

## OPTION CHECKLIST NO. 7: FUELS & COMBUSTION

### FUEL CHECKLIST

#### Daily Check

- |   |
|---|
| <ul style="list-style-type: none"><li>• Oil temperature at the burner ii. Oil/steam leakages.</li></ul> |
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#### Weekly Task

- |   |
|---|
| <ul style="list-style-type: none"><li>• Cleaning of all filters ii. Draining of water from all tanks.</li></ul> |
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#### Yearly Jobs

- |  |
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| <ul style="list-style-type: none"><li>• Cleaning of all tanks.</li></ul> |
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#### Troubleshooting Hints

##### Oil not pumpable

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| <ul style="list-style-type: none"><li>• Viscosity too high.</li></ul>        |
| <ul style="list-style-type: none"><li>• Blocked lines and filters.</li></ul> |
| <ul style="list-style-type: none"><li>• Sludge in oil.</li></ul>             |
| <ul style="list-style-type: none"><li>• Leak in oil suction.</li></ul>       |
| <ul style="list-style-type: none"><li>• Vent pipe choked.</li></ul>          |

##### Blocking of strainers

- |  |
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| <ul style="list-style-type: none"><li>• Sludge or wax in oil.</li></ul>                          |
| <ul style="list-style-type: none"><li>• Heavy precipitated compounds in oil.</li></ul>           |
| <ul style="list-style-type: none"><li>• Rust or scale in tank.</li></ul>                         |
| <ul style="list-style-type: none"><li>• Carbonization of oil due to excessive heating.</li></ul> |

##### Excess water in oil

- |   |
|---|
| <ul style="list-style-type: none"><li>• Water delivered along with oil.</li></ul>     |
| <ul style="list-style-type: none"><li>• Leaking manhole.</li></ul>                    |
| <ul style="list-style-type: none"><li>• Seepage from underground tank.</li></ul>      |
| <ul style="list-style-type: none"><li>• Ingress of moisture from vent pipe.</li></ul> |
| <ul style="list-style-type: none"><li>• Leaking heater steam coils.</li></ul>         |

## 方案列表 7: 燃料和燃烧

### 燃料列表

#### 每日检查

- 锅炉油温。油/蒸汽泄漏。

#### 每周任务

- 清洗所有的过滤网。排出所有贮水池的水。

#### 每年任务

- 清洗所有贮水池。

### 故障处理提示

油无法用泵抽出。

- 粘度过高。
- 管路和过滤器堵塞。
- 油中含有淤渣。
- 吸油管泄漏。
- 通气管堵塞。

### 滤网堵塞

- 油中含油淤渣或蜡状物。
- 油中沉淀物含量过高。
- 油罐内有铁锈。
- 油由于过热而碳化。

### 油中的水含量过高

- 水随着油一起输送。
- 检查孔存在泄漏。
- 地下油罐泄漏。
- 通气管有湿气进入。
- 蒸汽加热管泄漏。

## Pipeline plugged

<ul style="list-style-type: none"><li>• Sludge in oil.</li></ul>
<ul style="list-style-type: none"><li>• High viscosity oil.</li></ul>
<ul style="list-style-type: none"><li>• Foreign materials such as rags, scale and wood splinters in line.</li></ul>
<ul style="list-style-type: none"><li>• Carbonization of oil.</li></ul>

## COMBUSTION CHECKLIST & TROUBLESHOOTING

### Start up

<ul style="list-style-type: none"><li>• Check for correct sized burner/nozzle.</li></ul>
<ul style="list-style-type: none"><li>• Establish air supply first (start blower). Ensure no vapour/gases are present before light up.</li></ul>
<ul style="list-style-type: none"><li>• Ensure a flame from a torch or other source is placed in front of the nozzle.</li></ul>
<ul style="list-style-type: none"><li>• Turn ON the (preheated) oil supply (before start-up, drain off cold oil).</li></ul>

