

# M e E ec de

KYCVUjtp

Rtqfwekqp'Gpikpggtpi'Tgugctej'Fgrv0."

## Abstract:

*High speed and high performance submerged arc welding (SAW) with multiple electrodes is used for the corner*

Submerged arc welding with multiple electrodes (multi-electrode SAW), which has the advantages of high speed and high performance, is used for the corner of a workpiece. However, the welding conditions have not been established. For this reason, the welding conditions are investigated.

Submerged arc welding (SAW) with multiple electrodes is used for the corner of a workpiece.

Submerged Arc Welding (SAW) with multiple electrodes.)

Furthermore, because the phenomenon of welding is not clear, the welding conditions are investigated. The welding conditions are investigated by changing the welding current, the welding speed, and the electrode diameter. The results show that the welding conditions are established.



Vgejpkecn'Tgugctej'Egprgt.  
JFE Engineering

\*1 Itqwr'Ocpicigt.'Ygnfkpi'Vejpk'e'I tqwr.'



Vjku"hwpevkqp"cwvq o cvkecm{"cflwuvu"vjg"ygnfkpi"eqp-  
 ditions based on the penetration depth monitoring data  
 and controls the penetration depth to a uniform value.  
 Vjku" o cmgu"kv" rquukdng" vq" tgfweg"vjg" ykf vj" qh" l wewvc-  
 vkqpu"kp" vjg" rgpgvtcvkqp" fgrvj" kp" gcej" lqkv" kp" o wnvk/  
 gngevtqfg"UCY"qh"dqz"eqnw o p"eqtpgt"lqkvu"Vjg"eqpegrv"  
 of the penetration depth control method is described  
 below.

Vjg"cte" rqukvkqp"ku" fgŁpgf"cu"vjg"uw o"\*L + L<sub>a</sub>) of  
 vjg" yktg"gzvpgukqp"\*L) and arc length (L<sub>a</sub>), and is cal-  
 culated from measurable parameters (welding current,  
 welding voltage, wire feed speed). Penetration is con-  
 vtqmgf"d{"cflwuvkpi"vjg"ygnfkpi"ewttgpv"uq"vjcv"vjku"guvk-  
 mated arc position is the correct value as set in advance.

shows the parameters used to predict the arc  
 position.

(1) shows the relationship between the arc  
 rqukvkqp" cpf" rgpgvtcvkqp" yjgp" ygnfkpi" lcv" rncvgu"  
 From this, the arc position and penetration show sub-  
 uvcpvkcm{"vjg"ucog"xcnwgu."eqpŁt o kpi"vjcv"vjg"tgnc-  
 vkqpujkr"ku"cu"gzrgevfgf0

(2) shows the relationship between the results  
 of monitoring of the arc position and the shape of the  
 rgpgvtcvkqp" dgc f" qp" vjg" dcem"ukfg" \*gswkxcngpv" vq" vjg"  
 rgpgvtcvkqp" fgrvj+"kp"qp"ukfg" ygnfkpi"Vjg"gzrgevfg"  
 relationship between the estimated arc position and  
 vjg"ujcrg" qh" vjg" rgpgvtcvkqp" dgc f" qp" vjg" dcem" ukfg"  
 ycu"eqpŁt of f0

Application of the developed control method to  
 ygnfkpi" qh" eqtpgt" lqkvu" qh" dqz" eqnw o pu" ycu" uvwfkfgf0"  
 Yjgp" ygnfkpi" eqtpgt" lqkvu." rgpgvtcvkqp" ku" kfgpvk-  
 cal to the penetration depth of the leading electrode.  
 Vjgthqtg."hqt" gngevtqfg"eqpvtqn"kp"vjku"v{rg"qh" ygnfkpi."  
 penetration control is limited to the leading electrode,  
 cpf" vjg"qvjgt" gngevtqfgu" ctg" qpn{" o qpkvqtgf0" Cu" lqkvu"  
 yjkej" ctg" uwdlgev" vq" eqpvtqn." eqpvtqn" ycu" ko rng o gpgvf"  
 d{"ugngevkpi" i tqxgu" ykvj" c"nctigt"tqv" hceg"cpf" i tqxgu"  
 ykvj" c"nctigt"tqv" icr."eqpukfgtkpi" gttqt"kp"vjg"ceewtce{"  
 of the grooves. As a result, in grooves with a larger root  
 hceg."ucvkuhcevqt{"eqpvtqn" ycu" tgenk|gf" d{"cflwuvkpi" vjg"  
 current corresponding to the condition of the groove,  
 and in grooves with a larger root gap, control had been  
 rgthqtogf" d{" ejcpikpi" vjg" ewttgpv" cu" vjg" tqv" icr"  
 kpetgcugf0" Vjgug" tguwvnu" eqpŁt o gf" vjcv" vjg" rgpgvtcvkqp"  
 \* o l vjg"ql v<sup>3</sup> qp o

