

Title : Extrusion dies

Date: 23/3/2020

Name of Faculty: Ms. Monika K. Patel

Lecture No : 4

Source of information : Book: Plastics Mould design

Die Configurations and Extruded Products

The shape of the die orifice determines the cross-sectional shape of the extrudate

Common die profiles and corresponding extruded shapes:

- Solid profiles
- Hollow profiles, such as tubes
- Wire and cable coating
- Sheet and film
- Filaments

Extrusion of Solid Profiles

Regular shapes such as

- Rounds
- Squares

Irregular cross-sections such as

- Structural shapes
- Door and window moldings
- Automobile trim
- House siding

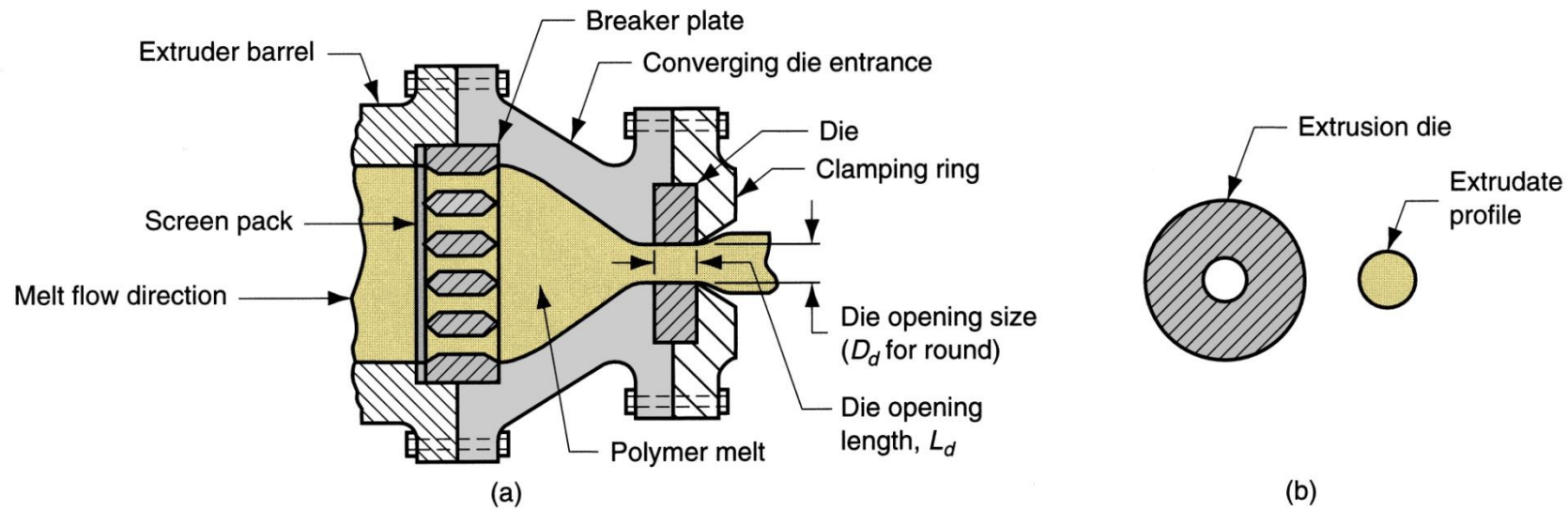


Fig. (a) Side view cross-section of an extrusion die for solid regular shapes, such as round stock; (b) front view of die, with profile of extrudate Die swell is evident in both views

(Some die construction details are simplified or omitted for clarity.)

