

## **Unit 209: Drainage systems**

### **Outcome 4 (part 3)**

# **Install and test above ground systems**

# Rainwater systems

## PVCu guttering

PVCu is the most common material that standard domestic guttering and downpipes are made from (unplasticised polyvinyl chloride).

### Care:

- It is affected by some wood preservatives and paints
- It has a high coefficient of expansion compared to other materials (0.00018), which means the gutter can buckle or dislocate
- It goes brittle in cold weather

# Rainwater systems

## PVCu guttering

### Advantages:

- Easy to install
- Lightweight to handle
- Minimal maintenance
- Economical
- Corrosion free
- Smooth finish
- Long life expectancy

# Rainwater systems

## PVCu profiles



Half round is a standard shape for domestic properties.



Deep flow is a higher capacity half round, used for steep-angled roofs or high intensity rainfall areas.



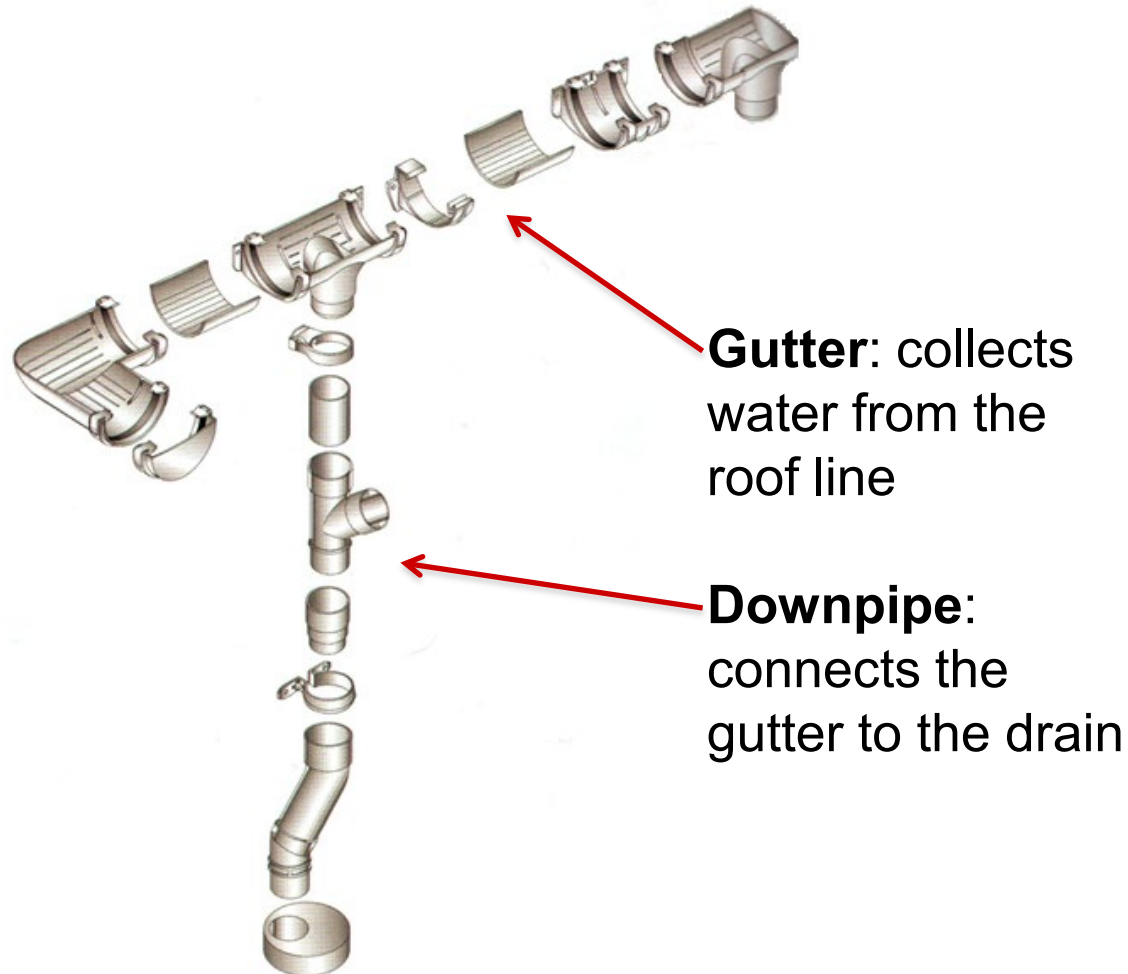
Square line used in conjunction with squared downpipe.



Ogee used to give a period look to a property.

# Rainwater systems

Research and find the names of all these components.



