



Measuring Extruders Recommendations Concerning Technical Application



... where quality is measured.

Measuring Extruders - Recommendations Concerning Technical Application

Thermoplastics

Material	Products	Barrel length [D]	Screw compression	Barrel temperatures					Remarks
				Zone 1	Zone 2	Zone 3	Zone 4	Die head	
Cellulose acetate (CA)	Ribbons, blown and flat films	25 - 32	CP 3:1 3Z 3:1	175	185	195	200	210	preheat 2 h at 80 °C
Polyacetals (POM)	Ribbons, tubes, rods	20 - 32	CP 3:1 / 4:1	170	190	205	210	210	extrusion at low speeds
Polyamide PA 6 Polyamide PA 6.6	Ribbons, blown and flat films, monofilaments	25 - 32	3Z 3:1 / 4:1	230 250	240 260	250 270	255 275	260 280	preheat 3 h at 80 °C under vacuum, ring nut with heating
Polycarbonate (PC)	Ribbons, profiles	25 - 32	CP 2:1	290	280	270	260	240 - 250	preheat 3 h at 120 °C
Polyester linear	Monofilaments, films	25 - 32	3Z 4:1	250	260	270	275	280	preheat 3 - 4 h at 80 °C
Polyethylene (PE)	Ribbons, blown films, round strands, cables	20 - 32	3Z 3:1 / 4:1	190	200	210	220	220 - 230	
PE, grits (HDPE, UHMPE)	Ribbons, blown films, round strands	25 - 32	ZC 1:1	160 - 220	170 - 230	180 - 240	185 - 245	190 - 250	conical, grooved feed zone
Polymethylmethacrylate (PMMA)	Sheets, profiles	20 - 32	CP 2:1 / 3:1	170	180	190 - 200	210	220	preheat 5 h at 70 - 100 °C
Polypropylene (PP)	Ribbons, blown films, tubes, round strands	20 - 32	3Z 3:1 / 4:1	210	220	230	-	240	
Polystyrene (PS)	Ribbons, profiles, blown films	20 - 32	CP 2:1 / 3:1	170	180	190	200	210	
PS copolymers ABS	Round strands, blown and flat films, ribbons and tubes	20 - 32	CP 2:1 / 3:1	170 - 190	175 - 195	185 - 200	185 - 225	185 - 225	preheat 2 h at 80 °C
Polysulfone	Ribbons, blown and flat films	20 - 32	CP 2:1	250 - 280	270 - 300	290 - 320	290 - 330	290 - 330	preheat 4 h at approx. 140 °C
Polyurethane (PUR)	Ribbons, profiles	25 - 32	CP 3:1	140 - 220	160 - 220	180 - 220	190 - 220	190 - 220	preheat 2 h at 100 - 110 °C
Polyvinyl butyral (PVB)	Ribbons, profiles	25	3Z 3:1	100	120	130	140	140	
Polyvinyl chloride (PVC)	Ribbons, profiles, blown films, tubes, round strands, cables	• Rigid PVC pellets	CP 2:1	150 - 160	155 - 165	160 - 170	-	170 - 190	above $n = 45 \text{ min}^{-1}$ air cooling for barrel required
• Rigid PVC powder		CP 2:1 / 3:1	160 - 170	165 - 175	170 - 180	175 - 185	180 - 190		
• Soft PVC pellets		CP 2:1 / 3:1	150 - 170	160 - 190	165 - 200	-	170 - 200		
• Soft PVC powder		CP 3:1	150 - 170	160 - 190	170 - 200	175 - 205	170 - 200		



Screw examples (top down): 4:1 metering screw, 4:1 core progressive screw, 4:1 dispersion screw with Maddock and mixing segment

Thermosets

Material	Products	Barrel length [D]	Screw compression	Barrel temperatures					Remarks
				Zone 1	Zone 2	Zone 3	Zone 4	Die head	
Epoxy resins (EP)	Rods	15	ZC 1:1	80	80 - 90	110 - 130	-	110 - 130	possibly liquid heating/cooling of barrel and die head
Urea resin (UF)	Rods	15	ZC 1:1	80	80 - 90	110 - 130	-	110 - 130	possibly liquid heating/cooling of barrel and die head
Melamines (MF)	Rods	15	ZC 1:1	80	90	110	-	130	possibly liquid heating/cooling of barrel and die head
Phenolics (PF)	Rods	15	ZC 1:1	80	90	100	-	110	possibly liquid heating/cooling of barrel and die head
Polyester (UP)	Rods	15	ZC 1:1	70	80	90	-	100	possibly liquid heating/cooling of barrel and die head

Elastomers

Material	Products	Barrel length [D]	Screw compression	Barrel temperatures					Remarks
				Zone 1	Zone 2	Zone 3	Zone 4	Die head	
Natural rubber compounds, ribbons of rolled sheets, pellets, NBR	Round and Garvey profiles	10	ZC 1:1	80	-	-	-	100	feed roll for ribbons, feed hopper for pellets
Synthetic rubber, compounds, ribbons of rolled sheets, pellets	Round and Garvey profiles, ribbon profiles	20	ZC 1:1 CP 2:1	60 - 80	70 - 90	-	-	100 - 110	feed roll for ribbons, feed hopper for pellets, for flat profiles die up to 50 x 0.5 mm, scrow CP 1:3

Other materials

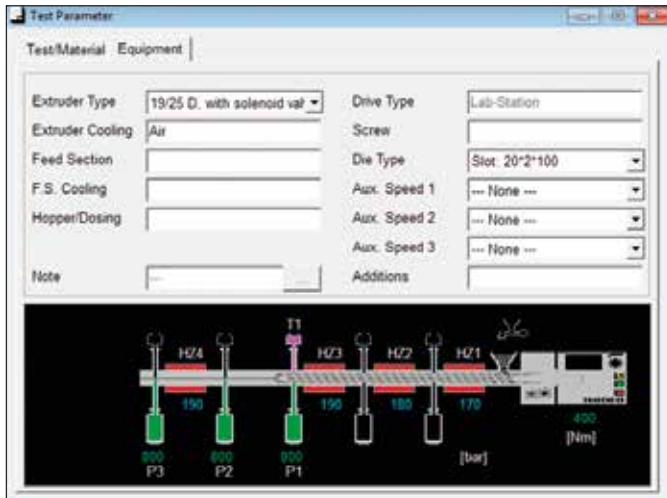
Material	Products	Barrel length [D]	Screw compression	Barrel temperatures					Remarks
				Zone 1	Zone 2	Zone 3	Zone 4	Die head	
Electrodes	Round and flat profiles	20	ZC 1:1	70	75	75	-	80	vertical feed screw, air cooling of barrel required, for flat profiles die up to 50 x 0.5 mm
Ceramics	Round and flat profiles, tubes	20	ZC 1:1	40 - 60	50 - 70	60 - 80	-	80 - 100	screw and barrel made of special materials
Powder coatings	Ribbon and round profiles	25	CP 2:1 ZC 1:1	70	80	90	100	100 - 120	frequently special screws with mixing section required, air cooling required

CP = core progressive screw
 ZC = zero compression
 3Z = 3-zone metering screw

- 25 D total length: 10 D + 3 D + 12 D
- 20 D total length: 10 D + 3 D + 7 D

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WinExt software: System configuration surface
 HZ 1-4 = heating zones, P 1-3 = pressure transducers, T 1 = melt temperature

System configuration made easy

With the WinExt software you can easily configure and give the initial settings to your extrusion line.

The software automatically recognizes the main machine components via the CAN bus connection and controls not only the extruder with the drive unit, but all the auxiliaries (die, feeders, follow-up equipment) as well.

During the operation you can follow and visualize in graph the following values:

- up to 8 zone temperatures
- up to 4 melt temperatures
- up to 8 pressures
- torque
- extruder speed
- speed of the different auxiliaries
- throughput (with balance)

These measured values can be stored throughout the extrusion process so that you can evaluate them later.

With the correlation software you can compare the recorded data of several different extrusion processes.

Automatic calculation, numerical and graphical display of mean values and standard deviations make it easy to spot irregularities, assess trends in data or compare against standards.

Determination of mastercurves according to the time temperature superposition principle is another outstanding feature of the correlation software.

The Brabender support

Our state of the art application laboratory is always made available to our customers.

You can choose to send material to us for testing or schedule a specific Lab Trial with our expert team.

In our application laboratory, you will have access to our full product line to help come to a solution for your application.



Brabender application laboratory



Plastograph EC Plus
 with measuring extruder 19/25



Brabender® GmbH & Co. KG

Kulturstr. 49-55 · 47055 Duisburg · Germany
 Phone: +49 203 7788-0
 plastics-sales@brabender.com
 www.brabender.com



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