Electric Assisted Localized Heat Treatment

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OBJECTIVE

1. To study the mechanical properties of metal after **electrically assisted heat treatment**.
2. Developing a setup to make it **as localized as possible**.
3. Studying the **effects of temperature** and **rate of cooling** on the **change in microstructure** and other **mechanical properties**.
4. Comparing the obtained results with the most commonly used heat treatment process.
5. Improving the procedure to work with any metal (MS, Ti, Mg, etc.).
6. Testing it on the procedure for **metals deposited using additive manufacturing** and developing it accordingly to fit the same.

SETUP

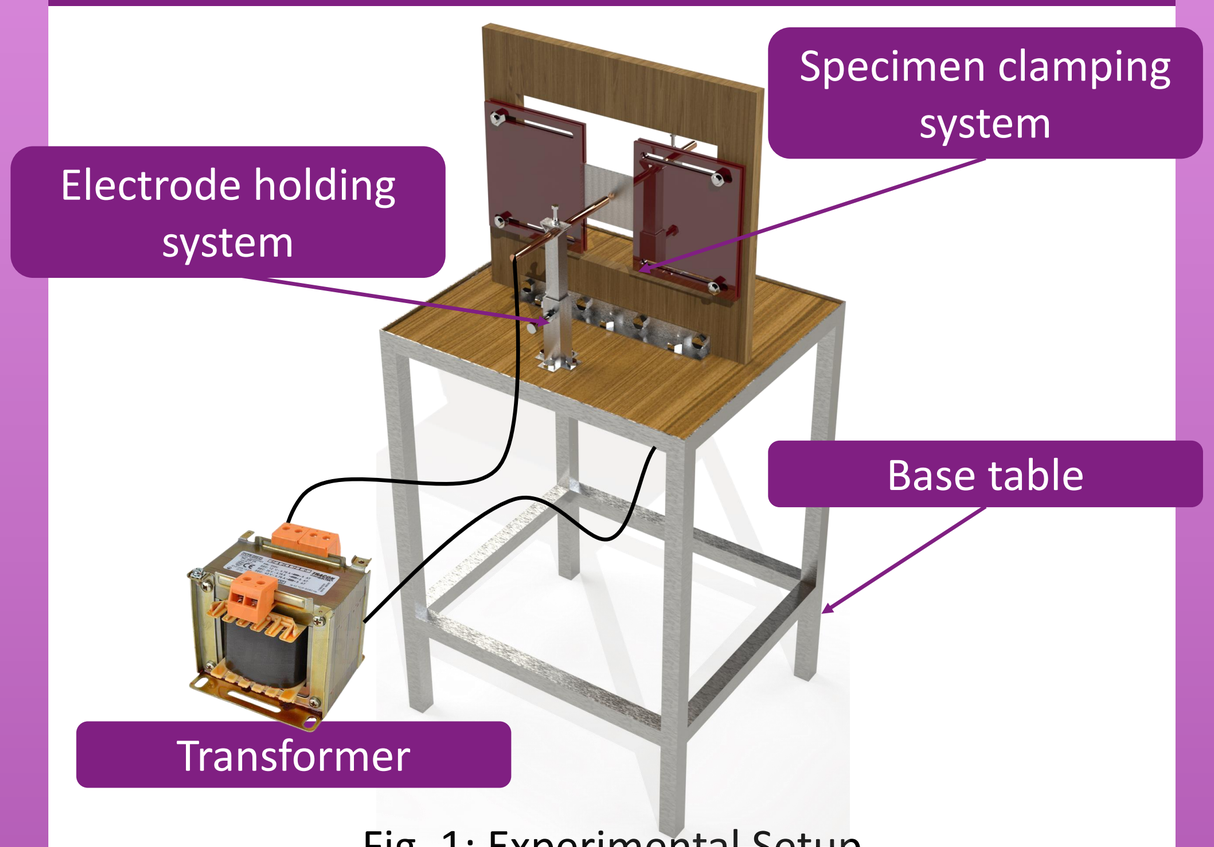
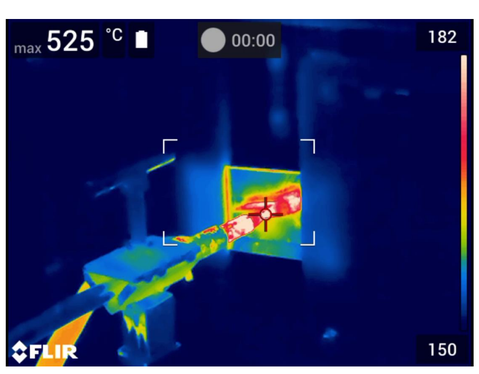


