

IKIO DIAPHRAGM TYPE

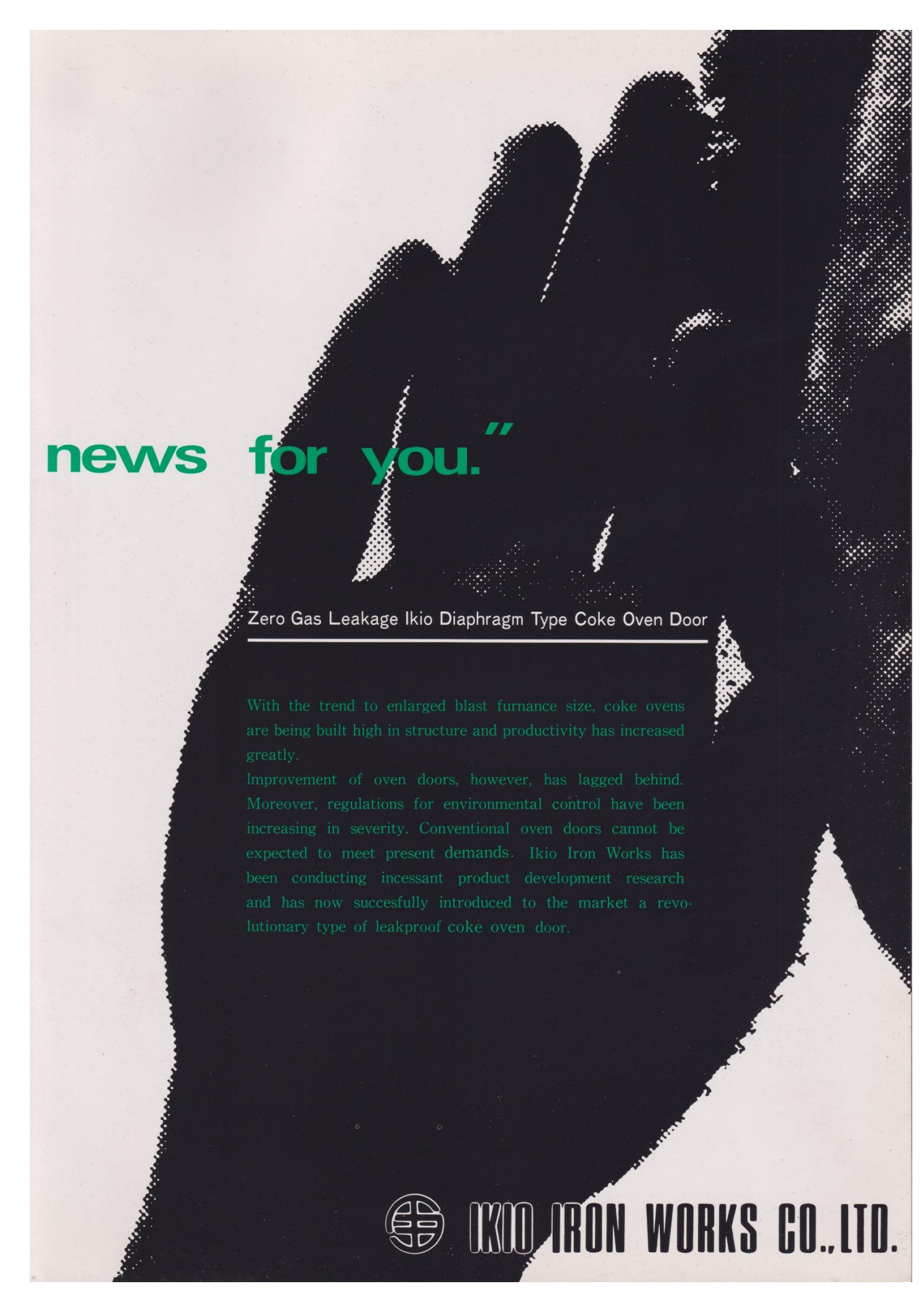
OVEN DOOR

IKIO IRON WORKS CO.,LTD.
IKIO ENGINEERING CO.,LTD.

