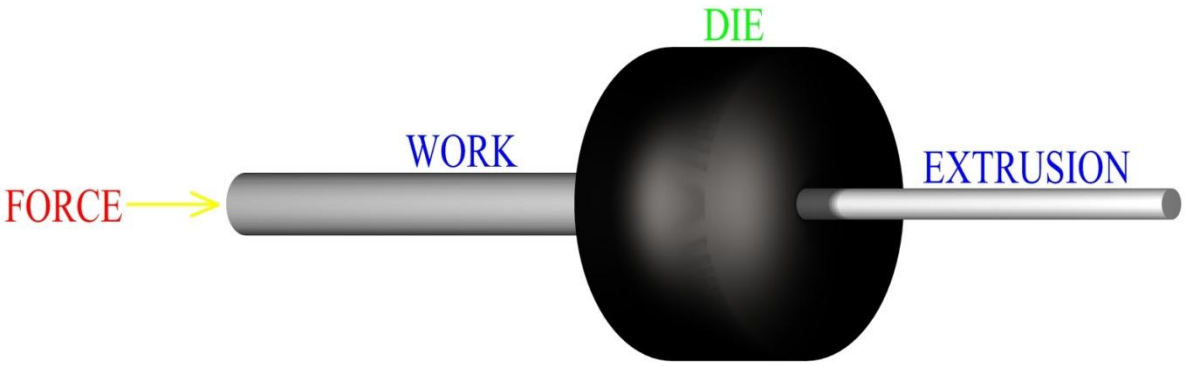
AGS-TECH Inc., Tel: 505-550-6501 and 505-565-5102, Fax: 505-814-5778,

