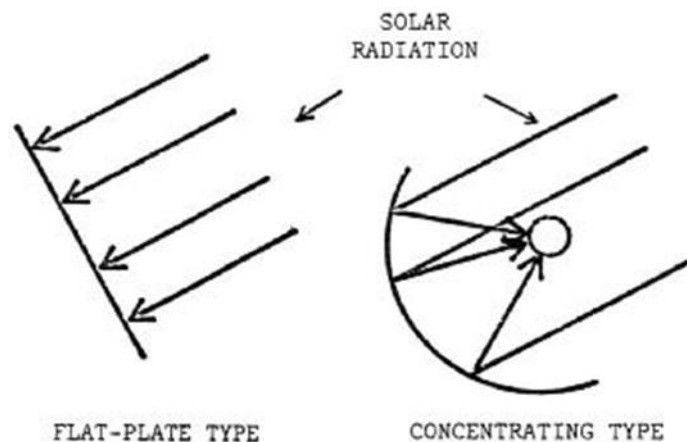


Concentrating collectors

Concentrating plate collector

- Radiation magnification from as low as low 1.5 to huge concentration of 10000
- This concentration may bring temperature up to 500°C or more
- Only direct radiation is concentrated



Concentrating collectors

- Focusing type solar collectors
 - Line focusing
 - Point focusing

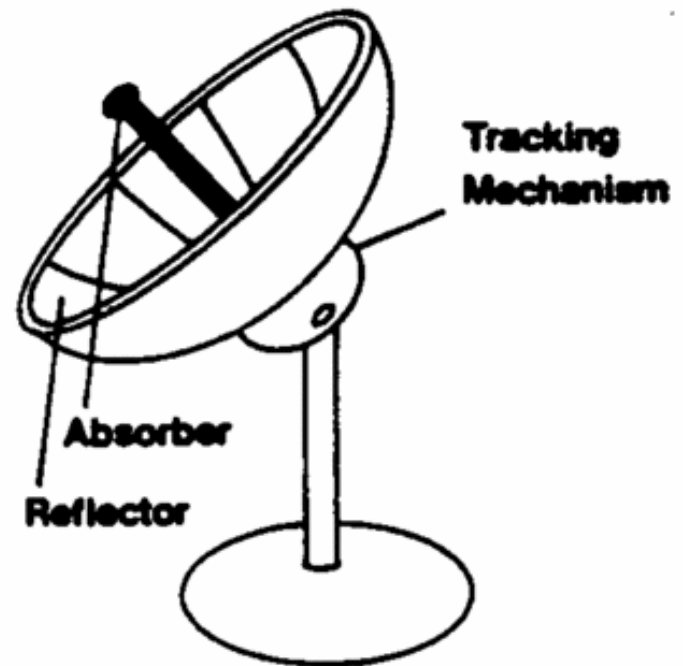
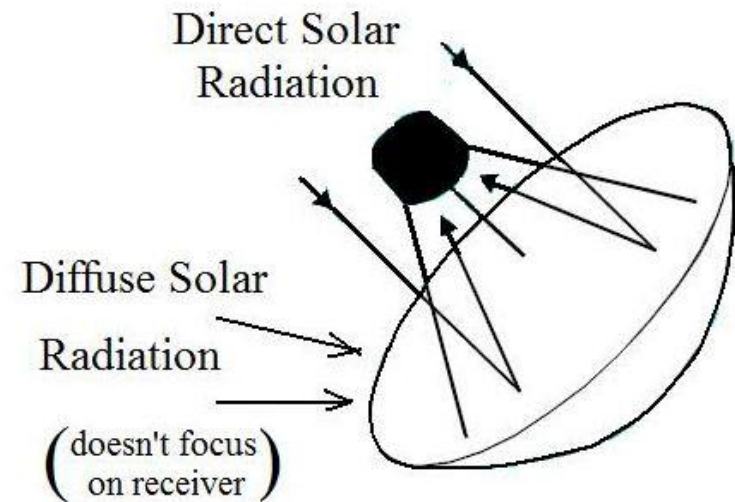
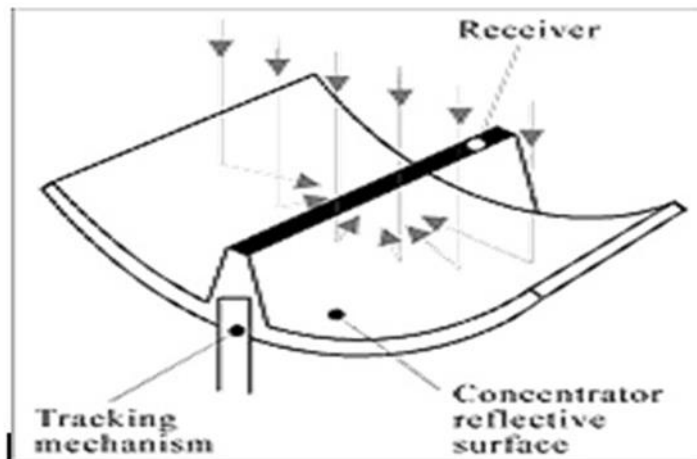
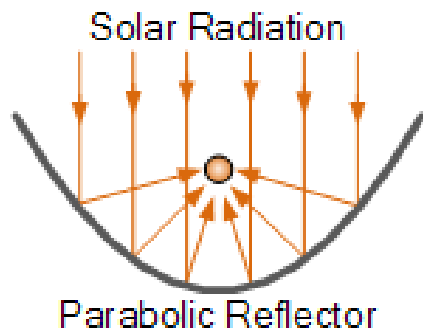