IKIO DIAPHRAGM TYPE
COKE OVEN DOOR
MODEL—I

A high-contrast, black and white halftone image of a hand, possibly a fist or a hand with fingers slightly curled. The image is composed of a dense pattern of black dots on a white background. Overlaid on the center of the hand is the text "Here's good" in a green, sans-serif font. The text is positioned horizontally across the middle of the hand, with "Here's" on the left and "good" on the right. The overall effect is a stark, graphic representation of a hand, reminiscent of a stencil or a high-contrast photograph.

"Here's good



news for you."

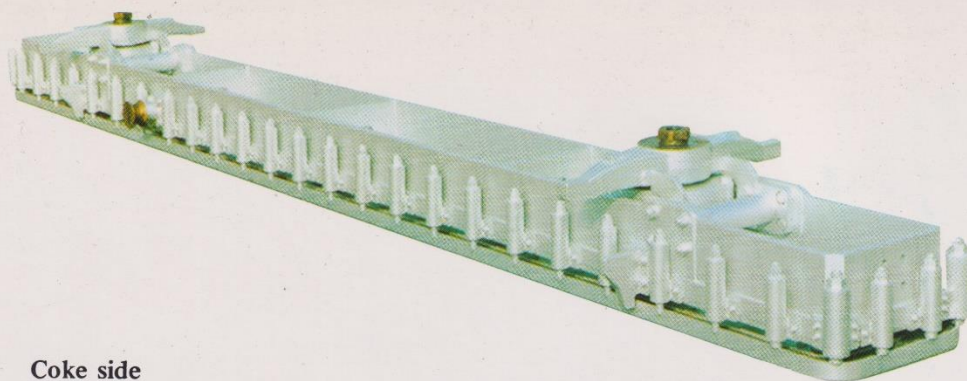
Zero Gas Leakage Ikio Diaphragm Type Coke Oven Door

With the trend to enlarged blast furnace size, coke ovens are being built high in structure and productivity has increased greatly.

Improvement of oven doors, however, has lagged behind. Moreover, regulations for environmental control have been increasing in severity. Conventional oven doors cannot be expected to meet present demands. Ikio Iron Works has been conducting incessant product development research and has now successfully introduced to the market a revolutionary type of leakproof coke oven door.



IKIO IRON WORKS CO., LTD.



Coke side

PROBLEMS AND RESOLUTION

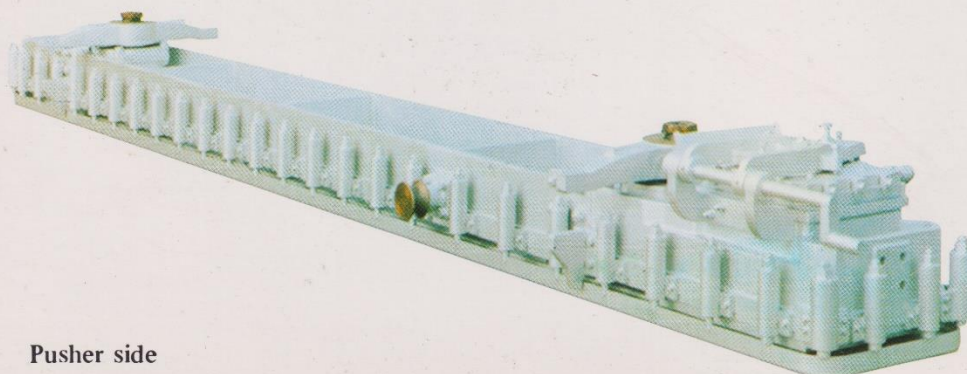
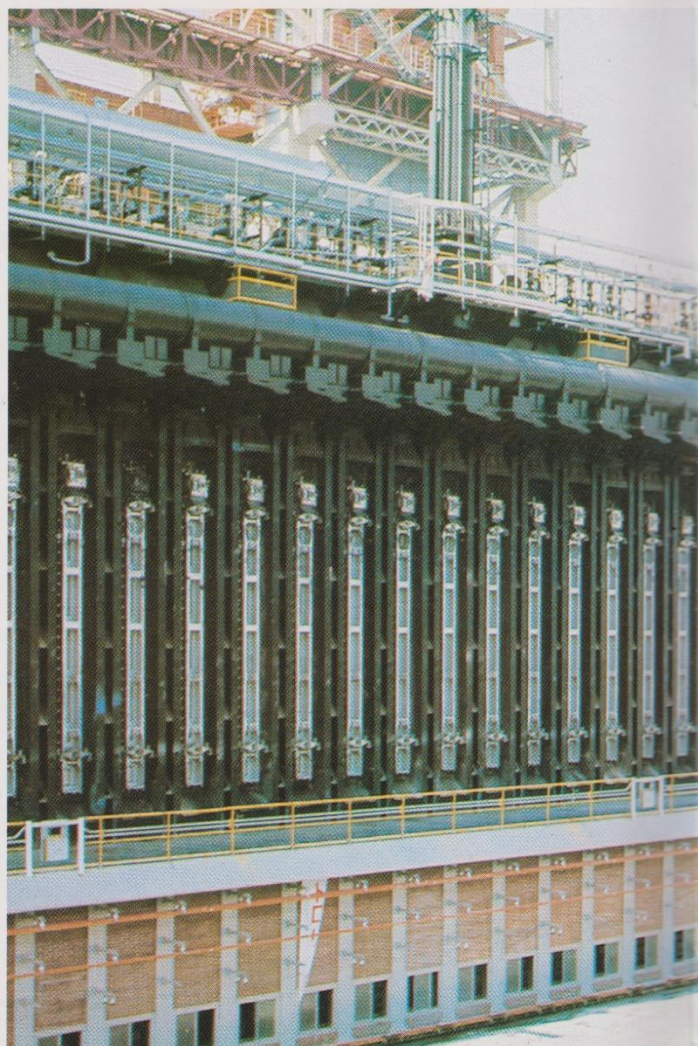
The problems involved in coke oven operations today are as follows :