Email: sales@agstech.net, Web: http://www.agstech.net

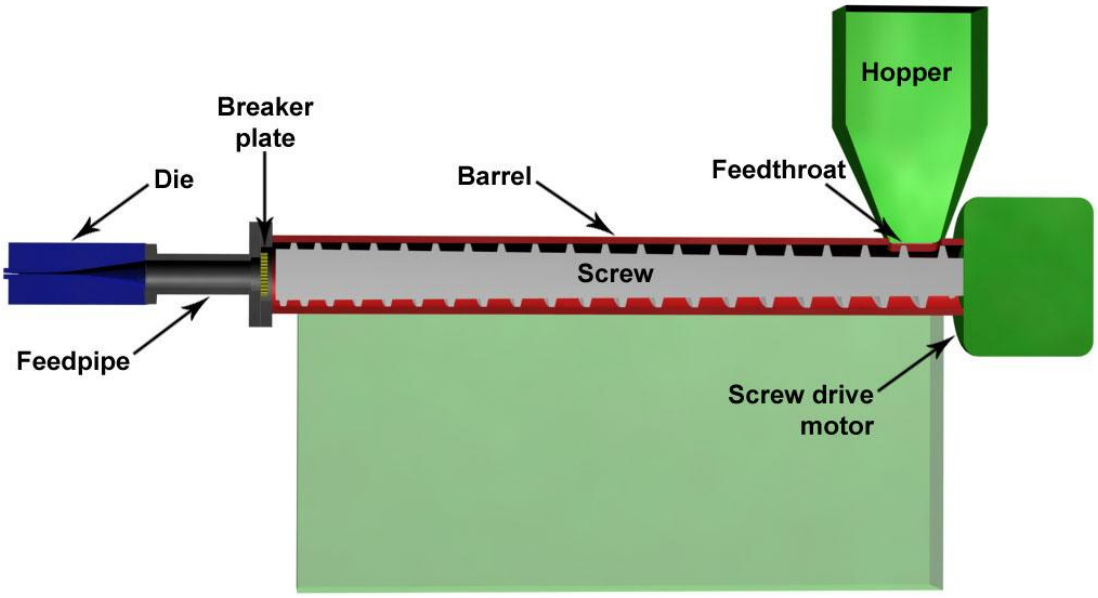
Aluminum Extrusion Dies

Aluminum Extrusion Equipment

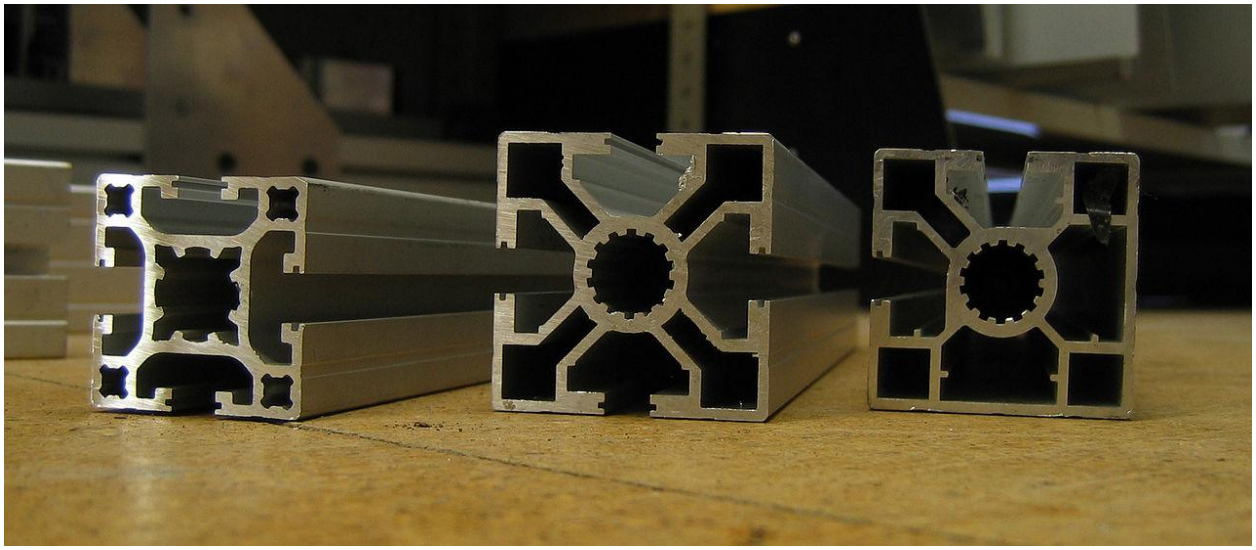
Simplified Illustration of the Extrusion Process



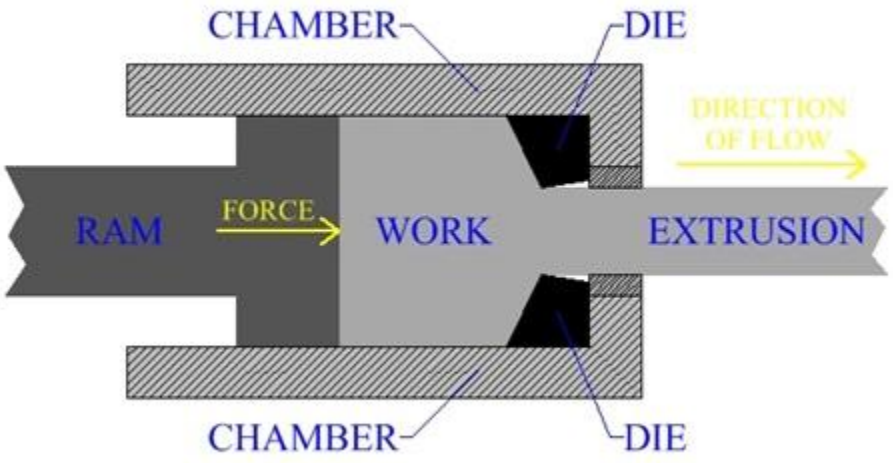
Extruder



Extruded Aluminum Profiles



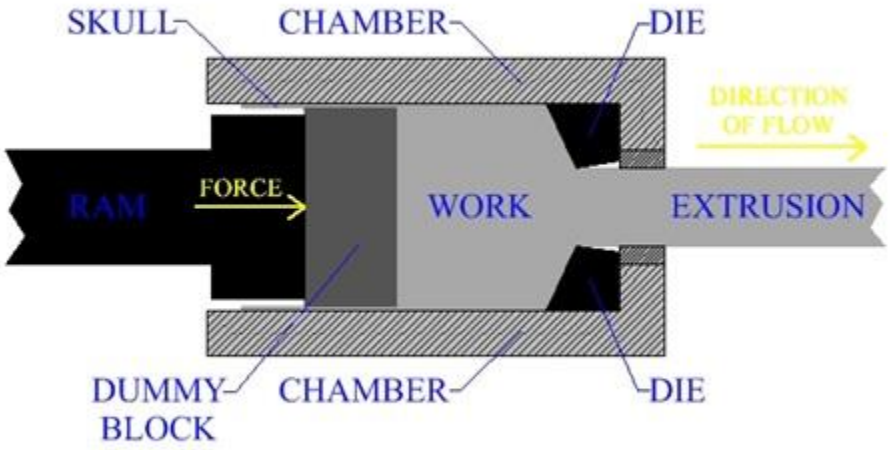
DIRECT EXTRUSION:



