CHILLER SIZING FORMULAS

INJECTION MOLDING		EXTRUSION
		SHEET CALENDERING
		PE 35 lbs/hour/ton
HDPE	30 lbs/hour	ABS 60 lbs/hour/ton
LDPE	35 lbs/hour	PS 60 lbs/hour/ton
PP	35 lbs/hour	
ACRYLIC	35 lbs/hour	**PROFILE & PIPE**
PPO	40 lbs/hour	
NYLON	40 lbs/hour	HDPE 50 - 60 lbs/hour/ton
DERLIN	40 lbs/hour	LDPE 50 - 60 lbs/hour/ton
UREATHANE	40 lbs/hour	PP 50 - 60 lbs/hour/ton
PET	40 lbs/hour	PET 50 - 60 lbs/hour/ton
PS	50 lbs/hour	ABS 60 - 75 lbs/hour/ton
ABS	50 lbs/hour	PVC 60 - 75 lbs/hour/ton
PC	50 lbs/hour	**EXTRUDER COOLING**
ACETAL	50 lbs/hour	
CELCON	50 lbs/hour	Barrel 1 ton/" screw dia.
PVC	60 lbs/hour	Screw 2 tons
		Throat 1/2 ton up to 3"
		Throat 1 ton 4" to 6"
		Gear Box (oil) 100 hp / ton

FEED THROAT INJECTION MOLDING:	1/2 ton up to 400 ton machine. 1 ton over 400 ton machine.

BLOW HOLDING	VACUUM FORMING
POLYOLFINS 35 lbs/hour/ton	HDPE 70 lbs/hour/ton
PET 40 lbs/hour/ton	LDPE 70 lbs/hour/ton
PVC 70 lbs/hour/ton	PP 70 lbs/hour/ton
	PS 200 lbs/hour/ton
	PVC 250 lbs/hour/ton

BLOWN FILM LOAD SIZING	
100 CFM	
100 CFM	40 F (4.4 C) Air Off 1.14 tons Ent. Glycol 33 F
100 CFM	45 F (7.2 C) Air Off 1.05 tons Ent. Glycol 35 F
	50 F (10 C) Air Off 0.85 tons Ent. Water 40 F
Entering Air Conditions	
	90 F dry bulb / 78 F wet bulb
A Guide to calculate the DIE CFM:	Includes blower motor heat
1 – 3 cfm / lb.	
2 – 150 to 170 cfm / inch	

HOT RUNNER MOLDS:
convert heater watts to btu's and divide by 2. (watts x 3.414 divide by 24,000 Btu

MIXER:
$\frac{\text{lbs/hour x .5 x temp. difference}}{\text{12,000 Btu/ton}}$ + 0.2 hp. = tons

VACUUM FORMING:

(temp. sheet on - temp. sheet off) x S.H> x lbs/hour = tons
12,000 Btu/ton

* S.H. is specific heat of plastic.
* Approx. temp. in 220° F. and temp. out 100° F.
* Sheet is cooled by the surrounding air, lbs/hour may be increased by 10%

COOLING & HEATING LOAD:

lbs/hour x (temp. start - temp. end) x S.H. = BTU's

* S.H. is specific heat of material.

MOLD HEAT UP TIME:

weight (lbs) x (temp. start - temp. end) x S.H. = Time in Hrs.
heater capacity (Btu's)

* S.H. is specific heat of mold material.

PLATING BATHS:

DC amps x DC volts x 3.414 x 75% eff. = Tons
12,000 Btu/ton

FOR TOWER WATER	
COOLING TOWER SIZING	**GENERAL FORMULAE**
Hydraulic Cooling .11 hp / ton Vacuum Pump .1 hp / ton Rubber Mills .1 hp / ton Gear Drives .1 hp / ton Water Pumps .2 hp / ton Air Compressor oil .16 hp / ton Air Comp. after cooler .2 hp / ton Spot Welders 100 kw / ton Chiller Condenser 1 ton = 1 ton	Chiller Ton 12,000 btu Chiller Flow 2.4 gpm / ton Chiller Tons gpm x TD div. 24 Chiller With Water Range 42 F to 70 F Chiller With Glycol Range 15 F to 42 F Tower Ton 15,000 btu Tower Flow 3 gpm / /ton Tower Tons gpm x TD div. 30 Tower Water Range summer 70 F to 85 F, winter a low of 50 F to 85 F
To run any of the above equipment on a chiller multiply the tower cooling load by 1.25.	TD - Temperature Difference (between in & out

DIE CASTING:

Zinc - lbs/hour x 35 btu/lb. = Tower Tons *(pour at 800 F. Remove at 600 F.)
15,000 Btu/ton

Aluminum - lbs/hour x 325 btu/lb. = Tower Tons * (pour at 1200 F. Remove at 600 F.)
15,000 Btu/ton

STEEL QUENCHING:

Continuous - lbs/hour x 0.166 x (temp. in - temp. out) = Tower Tons
15,000 Btu/ton

Batch - lbs/load x 0.166 x (temp. in - temp. out) = Tower Tons
Quench time (hrs) x 15,000 Btu/ton

FAN BEARINGS:	0.2 ton/fan motor (2 gpm/fan motor)
TRANSFORMER COOLING:	1 KVA = 1 ton
MOLD ROOM COOLING:	80 sq. ft./ton (16' ceiling)
TRANSFORMER COOLING:	1 KVA = 1 ton
* To use any of the above on a chilling system use 12,000 Btu instead of 15,000	