1: The structure of the coke oven itself is still subject to various conditions. Consequently, the door and the door jamb are set in the same conditions. Under such circumstances, the conventional coke oven doors cannot have been expected to achieve a complete gas-sealing unless the necessary change are made as needed to meet the conditions of the coke ovens.

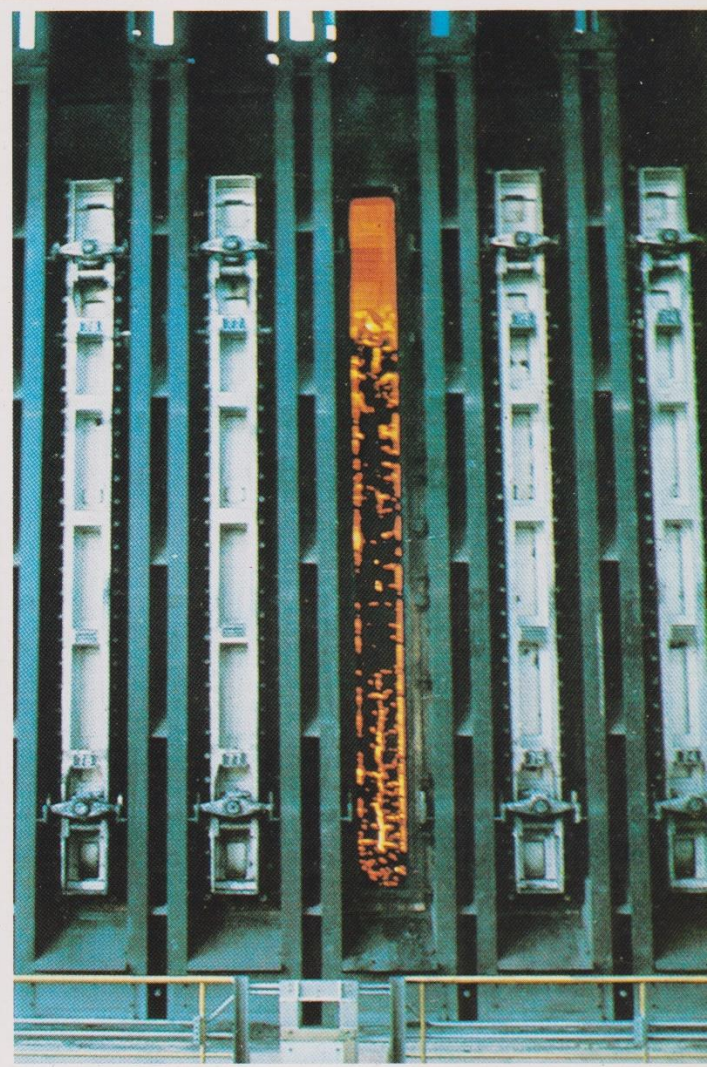
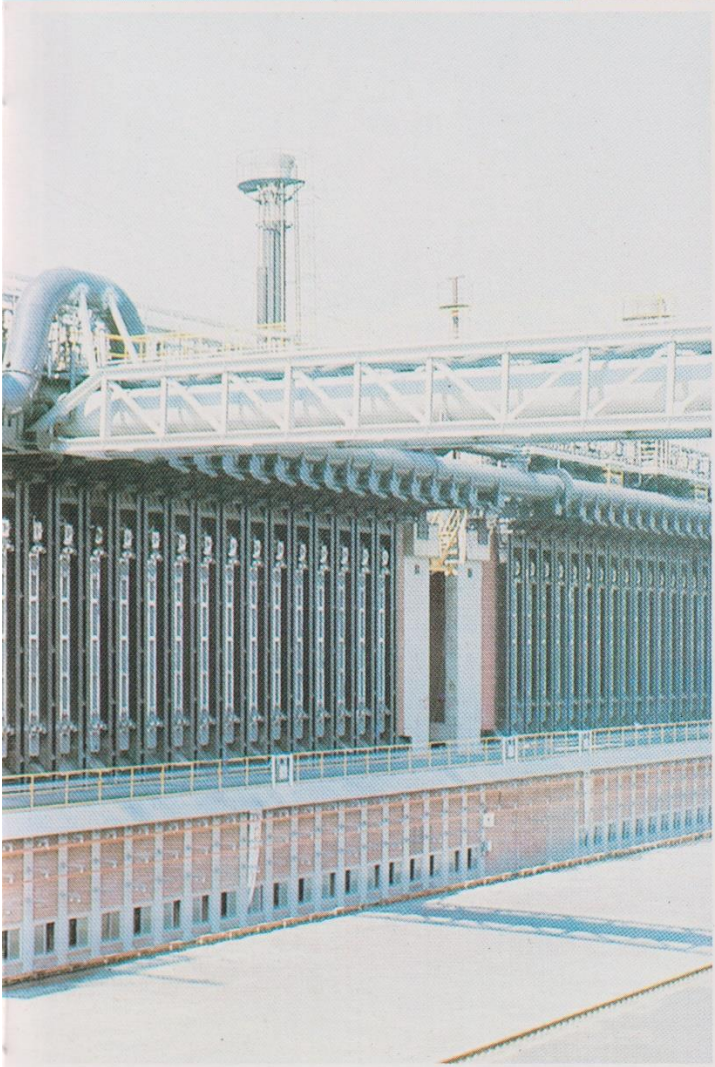
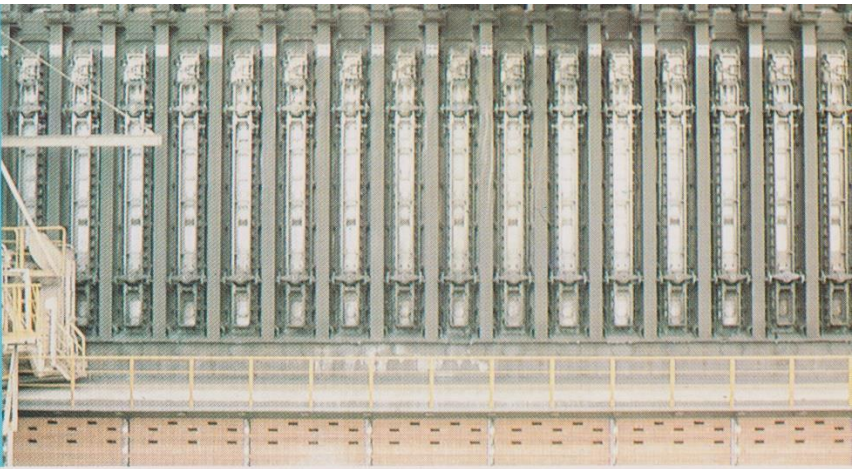
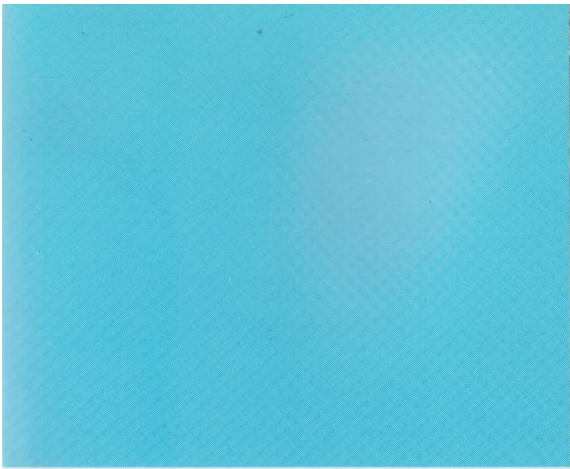
2: Adjustment of the gas sealing has been done only after gas-leakage is found.