In direct, or forward extrusion, the work billet is contained in a chamber. The ram exerts force on one side of the work piece, while the forming die, through which the material is extruded, is located on the opposite side of the chamber. The length of extruded metal product flows in the same direction that the force is applied. During direct extrusion, metal flow and forces required are affected by the friction between the work piece and the chamber walls. Particularly in hot working, oxide scale build up on the outer surfaces of the work piece can negatively influence the operation. For these reasons, it

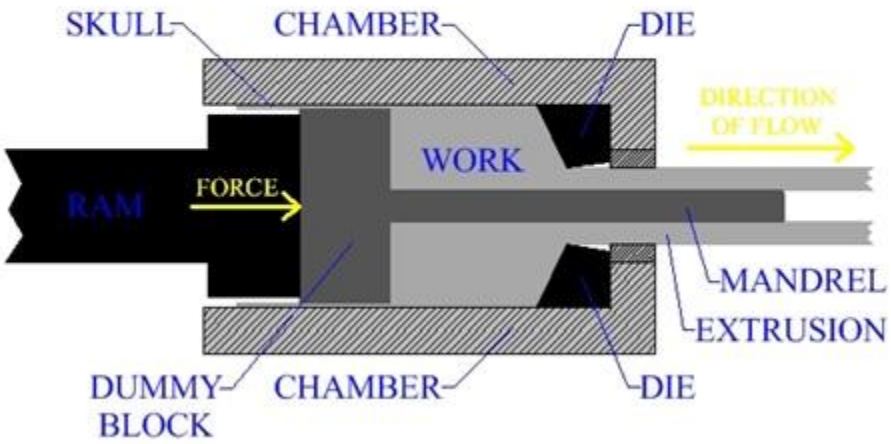
is common manufacturing practice to place a dummy block ahead of the ram. The dummy block is of slightly smaller diameter than the chamber and work piece. As the metal extrusion proceeds, the outermost surface of the work is not extruded and remains in the chamber. This material will form a thin shell, (called skull), that will latter be removed. Much of the skull will be comprised of the surface layer of oxidized scale from the work metal.

Use of Dummy Block



Hollow, or semi hollow, parts can be directly extruded with the use of a mandrel attached to the dummy block. A hole is created through the work, parallel to the axis over which the ram applies the force to form the extrusion. The mandrel is fitted within this hole. Once the operation begins, the ram is forced forward. The extruded metal flows between the mandrel and the die surfaces, forming the part. The interior profile of the metal extrusion is formed by the mandrel, while the exterior profile is formed by the extruding die.

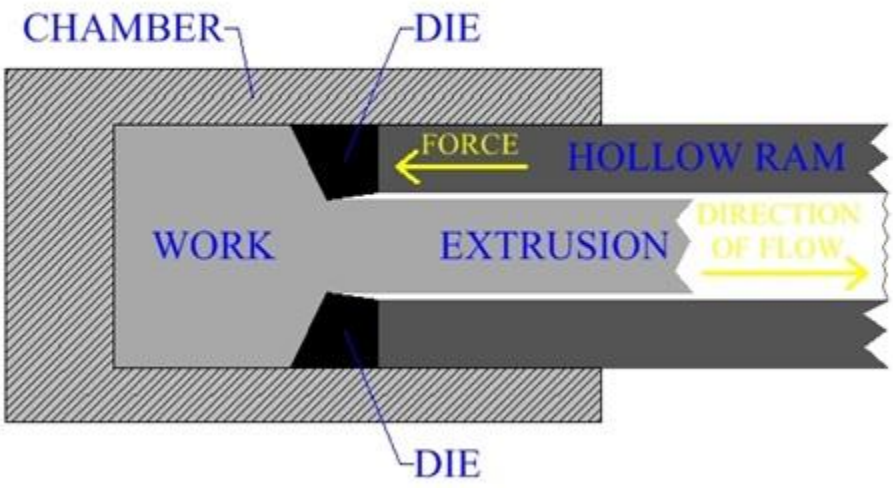
Direct Extrusion of Hollow Part



INDIRECT EXTRUSION:

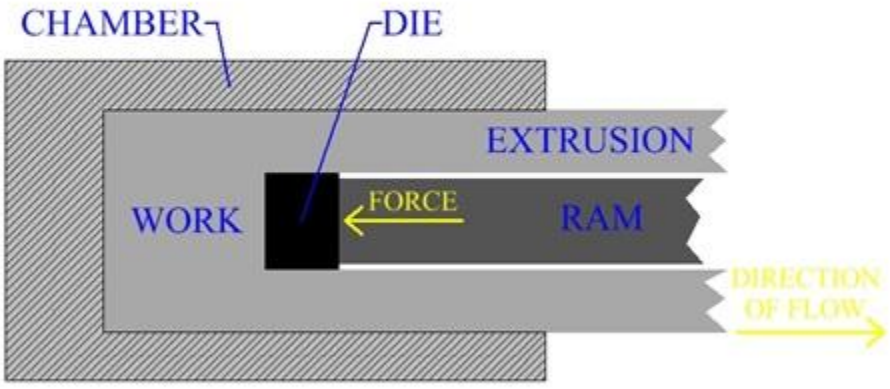
Indirect extrusion is a particular type of metal extrusion process in which the work piece is located in a chamber that is completely closed off at one side. The metal extrusion die are located on the ram, which exerts force from the open end of the chamber. As the manufacturing process proceeds, the extruded product flows in the opposite direction that the ram is moving. For this purpose the ram is made hollow, so that the extruded section travels through the ram itself. This manufacturing process is advantageous in that there are no frictional forces between the work piece and the chamber walls. Indirect extrusion does present limitations. Tooling and machine set up are more complicated, hollow rams are not as strong and less ridged and support of the length of

the metal extrusion's profile, as it travels out of the mold, is more difficult.



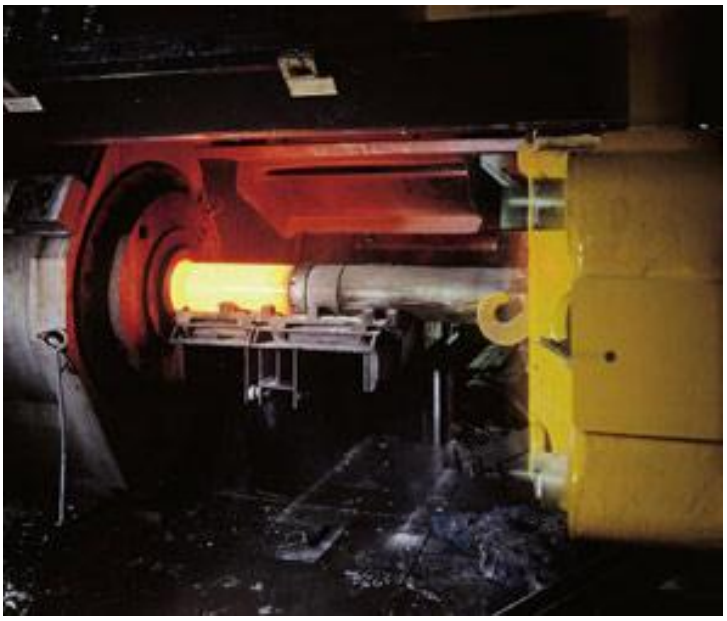
Indirect extrusion can also be used to produce hollow parts. In this process, a ram is forced into the work material. The ram gives the internal geometry to the tubular part, while the material is formed around it. Difficulties in supporting the ram limit this process and the length of tubular metal extrusions that may be manufactured.

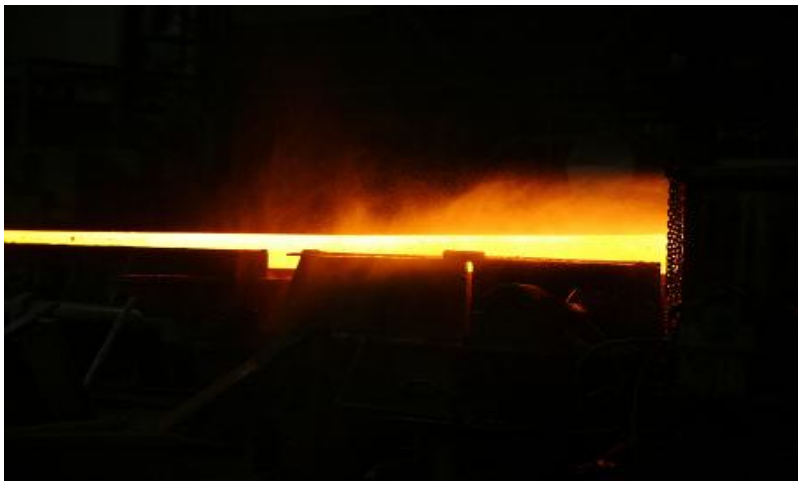
Indirect Extrusion of Hollow Part



COLD EXTRUSION:

HOT EXTRUSION:





OVER JACKETING EXTRUSION:

COEXTRUSIONS:

COMPOUND EXTRUSION: