

Hacettepe Racing

Cost Explanation File



Formula Student

July 2019

Verona, Italy

Introduction

In this file you can see that what we did about becoming cost explanation more understandable. Firstly we mentioned about some materials we used. Another case we drew a wage overheads rate table in Turkey. We showed how does calculate machine workers cost. We used this rate for all workers. Their wages are visible clearly. Lastly, we defined machines which we used. We explained some basic properties of them. Also we showed some machining costs. For unskilled worker their wages include all expenses except working costs.

We hope that we will be helpful for you.

Currency: €/TL=6.42 (8.4.2019 20:00 GMT+3)



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Material Cost Explanation

<u>ITEMS</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>SOURCE</u>
ALUMINUM SHEET	KG	3.57 Euro	https://metalavm.com/aluminyum-sac-100-mm-1250x2500
ALUMINUM STICK	KG	4.42 Euro	https://metalavm.com/aluminyum-cubuk-10-mm
STEEL AISI 1020	KG	0.71 Euro	http://tr.frlsteelstrip.com/steel-coil/cold-rolled-steel-coil/cold-rolled-aisi-1020-steel-steel.html
STEEL S460MC	KG	1.04 Euro	http://tr.coldrolledsteels.com/news/s460mc-steel-sheet-14108097.html
STEEL S355MC	KG	0.89 Euro	http://www.steel-plate-sheet.com/Steel-plate/EN/S355MC.html
CARBON FİBER 3K 200 GR	M2	23.70 Euro	https://www.kompozit.net/karbon-fiber-kumas-200-gr-m2-3k-twill-1m2
EPOXY RESİN	KG	18.70 Euro	https://www.walmart.com/ip/EPOXY-RESIN-1-Gal-kit-CRYSTAL-CLEAR-for-Super-Gloss-Coating-and-Table-Tops/195386792
WOOD(BALSA)	KG	13.24Euro	https://urun.n11.com/maket-aksesuari/delrey-olcekli-maket-balsa-levha-6mm-10cm-1mt-3lu-P287219061



WOOD	KG	0.44Euro	https://balkotrade.com/plywood/plywood-fiyatlari/balko-filmsiz-rus-birch-3mm.html
PEE PLY	M2	5.12Euro	https://www.alibaba.com/product-detail/Free-Sample-Manufacture-bullet-proof-fabric_60808426981.html?spm=a2700.7724857.normalList.45.26217655h0iCJ7
FLOW MESH	M2	2.78Euro	https://screenmeshchina.en.made-in-china.com/product/kvfJQwNXZzRB/China-Manganese-Stainless-Steel-Wire-Curve-Wire-Mesh-Polyurethane-Screen-Mesh-for-Mine.html
RELEASE AGENT	LT	32.37 Euro	https://www.bennye.com.tr/pol-ease-2300-release-agent-pmu1190
ACETONE	LT	3.82Euro	https://urun.n11.com/oje-cikarici-ve-aseton/itri-aseton-1000-ml-P298475534
PHOSPHORIC ACID	LT	2.34Euro	http://www.avlmedikal.com/solusyonlar/6080-phosphoric-acid-solution-01-n-1-lt.html
CARBON FİBER PIPE 20X1MM	M	20.73Euro	https://www.hepsiburada.com/carbon-3k-karbon-boru-20mm-1m-p-HBV00000BDW5C?magaza=Pilottr&wt_gl=cpc.tum.universite.genel.pla&gclid=Cj0KCQjw4qvlBRDiARIsAHme6ouSuarAE0B6vrjiWN1gRawuewLpXsUjIPi5q0GaermDmXeGLSdthMlaAq1eEALw_wcB
CARBON FİBER PIPE 20X1.5MM	M	43.1Euro	https://www.ebay.com/itm/19mm-ID-x-22mm-OD-x-500mm-Highest-quality-Glossy-3k-Carbon-Fiber-Tube-22-19/322818983887?hash=item4b2982c7cf:m:mB-2EPshINQpPhpWOTp45xg



Labor Rates (Monthly)

SKILLED WORKER

WAGE OVERHEADS	39.5 %
SSI Employee Contribution	19.5 %
Living Allowance	10.5 %
Income Tax	8.5 %
Unemployment Premium	1%

RESOURCE(forwages) | <https://turkishlaborlaw.com/news/legal-news/657-2019-minimum-wage-announced-with-26-hike>

MONTHLY TOTAL WAGE = MONTHLY BASE WAGE x (1 + WAGE OVERHEADS RATE)

For example;

Monthly total wage=1000TL, Wage overheads rate=%39.5=>Monthly base wage= 605TL

●TIG WELDING

	Daily Working Hour	Working Day per Month	Monthly Working Hour	Monthly Base Wage	Monthly Total Wage	Daily Base Wage	Hourly Wage
Welding	7 Hours	26	182 Hours	2835€	3954€	10,9€	15,57€

Welding speed is 160mm/min=9600mm/h=9.6m/h(With preparation etc.)

