



Fig. 2. A step curve of crack propagation gauge strands broken versus time during crack propagation stage.

Table 1
Chemical composition (wt.%)

Material/electrode	C	Si	Mn	P	S	Cr	Ni	Nb	Cu	Co	N	Mo
Base metal AISI 304L	0.022	0.35	1.79	0.026	0.001	18.32	8.23	0.002	0.40	0.08	0.055	
GMAW AWS A5.9 ER 308LSi	0.014	0.86	1.73	0.015	0.007	19.68	10.15	–	0.05	–	–	0.05

Table 2
Mechanical properties

Material/ electrode	Plate thickness/ electrode diameter (mm)	Proof strength, R_p (MPa)		UTS, R_m (MPa)	Elongation (%)	Hardness (Hv)
		0.2%	1%			
AISI 304L	6	297	328	622	54	185
GMAW ER 308LSi	1.2	420	–	600	40	–

Table 3
Welding process parameters

Process	Electrode diameter (mm)	Voltage (volts) V	Current (AMP) A	Welding speed (mm/s)	Wire feed rate (m/min)	Gas flow rate (argon) (l/min)
GMAW(semi Automatic) DCEP	1.2	32–34	232–238	7.5–10	14	16