

HEAT PROFILE REFERENCE TABLE

% SHOT CAPACITY	RESIDENCE TIME	HEAT PROFILE			
		TYPE	REAR ZONE	CENTER ZONE	FRONT ZONE
25% or less	2 min or more	Ascending	Resin (1)	Average of Rear and Front Zones	Melt Adj (3)
25% or less	Less than 2 min	Flat	Melt (2)	Melt (2)	Melt Adj (3)
25 to 35%	2 min or more	Flat	Melt (2)	Melt (2)	Melt Adj (3)
25 to 35%	Less than 2 min	Hump	Resin (1)	Melt (2) + 30 to 45°F	Melt Adj (3)
35 to 45%	2 min or more	Hump	Resin (1)	Melt (2) + 30 to 45°F	Melt Adj (3)
35 to 45%	Less than 2 min	Reverse	Melt (2) + 30 to 45°F	Average of Rear and Front Zones	Melt Adj (3)
More than 45%	2 min or more	Reverse	Melt (2) + 30 to 45°F	Average of Rear and Front Zones	Melt Adj (3)
More than 45%	Less than 2 min	Reverse	Melt (2) + 40 to 60°F	Average of Rear and Front Zones	Melt Adj (3)

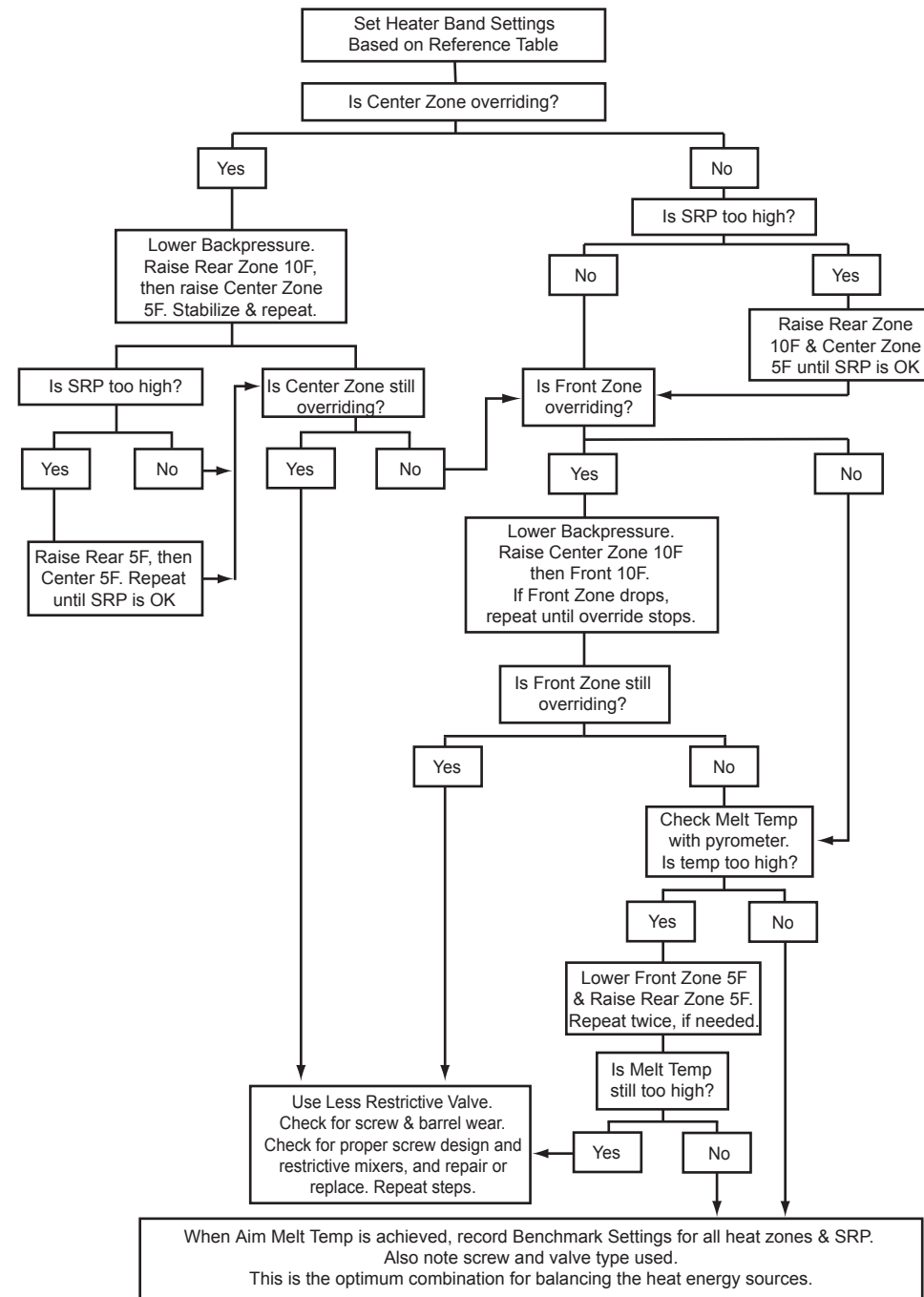
Notes:

- (1) Rear zone temperature recommended by the resin manufacturer.
- (2) Desired melt temperature.
- (3) Within a range of desired melt temp to 10°F below desired melt temperature

The guidelines for initial heater band settings presented in this table are for the injection molding of non-reinforced thermoplastics with a shot size in the range of 25% to 75% of the machine shot capacity. It should be noted that residence times, screw RPM, additives and other factors are variables that must be considered when setting the heat profile.

The heat profile guidelines described above provide a starting point and should be adjusted (See Heat Profile Decision Chart) to produce the best melt quality at the lowest possible moldable temperature with all heater band zones cycling ... and remember to check the Screw Rotate Pressure (SRP).

HEAT PROFILE DECISION CHART



CALCULATIONS

Calculating Throughput:

Where: **D**=Screw Diameter **Mfd**=Meter Flight Depth
RPM=Screw Speed **Sg**=Specific Gravity

$$\text{Pounds/Hour} = D^2 \times 2.3 \times Mfd \times RPM \times .9 \times Sg$$

$$\text{Ounces/Second} = \text{Pounds/Hour} \times .00444$$

$$\text{Ounces} \times 28.3 = \text{Grams} \quad \text{Grams} \times .0353 = \text{Ounces}$$

Calculating Residence Time (Minutes) or RT:

Where: **Inventory** = Rated Shot Capacity / 1.05 x Sd
Sd = Solid Density @ Room Temp

$$\text{RT} = \text{Inventory} / \text{Shot Size} \times \text{Cycle Time} / 60$$

Using the percentage of stroke of the machine and overall cycle time method of calculation does not include the two different weights of the resin (solid versus molten) and the L/D ratio. Assumptions then are made that the total shot capacity of the machine is equal to the total inventory of the screw. Contact Reiloy USA for further information regarding residence times.

REPLACE OR REPAIR WORN COMPONENTS

A "normal" clearance between a new barrel and a new screw from the manufacturer might well be an average of the maximum and minimum clearances shown. Based on information in Reiloy USA's studies and past experience, the suggested guideline for repair/replacement is as follows:

"If the combined wear of the barrel and screw is twice the normal OEM clearance, the barrel or screw (or both) should be repaired or replaced."

Bore Diameter MM (Inch)	Avg. Min. Clearance (Inch)	Avg. Max. Clearance (Inch)	Repair / Repl Clearance (Inch)
30 (1 1/4")	0.006	0.009	0.015
35 (1 3/8")	0.007	0.010	0.016
40 (1 1/2")	0.007	0.010	0.016
45 (1 3/4")	0.007	0.010	0.017
50 (2")	0.007	0.010	0.017
55 (2 1/4")	0.008	0.011	0.018
60 (2 3/8")	0.008	0.011	0.018
65 (2 1/2")	0.008	0.011	0.018
70 (2 3/4")	0.008	0.012	0.019
75 (3")	0.008	0.012	0.019
80 (-)	0.008	0.012	0.019
83 (3 1/4")	0.009	0.013	0.021
90 (3 1/2")	0.009	0.013	0.021
100 (4")	0.009	0.013	0.021
105 (4 1/4")	0.010	0.014	0.023
115 (4 1/2")	0.010	0.014	0.023
125 (-)	0.010	0.015	0.025
133 (5 1/4")	0.010	0.015	0.025
135 (-)	0.010	0.015	0.025
140 (5 1/2")	0.010	0.015	0.025

