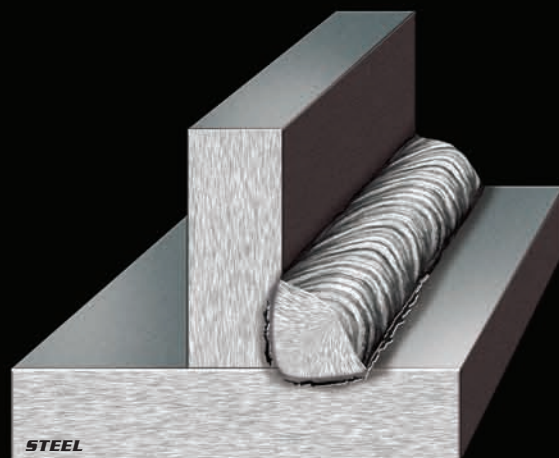


# Why Welds Crack

## DURING FABRICATION

- Joint Restraint
- High Carbon/Alloy Content
- Hydrogen Pickup
- Improper Bead Shape
- Low Melting Point Contaminants
- Rapid Cooling Rate



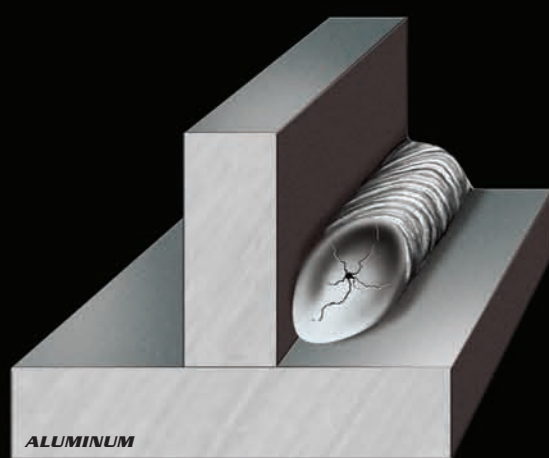
**HEAT AFFECTED  
ZONE CRACK**  
(Underbead Crack)

### Possible Causes

Excess Hydrogen  
High Carbon/Alloy Content in Base Metal  
High Residual Stress Levels

### Possible Cures

Use Low Hydrogen Consumables  
Control Hydrogen Content in Weld Metal  
Increase Pre-Heat  
Increase Post-Heat



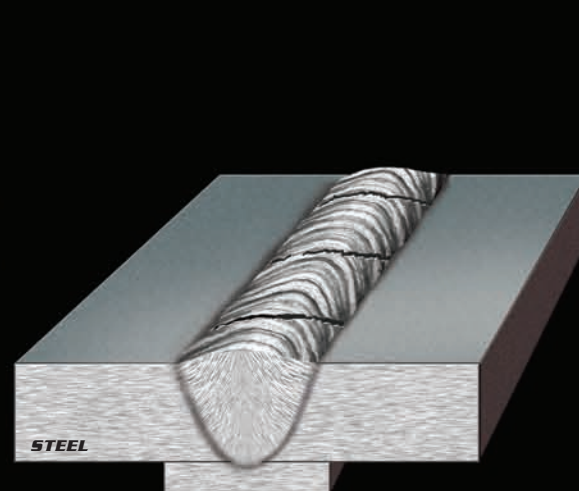
**CRATER CRACK**

### Possible Cause

Inadequate Crater Fill

### Possible Cures

Backstep at the End of the Weld  
Use Crater Fill Machine Settings



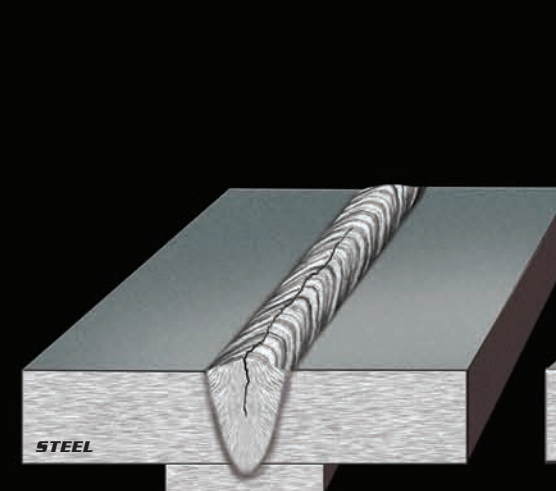
**TRANSVERSE CRACK**

### Possible Causes

Excess Hydrogen  
Excessive Strength in Weld Metal  
High Residual Stress Levels

### Possible Cures

Increase Pre-Heat  
Use Lower Strength Consumables  
(Consistent with design requirements)  
Increase Post-Heat



**LONGITUDINAL CRACK**  
(Centerline Crack)

### Possible Causes

Improper Width to Depth Ratio  
Low Melting Point Contaminants  
Concave Weld Surface

### Possible Cures

Use Width to Depth Ratio of 1:1 to 1.4:1  
Limit Excess Penetration  
Decrease Voltage and/or Travel Speed



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