Therefore welding= 1.623 Euro/m

Assembling unqualified parts line on line is 2TL/piece=0.31Euro/piece

(The tig welding fee includes all expenses.)

●LASER CUT

	Daily Working Hour	Working Day per Month	Monthly Working Hour	Monthly Base Wage	Monthly Total Wage	Daily Base Wage	Hourly Wage
Laser Cut	7 Hours	26 Days	182 Hours	585,12	816,19	22,5€	3,21€

The laser machine cut rate= 4000mm²/min

Laser cut cost= 0.0010 Euro/mm²

●5-AXIS LASER CUT

	Daily Working Hour	Working Day per Month	Monthly Working Hour	Monthly Base Wage	Monthly Total Wage	Daily Base Wage	Hourly Wage
5-axis Laser Cut	10 Hours	26 Days	182 Hours	957,06€	1244,18€	36,81€	3,68€

The laser machine cut rate= 2500mm/min

5-axes laser cut cost= 0.006 Euro/mm

For every piece CAM and setup cost is 10TL which is 1.55 Euro/piece.

●CNC ROUTER

	Daily Working Hour	Working Day per Month	Monthly Working Hour	Monthly Base Wage	Monthly Total Wage	Daily Base Wage	Hourly Wage
CNC Router	10 Hours	26 Days	260 Hours	1011,21€	1410,72€	38,92€	3,89€

The CNC Router average cut rate= 6000mm³/min

CNC Router cost approximately= 0.000039 Euro/mm³ for steel

CNC Router cost approximately= 0.0000039 Euro/mm³ for wood (because of high cutting speed and higher tool life)

For every piece CAM and setup cost is 10TL which is 1.55 Euro/piece.

●CNC 5-AXES MILLING(ROUTER)

	Daily Working Hour	Working Day per Month	Monthly Working Hour	Monthly Base Wage	Monthly Total Wage	Daily Base Wage	Hourly Wage
CNC 5axes milling	10 Hours	26 Days	260 Hours	1011,21€	1410,72€	38,92€	3,89€

The CNC milling cut rate=8000mm³/min

5 axes CNC milling cost approximately = 0.000068 Euro/ mm³ for steel

5 axes CNC milling cost approximately= 0.0000068 Euro/mm³ for wood (because of high cutting speeds and higher tool life)

For every piece CAM and setup cost is 35TL which is 5.45Euro/piece.



●TURNING

	Daily Working Hour	Working Day per Month	Monthly Working Hour	Monthly Base Wage	Monthly Total Wage	Daily Base Wage	Hourly Wage
Turning	8 Hours	26 Days	208 Hours	641,49€	894,88€	24,67€	3,08€

Turning feed rate is approximately= 5000mm³/min

Turning cost is approximately=0.0000151 Euro/ mm³

Setup and installing each piece costs 3TL which is 0.46 Euro/piece.

●MILLING

	Daily Working Hour	Working Day per Month	Monthly Working Hour	Monthly Base Wage	Monthly Total Wage	Daily Base Wage	Hourly Wage
Milling	8 Hours	26 Days	208 Hours	748,28€	1043,92€	28,78€	3,59€

Milling feed rate is approximately= 5000mm³/min

Milling cost is approximately=0.0000181 Euro/mm³

Setup and installing each piece costs 3TL which is 0.46 Euro/piece.

● COMPOSITE LABOUR

(For composite applications like; Resin application, Lamination, Vacuum form, Cure)

	Daily Working Hour	Working Day per Month	Monthly Working Hour	Monthly Base Wage	Monthly Total Wage	Daily Base Wage	Hourly Wage
Composite Labour	8 Hours	26 Days	208 Hours	2672,89€	3728,66€	102,8€	12,85€

Infusion molding= 3 hours/m²

	Daily Working Hour	Working Day per Month	Monthly Working Hour	Monthly Base Wage	Monthly Total Wage	Daily Base Wage	Hourly Wage
Resin Application	8 Hours	26 Days	208 Hours	808,97€	1128€	31,14€	3,89€