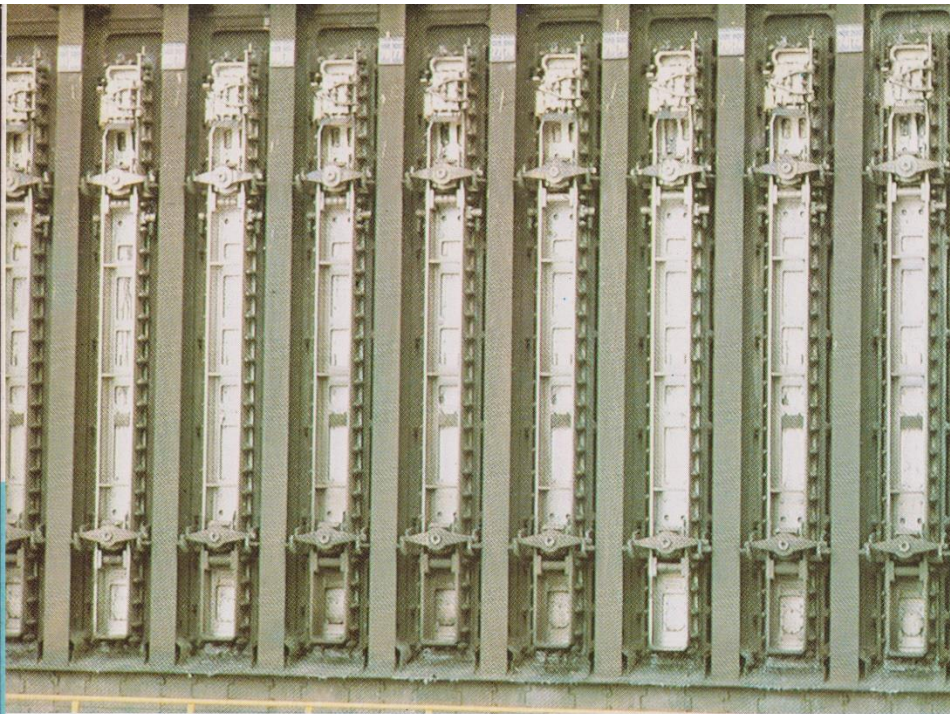
3: When the oven doors are subjected to a long-term coking operation, the warping becomes permanent because of the thermal effect to structure.

Therefore, we have resolved above-mentioned problems and developed. Ikio Diaphragm Type coke oven door of automatic adjustment and of less influence from coke oven.



