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Prof. Adrian Gerlich

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Digital Image Correlation

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Fig. 5.4.1 Fig. 5.4.2
Fig. 5.4.3

Table
5.4.1 Table 5.4.2 Fig. 5.4.4

Fig. 5.4.5 MAG

Table 5.4.3 Table 5.4.4
1.0 mm/min

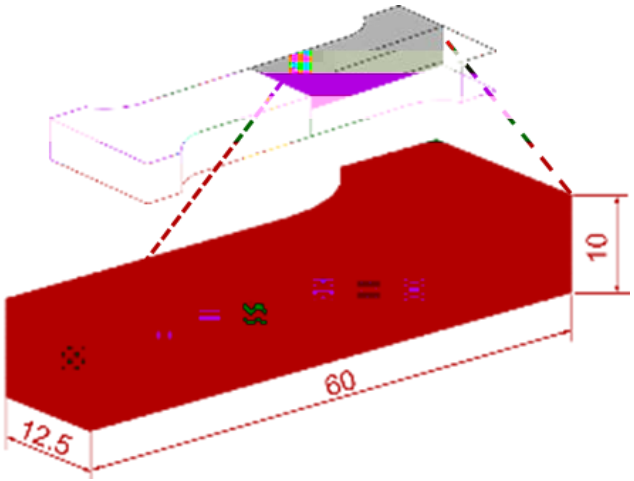

Fig. 5.4.1 The analysis model shape.

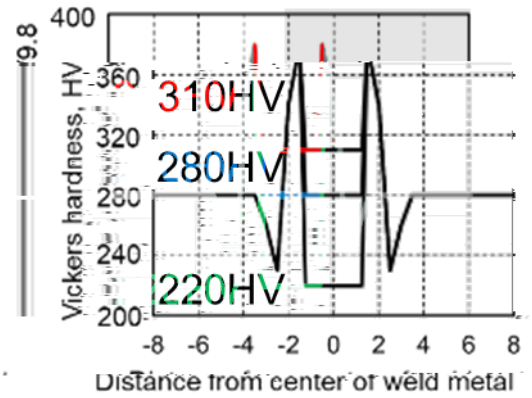

Fig. 5.4.2 The hardness distribution of weld in the analysis model.

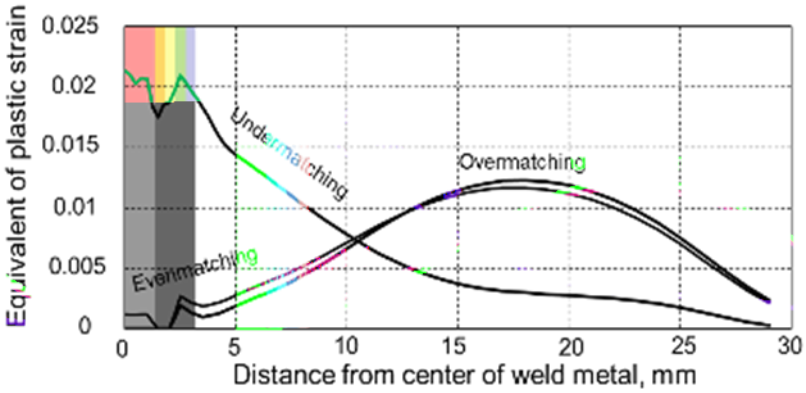

Fig. 5.4.3 Strain distribution obtained by the analysis.

Table 5.4.1 Chemical compositions of specimen (butt-welded joint).

Base metal

Material	C	Si	Mn	P	S	Cu	Ni	Cr	Fe
BA	0.14	0.25	1.32	0.006	0.004	0.01	0.02	0.25	Bal

Filler wire

Material	C	Si	Mn	P	S	Cu	Cr	Fe
TG-S50	0.06	0.73	1.47	0.021	0.007	0.24	0.02	Bal

Table 5.4.2 Welding conditions (butt-welded joint).

