

☐ **Causa Probable** / Probable Cause      ☐ **Posibilidad Remota** / Remote Possibility

## ELECTRODES | Electroodos

| ÁREA DE CAUSA                | Expulsión en Interfaz<br>Expulsion at Interface | Expulsión Superficial / Electrodo Pegado<br>Surface Expulsion / Sticking | Mushrooming del Electrodo<br>Electrode Mushroom | Baja Resistencia de Soldadura<br>Low Weld Strength | Indentación Excesiva<br>Excessive Indentation | Grieta Interna en Nugget<br>Internal Crack in Nugget | Grietas en Material Base<br>Cracks in Parent Material | Nugget Ennegrecido<br>Blackened Weld Nugget |
|------------------------------|-------------------------------------------------|--------------------------------------------------------------------------|-------------------------------------------------|----------------------------------------------------|-----------------------------------------------|------------------------------------------------------|-------------------------------------------------------|---------------------------------------------|
| Cara del electrodo pequeña   |                                                 |                                                                          |                                                 |                                                    |                                               |                                                      |                                                       |                                             |
| Cara del electrodo grande    |                                                 |                                                                          |                                                 |                                                    |                                               |                                                      |                                                       |                                             |
| Electrodos desalineados      |                                                 |                                                                          |                                                 |                                                    |                                               |                                                      |                                                       |                                             |
| Enfriamiento insuficiente    |                                                 |                                                                          |                                                 |                                                    |                                               |                                                      |                                                       |                                             |
| Tiempo de soldadura excesivo |                                                 |                                                                          |                                                 |                                                    |                                               |                                                      |                                                       |                                             |

## PARTS WELDED | Piezas a Soldar

| ÁREA DE CAUSA                    | Expulsión en Interfaz<br>Expulsion at Interface | Expulsión Superficial / Electrodo Pegado<br>Surface Expulsion / Sticking | Mushrooming del Electrodo<br>Electrode Mushroom | Baja Resistencia de Soldadura<br>Low Weld Strength | Indentación Excesiva<br>Excessive Indentation | Grieta Interna en Nugget<br>Internal Crack in Nugget | Grietas en Material Base<br>Cracks in Parent Material | Nugget Ennegrecido<br>Blackened Weld Nugget |
|----------------------------------|-------------------------------------------------|--------------------------------------------------------------------------|-------------------------------------------------|----------------------------------------------------|-----------------------------------------------|------------------------------------------------------|-------------------------------------------------------|---------------------------------------------|
| Material sucio / con escamas     |                                                 |                                                                          |                                                 |                                                    |                                               |                                                      |                                                       |                                             |
| Mal ajuste de piezas (fit-up)    |                                                 |                                                                          |                                                 |                                                    |                                               |                                                      |                                                       |                                             |
| Distancia de borde insuficiente  |                                                 |                                                                          |                                                 |                                                    |                                               |                                                      |                                                       |                                             |
| Soldaduras muy cercanas entre sí |                                                 |                                                                          |                                                 |                                                    |                                               |                                                      |                                                       |                                             |
| Metalurgia del material soldado  |                                                 |                                                                          |                                                 |                                                    |                                               |                                                      |                                                       |                                             |
| Mal seguimiento del cabezal      |                                                 |                                                                          |                                                 |                                                    |                                               |                                                      |                                                       |                                             |

## WELDING CONDITIONS | Condiciones de Soldadura

| ÁREA DE CAUSA        | Expulsión en Interfaz<br>Expulsion at Interface | Expulsión Superficial / Electrodo Pegado<br>Surface Expulsion / Sticking | Mushrooming del Electrodo<br>Electrode Mushroom | Baja Resistencia de Soldadura<br>Low Weld Strength | Indentación Excesiva<br>Excessive Indentation | Grieta Interna en Nugget<br>Internal Crack in Nugget | Grietas en Material Base<br>Cracks in Parent Material | Nugget Ennegrecido<br>Blackened Weld Nugget |
|----------------------|-------------------------------------------------|--------------------------------------------------------------------------|-------------------------------------------------|----------------------------------------------------|-----------------------------------------------|------------------------------------------------------|-------------------------------------------------------|---------------------------------------------|
| Squeeze Time - Corto |                                                 |                                                                          |                                                 |                                                    |                                               |                                                      |                                                       |                                             |
| Weld Time - Corto    |                                                 |                                                                          |                                                 |                                                    |                                               |                                                      |                                                       |                                             |
| Weld Time - Largo    |                                                 |                                                                          |                                                 |                                                    |                                               |                                                      |                                                       |                                             |
| Hold Time - Corto    |                                                 |                                                                          |                                                 |                                                    |                                               |                                                      |                                                       |                                             |
| Weld Force - Baja    |                                                 |                                                                          |                                                 |                                                    |                                               |                                                      |                                                       |                                             |
| Weld Force - Alta    |                                                 |                                                                          |                                                 |                                                    |                                               |                                                      |                                                       |                                             |
| Weld Current - Baja  |                                                 |                                                                          |                                                 |                                                    |                                               |                                                      |                                                       |                                             |
| Weld Current - Alta  |                                                 |                                                                          |                                                 |                                                    |                                               |                                                      |                                                       |                                             |