

BASIS			CAPITAL COST		\$
Location	Nanjing, China		ISBL		8,840,486
Capacity (tonne/year)	1549		OSBL		3,536,195
Production (tonne/year)	1291		Land		2,920,000
Operating Hours	6600		Design & engineering		3,094,170
Operating Rate	83%		Contingency		1,237,668
Year	2021		One-off chemicals		9,315
			Total fixed investment		19,628,519
			Working capital		2,944,278
			Total investment		22,572,797
			QUANTITY PER TONNE OF PRODUCT		UNIT COST (\$/tonne of product)
RAW MATERIALS			PRICE (\$/unit)*	COST (\$)	
Toluene	0.97	tonnes	570.00	717,335	556
Nitric acid	1.24	tonnes	270.00	432,894	335
Methanol	0.27	tonnes	280.00	99,132	77
Hydrogen	0.03	tonnes	4750.00	172,423	134
Formic acid	0.80	tonnes	360.00	373,905	290
Total raw materials				1,795,689	1,391
UTILITIES					
Cooling water (16°C)	0.56	tonnes	0.26	241,946	187
High-pressure steam (4.3 MPa)	0.05	tonnes	33.68	2,821,950	2,186
Electricity	6.77	kWh	0.10	1,173,140	909
Total utilities				4,237,036	3,282
CATALYSTS					
H-Modernite	0.09	kg	15.00	1,770	1
Palladium-on-carbon (5%)	0.02	kg	6500.00	178,230	138
Cobalt (II) phthalocyanine	1.75	kg	12.00	27,100	21
Platinum-on-carbon (5%)	0.27	kg	20300.00	7,001,470	5,423
Total catalysts				7,208,570	5,584
TOTAL VARIABLE COSTS				13,241,295	10,257
DIRECT FIXED COSTS					
Operating labour	40.00	persons		898,188	
Supervision	0.25			224,547	
Labour overheads	0.60	of operating labour and supervision		673,641	
Maintenance	0.05	of ISBL		442,024	
Total direct fixed costs				2,238,401	1,734
DIRECT CASH COST OF PRODUCTION				15,479,696	11,991
ALLOCATED CASH COSTS					
General overheads (inc. marketing and R&D)	0.65	of direct fixed cost		1,454,961	
Insurance	0.01	of ISBL		88,405	
Tax	0.15			1,601,589	
Total allocated costs				3,144,955	2,436
TOTAL BARE CASH COST				18,624,651	14,427
FINANCIAL PROVISION					
Interest	0.05			658,692	
Depreciation				1,128,640	
TOTAL COST OF PRODUCTION				20,411,983	15,811