Welding speed, m/min	0.5
Laser type	LD
Laser power, kW	6
Laser irradiation angle, deg	5
Defocus length, mm	10
Laser core, μm	400
Focus lens	f400
Homoginizer	LL-line2.85
Spot size, mm	1.6 × 11
Weaving width, mm	0.6
Wire feeding speed, m/min	12.7
Wire feeding position, mm	0
Wire feeding angle, deg	180
Ar gas shielding, l/min	10
Energization distance, mm	81

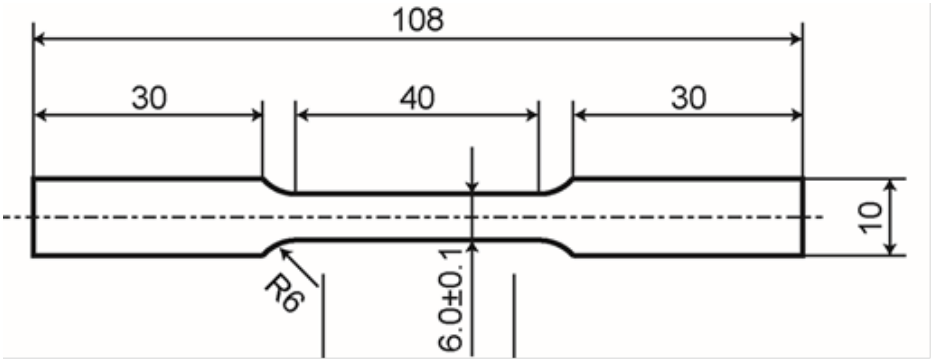

Fig. 5.4.4 Specimen shape.

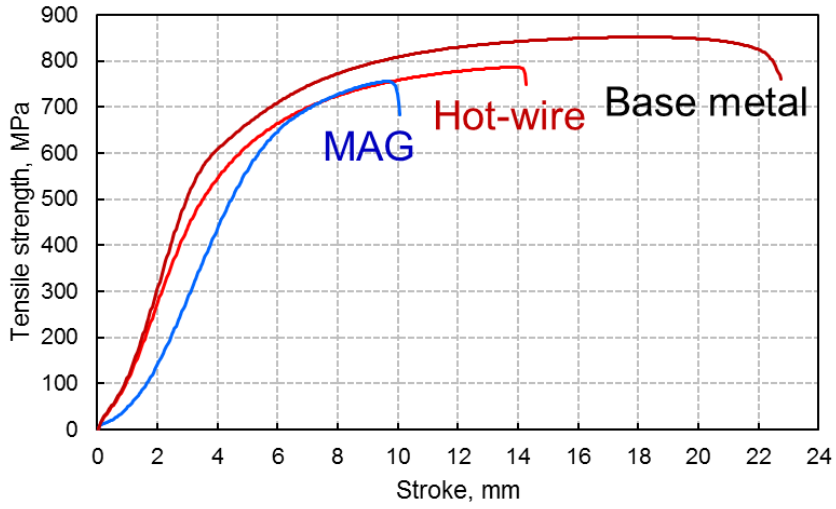

Fig. 5.4.5 Load-displacement curve (lap joint).

