



Oil & Gas Industry Benchmark # 1

**Petro-Chemical & Gas Facilities - Engineering, Procurement and Construction (EPC)
Benchmarking Data: (Data collected from 12 completed EPC projects in USA & Canada)**

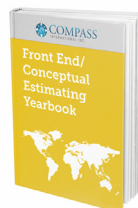
Typical Benchmark Percentages & Cost Ranges related to North American Petro-Chemical, Industrial & Gas Facilities. Applicable to New & Revamp CAPEX / Facility Projects with a Total Installed Cost (TIC) value between \$10 million & \$150 million.

#	Percentages & Ratios	Low Range	High Range
1	Site Works as a percentage of Major Equipment (M.E.) cost, excludes M.E.setting.	2.00%	4.50%
2	Concrete as a percentage of Major Equipment (M.E.) cost, excludes M.E.setting.	11.50%	16.50%
3	Structural Steel / Platforms /Siding as a percentage of Major Equipment (M.E.) cost, excludes M.E.setting.	10.50%	18.50%
4	Piping as a percentage of Major Equipment (M.E.) cost, excludes M.E.setting.	45.00%	70.00%
5	Piping Material (Inside Battery Limits - ISBL & Outside Battery Limits OSBL) as a percentage of Major Equipment (M.E.) cost, excludes M.E.setting.	19.00%	48.50%
6	Piping Labor (Inside Battery Limits - ISBL & Outside Battery Limits OSBL) as a percentage of Major Equipment (M.E.) cost, excludes M.E.setting.	40.00%	125.00%
7	Direct Construction Labor as percent of Total Installed Cost (TIC).	65.00%	35.00%
8	Indirect costs (Support Labor, Field Establishment, and Construction Equipment) as percent Direct Labor Cost.	25.00%	125.00%
9	Piping Labor as percent Direct Labor.	15.00%	55.00%
10	Instrumentation Labor (Inside Battery Limits - ISBL & Outside Battery Limits OSBL) as a percentage of Major Equipment (M.E.) cost, excludes M.E.setting.	6.00%	14.50%
11	Instrumentation Materials (Inside Battery Limits - ISBL & Outside Battery Limits OSBL) as a percentage of Major Equipment (M.E.) cost, excludes M.E.setting.	6.50%	16.50%
12	Electrical Labor (Inside Battery Limits - ISBL & Outside Battery Limits OSBL) as a percentage of Major Equipment (M.E.) cost, excludes M.E.setting.	9.50%	17.50%
13	Electrical Materials (Inside Battery Limits - ISBL & Outside Battery Limits OSBL) as a percentage of Major Equipment (M.E.) cost, excludes M.E.setting.	7.00%	18.50%
14	Overall Major Equipment (M.E.) cost multiplier to obtain Total Installed Cost (TIC).	3	5.5
15	Buildings & Structures as a percentage of Major Equipment (M.E.) cost, excludes M.E.setting.	4.80%	11.30%
16	Off sites scope percentage of Total Installed Cost of Facility.	15.00%	30.00%

A more detailed list of construction benchmarks, ratios and cost models is contained in our 2018 Front End / Conceptual Yearbook.

If you have any questions or comments on this report please contact:

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