Resin application = 10mins/m²

Therefore resin application cost=3.89Euro/m²

	Daily Working Hour	Working Day per Month	Monthly Working Hour	Monthly Base Wage	Monthly Total Wage	Daily Base Wage	Hourly Wage
Lamination	8 Hours	26 Days	208 Hours	107,46€	149,91€	4,16€	0,52€

Lamination, vacuum fabric lay down = 4 mins/m²

Therefore lamination cost=1.55Euro/m²



UNSKILLED WORKER

WAGE OVERHEADS	39.5 %
SSI Employee Contribution	19.5 %
Living Allowance	10.5 %
Income Tax	8.5 %
Unemployment Premium	1%

RESOURCE(forwages) | <https://turkishlaborlaw.com/news/legal-news/657-2019-minimum-wage-announced-with-26-hike>

MONTHLY TOTAL WAGE = MONTHLY BASE WAGE x (1 + WAGE OVERHEADS RATE)

For example;

Monthly total wage=1000TL, Wage overheads rate=%39.5=>Monthly base wage= 605TL

Unskilled workers do these things;

Cure,Bending,Drilling,Threading,Cutting,Covering,Painting,Assembly,Fastener Install and Grinding.

● CURE

	Daily Working Hour	Working Day per Month	Monthly Working Hour	Monthly Base Wage	Monthly Total Wage	Daily Base Wage	Hourly Wage
Cure	7 Hours	26 Days	182 Hours	849,93€	1185,65€	32,68€	4,67€

● THERMAL CURE

	Daily Working Hour	Working Day per Month	Monthly Working Hour	Monthly Base Wage	Monthly Total Wage	Daily Base Wage	Hourly Wage
Thermal Cure	7 Hours	26 Days	182 Hours	849,93€	1185,65€	32,68€	4,67€



●BENDING OPERATION

	Daily Working Hour	Working Day per Month	Monthly Working Hour	Monthly Base Wage	Monthly Total Wage	Daily Base Wage	Hourly Wage
Bending Operation	7 Hours	26 Days	182 Hours	85,04€	118,64€	3,27€	0,47€

●ROLL BENDING

	Daily Working Hour	Working Day per Month	Monthly Working Hour	Montly Base Wage	Monthly Total Wage	Daily Base Wage	Hourly Wage
Roll Bending	7 Hours	26 Days	182 Hours	283,48€	395.47€	10,9€	1,56€

●DRILLING

	Daily Working Hour	Working Day per Month	Monthly Working Hour	Monthly Base Wage	Monthly Total Wage	Daily BaseWage	Hourly Wage
Drilling	7 Hours	26 Days	182 Hours	85,04€	118,64€	3,27€	0,47€

●THREADING

	Daily Working Hour	Working Day per Month	Monthly Working Hour	Monthly Base Wage	Monthly Total Wage	Daily Base Wage	Hourly Wage
Threading	7 Hours	26 Days	182 Hours	141,74€	197,74€	5,45€	0,78€

●CUTTING

	Daily Working Hour	Working Day per Month	Monthly Working Hour	Monthly Base Wage	Monthly Total Wage	Daily Base Wage	Hourly Wage
Cut(manual)	7 Hours	26 Days	182 Hours	28,35€	39,55€	1,12€	0,16€

	Daily Working Hour	Working Day per Month	Monthly Working Hour	Monthly Base Wage	Monthly Total Wage	Daily Base Wage	Hourly Wage
Cut(handtool)	7 Hours	26 Days	182 Hours	850,46€	1186,4€	32,71€	4,67€

	Daily Working Hour	Working Day per Month	Monthly Working Hour	Monthly Base Wage	Monthly Total Wage	Daily Base Wage	Hourly Wage
Tube cut (diamond)	7 Hours	26 Days	182 Hours	850,46€	1186,4€	32,71€	4,67€



●COVERING

	Daily Working Hour	Working Day per Month	Monthly Working Hour	Monthly Base Wage	Monthly Total Wage	Daily Base Wage	Hourly Wage
Covering	7 Hours	26 Days	182 Hours	637,85€	889,71€	24,53€	3,5€

●PAINTING

	Daily Working Hour	Working Day per Month	Monthly Working Hour	Monthly Base Wage	Monthly Total Wage	Daily Base Wage	Hourly Wage
Painting	7 Hours	26 Days	182 Hours	2551.4€	3559,19€	98,13€	14,02€