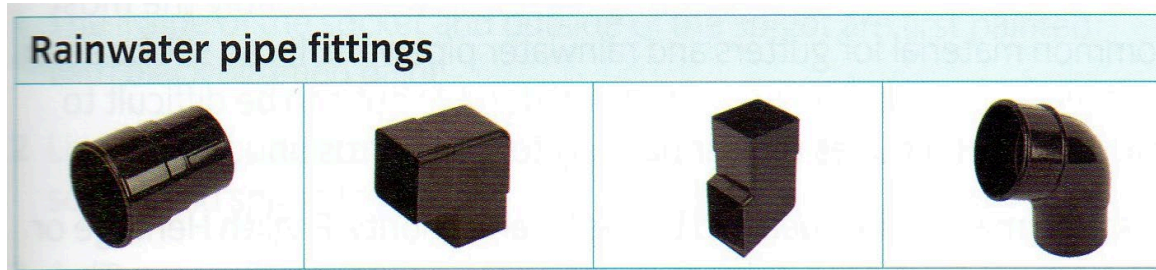
# Rainwater systems

Fittings for standard 112mm gutter systems.

Running outlets			
			
90° gutter angle			
			
135° gutter angle			
			
External stop end			
			
Gutter unions			
			

# Rainwater systems

Fittings for standard 68mm downpipe systems  
(62mm square).

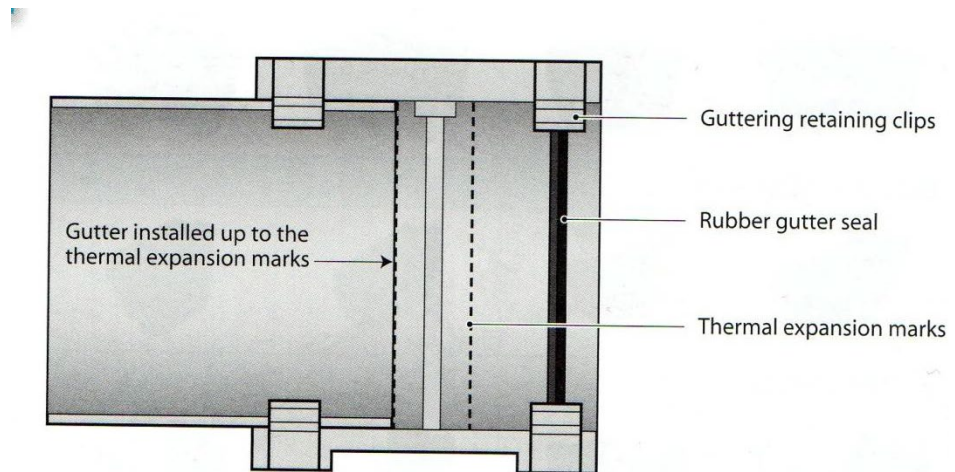


# Rainwater systems

## Expansion

This is one of the problems with plastic guttering, which can cause the system to creak when warming up. In extreme cases, it can cause buckling and dislocation.

Manufacturers build into their fittings a 10mm expansion gap. The fitting must only be inserted up to this line.





# Rainwater systems

## Cast iron guttering

Before plastic, cast iron was very common – especially in the Victorian era – and it can still be seen on many older buildings. It is strong and durable but can be difficult to maintain, as it requires regular painting to stop external corrosion.

Cast iron is still specified by English Heritage, National Trust, buildings in conservation areas or older buildings.

# Rainwater systems

## Cast iron profiles



Half round, similar to the plastic guttering.



Deep flow, again similar to the plastic guttering.



Ogee profile can vary and reflect the area of installation.

# Rainwater systems

## Cast iron guttering

### Advantages:

- It is strong and durable

### Disadvantages:

- Installation is expensive
- Installation is time-consuming
- Requires regular maintenance
- It is heavy
- Jointing is more difficult

# Rainwater systems

## Cast iron guttering

Another modern alternative is **cast aluminium** (or cast iron lookalike).

### Advantages:

- Installation is expensive
- Installation is time-consuming
- It is expensive to purchase

### Disadvantages:

- It is strong and durable
- It does not rust
- It is lighter in weight than cast iron

# Rainwater systems

## Cast iron guttering

From the picture you can see the cast iron has a socket location at one end, into which the plain end is laid, with a jointing material in between. Then the layers are bolted together using zinc-plated gutter bolts.



# Rainwater systems

## Cast iron jointing material

1. Paint and putty: using bitumen paint and linseed oil putty.
2. Silicone sealant: special quick-seal, low modulus sealant.
3. Rubber grommet: specially manufactured for some fittings.

# Rainwater systems

## **Extruded aluminium guttering**

This a modern way to produce long lengths of guttering on site, where continuous lengths of up to 30 metres can be produced.

An extruding machine is located in a van. The roll of aluminium is formed through this machine, offering lightweight, seamless and corrosion-resistant lengths of guttering.

# Rainwater systems

## Joining different materials and shapes

Sometimes it is necessary to make joins between different systems, and this may include different materials and differing profiles.

For this you need to use an adaptor:

Half-round PVCu to half-round cast iron	Half-round PVCu to ogee PVCu	Half-round PVCu to ogee cast iron	Half-round PVCu to square-section PVCu
