MASH TEMPERATURE CHART

Rest	Temperature Range/Optimum	Duration (minutes)	Purpose
Lactic acid	95 - 122 / 110 F 35 - 50 / 44 C	24 hours + until pH is <4.0 or degree of sourness is achieved.	Souring/major pH correction of carbonate water. A sachrified portion of the mash (5 - 15% of total) is cooled to <130° F, then mixed with crushed grain. Reference: 1 - p.132
Acid	86 - 128 / 95 F 30 - 53 / 35 C	10 - 20 (infusion) 60 - 90 (decoction)	pH adjustment of soft or moderately hard water. Used for light colored beer and weissen. Liberates phytase, only works with lightly kilned malts. Affect - increased mineral and yeast nutrient content. Reference: 1 - p.130
Beta Glucanase	95 - 131 / 104 F	?? - 30 20 seems to work	Beta Glucan (gum) breakdown (wheat and oatmeal only) Reference: 1 - p. 138, 2 - p. 22, 4
Acid/Beta Glucan Weissen	110 F 44 C	10	In addition to acid and beta glucan above, it produces ferrulic acid which is later converted to char. phenolics. Reference: 2 - p. 22, 3 - p. 59, 62
Protein	113-140/122-131 F 45-60/50-55 C	15 - 90	Protein breakdown the lower range (113 - 122) supports peptidase that can decrease body, upper range (122 - 132) favors proteinase which is more desirable for more modified malts (nitrogen >37) Reference: 1 - p.136, 138, 2 - p.23
Beta Amylase	126-154/140-149 F 52-68/60-65 C		Saccharification - Fermentable sugars Reference:
Alpha Amylase	130-170/149-158 F 54.5-77/68-70 C		Saccharification - Dextrins, longer chain sugars Reference:
Saccharification	Temp of: 148 - 151 F 152 - 155 F 155 - 158 F		Produces: Light beer Amber, golden lager, pilsener, dortmunder Highly malty beers Reference: 1 - p. 140-42

References:
1 - New Brewing Lager Beer; Greg Noonan, 1996
2 - Mashing Basics; Jim Busch, Brewing Techniques Vol. 3, No. 2 1995
3 - German Wheat Beers; Eric Warner, 1992
4 - Oatmeal Stout; Stephan Galante, Brew Your Own - Oct, 1997

Table compiled by Mike Schwartz