamp of 100 watts.

CLASSIFICATION

SECRET

STATE	X	NAVY	X	NSRB	DISTRIBUTION			
ARMY	X	AIR	X	FBI	OSI	EV		



3. The lighted picture is projected by means of two mirrors placed in the top part of the frame at angles of 45 and 135 degrees down onto a focussing screen (Mattscheibe) located a bit lower in the frame. The focussing screen and the picture can be observed through an eye piece attached to the outside of the frame at the height of 1.70 meters.
4. For the functioning of the device, it is essential that the foil have a strength corresponding to half of the wave length of the ultra-sound radiation. If it has this strength, the picture of the object will reveal all irregularities in its inner structure. A slide mechanism within the tub allows the horizontal and vertical shifting of the object so that the whole piece can be examined by gradually shifting the section exposed to ultra-sonic radiation.
5. Through an arrangement of mirrors placed between the ultra-sound source and the tube opening, the ultra-sound beam can be passed through the testing object obliquely. This has to be done when testing very thin objects in order to prolong the path of the ultra-sound beam.
6. The ultra-sound source used in the device described above is produced by RFT, Erfurt.

SECRET