Hollow Profiles

Examples: tubes, pipes, hoses, and other cross-sections containing holes

Hollow profiles require mandrel to form the shape

Mandrel held in place using a spider

- Polymer melt flows around legs supporting the mandrel to reunite into a monolithic tube wall

Mandrel often includes an air channel through which air is blown to maintain hollow form of extrudate during hardening

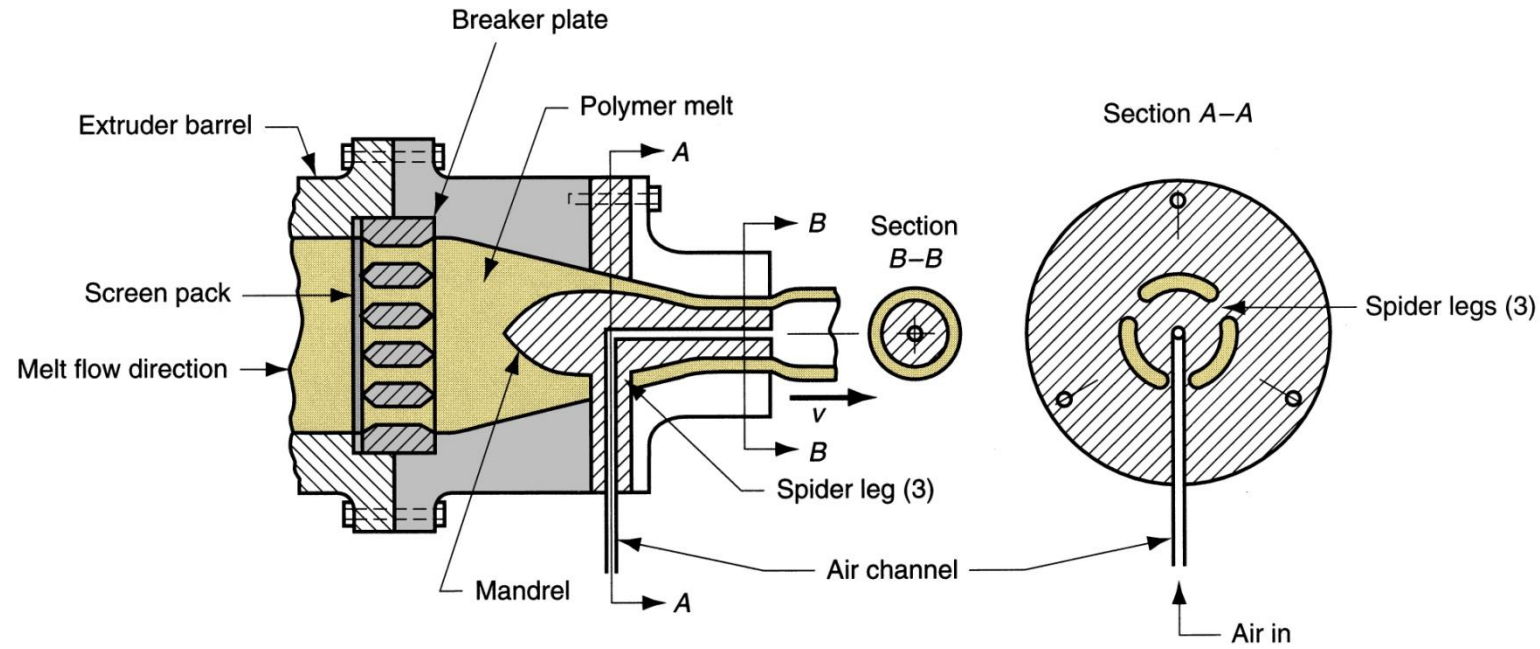


Figure: Side view cross-section of extrusion die for shaping hollow cross-sections such as tubes and pipes; Section A-A is a front view cross-section showing how the mandrel is held in place; Section B-B shows the tubular cross-section just prior to exiting the die; die swell causes an enlargement of the diameter

Wire and Cable Coating

- ❑ Polymer melt is applied to bare wire as it is pulled at high speed through a die
 - A slight vacuum is drawn between wire and polymer to promote adhesion of coating
- ❑ Wire provides rigidity during cooling - usually aided by passing coated wire through a water trough
- ❑ Product is wound onto large spools at speeds up to 50 m/s (10,000 ft/min)

