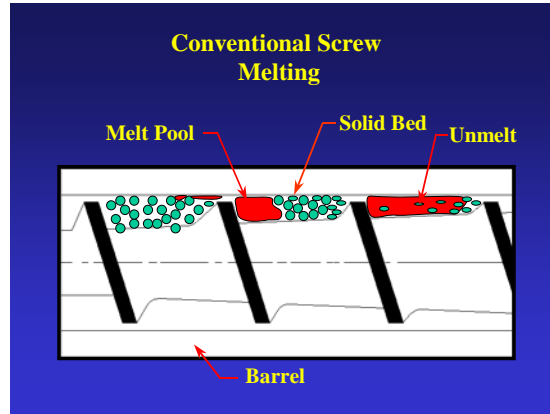


CLASSIFYING SCREW DESIGNS

As screw designs have evolved through the years, there are several generic categories that single (as opposed to twin) screws can be divided into:

- A.) Single flighted; (conventional) screws
- B.) Mixing screws
- C.) Barrier screws
- D.) Distributive mix/melt screws

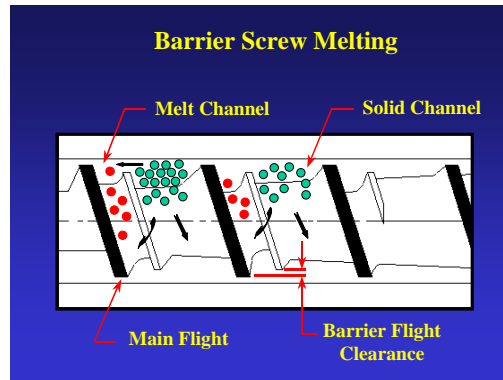
Single flighted screws have only a primary flight from the origin to the termination. Even though the lead may change, there are no secondary flights. Often, the term “general purpose” is applied to this type of screw. This is misleading as this type of design is rarely, if ever, the most efficient design for melting any material.



Mixing screws are single flighted screws that utilize one or more sections of the screw for mixing device(s). There are dozens of different designs for mixers some of which may be a short section of secondary flighting. Mixers can be dispersive or distributive and are intended to provide homogenization and uniformity of melt and color.

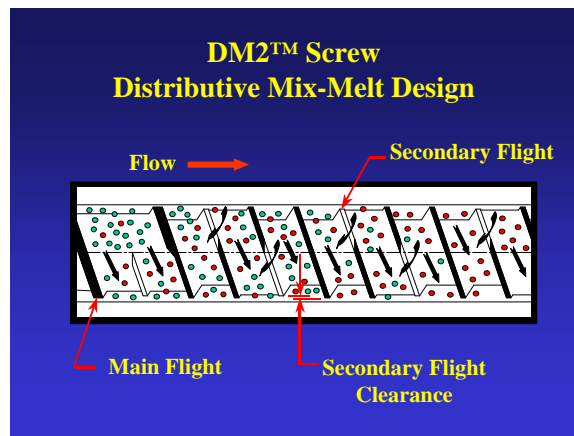


Barrier screws are screws that use a secondary flight to separate melted material or the melt pool from unmelted material or the solid bed, thus creating a melt channel and a solids channel. This significantly improves the efficiency of the melting process.



There are many different variations of barrier screws and some of the more familiar commercial names are: Efficient Screw®, Barr II Screw®, MC-3®, Uniroyal Screw®, Melt Pro® and Melt Star®. All of these barrier designs may or may not incorporate a mixing section or mixing device.

Distributive mix/melt screws are often mistaken for barrier screws as they also incorporate flighting beyond a primary flight. These designs start the melting process traditionally; either with a single flighted or barrier type design, then utilize a controlled interchange of melted and unmelted material to complete the melting process. This not only provides for more efficient (less energy input) melting, but also generates less shear and lower melt temperatures. The eccentricities of the root in this section also provide for additional low shear mixing.



There are applications where we would recommend each of the above types of screw configuration, but in most cases we would choose a barrier, barrier plus mixer, distributive mix/melt or distributive mix/melt with a barrier to optimize performance. Some well known commercial names for distributive mix/melt type screws are: Glycon's DM2®, HPM's Double Wave®, Xaloy's Fusion®, and Robert Barr's VBET®.

