Kitchen Exhaust Duct (KED) Requirements
Scope:

- Objectives
- Introduction
- Fire Safety Concerns
- KED Requirements
- Enforcement
- Conclusion
Objectives

- Why we need to impose requirement on KED?
- How it is related to FSM?
Introduction

• Fire Safety Investigation

Blk 851 Jurong West Street 81, COFFEE SHOP ON FIRE !.mp4

Source of video : YouTube
Why Fire Occurred?

- Grease accumulation
- Fire tetrahedron
Fire Tetrahedron

- Heat
- Fuel
- Oxygen

Chain reaction
Common Causes of Fire

- Unattended cooking
- Malfunction of cooking equipment
- Tossing cooking style
- Over heated cooking
Where is the Grease Residual?

http://commercialfiresafety.org/category/design-kitchen-exhaust-system/
Fire Safety Concerns

- Why is there a need for such requirements?
- What are the concerns?
<table>
<thead>
<tr>
<th>Year</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
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<td>16</td>
<td>12</td>
<td>16</td>
<td>18</td>
<td>21</td>
</tr>
</tbody>
</table>
LPG storage Cabinet

Burnt Through
Picture taken within the unit, looking at the burnt-through-duct.
HDB’s unit window to KED - 300mm
1. Setback is needed from the KED when it runs outside an eating establishment/industrial unit.
- No unprotected openings of occupied area within 1.5m or 3m from KED
1. Setback is needed from the KED when it runs outside an eating establishment/industrial unit.

2. Non fire rated KED shall be located minimum 3m away from LPG cylinders and pipe work. It shall not be located directly above LPG storage cabinet.
LPG storage
KED > 0.6m

Vaporizer

>3m

Liquid phase

Vapour phase

Non fire rated LPG cabinet
1. Setback is needed from the KED when it runs outside of an eating establishment/industrial unit.
2. Non fire rated KED shall be located minimum 3m away from LPG cylinders and pipe work. It shall not be located directly above LPG storage cabinet.

3. The exhaust ducts and kitchen hoods (including the interior) shall be degreased and cleaned at least once every 12 months. The work shall be carried out by a specialist and the records of cleaning and degreasing shall be kept by the owner/operator for verification by relevant authority.
# Maintenance Guide

- **“When” to clean** & **“Where” to measure**

<table>
<thead>
<tr>
<th>Standard</th>
<th>When should Duct be to Clean</th>
<th>Acceptable cleanliness</th>
<th>Instrument</th>
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</thead>
<tbody>
<tr>
<td>NFPA 96 (US)</td>
<td>Average thickness of surface grease &gt; 2000 µm (0.078 inch/0.19812mm)</td>
<td>&lt; 50 µm (0.002 inch/0.0508mm)</td>
<td>Depth Gauge Comb</td>
</tr>
<tr>
<td>TR 19 (UK)</td>
<td>Average thickness of surface grease &gt; 200 µm (0.0078 inch/0.19812mm)</td>
<td>&lt; 50 µm (0.002 inch/0.0508mm)</td>
<td>Wet Film Thickness Gauge</td>
</tr>
</tbody>
</table>

**Where to measure, where practicable**

1. Canopy / Extract plenum behind filters
2. Duct 1 metre from canopy
3. Duct 3 metre from canopy
4. Duct midway between canopy and fan
5. Duct upstream of fan
6. Discharge duct downstream of fan
Leaking Hood – 2 nos of large plastic containers placed under the hood to collect grease.

Tell-tale Sign
Telltale sign

Leaking Ducts (running above kitchen area) - Plastic bottles placed under the duct to collect grease.
3.3 Ventilation And Air Exhaust Systems

The ventilation and air exhaust systems in a food shop, including the kitchen, shall be designed and operated in accordance to the requirements set out here:

(e) There shall be regular cleaning and maintenance of the exhausts.
Add the text from the email.

NEA’s ADVISORY, JAN 2015

Advisories For NEA Food Establishment Licenses

FIRE SAFETY ADVISORY TO PERFORM REGULAR MAINTENANCE OF EXHAUST DUCTING

The Singapore Civil Defence Force (SCDF) has shared with NEA that every year, there are numerous fire incidents in coffee shops. During the investigation of these fires, the SCDF has attributed the fires to excess grease build up caused by poor maintenance of the Kitchen Exhaust systems and the exhaust ducting.

The SCDF advised that these fires can be prevented through regular maintenance of the exhaust systems and ducting. The National Environment Agency (NEA) would like to remind all licensees to ensure that all the exhaust systems and its ducting are maintained at least once a year. During NEA inspections, our officers will check that all equipment, including exhaust system and its ducting, used at your premises are maintained regularly and in good working order. You are also advised to retain the maintenance invoice for verification purposes.

We seek your co-operation on this issue. Please contact NEA Call Centre at 1800-2255632 or Contact_NEA@nea.gov.sg if you have any queries or would like to report such incidents.

Thank you
ENFORCEMENT

✓ NFSOs (not FHAN)—fine, court action for non compliance to the SCDF Fire Safety Circular – if operators fail to see that the exhaust ducts (including the interior) and kitchen hoods be degreased and cleaned at least once every 12 months

✓ The cleaning and maintenance of KED once in 12 months apply to all KED
Insurance Matter

• We engaged General Insurance Association (representing 35 insurance companies)

• They informed that they may not specifically ask for KED maintenance/cleaning records at point of insurance contract

• However, owners are expected to follow the regulatory requirement on cleaning and degreasing.
Conclusion

With the requirements imposed on unprotected opening and degreasing, we can reduce the probability of fire spread through ducting and reduce kitchen exhaust duct fire.