### Operations

<ul style="list-style-type: none"><li>• Check for correct temperature of oil at the burner tip (consult viscosity vs. temperature chart).</li></ul>
<ul style="list-style-type: none"><li>• Check air pressure for LAP burners (63.5 cm to 76.2 cm w.c. air pressure is commonly adopted).</li></ul>
<ul style="list-style-type: none"><li>• Check for oil drips near burner.</li></ul>
<ul style="list-style-type: none"><li>• Check for flame fading/flame pulsation.</li></ul>
<ul style="list-style-type: none"><li>• Check positioning of burner (ensure no flame impingement on refractory walls or charge).</li></ul>
<ul style="list-style-type: none"><li>• Adjust flame length to suit the conditions (ensure flame does not extend beyond the furnace).</li></ul>

### Load changes

<ul style="list-style-type: none"><li>• Operate both air and oil valves simultaneously (For self-proportioned burner, operate the self-proportioning lever. Do not adjust valve only in oil line).</li></ul>
<ul style="list-style-type: none"><li>• Adjust burners and damper for a light brown (hazy) smoke from chimney and at least 12 per cent CO<sub>2</sub>.</li></ul>

### Shut down

<ul style="list-style-type: none"><li>• Close oil line first.</li></ul>
<ul style="list-style-type: none"><li>• Shut the blower after a few seconds (ensure gases are purged from combustion chamber).</li></ul>
<ul style="list-style-type: none"><li>• Do not expose the burner nozzle to the radiant heat of the furnace. (When oil is shut off, remove burner/nozzle or interpose a thin refractory between nozzle and furnace).</li></ul>

## 管线堵塞

<ul style="list-style-type: none"><li>• 油中淤渣。</li></ul>
<ul style="list-style-type: none"><li>• 油粘度过高。</li></ul>
<ul style="list-style-type: none"><li>• 管线中有布屑、锈块和木屑等杂质。</li></ul>
<ul style="list-style-type: none"><li>• 油被碳化。</li></ul>

## 燃烧列表 和 故障处理办法

### 起动

<ul style="list-style-type: none"><li>• 检查燃烧室/喷嘴的尺寸是否正确。</li></ul>
<ul style="list-style-type: none"><li>• 先确保空气供应（启动鼓风机）。确保在点燃前燃烧室内没有蒸汽/汽油。</li></ul>
<ul style="list-style-type: none"><li>• 确保喷嘴前有明火，可由吹焰器等火源提供。</li></ul>
<ul style="list-style-type: none"><li>• 打开（已预热的）燃油供应（在起动前，先排掉冷油）。</li></ul>

### 运行

<ul style="list-style-type: none"><li>• 检查燃烧器喷尖的油温是否正确（参考粘度和油温对应表）。</li></ul>
<ul style="list-style-type: none"><li>• 检查LAP燃烧室的气压（通常采用63.5 cm到76.2 cm水柱的气压）。</li></ul>
<ul style="list-style-type: none"><li>• 检查燃烧室附近的滴油器。</li></ul>
<ul style="list-style-type: none"><li>• 检查歇火/火焰脉动。</li></ul>
<ul style="list-style-type: none"><li>• 检查燃烧室位置（确保火焰不会直接打在耐火衬壁或耐火炉料上）。</li></ul>
<ul style="list-style-type: none"><li>• 调整火焰高度，以适应环境（确保火焰不会延伸到窑炉以外）。</li></ul>

### 负荷变化

<ul style="list-style-type: none"><li>• 同时操作空气和燃油阀门（如果是自动配比燃烧室，则操作自动配比杆。不要只调节油路上的阀门）。</li></ul>
<ul style="list-style-type: none"><li>• 调节燃烧室和挡板，使烟囱排除的烟气呈浅褐色，含氧量至少为12%。</li></ul>

### 关闭

<ul style="list-style-type: none"><li>• 首先关闭油路。</li></ul>
<ul style="list-style-type: none"><li>• 几秒后，关闭鼓风机（以确保废气从燃烧室排净）。</li></ul>
<ul style="list-style-type: none"><li>• 不要将燃烧室喷嘴暴露在炉子的辐射热下（关闭油路后，移除喷嘴，或在喷嘴和炉子之间插入一块隔热板。</li></ul>