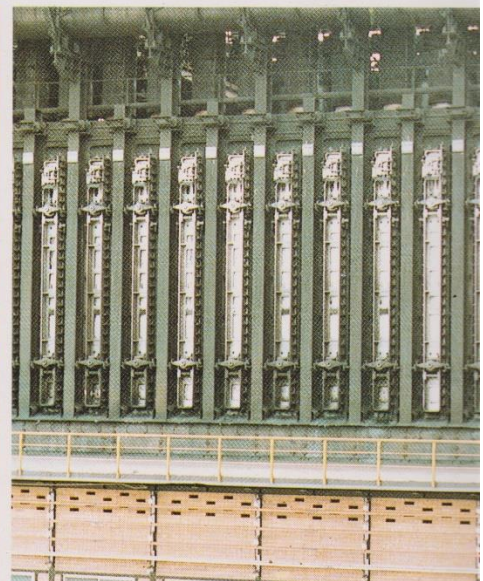
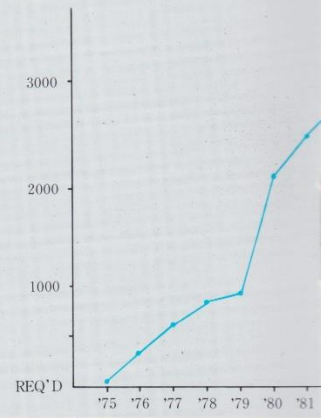
Pusher side





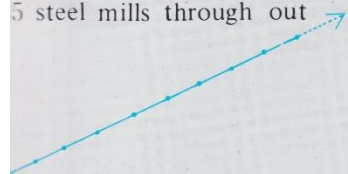
Ikio's Coke oven doors evaluate

Ikio diaphragm type coke oven doors are currently manufactured from final packaging. These are zero gas leakage type by the world.

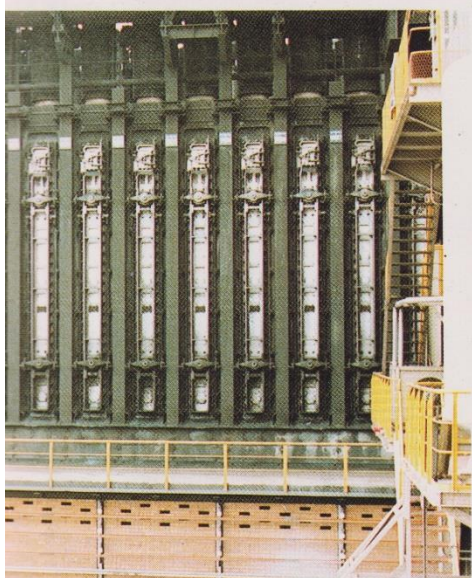


ted thorough out the world

e oven doors are consist-
the initial design to the
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'82 '83 '84 '85 '86 '87 '88 '89 '90 '91



■ DIAPHRAGM AND KNIFE-EDGE (Fig. 2)

A diaphragm of flexible and austenitic stainless steel with a high yield strength and corrosion resistance, is positioned between the main body and refractory plug of the door, and bolted to the refractory plug.

■ PLUNGERS (Fig. 3)

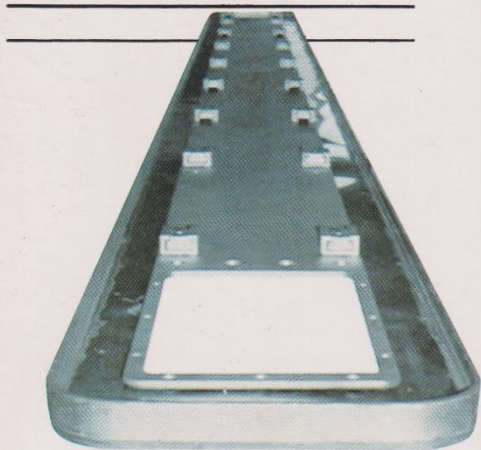
The diaphragm and the knife-edge are constantly pressed to the jamb contact face automatically and smoothly by the plungers which are located approximately 250mm (10") apart along the sides of the oven door and have strokes 10mm (3/8") forward and 15mm (5/8") backward.

■ FEATURES

1. Spacing of 40mm between the main body and the refractory plug of the oven door protects the door against heat transmission from the oven, and the cooling effect due to natural air flow minimizes temperature difference inside of the oven door. This construction minimizes strains of the oven door and prevents further warping. As a result, the springs press the knife edge tight on the jamb contact face automatically, and a complete sealing-in of gas is made possible. The oven door thus be termed of non-pollution type.
2. Because the strains in the door is minimized of the knifeedge can contact automatically and easily to the surface of door jamb. This door saves labour cost.
3. Insulation of heat by air reduces over-all heat-radiation, raises coking efficiency, decreases heat consumption, lessens ambient temperature in front of the oven, and thus provides improvements in working conditions and productivity.