●ASSEMBLY WORKER

	Daily Working Hour	Working Day per Month	Monthly Working Hour	Monthly Base Wage	Monthly Total Wage	Daily Base Wage	Hourly Wage
Assembly	7 Hours	26 Days	182 Hours	1587,53€	2214,48€	61,06	8.72€

Assembling qualified necessary parts (like bearing etc) line on line and attaching wire is 56TL/hour

●FASTENER INSTALL

	Daily Working Hour	Working Day per Month	Monthly Working Hour	Monthly Base Wage	Monthly Total Wage	Daily Base Wage	Hourly Wage
Fastener Install	7 Hours	26 Days	182 Hours	452,23€	593,15€	16,35€	2,34€

A fastener is approximately tighten 4 tour. We can assume tighten a tour, a nut to a bolt with a washer takes 6 seconds. For tighten the triple process (a nut,+a bolt,+a washer takes 6 seconds for every tour.) 4 tour for every fasteners takes 24 seconds. A fastener install takes 8 seconds. (4 tour x 2 seconds) Therefore a fastener install is 0.0165Euro/piece

●GRINDING

	Daily Working Hour	Working Day per Month	Monthly Working Hour	Monthly Base Wage	Monthly Total Wage	Daily Base Wage	Hourly Wage
Grinding (with handtool)	7 Hours	26 Days	182 Hours	1133,96€	1581.87€	43,61€	6,23€

Grinding(with handtool) 40TL/hour=6.23Euro/hour

Grinding speed approximately 200mm/min=12m/hour

Therefore grinding (with handtool)=0.519Euro/m

	Daily Working Hour	Working Day per Month	Monthly Working Hour	Monthly Base Wage	Monthly Total Wage	Daily Base Wage	Hourly Wage
Grinding (with hand)	7 Hours	26 Days	182 Hours	1133,96€	1581.87€	43,61€	6,23€

Grinding (withhand) 40TL/hour. The speed is approximately 0.25m²/hour. 160TL/m²=24.92Euro/m²



MACHINING OPERATIONS

LASERCUT



General Informations

Machine type: 5-axis CNC laser cut machine
Year of production: 2015
Power: 5000W
Sheet cutting length: 3050mm
Sheet cutting width: 1600mm
Laser cut machine cut rate: $4000\text{mm}^2/\text{min}$
Machine running time per year: 2850,5hour/year
Maintenance cost: %4.5 (of acquisition cost=4500€/year)
Wage machine operator: 3.32 €/hour
Energy cost: 0,083€/kWh

Machine Overheads Rate (%37.53)

Coolants: %4
Lubricants: %3.5
Tools: %16.7
Technical employees: %5.33
Others: %8

Machine, Machining Cost and Efficiency

Acquisition cost: 100.000€
Machine efficiency: %75
Derpreciation years: 4 years
Energy consumption: 5 kW
Laser cut cost: 4.95€/min(0.010€/mm^2)



MILLING



General Informations

Machine type: Milling
Year of production: 2008
Power: 5500 Watt
X/Y/Z axis movement: 1100mm/600mm/600mm
Table dimensions: 1100x560mm
Working area: 1100x600mm
Maintenance cost: %6 (of acquisitions cost= 1020€/year)
Wage machine operator: 3.32€/Hour
Table loading capacity: 900kg
Spindle RPM: 8000
Spindle Engine: 11/15 Hp
X/Y/Z Cutting speeds: 12000mm/min
Weight: 6000kg
Energy cost: 0.091€/kWh

Machine Overheads Rate(%34)

Coolants: %7
Lubricants: %8
Tools: %11.5
Technical employees: %6
Others: %1.5

Machine, Machining Cost and Efficiency

Acquisition cost: 17000€
Machine efficiency: %90
Depreciation years: 11 years
Energy consumption: 5.5kW
Milling cost: 5.45€/Hour



TURNING



General Informations

Machine type: Turning Machine

Year of production: 2012

Power: 1100Watt

Spindle RPM:60-1500

Turning feed rate is approximately= 5000mm³/min

Spindle hole diameter:38mm

Spindle engine rpm:20000

Diameter of counter pinto pinol:32mm

Counter pinto pinol progress amount:100mm

Distance between pinto:920mm

Wage machine operator: 3.08€/Hour

Maintenance cost: %8(of acquisition cost:1000€/hour)

Energy cost: 0.023€/kWh

Machine Overheads Rate(%30)

