



ภาคผนวก ก

AISI 1010

Category	Steel
Class	Carbon steel
Type	Standard
Designations	France: AFNOR XC 10 Germany: DIN 1.1121 Japan: JIS S12C , JIS S10C , JIS S9CK United States: AMS 5040 , AMS 5042 , AMS 5044 , AMS 5047 , AMS 5053 , ASTM A108 , ASTM A29 , ASTM A510 , ASTM A519 , ASTM A545 , ASTM A549 , ASTM A575 , ASTM A576 , MIL SPEC MIL-S-11310 (CS1010) , SAE J403 , SAE J412 , SAE J414 , UNS G10100

Composition

Element	Weight %
C	0.08-0.13
Mn	0.30-0.60
P	0.04 (max)
S	0.05 (max)

Mechanical Properties

Properties	T (°C)	Conditions
		Treatment
Density ($\times 1000 \text{ kg/m}^3$)	7.7-8.03	25
Poisson's Ratio	0.27-0.30	25
Elastic Modulus (GPa)	190-210	25
Tensile Strength (Mpa)	365	
Yield Strength (Mpa)	305	25 cold drawn (round bar (19-32 mm)) more
Elongation (%)	20	
Reduction in Area (%)	40	
Hardness (HB)	105	25 cold drawn (round bar (19-32 mm)) more



ภาคผนวก ข

1. ผลการทดสอบความแข็ง

Time	Hardness Brinell (HB)			
	Tempering Specimen	750 °C	800 °C	850 °C
ชิ้นงานที่ยังไม่ ผ่านการ Austenitizing	1	133.24		
	2	140.20		
	3	140.20		
	Average	137.88		
10	1	183.82	183.82	183.82
	2	198.59	176.96	190.99
	3	190.99	176.96	198.59
	Average	191.33	179.25	191.13
20	1	183.78	190.99	214.59
	2	183.82	194.23	219.59
	3	198.59	190.99	236.72
	Average	188.73	192.23	221.97
40	1	170.49	173.68	133.24
	2	176.96	170.49	142.63
	3	176.96	173.68	173.68
	Average	174.80	172.61	149.85

2. ผลการทดสอบ Tensile strength

Time	Tensile strength (N/ mm ²)			
	Tempering Specimen	750 °C	800 °C	850 °C
ชิ้นงานที่ยังไม่ ผ่านการ Austenitizing	1		406.32	
	2		413.17	
	3		382.19	
	Average		400.56	
10	1	605.65	556.00	561.89
	2	580.83	665.57	599.36
	3	615.09	573.25	669.81
	Average	600.52	598.28	610.36
20	1	646.48	554.77	559.52
	2	622.08	560.43	591.39
	3	669.71	579.31	601.28
	Average	646.09	564.84	584.06
40	1	598.51	571.17	509.31
	2	591.98	598.93	508.77
	3	564.35	588.56	504.29
	Average	584.84	586.22	507.46

3. ผลการคำนวณ Elongation

Time	Elongation (%)			
	Tempering Specimen	750 °C	800 °C	850 °C
ชิ้นงานที่ยังไม่ ผ่านการ Austenitizing	1		11.7	
	2		11.9	
	3		11.0	
	Average		11.5	
10	1	7.7	6.8	7.6
	2	8.7	7.7	7.6
	3	8.5	8.6	7.7
	Average	8.30	7.70	7.63
20	1	8.4	6.0	6.3
	2	7.5	7.0	7.5
	3	8.2	6.8	7.1
	Average	8.03	6.60	6.96
40	1	8.4	7.9	9.7
	2	7.7	6.7	10.0
	3	7.3	8.4	9.7
	Average	7.80	7.66	9.8

4. ผลการคำนวณค่า Modulus of elasticity

Time	Modulus of elasticity (N/ mm ²)			
	Tempering Specimen	750 °C	800 °C	850 °C
ชิ้นงานที่ยังไม่ ผ่านการ Austenitizing	1	16.64		
	2	16.65		
	3	16.65		
	Average	16.65		
10	1	39.50	40.83	36.96
	2	33.24	43.43	39.56
	3	36.09	33.15	43.49
	Average	36.28	39.14	40.00
20	1	38.67	46.22	44.26
	2	41.28	40.16	39.40
	3	40.80	42.80	42.45
	Average	40.25	43.06	42.04
40	1	35.69	35.99	26.14
	2	38.51	44.63	25.37
	3	38.73	34.99	26.01
	Average	37.64	38.54	25.84