How do electric heaters work? How can we use to heat Resids?
Designing Heaters

What are you heating? *M
How hot does it need to get? *M
What voltage do you have available? *E
Do API Rules apply? *M
Corrosive Considerations *M
Watt Density Considerations *M
Attachment Methods *M
What if the temp goes too hi?

Area Classification?
Designing Heaters
Designing Heaters

Circulation Heaters

Things to consider:
- Flow Rate (s)
- Process Control Location
- Hi Temp Shutdowns
- ASME/ANSI B31.3 considerations
- Area Classification
- Terminal Box Temps
Flanged Immersion Heater
Controlling Electric Process Heaters
Control Panel
Process Control-Local & Remote
So how do heaters **FAIL**?

1. Terminal Pin failure
2. Moisture in T Box
3. Low Flow or No Flow issues
Moisture in T Box = Heater Fail
Meg that Heater!

Start Up

Before energizing the heater, the following items should have been checked with the heater power disconnected:

1. Electrical termination is tight and wiring is per wiring diagram supplied with heater
2. Proper disconnecting means and fusing have been installed
3. The voltage rating of the heater is the same as that being applied
4. Megohm is within acceptable limits
5. Proper temperature controls and safety limiting devices are in place
6. Heater is securely installed in tank heater and no leaks are visible

Tight Termination = 20 inch pounds
Megging an electric process heater

Perfect = Infinity

“OK” = 20 +
Electric Process Heater Megging

**When:**
- Meg in the crate
- Meg after installation and prior to wiring
- Meg at Commissioning (with/without wire)
- As a PM punch list item annually

**How:**
- Disconnect all wires/t stats etc
- Connect (-neg) lead to ground
- Connect (+pos) lead to circuit group
- Set meter to 500 Vdc. Test for 1 min
- Record values
- Repeat at 1000 and 2500 Vdc and record
Heater Low Meg - What should you do?

Contact Valin Account Manager
120V bake out
Oven bake out at Valin Houston
Preventing Most Common Failures

1. Welded Bus Terminals
2. Modern Control Innovations
3. Cooler Running Heaters
The Aspyre SCR
Modern Innovations in Electric Process Heat

**Improvement Summary**

<table>
<thead>
<tr>
<th>Application</th>
<th>OPTIMAX Improvements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction Gas No. 2</td>
<td>50% less</td>
</tr>
<tr>
<td></td>
<td>51.4% less</td>
</tr>
<tr>
<td></td>
<td>108 in. shorter</td>
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*An entire element bundle and heater shell can be eliminated with OPTIMAX technology.*
Up to half the size & Cooler

Conventional Heat Exchanger
- Size
- Sheath Temperatures

New OPTIMAX
- Smaller and Lighter
- Unnecessary Length Remove Excess
Spares Program

Valin can store or service your spares
24 hr notice and we will have it on your dock

Valin Storage
Monthly monitoring in climate controlled facility and health check reports

On Site Care Program
Valin Thermal Solutions