SCREW DESIGN GUIDELINES

RESIN	MOLECULAR TYPE	CRITICAL TEMP °F (a)	DENSITY G/cm³		SCREW DESIGN BASED ON			SELECTED TRADE NAMES
			SOLID	MELT	METER CHANNEL DEPTH (b)	TRANSITION LENGTH (c)	COMPRESSION RATIO (d)	
ABS	Amorphous	228 Tg	1.08	.97	Deep	Long	Low	Cyclocac, Magnum, Lustran
CA	Crystalline*	NA	1.22	1.14	Deep	Medium	Low	Tenite
CAB	Crystalline*	NA	1.15	1.08	Deep	Medium	Low	Tenite
CAP	Crystalline*	NA	1.17	1.10	Deep	Medium	Low	Tenite
FEP	Crystalline	527 Tm	2.12	1.49	Medium	Short	Medium	Teflon
HDPE	Crystalline	278 Tm	.95	.73	Medium	Medium	Medium	Dowlex, Marlex, Petrothene, Alathon
HIPS	Amorphous	210 Tg	1.05	.97	Deep	Long	Low	Styron, Lustrex, RTP
Ionomer	Crystalline	205 Tm	.93	.73	Medium	Medium	Medium	Surlyn, Latek, Formion
LCP	Crystalline	525 Tm	1.35	Unk	Shallow	Medium	Medium	Vectra, Xydar, Ekkcel
LDPE	Crystalline	221 Tm	.92	.76	Medium	Medium	Medium	Petrothene, Tenite, Escorene
LLDPE	Crystalline	250 Tm	.93	.70	Medium	Medium	Medium	Petrothene, Dowlex, Escorene, Attane
PA 66	Crystalline	500 Tm	1.14	.97	Shallow	Medium	High	Zytel, Ultramid, Wellamid, Vydyn
PBT	Crystalline*	470 Tm	1.34	1.11	Medium	Medium	Low	Valox, Celanex
PC	Amorphous	302 Tg	1.20	1.02	Deep	Long	Low	Lexan, Makrolon, Calibre
PEI	Amorphous	420 Tg	1.27	1.08	Medium	Medium	Medium	Ultem
PET	Crystalline**	460 Tm	1.40	1.10	Medium	Medium	Medium	Kodapak, Petlon, Rynite (reinforced)
PFA	Crystalline	582 Tm	2.15	Unk	Medium	Short	Medium	Teflon
PMMA	Amorphous	203 Tg	1.20	1.05	Deep	Long	Low	(Acrylic) Plexiglas, Acrylite
POM	Crystalline	358 Tm	1.42	1.17	Shallow	Medium	Medium	Delrin (H); Celcon (C)
PP	Crystalline	348 Tm	.90	.75	Medium	Medium	Medium	Marlex, Hifax, Escorene, Nortuff
PPE-PPO	Amorphous	Unk	1.08	.90	Medium	Medium	Low	Noryl, Prevx
PS	Amorphous	193 Tg	1.05	.97	Medium	Medium	Medium	Styron
PSU	Amorphous	374 Tg	1.24	1.16	Medium	Medium	Medium	Udel, Ultrason S
PVC-F	Amorphous	194 Tg	1.30	1.20	Deep	Medium	Low	Geon
PVC-R	Amorphous	188 Tg	1.40	1.22	Deep	Long	Low	Geon
SAN	Amorphous	300 Tg	1.07	1.00	Medium	Medium	Medium	Lustran-SAN, Tyril, Luran

(a) Tm = Melting Point Tg = Glass Transition Point (mean of temps)

(b) Degree of meter channel depth. Example: Medium for 2" (50 mm) diameter .100" to .125".

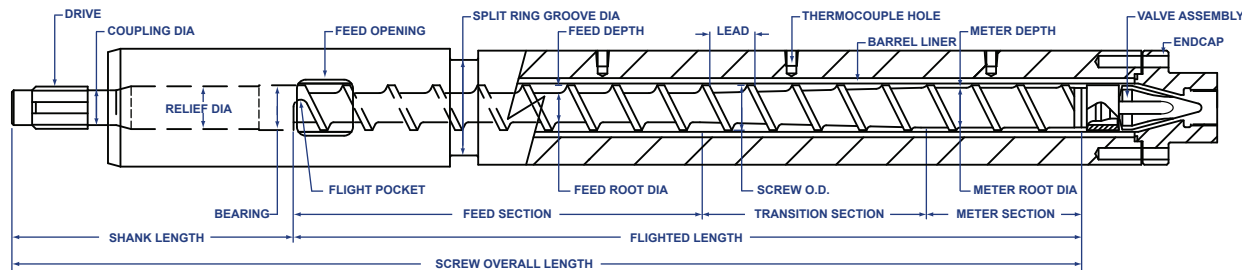
(c) Short = 4D or less; Medium = 5D to 7D; Long = 8D or more