Figure 7. Parabolic Dish

Concentrating collectors



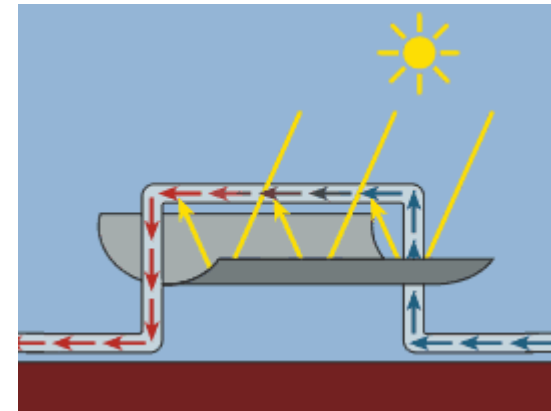
Diffuse & Direct Solar Radiation

Types of concentrating collectors

- + Parabolic trough collector
- + Mirror strip reflector
- + Fresnel lens collector
- + Flat plate collector with adjustable mirrors
- + Compound parabolic concentrator (CPC)

Parabolic trough collector

- Solar radiation concentrated is absorbed at the focus of the parabola
- Collector pipe with selective absorber coating is on the focus line
- Length 3 to 5 m and width 1.5 to 2.4 m about



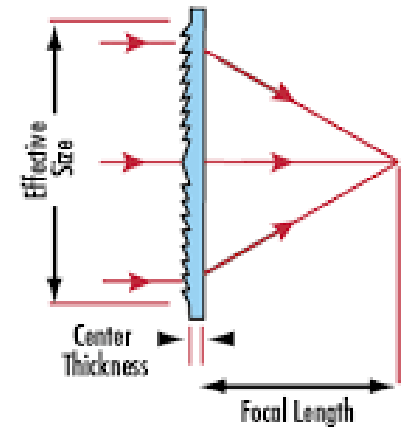
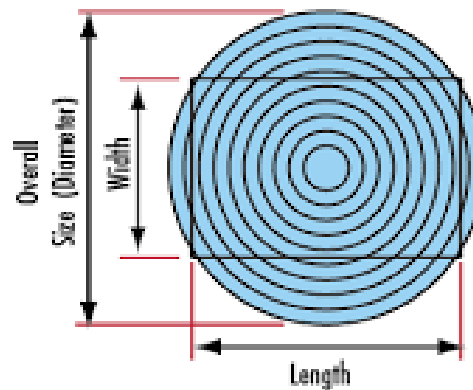
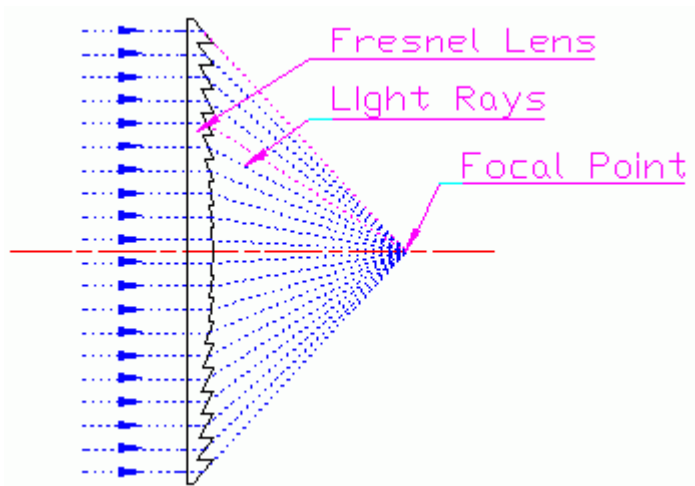
Mirror strip collector

