# Checklist of Information Required to Troubleshoot Silicon Carbide Heating Element Problems

## Customer Data
- **Customer Name:**
- **Contact Name:**
- **Address:**
- **Product manufacturered/Industry:**
- **I2R Contact:**
- **Contact email:**
- **Contact phone:**

## Furnace Data
- **Furnace builder:**
- **Furnace type:**
- **Production capacity, lb/h:**
- **Production Process:**
- **Furnace Temperature, °C or °F:**
- **Firing Cycle:**
- **Number of Zones:**
- **Time to temperature:**
- **Refractory/Insulation thickness:**
- **Refractory Insulation Composition:**
- **Diameters of holes in refractory:**
- **Ceramic Terminal Tube used, size:**

### Chamber/Zone dimension:
- **Width**
- **Height**
- **Length**

### Furnace atmosphere:
- **Is atmosphere contained in muffle:**
- **hat is the atmosphere dew point?**
- **What volatiles are given off from the load during heating?**
- **Is there any steam?**

## Electrical Data:
- **Electrical orientation (Wye/Delta/Single-Phase):**
- **SCR Rating:**
- **Transformer Voltage taps:**
- **SCR Manufacturer:**
- **Transformer Rating:**
- **Method of Control (SCR, SSR or Contactor):**
- **Transformer Manufacturer:**
- **If SCR, what firing method is employed? (phase-angle, zero-switching and type i.e single cycle, slow cycle and time base, if known):**

### Main Line Power:
- **Volt (AC)**
- **Phase**
- **Hz**
**Element data**

Type of element & part number: ______________________

Element loading:________________________

Element temperature:_______________________

Element dimension:_______________________

Element Spacing (Centerline to Centerline)________________

Number of elements _______________________

Power per element, kW: _______________________

Hot Zone Length _______________________

Cold End Length: _______________________

Element spacing from chamber walls:_______

**Connections and Installation**

What orientation are the elements installed in?
(Horizontal, Vertical, at an Angle, etc.)

How are the elements supported?

Are terminal tubes/lead-in sleeves being used?

Are the terminal holes in line with each other from one side of the furnace to the other? (where applicable)

Are the terminal holes free of debris? (any signs of condensates in the holes?)

Are the elements being packed around with fiber at the ends where they pass through the refractories?

Are the elements still able to move freely in both linear and radial directions? (important for thermal expansion/contraction)

Is there sufficient slack in the length of the aluminum straps so as to not transfer stress to the elements?

Are there any signs of residues on the element hot zones?

Are there any signs of residues on the element cold ends?

Do you know/what do you think the residues are?

Are the elements being installed in well matched groups?
(if unclear, we can explain and help)

Are new and old elements being installed in the same connection group?

Have the transformer tappings and/or SCR outputs been adjusted when replacing spent elements with new ones?

Are the aluminum braids showing signs or oxidation, arcing or heating up?
Are the connection clamps loose on the ends of the elements? ________________________________

How are the elements connected in each control group? (Please describe and/or send a sketch or connection schematic) ________________________________

Element Radiant Protection Tube Data (where applicable)

Tube material __________ Tube dimensions (mm): __________

Type(Straight, U, W, Inner) __________ Tube length (mm): __________

Tube orientation (Hor./Vert.) __________ Tube loading, W/cm2: __________

Number of tubes: __________ Net power per tube, kW: __________

NOTE: PLEASE DESCRIBE THE ISSUE BEING EXPERIENCED AS THOROUGHLY AS POSSIBLE. USE SEPARATE SHEETS TO PROVIDE ADDITIONAL INFO/ WHEN THERE IS INSUFFICIENT SPACE ON THIS FORM. PLEASE SEND PHOTOS AND PROVIDE AS MUCH INFORMATION AS POSSIBLE ABOUT THE PROCESS. WHEN COMPLETE, PLEASE EMAIL THIS FORM, PHOTOS, AND ADDITIONAL INFO TO: SALES@ISQUAREDRELEMENT.COM