5.5

5.5.1

Fig. 5.5.1

Fig. 5.5.2 Fig. 5.5.3 Fig. 5.5.4 Fig. 5.5.5 Fig. 5.5.6

Fig. 5.5.2

Fig. 5.4.3

Fig. 5.5.4 5.5.5

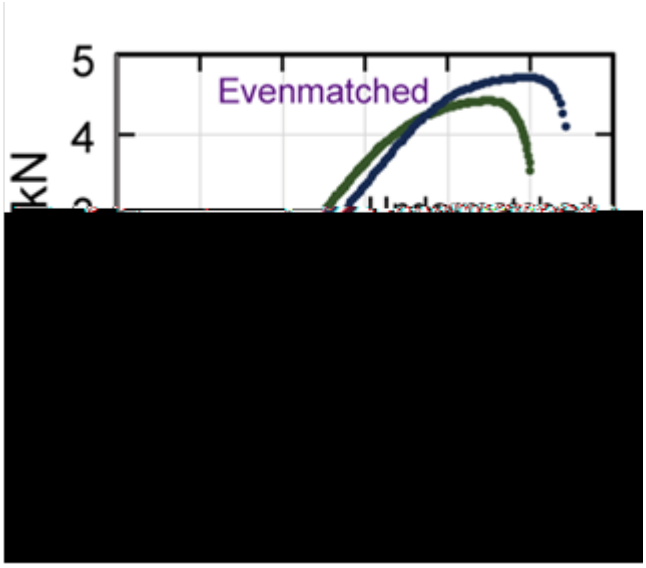

Fig. 5.5.1 Load-displacement curve.

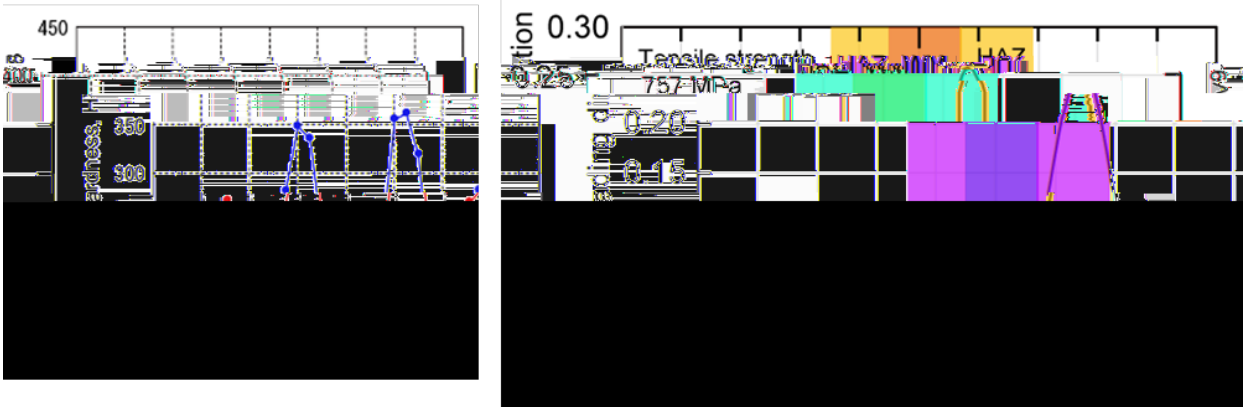

Fig. 5.5.2 Hardness distribution and the strain distribution (undermatched).

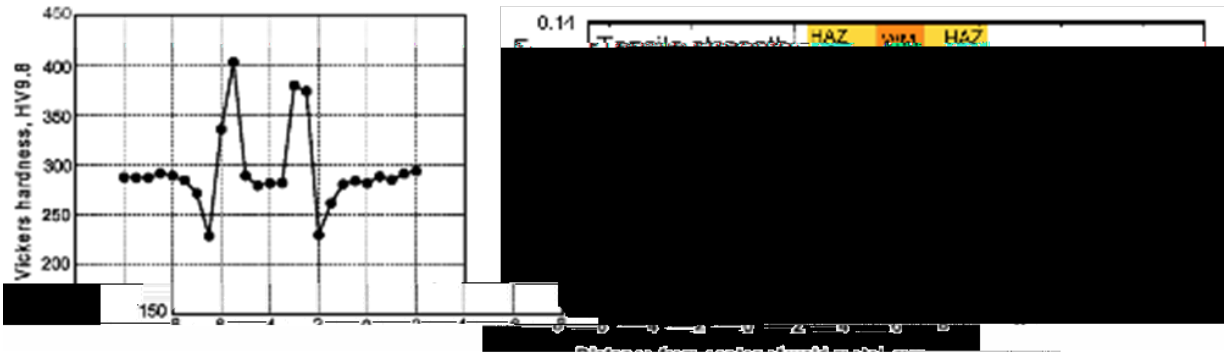

Fig. 5.5.3 Hardness distribution and the strain distribution (evenmatched).