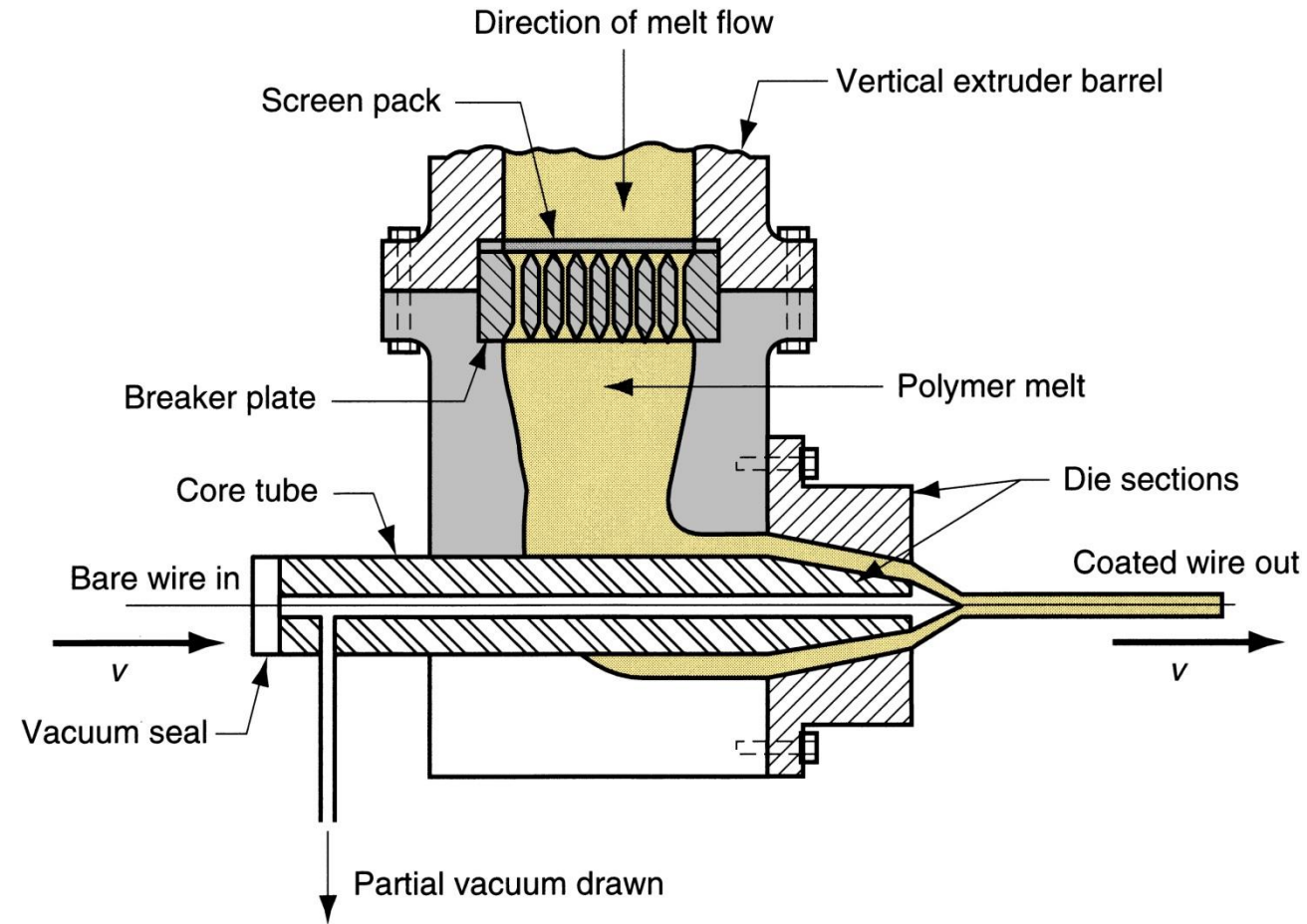


Figure: Side view cross-section of die for coating of electrical wire by extrusion

Assignment-1

- What are the common die profiles?
- Draw the cross-section of solid extrusion die and explain the terms?
- How wire and cable coating die is prepared?
- Hard copy submission date (31/3/2020).
- Phone number of faculty: 7600013902