Fig. 1: Experimental Setup

PROCEDURE

1. Electric Heating
2. Quenching

Localized Heating



Temperature Profile

Post Heat Treatment

Fig. 2 Heat Treatment Process

RESULTS AND DISCUSSION

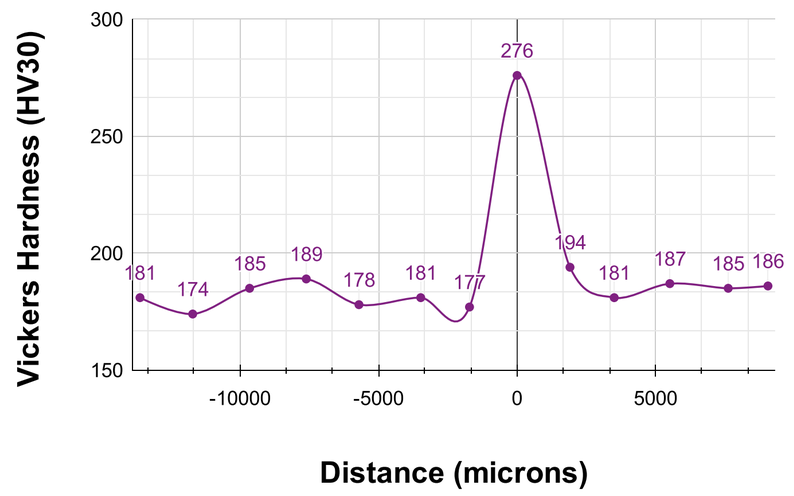


Fig. 3: Vickers Hardness (HV30/10)

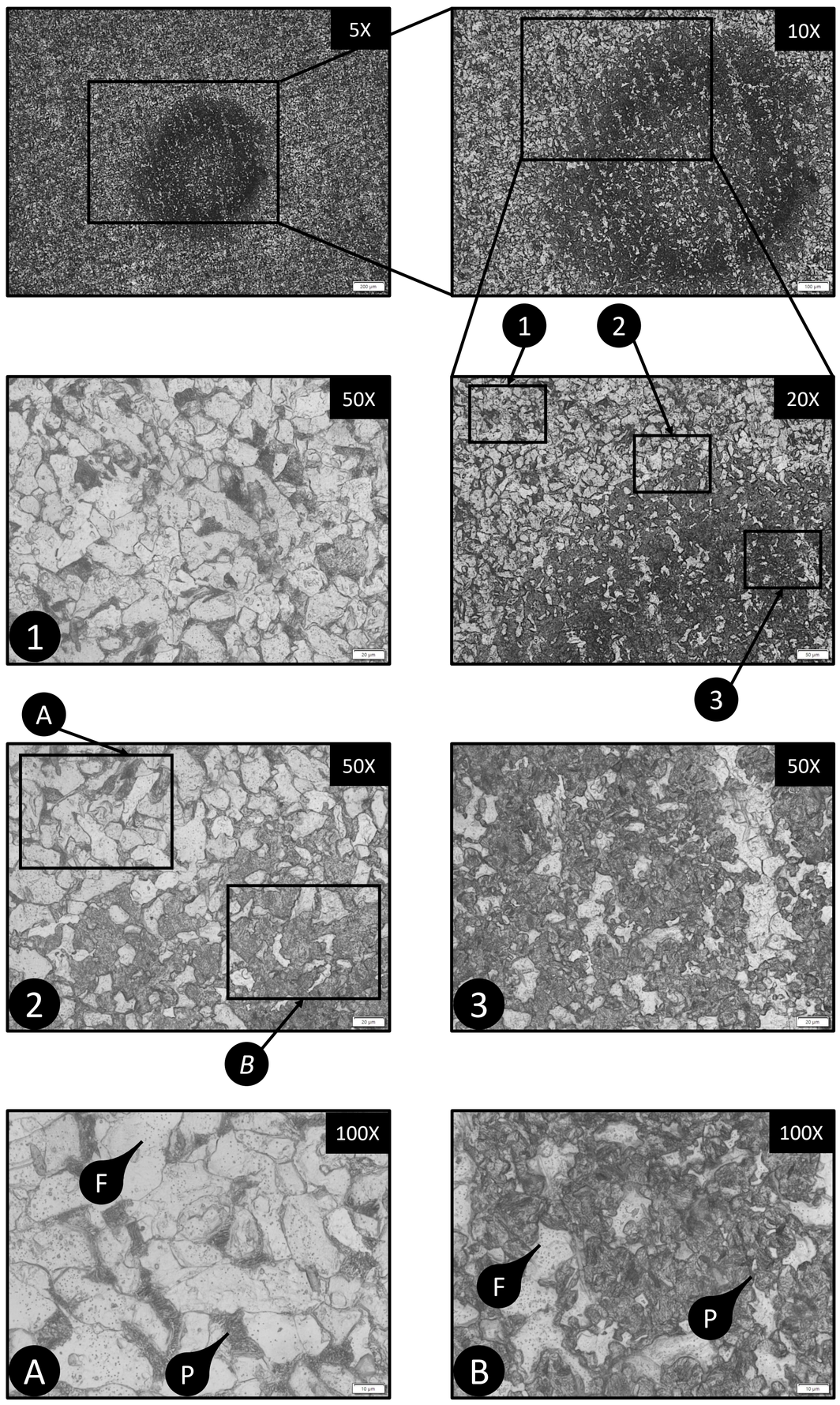


Fig. 4: Metallographic structure of the specimen **Ferrite (F)** and **Pearlite(P)**

ADVANTAGES

1. Selective Modification
2. Reduced Energy Consumption
3. Minimized Distortion
4. Efficient Use of Resources