(d) Low - less than 2.5:1; Medium - 2.5 to 3.4:1; High - 3.5:1 and above

* Processes like amorphous

** Bottle grade material

H = Homopolymer C = Copolymer



DECIMAL • METRIC EQUIVALENTS

To convert inches to millimeters, use inches x 25.4.
To convert millimeters to inches, use millimeters ÷ 25.4.

m/m	inches	m/m	inches	m/m	inches	m/m	inches
1	0.0394	51	2.0079	101	3.9764	151	5.9449
2	0.0787	52	2.0472	102	4.0157	152	5.9843
3	0.1181	53	2.0866	103	4.0551	153	6.0236
4	0.1575	54	2.1260	104	4.0945	154	6.0630
5	0.1969	55	2.1654	105	4.1339	155	6.1024
6	0.2362	56	2.2047	106	4.1732	156	6.1417
7	0.2756	57	2.2441	107	4.2126	157	6.1811
8	0.3150	58	2.2835	108	4.2520	158	6.2205
9	0.3543	59	2.3228	109	4.2913	159	6.2598
10	0.3937	60	2.3622	110	4.3307	160	6.2992
11	0.4331	61	2.4016	111	4.3701	161	6.3386
12	0.4724	62	2.4409	112	4.4094	162	6.3780
13	0.5118	63	2.4803	113	4.4488	163	6.4173
14	0.5512	64	2.5197	114	4.4882	164	6.4567
15	0.5906	65	2.5591	115	4.5276	165	6.4961
16	0.6299	66	2.5984	116	4.5669	166	6.5354
17	0.6693	67	2.6378	117	4.6063	167	6.5748
18	0.7087	68	2.6772	118	4.6457	168	6.6142
19	0.7480	69	2.7165	119	4.6850	169	6.6535
20	0.7874	70	2.7559	120	4.7244	170	6.6929
21	0.8268	71	2.7953	121	4.7638	171	6.7323
22	0.8661	72	2.8346	122	4.8032	172	6.7717
23	0.9055	73	2.8740	123	4.8425	173	6.8110
24	0.9449	74	2.9134	124	4.8819	174	6.8504
25	0.9843	75	2.9528	125	4.9213	175	6.8898
26	1.0236	76	2.9921	126	4.9606	176	6.9291
27	1.0630	77	3.0315	127	5.0000	177	6.9685
28	1.1024	78	3.0709	128	5.0394	178	7.0079
29	1.1417	79	3.1102	129	5.0787	179	7.0472
30	1.1811	80	3.1496	130	5.1181	180	7.0866
31	1.2205	81	3.1890	131	5.1575	181	7.1260
32	1.2598	82	3.2283	132	5.1969	182	7.1654
33	1.2992	83	3.2677	133	5.2362	183	7.2047
34	1.3386	84	3.3071	134	5.2756	184	7.2441
35	1.3780	85	3.3465	135	5.3150	185	7.2835
36	1.4173	86	3.3858	136	5.3543	186	7.3228
37	1.4567	87	3.4252	137	5.3937	187	7.3622
38	1.4961	88	3.4646	138	5.4331	188	7.4016
39	1.5354	89	3.5039	139	5.4724	189	7.4409
40	1.5748	90	3.5433	140	5.5118	190	7.4803
41	1.6142	91	3.5827	141	5.5512	191	7.5197
42	1.6535	92	3.6220	142	5.5906	192	7.5591
43	1.6929	93	3.6614	143	5.6299	193	7.5984
44	1.7323	94	3.7008	144	5.6693	194	7.6378
45	1.7717	95	3.7402	145	5.7087	195	7.6772
46	1.8110	96	3.7795	146	5.7480	196	7.7165
47	1.8504	97	3.8189	147	5.7874	197	7.7559
48	1.8898	98	3.8583	148	5.8268	198	7.7953
49	1.9291	99	3.8976	149	5.8661	199	7.8346
50	1.9685	100	3.9370	150	5.9055	200	7.8740



Reifenhäuser

REILOY



INJECTION MOLDING

POCKET GUIDE



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