EDPT 601

Materials Manufacturing Technology

2 CastingProblems

Students Names:

Date

____/____/____

dd / mm / yy

Semester _____ Student ID _____ Group _____

(For instructor use only)Evaluation**Evaluation**

Grade

Comments

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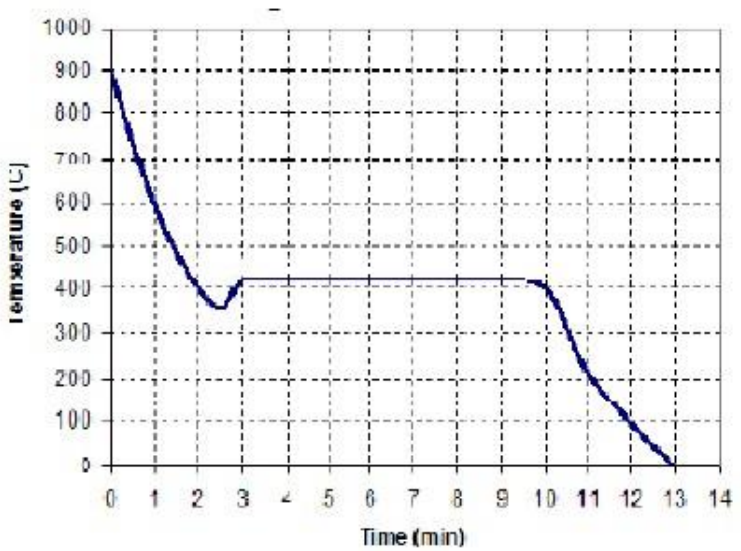
1- Given the cooling curve of a pure metal
   a- Calculate the cooling rate
   b- Solidification time
   c- Total solidification time



2- For the following Aluminum products:
   a- Determine the parting plane
   b- Find the pattern dimensions after adding necessary allowances (assuming a machining allowance of 3 mm, shrinkage allowance of 13 mm/m and a draft angle of 3°).
   c- Calculate the volume of the molten metal required for the casting assuming that the material required for the gating system is 30% of the volume of the product. (density 2.7 gm/cm3)
   d- Design the core for figure (b)
   e- Calculate the solidification time if B=1.8 (min/cm2)

$ts = B (V/A)^2$

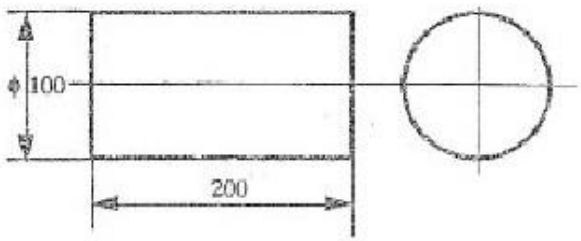


Fig (a)

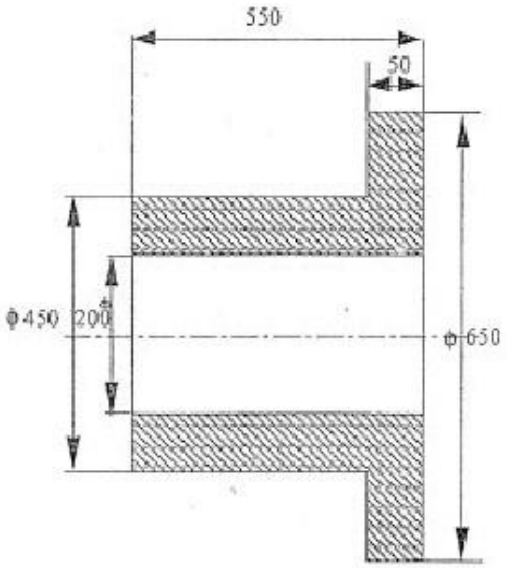


Fig (b)

Core print dimensions

Core Diam., mm	Core Length, L, mm									
	up to 50		51 to 150		151 to 300		301 to 500		501 to 750	
	h_1	l	h_1	l	h_1	l	h_1	l	h_1	l
up to 25	20	15	25	25	-	-	-	-	-	-
26-50	20	20	40	35	60	45	70	60	-	-
51-100	25	25	35	40	50	50	70	70	100	90
101-200	30	30	30	50	40	55	60	80	90	100
201-300	35		35		40	60	50	90	80	110
301-400	40		40		40	80	50	100	70	120
401-500	40		40		40	110	50	120	60	130

l is the length of core print of a horizontal core
h_1 is the height of lower core print of a vertical core, h_u is usually 60 % of lower core print.