

# Screw design selection for processing Eastman Trēva™ engineering bioplastic

Eastman Trēva™ engineering bioplastic can be processed well on general-purpose screws and barrier screws that have appropriate length/diameter (L/D) ratio, feed section depth, and compression ratio. In general, preferred ranges are:

**L/D ratio:** 18:1 to 20:1

**Compression ratio:** 2.8 to 3.5

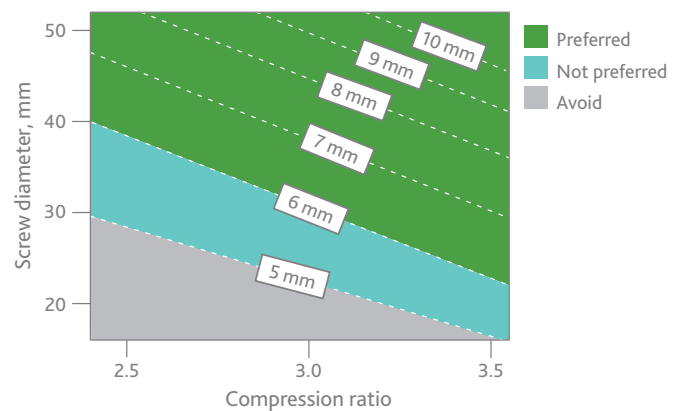
**Feed section depth:** > 6 mm (0.25 in.)

**Feed/transition/metering:** 35%–40%/40%–45%/15%–25%

Compression ratio is important for ease of plasticating Trēva, but it is even more important to consider the minimum preferred feed-section flight depth of 6 mm. Screws with feed depth less than 6 mm may exhibit squeaking, slippage, and inconsistent screw recovery (charging, dosing), resulting in inconsistent part weight, excessive melt residence time, splay, and overheating the melt.

To some extent, these problems may be overcome by reducing back pressure and increasing screw rotational speed. It may also be helpful to raise the rear barrel zone temperature 15°–20°C rather than using the typical flat temperature profile. Occasional problems with screw recovery time may also be solved by adding 0.03% to 0.05% zinc stearate powder to the pellets in the feed section; however, this may create a slight color shift, depending on processing temperature and residence time in the melt.

The following chart shows the general effect of choices of screw diameter and compression ratio on the resulting feed section depth. For screw diameters less than 40 mm, the choice of compression ratio may put the feed section depth below the preferred minimum of 6 mm.



Screw design choices are varied and sometimes complex. If there are questions about a particular screw, machine, and mold combination, contact your Eastman technical representative for further information and guidance.





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