Coolants: %3

Lubricants:%8

Tools:%13

Technichal employees:%3

Others:%3

Machine, Machining Cost and Efficiency

Acquisition cost: 12.500€

Machine efficiency: %80

Derpreciation years: 7 years

Energy consumption: 1.1kW

Turning cost: 4.68€/Hour(0.0000151€/mm³)



CNC ROUTER



General Informations

Machine type: CNC Router
Year of production: 2016
Power: 4500Watt
X/Y/Z axis movement: 1100mm/600mm/600mm
Table dimensions: 1100x560x3700mm
Working area: 1300x2500x200mm
Maintenance cost: %12.2(of acquisition cost= 2560€/year)
Wage machine operator: 7.01€/Hour
Spindle RPM: 18000
Spindle engine: 6 Hp
Weight: 1500kg
Energy Cost: 0.084€/kWh

Machine Overheads Rate(%32)

Coolants: %7
Lubricants:%7
Tools:%15
Technichal employees:%2
Others:%1

Machine, Machining Cost and Efficiency

Acquisition cost:21000€
Machine efficiency: %85
Derpreciation years: 3years
Energy consumption: 4.5kW
CNC router cost: 11.68€/Hour



CNC 5-AXES MILLING MACHINE(ROUTER)



General Informations

Machine Type: CNC 5-Axes milling machine

Power:30kW

Year of production:2017

Maximum Speed: X,Y,Z: 40m/s, 40m/s, 20m/s C,A(axes): 2700°/min, 2700°/min

Output power of spindle:10kW

Spindle:22000RPM

Table size:(2000x4000)mm

Machine size:(4260x2150x3300)mm

Total weight:12T

Travelling: C/A axis: $\pm 213^\circ / \pm 213^\circ$

Beam speaching:2750mm

Beam height:1500mm

Enegy cost:0.498€/kWh

Maintenance cost: %8 (of acquistion cost: 8000€/year)

Wage machine operator:21.49€/hour

Machine Overheads Rate(%34)

Coolants: %5

Lubricants:%11

Tools:%15

Technichal employees:%2

Others:%1

Machine, Machining Cost and Efficiency

Acquistion cost:100000€

Machine efficiency: %88

Derpreciation years: 2years

Energy consumption: 30kW

CNC 5-Axes milling machine cost: 32.55€/Hour



WATERJET



General Informations

Machine Type: CNC Waterjet machine (Mach 2b 2031)
Power:23kW
Year of production:2010
Sheet Length:3100mm Sheet Width:2000mm Z-Axis:175mm
Working Pressure:3800bar
Total weight:6500Kg
Energy cost:0.382€/kWh
Maintenance cost: %7,5 (of acquisition cost: 5093€/year)
Wage machine operator:13,68€/hour

Machine Overheads Rate(%29)

Coolants: %5
Lubricants:%10
Tools:%10
Technical employees:%2
Others:%2

Machine, Machining Cost and Efficiency

Acquisition cost:67913€
Machine efficiency: %90
Depreciation years: 9years
Energy consumption: 23kW
CNC 5-Axes milling machine cost: 20.72€/Hour



3D PRINTER



General Informations

Machine Type: Wanhao Duplicator D6 Plus 3D Printer

Power: 221 Watt

Year of production: 2018

Working Sizes: 200x200x175mm

Working Temperature: 180-260 C

Total weight: 17Kg

Energy cost: 0.0004€/kWh

Maintenance cost: %11 (of acquisition cost: 117€/year)

Wage machine operator: 11,68€/hour

Machine Overheads Rate(%21)