Number of concave mirror strips are mounted on the flat plat

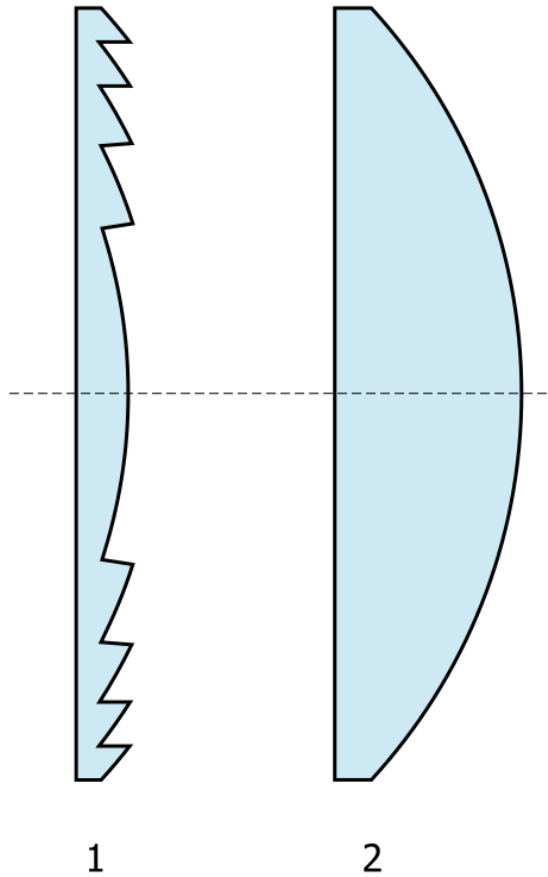


Fresnel lens collector

- Made from acrylic plastic
- North south orientation is preferred

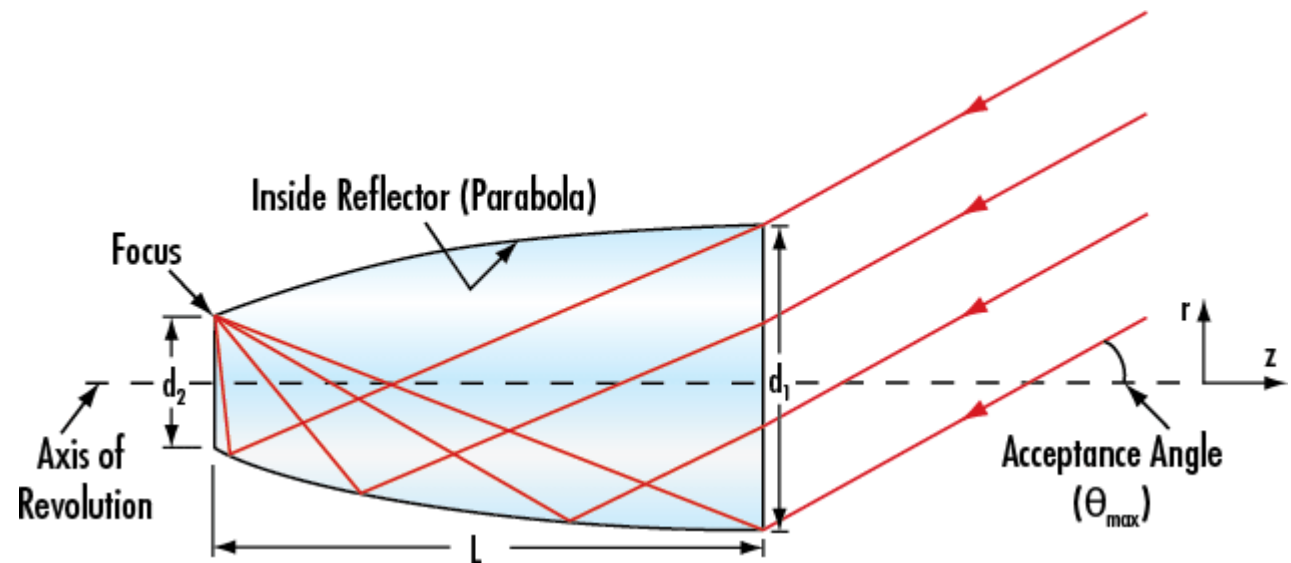


Fresnel lens collector



Compound parabolic concentrator

- Non focusing
- Includes diffused radiation too
- No need for tracking
- Efficiency is good



Advantages of CPC

- Less material and potentially less costly
- Higher insolation
- Area for heat loss is decreased
- Selective surface coatings over absorber are economically viable
- Can be used for electricity generation
- Heat storage is better
- High efficiency cycles
- No anti freeze required

Disadvantages

- Only beam radiation
- Optical losses
- High initial cost
- Non uniform flux
- Difficult tracking