



INDUSTRY BRIEFING NOTE

Published: January 2009

Appliance Combustion Issues

Introduction

Over many years our customers and industry have encountered periodic, isolated and/or regional manifestations of combustion problems with domestic appliances burning Kerosene.

Different manifestations of combustion problems have occurred but the most common ones, often where the fuel itself has been brought into question show commonality to appliance burner types.

However the manifestation of combustion problems encountered may in some cases only relate to a specific burner type due to its method of operation whereas the cause could be a common problem affecting many installation types but with differing symptoms.

In 2003 OFTEC and FPS representatives first drafted a questionnaire form (T61q) as a means of capturing reported combustion problems in the field, which has been administered by OFTEC since publication. The information received and collated now shows common trends and indicators which could affect the quality of combustion and operation of oil fired appliances both in relation to fuel and installation related variances from the norm or expected. As a result of this the following guidance is issued.

If combustion problems are encountered:

Do:

- Check the tank for condensation / water
- Check the filters in the oil supply system inc. filters integral to fuel pumps & oil control valves
- Check that the oil tank provides sufficient minimum head of supply for the appliance(s)
- Check that oil supply lines are sufficiently sized for the appliance(s)
- Check that there is sufficient combustion, ventilation and make up air supplies for the appliance(s)
- Check that flue and chimney systems are correct and function as required by the appliance(s)
- Check for room extract fan interference
- Check that all burner settings are correct
- Check with the supplier that the correct grade of fuel for the appliance(s) has been delivered
- Check with the supplier that fuel is not cross contaminated with other grades such as gas oil or paraffin

The aforementioned points and combinations of same can give rise to combustion problems on site. Where these have been ruled out then please complete a T61q questionnaire (www.oftec.org or www.fps.org.uk) and submit completed forms to OFTEC Technical Department for review and further advice.

Don't:

- Presume that existing installations are ok, even when problems have not previously been encountered
- Presume that changing or altering the fuel type will resolve combustion problems
- Presume that fuel additives can resolve combustion problems
- Presume that the fuel is always correct
- Presume anything!

Combustion symptoms:

Premature Carboning

Most commonly associated with continually burning vaporising appliances.

Key factors:

- Condensation / water in the tank & partially blocked filters in the oil supply system inc. filters integral to oil control valves
- Insufficient minimum head of oil supply especially when multiple appliances share a common supply line system resulting in fuel starvation
- Insufficiently sized oil supply lines especially when multiple appliances share a common supply line system.
- Insufficient combustion, ventilation and make up air supplies.
- Insufficient flue and chimney systems/operation
- Room extract fan interference.
- Incorrect burner settings
- Incorrect grades of fuel such as gas oil or paraffin.
- Cross contaminated kerosene with other fuel grades such as gas oil, derv or paraffin or use of unapproved fuel additives.

Appliance over firing & appliance sooting

All types of appliance burner.

Key factors:

- Insufficient combustion, ventilation and make up air supplies.
- Insufficient flue and chimney systems/operation.
- Extract fan interference.
- Incorrect burner settings
- Incorrect grades of fuel such as gas oil or paraffin.
- Cross contaminated kerosene with other fuel grades such as gas oil, derv or paraffin or use of unapproved fuel additives.

Component failures

Most commonly associated with premature failure of pressure jet burner fuel pumps.

Key factors:

- Condensation / water in the tank & partially blocked filters in the oil supply system inc. filters integral to oil pumps
- Insufficient minimum head of oil supply especially when multiple appliances share a common supply line system.
- Incorrectly sized oil supply lines (gravity and suction).
- Incorrect grades of fuel for burner type e.g. kerosene in a gas oil fuel pump or paraffin in a kerosene fuel pump.
- Cross contaminated fuel such as gas oil cross contaminated with kerosene, kerosene cross contaminated with paraffin.

Intermittent burner lock outs

Most commonly associated with pressure jet burners.

Key factors:

- Condensation / water in the tank & partially blocked filters in the oil supply system inc. filters integral to oil pumps
- Insufficient minimum head of oil supply especially when multiple appliances share a common supply line system resulting in intermittent fuel starvation
- Insufficiently sized oil supply lines especially when multiple appliances share a common supply line system resulting in intermittent fuel starvation
- Incorrectly sized oil supply lines (gravity and suction).
- Insufficient combustion, ventilation and make up air supplies.
- Insufficient flue and chimney systems/operation
- Room extract fan interference.
- Incorrect burner settings
- Incorrect grades of fuel for kerosene burners & settings such as gas oil or paraffin.
- Cross contaminated kerosene with other fuel grades such as gas oil, derv or paraffin or use of unapproved fuel additives.