Coolants: %3

Lubricants: %5

Tools: %10

Technical employees: %2

Others: %1

Machine, Machining Cost and Efficiency

Acquisition cost: 1065€

Machine efficiency: %90

Depreciation years: 1 year

Energy consumption: 221W

CNC 5-Axes milling machine cost: 17.69€/Hour



	M4	M5	M6	M8	M10	M12	M14
8	0,15	0,21	0,30				
10	0,13	0,14	0,20	0,51	2,50		
12	0,13	0,15	0,20	0,42	1,60		
16	0,15	0,17	0,22	0,43	0,84	1,65	
20	0,17	0,20	0,25	0,47	0,80	1,40	2,94
25	0,19	0,23	0,28	0,53	0,90	1,45	2,08
30	0,22	0,26	0,32	0,59	0,99	1,55	2,28
35	0,28	0,29	0,36	0,65	1,09	1,60	2,47
40	0,31	0,33	0,39	0,71	1,18	1,73	2,67
45	0,34	0,35	0,43	0,77	1,28	1,87	2,87
50	0,37	0,38	0,47	0,83	1,37	2,01	3,06
55	0,44	0,46	0,51	0,89	1,47	2,15	3,26
60	0,48	0,50	0,54	0,95	1,56	2,25	3,46
65		0,53	0,59	1,01	1,66	2,43	3,65
70		0,57	0,67	1,07	1,75	2,57	3,85
75		0,90	0,72	1,15	1,85	2,71	4,05
80		1,37	0,76	1,21	1,94	2,85	4,25
85			1,20	1,60	3,10	3,75	6,50
90			0,85	1,33	2,13	3,12	4,65
100			1,01	1,55	2,32	3,40	5,05
110			1,35	2,06	2,93	4,20	7,18
120			1,62	2,22	3,19	4,56	7,70
130			1,70	2,38	3,42	4,86	8,37
140			1,95	2,54	3,64	5,28	8,90
150			2,30	2,93	4,18	6,06	10,04
160				6,21	5,30	7,70	11,04
170				6,83	5,83	8,47	12,15
180				6,90	5,88	8,52	13,36
190				7,59	6,47	9,37	14,70
200				7,60	6,47	9,35	16,17
225				9,45	14,85	22,95	
250				10,80	18,90	27,90	

Figure 1-Stainless Steel DIN 933 8.8 Grade Price List(Turkish Liras per piece)



	M3	M4	M5	M6	M8	M10	M12	M14
4	0,23							
5	0,12	0,20						
6	0,08	0,12	0,25	0,45				
8	0,08	0,12	0,19	0,37				
10	0,08	0,12	0,15	0,24	0,78			
12	0,09	0,13	0,17	0,25	0,45	1,25		
16	0,10	0,15	0,18	0,26	0,49	0,95	2,10	
20	0,11	0,16	0,21	0,29	0,55	0,91	1,35	
25	0,13	0,18	0,25	0,34	0,61	1,01	1,49	3,85
30	0,16	0,22	0,29	0,37	0,69	1,11	1,68	2,66
35	0,18	0,26	0,33	0,47	0,77	1,21	1,79	2,91
40	0,21	0,28	0,38	0,52	0,87	1,31	1,94	3,16
45	0,29	0,35	0,43	0,57	0,95	1,50	2,09	3,55
50	0,35	0,37	0,44	0,62	1,04	1,64	2,27	3,67
55		0,42	0,60	0,90	1,30	2,10	3,00	5,50
60		0,45	0,57	0,77	1,20	1,90	2,65	4,38
65		0,80	0,70	1,20	1,70	2,40	3,50	6,40
70		1,50	0,66	0,88	1,37	2,17	2,99	5,01
75			1,20	1,40	2,10	2,85	4,50	7,25
80			2,27	1,00	1,47	2,32	3,18	5,63
90			2,46	1,08	1,78	2,69	3,64	6,26
100			2,85	1,18	2,12	3,11	4,64	7,24
110				2,51	2,59	3,81	5,02	8,68
120				2,72	2,75	4,12	6,22	9,41
130				2,93	3,28	4,84	6,81	10,13
140				3,38	3,51	5,18	7,30	10,85
150				3,90	4,50	6,28	8,83	17,37
160				5,25	7,00	9,50	17,00	23,60
170					9,50	13,00	21,00	27,60
180					12,00	16,00	24,00	32,50
200					17,00	21,00	35,00	39,00

Figure 2-Stainless Steel DIN 912 8.8 Grade Price List(Turkish Liras per piece)









								
	DIN 934	DIN 985	DIN 1587	DIN 315	DIN 125	DIN 127	DIN 6798A	DIN 9021
M2	0,08				0,02	0,02	0,02	
M2.5	0,09				0,02	0,02	0,02	
M3	0,04	0,09	0,21	0,39	0,02	0,02	0,03	0,02
M4	0,05	0,09	0,16	0,42	0,03	0,03	0,03	0,04
M5	0,06	0,10	0,17	0,46	0,04	0,03	0,04	0,06
M6	0,11	0,12	0,27	0,54	0,06	0,04	0,05	0,10
M8	0,19	0,24	0,50	0,79	0,07	0,06	0,07	0,21
M10	0,43	0,51	0,95	1,51	0,12	0,10	0,10	0,43
M12	0,64	0,76	1,42	3,61	0,24	0,14	0,12	0,75
M14	0,96	1,30	3,45	9,83	0,33	0,24	0,16	1,05

Figure 3- Nut and Washers Price List(Turkish Liras per piece)