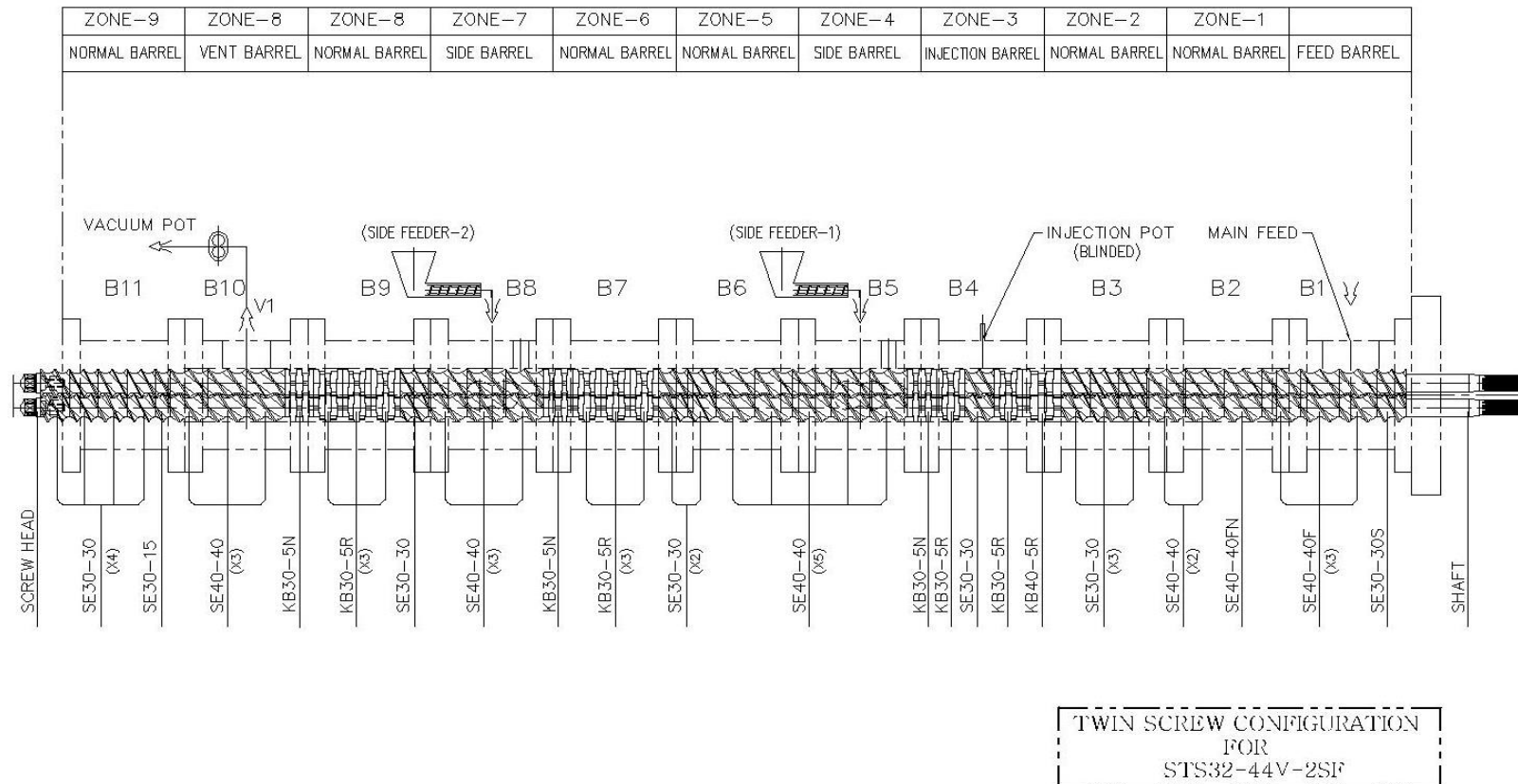


Recommended Screw Design for PK Compounding

We recommend TSE(Twin Screw Extruder) on both coloring, GF and FR compounding because of TSE's **self-cleaning ability**. Any possible resin congestion inside the extruder may cause the thermal degradation/cross linking of PK after long operation.

1. Screw configuration for typical compounding

For coloring, glass fiber and other typical case, we recommend normal 44: 1 L/D TSE with 3-4 kneading zone. Here is an example of 32pi, 44:1 TSE for PK compounding(R&D pilot). Too much adoption of kneading L or N turn is not recommended which may cause too large shear and resin dwelling inside the extruder.