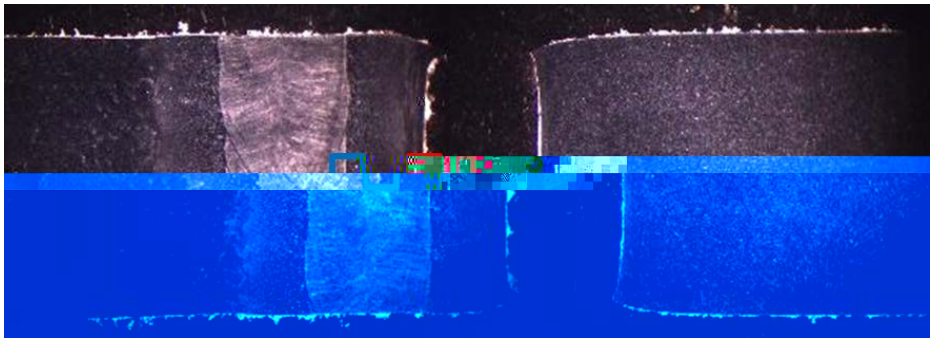

Fig. 5.5.4 The specimen after tensile test.

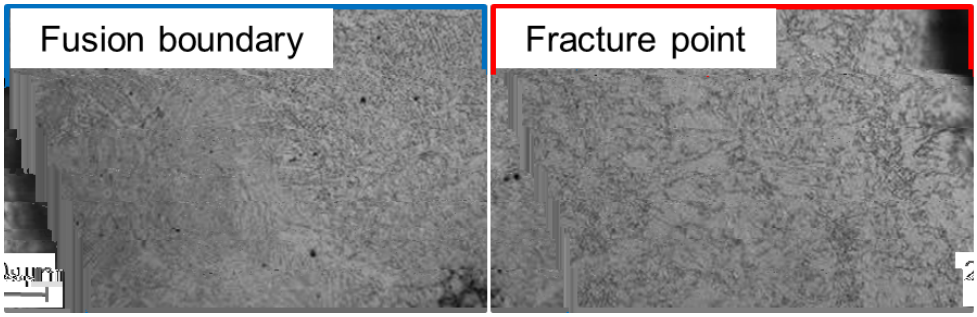

Fig. 5.5.5 Microstructure near the fracture point.

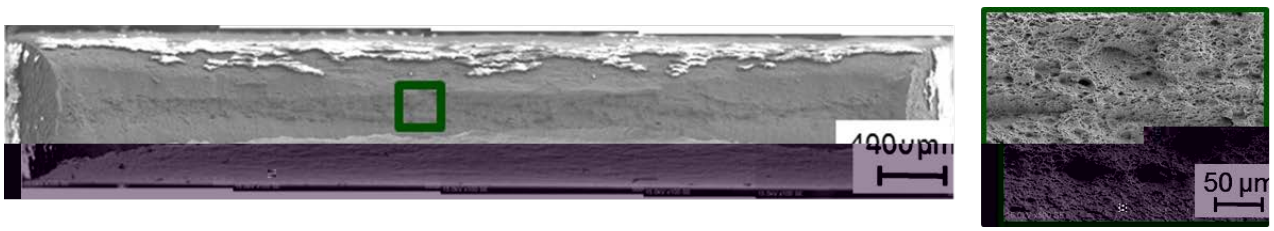

Fig. 5.5.6 Fracture surface.

5.5.2

Fig. 5.5.7 Fig. 5.5.8

1.5 mm

2.5 mm

Fig. 5.5.7 Hardness distribution and the strain distribution (Hot-wire).

Fig. 5.5.8 Hardness distribution and the strain distribution (MAG).

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