3 Areas

• Construction of standard chimney systems.

• Factory made insulated chimneys

• Carbon Monoxide
Chimney Systems
Brick and Clay/Concrete

- Traditional masonry chimney construction
- Lining introduced from 1966
- Unlined before 1966
Block Factory Made

- More insulation so better draw
- Can withstand Chimney fires
- Available in different sizes
- Available for open fires and stove chimneys
How a Chimney Works
Smoking back problems and lack of chimney draught are often caused by:

• Poor chimney design or construction

• Insufficient sweeping of the chimney

• Poor cleaning of any internal flue ways in the appliance

• Lack of ventilation

• Unfavourable Site conditions
Heat loss (BS EN 13384)

Issues effecting Heat loss
• Percentage of chimney exposed above the roof
• The mass of the chimney structure- how tall, how many flues, its girth as well as the material it is made of.
• The location of the flue and how much of it is exposed within the main structure.
  – Constructed in the gable end wall
  – Constructed on the outside of the gable end wall
  – Or constructed totally within the property
Calculation for an open fire

- Open fire efficiency: 20%
- Appliance output: 3 kw
- Heat input to flue = \((\text{Total Heat} - \text{Appliance output})\)
  \[= \left(\frac{3 \times 100}{20}\right) - 3\]
  \[= (300 \div 20) - 3\]
  \[= 15 - 3\]

Therefore heat input to the flue = 12 KW
Calculation for a Multi Fuel Stove

• Stove efficiency 80%
• Appliance output 6kw
• Heat input to flue

\[
\text{Heat input to flue} = \left( \frac{\text{Total Heat} - \text{Appliance output}}{80} \right) - 6
\]

\[
= \left( \frac{6 \times 100}{80} \right) - 6
\]

\[
= 7.5 - 6
\]

Therefore heat input to the flue = 1.5 KW
Factory Made insulated Chimney
Concealed Flues

Twinned walled metal flue to suitable height
Through roof flashing
Ceiling support plate

Inspection hatch
Fire stop plate
Flue support bracket
Chimney breast support lintel

Cleaning access
Optional fireplace surround
Decorative hearth
Construction hearth

Concealed Flues

No joints between Floor and ceiling

Minimum 300 x 300 mm Access panel

Oriental Flues
SafeFlue Oriente Flue
HETAS TRAINED
Ventilated Firestops

Non-combustible plate with spacer, e.g. manufacturer's fire stop component

Insulation
- Plasterboard
- Timber
- Distance X"

No combustible material in shaded zone.
Width of shaded zone at least equal to manufacturer's declared minimum distance (xxmm) as designated to BS EN 1856-1
Ventilated Firestops

A. Support Plate
B. Combustible Floor Joist
C. Plasterboard Ceiling
D. Fire Stop
E. Twin Wall Insulated Flue
F. Connecting Flue Pipe
   (Max length 1.8m)
G. 150mm Minimum or to manufacturers installation instructions
Carbon Monoxide
The amount of carboxyhaemoglobin in the blood is influenced by the following factors.

- The concentration of carbon monoxide in the inhaled air

- The duration of exposure to carbon monoxide

- The degree of activity of the person being exposed to carbon monoxide.

- Individual susceptibility (people with hearth or lung disorders, young children, the aged or pregnant women may all be at increased risk)
## %Carbon Vs Symptoms

<table>
<thead>
<tr>
<th>Carboxyhaemoglobin</th>
<th>Symptom</th>
</tr>
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<tbody>
<tr>
<td>%</td>
<td></td>
</tr>
<tr>
<td>0-10</td>
<td>None</td>
</tr>
<tr>
<td>10-20</td>
<td>Tightness across forehead</td>
</tr>
<tr>
<td>20-30</td>
<td>Headaches</td>
</tr>
<tr>
<td>30-40</td>
<td>Severe headache, Weakness, dizziness, nausea and vomiting</td>
</tr>
<tr>
<td>40-50</td>
<td>Collapse, increased pulse and respiratory problems</td>
</tr>
<tr>
<td>50-60</td>
<td>Coma, Intermittent convulsions</td>
</tr>
<tr>
<td>60-70</td>
<td>Depressed heart action, death possible</td>
</tr>
<tr>
<td>70-80</td>
<td>Weak pulse, slow respiration, death likely</td>
</tr>
<tr>
<td>&gt;80</td>
<td>Death in minutes</td>
</tr>
</tbody>
</table>
CARBON MONOXIDE VOLUMES

a) Correctly working gas appliance 8-40ppm

b) A solid fuel appliance 12,000-18,000ppm

c) Wood can even spike to 40,000ppm when refuelled
Questions