

What is the objective in Die Design?

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For flat dies, one usually wants to produce a film, sheet, or coating of uniform thickness across its entire width. To do this, it is necessary for the die to produce a uniform volumetric flow rate across its exit. Although this is almost always the primary objective in flat die design, often there are secondary ones. For materials that can degrade (such as PVC), a secondary objective could be to eliminate any re-circulation or "dead zones" in the die. For other situations, it may be to ensure that a maximum shear rate or shear stress is not exceeded anywhere in the die in order to avoid "melt fracture", "shark skins", or other similar instability. For foam applications, the pressure profile is also important to ensure that "pre-foaming" does not occur before exiting the die.

For profile dies, usually the primary objective is to have a uniform average velocity at the exit of the die along the entire profile. Such dies are said to be "balanced". As with flat dies, there can be secondary objectives as well.

– Wayne A. Gifford, Dieflow

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