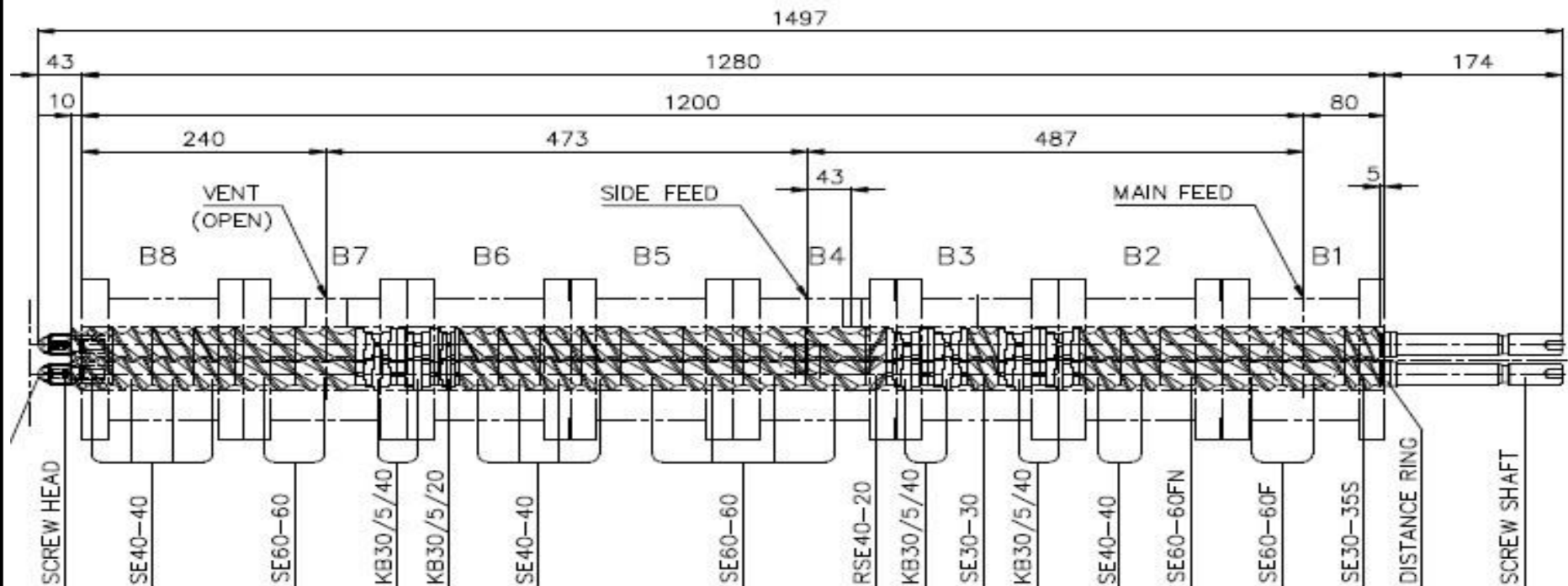


Recommended Screw Design for PK Compounding

2. Screw configuration for Flame Retardant compounding

For FR compounding, we recommend shorter L/D screw design such as 32-36:1 TSE with 2-3 kneading zone. In case of FR compounding, less shear and resin dwell time is needed. Also too much use of kneading L or N turn is not recommended.

Here is an example for 40pi 32:1 L/D TSE for FR & FR + GF compounding(R&D pilot). Side feeder can be located on B6 instead of B4 to minimize the breakage of glass fiber and shear increasing.

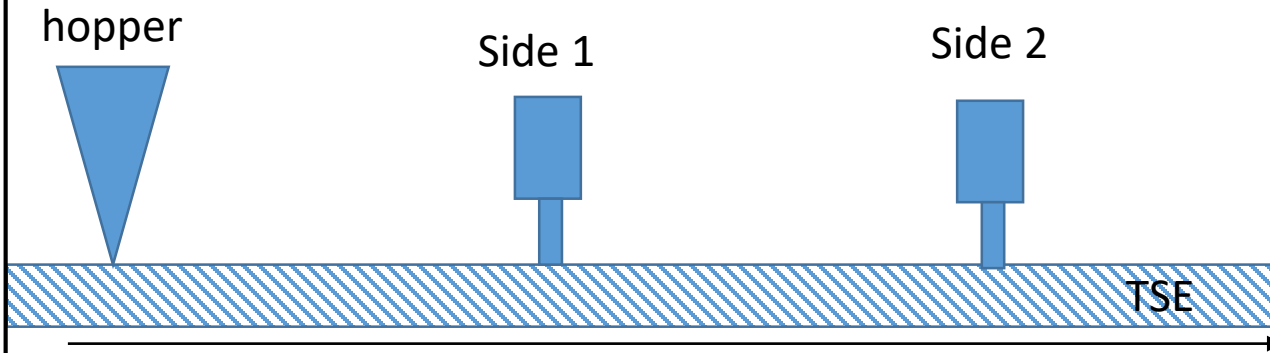


Recommended Temperature setting for PK Compounding

3. Barrel/die temperature setting for PK compounding

The most important thing for temperature setting on PK compounding is that the **barrel & die temp. setting should be controlled by the measured value of real PK melt, not the setting value itself.**

Except the case of GF, CF and other strengthening filler comp'd, lower temperature is better for PK compounding.



구분	hopper	B1	B2	B3	B4	B5	B6	B7	B8	B9	Adaptor (head)	die	Resin Melt (measured)
For M330, M930	220-240	220-240	220-240	220-240	220-240	220-240	220-240	220-240	220-240	220-240	220-240	220-240	230-260°C
For M630 M730	210-230	210-230	210-230	210-230	210-230	210-230	210-230	210-230	210-230	210-230	210-230	210-230	230-260°C
For M610 and M710	190-200	190-200	190-200	190-200	190-200	190-200	190-200	190-200	190-200	190-200	190-200	190-200	200-215°C

4. Usage of side feeder in case of GF high loading

In case of high loading of GF over 40wt%, using of both side 1 and side 2 feeder is preferred because of better fiber dispersion and processability until pelletizing.

Case	Side 1	Side 2
GF < 30%	X(no use)	O(use)
GF > 40%	O(use)	O(use)

N₂ purging at hopper during PK Compounding

4. Recommended production rate for PK GF

Typical mass production rate of PK GF 30% is 500kg/hr for 75pi TSE mass production line.

5. N₂ purging inside hopper

To minimize thermo-oxidation at compounding, we recommend N₂ gas purging inside the hopper. Desired location is the bottom of hopper & the room between the flights where PK pellets remain solid. Kicking O₂ outside that region and replacing it with N₂ before resin melting effectively prevents thermo-oxidation during melting inside the extruder.

Same use of N₂ purging in injection molding process shows similar Positive effects. An example of N₂ purge rate for 32pi 44:1 L/D TSE is 2.5m³/hr(R&D pilot)

