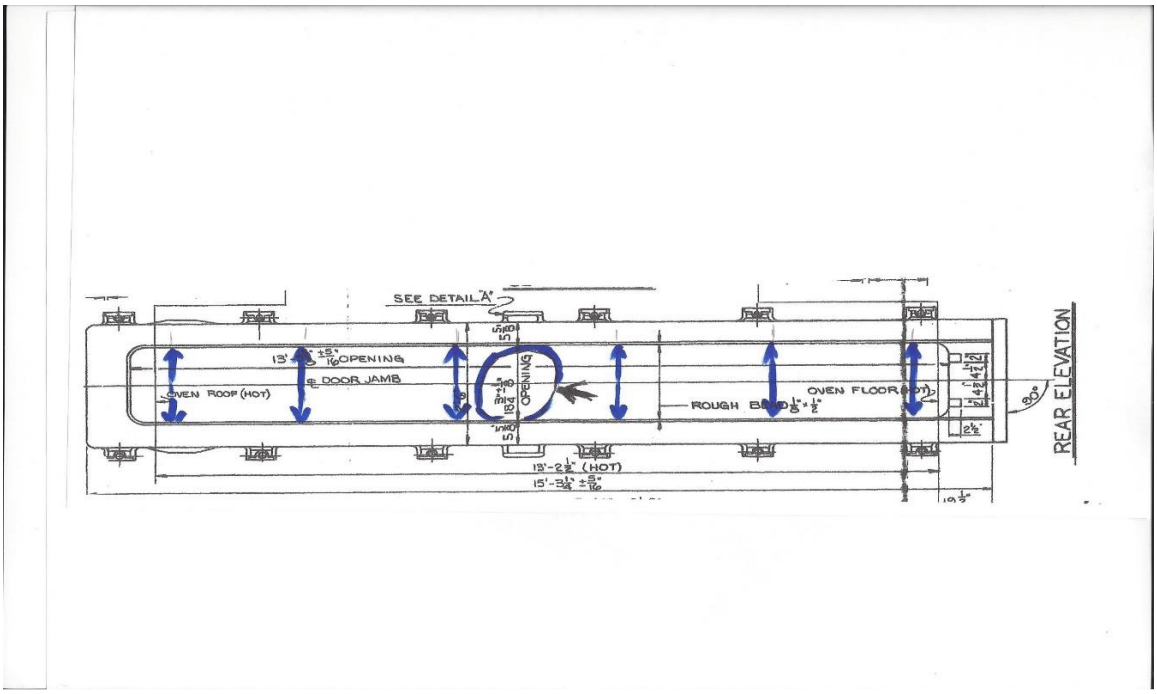
RAMM Metals, Inc.

Door Jambs used in a coke oven battery must stay with no deformation in service to avoid gas leaks and consequent environmental issues.

When the Door jambs are taken out of service for some maintenance job in the oven, they are put on the floor where they cool down. After the maintenance job is done, the Door Jambs have to be inspected to check if they deformed due to the thermal shock caused by the sudden cooling. CG iron for Jambs is expected to be more stable than ductile iron and have minimum warpage after use. This report confirms the stability of CG iron for Jambs.

The inspection is carried out on the width of the inside opening of the Jamb and also on the sealing surface of the Jamb, as shown in the sketch and photos below:



In 2013 and 2014, some 4.7 meters Door Jambs were inspected in a coke plant in USA by the RAMM engineer and by the coke plant maintenance supervisor. All Jambs listed below were put in service in 2006 or in 2007. So, the Door Jambs were inspected after 6 to 7 years of service.

CS-COKE SIDE JAMBS	OPENING **W**IDTH (nominal = **18 3/4"** +/- 1/8")		Difference between	FLATNESS OF SEALING	NOTES
RAMM Jambs	Max	Min	Max and Min	SURFACE	
RAMM CG # 12	18 3/4	18 3/4	0	FLAT	scrapped due to a small crack on one corner
RAMM CG # 04	18 7/8	18 3/4	1/8	FLAT	Good to be put back in service
RAMM CG # 40	18 3/4	18 5/8	1/8	FLAT	Good to be put back in service
RAMM CG # 38	18 7/8	18 3/4	1/8	FLAT	Good to be put back in service
RAMM CG # 11*	18 11/16	18 5/8	1/16	FLAT	Good to be put back in service
RAMM CG # 35*	18 9/16	18 1/2	1/16	FLAT	scrapped due to 18 1/2 W (1/4" out of tolerance)
RAMM CG # 09	18 7/8	18 3/4	1/8	FLAT	Good to be put back in service
RAMM CG # 03	18 7/8	18 3/4	1/8	FLAT	Good to be put back in service
RAMM CG # 36	18 7/8	18 3/4	1/8	FLAT	Good to be put back in service
	* Jambs used in the end of battery, where conditions are more severe in the winter time.				
CS-Jambs from competition					
Ductile iron #1	18 3/4	18	3/4	NOT FLAT (1/8" out)	scrapped due to "hour glass" deformation
Ductile iron #2	18 3/4	18 1/2	1/4	FLAT	scrapped due to "hour glass" deformation
Ductile iron #3	18 3/4	18	3/4	NOT FLAT (1/8" out)	scrapped due to "hour glass" deformation
Ductile iron #4	18 3/4	18 1/2	1/4	NOT FLAT (1/8" out)	scrapped due to "hour glass" deformation

PS-PUSHER SIDE JAMBS	OPENING WIDTH (nominal = **17 3/4"** +/- 1/8")		Difference between	FLATNESS OF SEALING	NOTES
RAMM Jambs	Max	Min	Max and Min	SURFACE	
RAMM CG # 97	17 5/8	17 7/16	3/16	FLAT	Good to be put back in service
PS-Jambs from competion					
Ductile iron #1	17 7/8	17 1/2	3/8	FLAT	scrapped due to "hour glass" deformation
Ductile iron #2	17 7/8	17 1/4	5/8	FLAT	scrapped due to "hour glass" deformation
Ductile iron #3	17 3/4	17 1/2	1/4	FLAT	scrapped due to "hour glass" deformation

RESULTS:

- **80%** (8 out of 10 pieces) of **RAMM Jambs** made in CG-Compacted Graphite Iron **were good to be put back in service**.

- 100% of competition Jambs made in Ductile Iron were scrapped due to “hour glass” deformation.

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