Note ;

Conventional doors now in use can be replaced with the Ikio diaphragm type oven door.



■ Structural Specifications

Cross Section

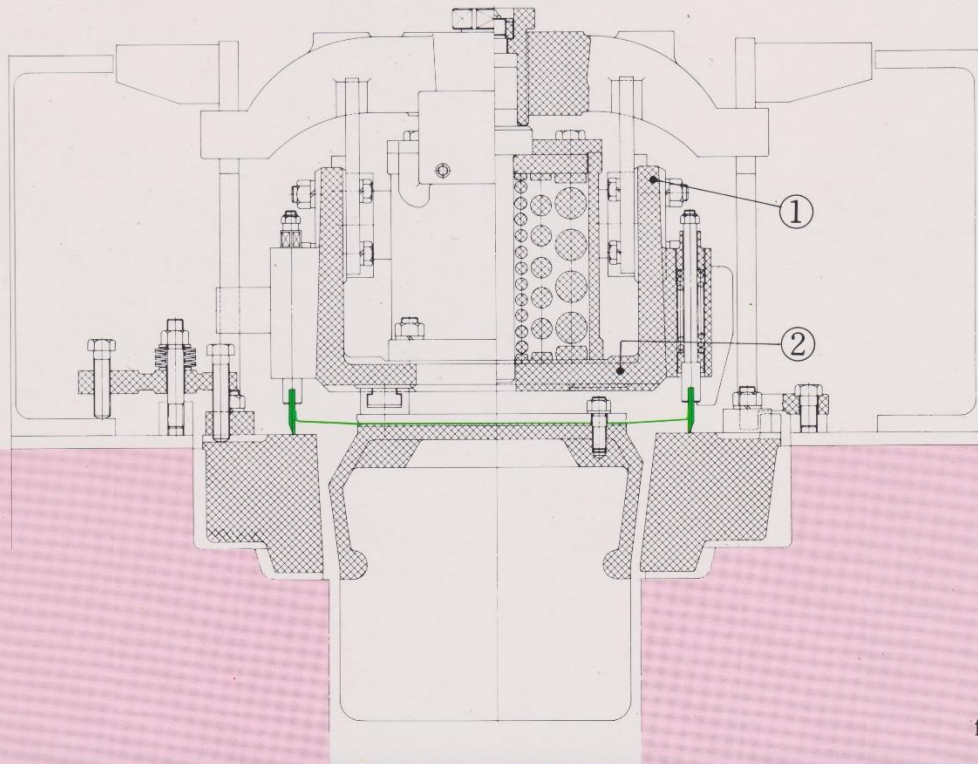


fig 1

Diaphragm and Knife-edge

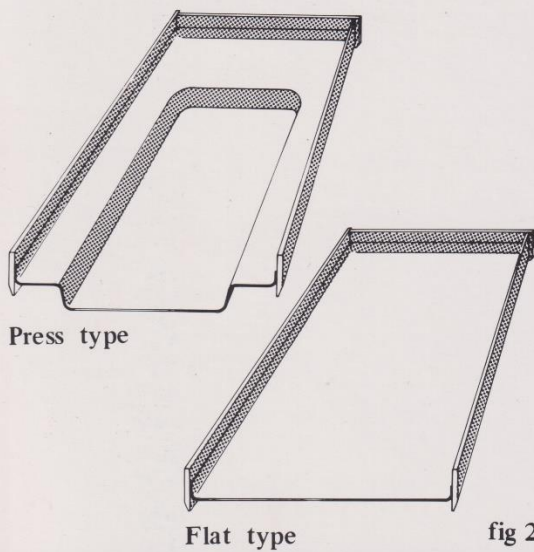


fig 2

PLUNGERS

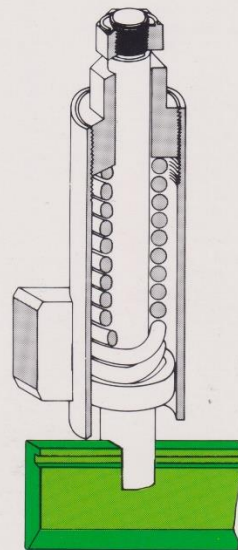


fig 3

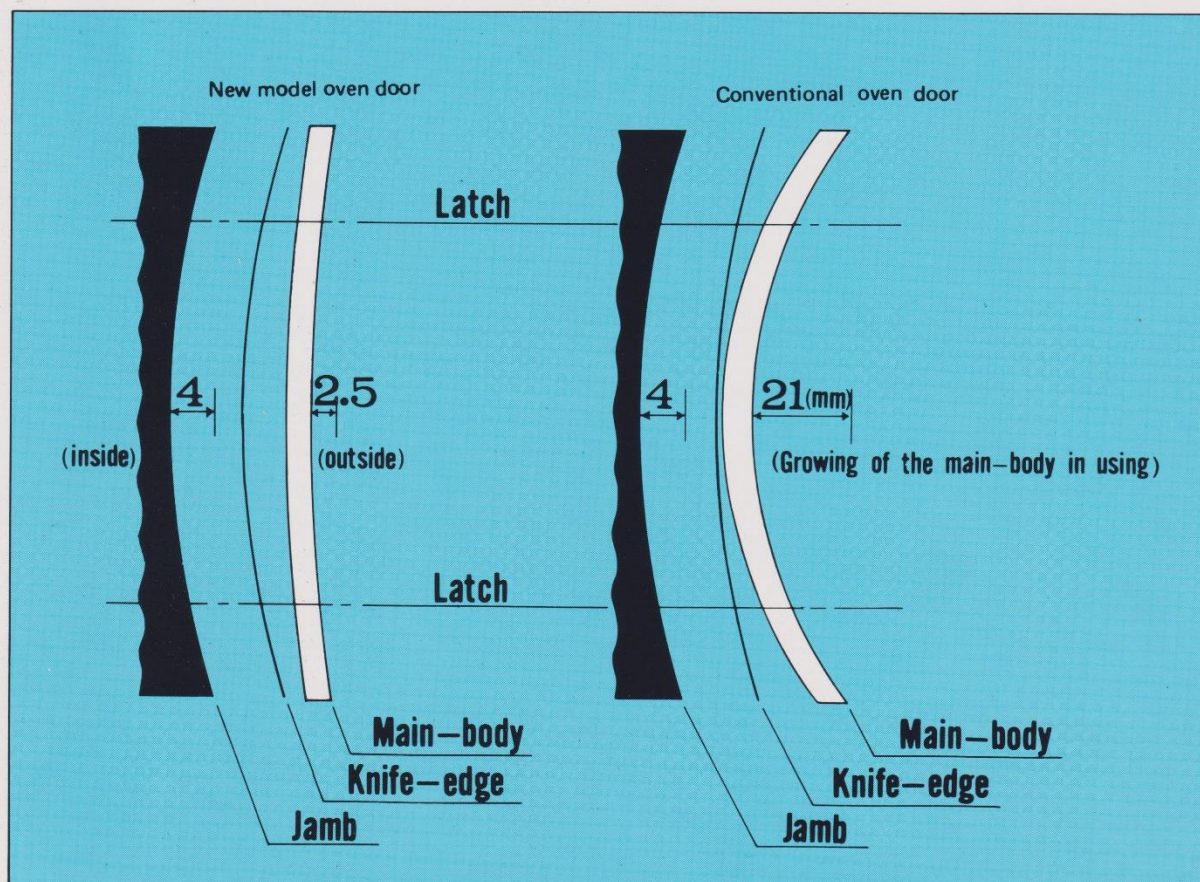
Comparative Data

Measurements obtained from an oven, 6.8m high, in actual use :

1. Temperature and temperature difference at various points on the oven door :

Items	Types	New model oven door	Conventional oven door
Temperature of oven door plate (fig1- ①)	Upper part	110	170
	Lower part	75	140
Temperature difference between oven door plate (fig1-①) and rib tip (fig1-②)	Upper part	30	50
	Lower part	15	35

2. Heat Strain Warp on Oven Door and Door Jamb





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