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شبكة المعلومات الجامعية

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شبكة المعلومات الجامعية



شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم



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جامعة عين شمس

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بالرسالة صفحات لم ترد بالأصل




Suez Canal University,
Faculty of Engineering
Ship Engineering Department

**Analysis Of
Theoretical And Experimental
Results of Residual Stresses
Due To Shipbuilding Processes**

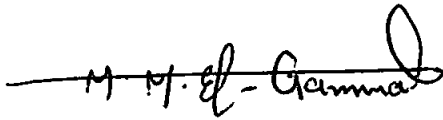
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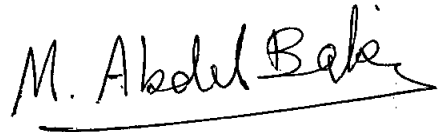
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We certify that we have read this thesis, and that in our opinion it is fully adequate, in scope and quality, as a dissertation for the degree of Master of Science.

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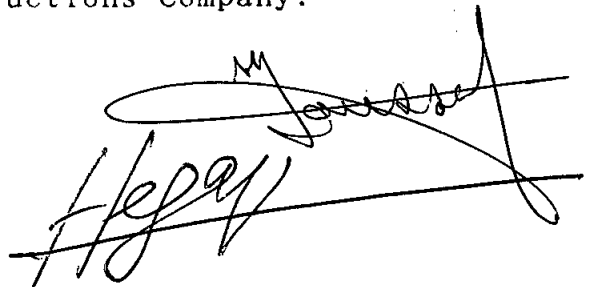
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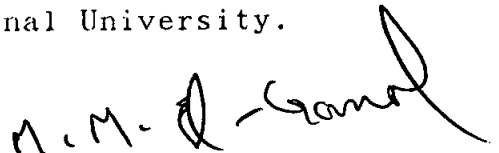
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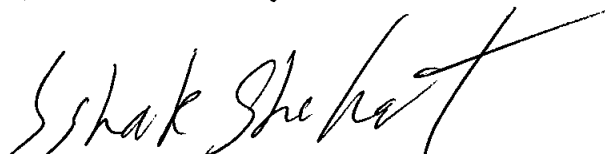
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ABSTRACT

The ship structure is subjected to many types of stresses. The history shows and proves that most of failures and cracks in ship structures are originated at the welded joints containing residual stresses. No one can deny the effect of those stresses specially in regions of tensile components which may cause the catastrophic failure of ships. This was the case of Schenectady which broken into two parts due to the act of the residual stresses. It is rather important to give a tool to take into consideration the assessment of the residual stresses. This has been done within the context of this thesis.

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Nomenclature

The following symbols are used in the present thesis.

A,B	Constants.
C,C ₁ ,C ₂	Constants.
D	A proportionality constant called the distribution ratio.
D _e	The distribution ratio of the end fillet weld.
D _s	The distribution ratio of the side fillet weld.
E	Young's Modulus.
E ₁	The moment arm of resultant about root = $W_s/3$
F	The external load per unit length of fillet.
F-ratio	The ratio between regression mean squares to error mean squares.
G	The shear modulus.
I	The welding current.
K,u,v	Constants.
L _e	Length of end fillet weld.
L _h	The length of hypotenuse of weld.
L _L	The leg length of fillet weld.
L _{Lo}	The initial leg length of fillet weld.
L _{pi}	The length of a circular pipe which is butt-welded at the end.
L _s	The length of the slot and inserted web.
L _t	The length of throat of weld.
L _w	The length of weld.
N	The number of welds in the cross-section of the joint.
P	The total external load.
P _i	The internal pressure.

Q_x	The shear load per unit length at any point along the length of the side fillet weld.
R	The radial distance to the point under consideration.
R_1	The radius of the hole.
R^2	The coefficient of determination.
R_i	The internal radius of the pipe.
R_s	The radius of the concentrated source of heating.
S	A constant assumed to be 0.05 cm^{-2}
SE	Standard error of element.
S_w	The average welding speed.
T	The temperature at point distant x or r from the origin.
T_c	The crack initiation period in built-in stress free structure.
T_{cr}	The crack initiation period for the same structure but contains residual and built-in stresses.
T_{fs1}	The fail-safe life period for a built-in stress free structure.
T_{fs1r}	The fail-safe life period for the same structure including the effect of residual and built-in stresses.
T_{wr}	The working life in the presence of residual and built-in stresses.
U_x	The stress concentration factor = $Q_x \cdot L_w / P$
V	The welding voltage.
W_s	The width of strip.
W_t	The width of tension zone.
a	The bead angle.
a_p	The cross-section area of plate.
a_s	The cross-section area of strip.
a_t	The total cross-section of weld.