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Richardson International Construction Factors Manual™

Richardson™'s 900 page International Construction Factors Manual (ICFM) is available in CD-ROM version only (non-database). ICFM contains valuable data on 56 major cities within 34 countries.

We have included a vast amount of information on the structure of the Governments, Economies, Taxes, Foreign Business Relations, Customs & Holidays, Employment Laws, Unemployment Rates, Weather, Geography, Crew and Wage Rates, Labor Productivity Factors, Shipping Costs, Trade Regulations, Environmental Issues and Import Duties.

Also included are developed construction cost factors formulas, cost and availability of local skilled labor, currency exchange rates, climate, natural resources, land area and uses, population and demographics, national holidays and much more general information. ICFM provides formulas to be used to adjust US-based estimates for process plant industry construction to these 34 countries.

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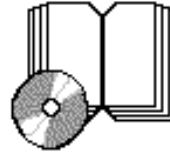
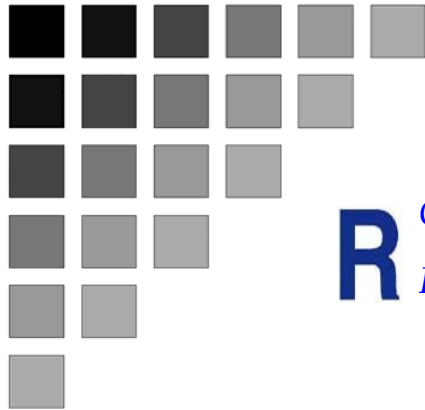
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Cost Factor Location Manual™ 2007 Edition

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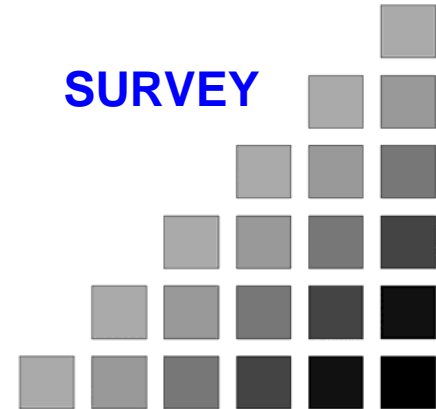
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SURVEY



COST DATA ON LINE, INC.

INTERNATIONAL CONSTRUCTION FACTOR MANUAL

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CDOL RICHARDSON INTERNATIONAL CONSTRUCTION FACTOR

GENERAL NOTES & INSTRUCTIONS

The purpose of CDOL Richardson Publications is to provide assistance in upgrading the Estimating skills of Others. Richardson is dedicated to the publication of authentic Construction Cost Information. The information contained within this manual is based on Data obtained from sources believed to be reliable. Averages have been weighted and adjusted for anticipated economic conditions to arrive at the forecasted data. It is noted that estimates can vary significantly on projects even when detailed plans and specifications are available. Costs can vary greatly depending on location, market conditions, (material and labor), experience, work delays, etc. Aspen Technology or the Editors, makes no warranty or guaranty as to the accuracy, correctness, or sufficiency of data contained within this manual and assumes no responsibility or liability in connection with their use.

The Format, Techniques, Language, Method of Expression, Manhours for performing the Work, Costs and other information herein are unique to this Richardson Manual. The data has been developed by Cost Data On Line, Inc., Copyright 2007.

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Construction Estimating

Estimating is a necessary and vital part of the construction industry. Construction estimates are made by combining the cost of materials with historical manhour performances to arrive at a total material and labor cost. To this, overhead costs to cover items required to accomplish the work and a margin for profit are added. Thus, estimating is not an absolute exact science, but is actually the making of a forecast or prediction. As a matter of fact, construction estimating can be compared to weather forecasting, stock market predictions or betting on how fast a 100 meter foot race will be run.

Using the 100 meter foot race as an example, it may be estimated that the race should be run in about 9 1/2 to 10 seconds. That is a good estimate. However, before wagering, the bettor should make reasonably sure that the race is between trained athletes, that they have practiced and are in good physical condition, that the weather is clear, the track is fast and not muddy, that no wind is blowing, that no obstacles exist, that the race in run in a straight line and not around a curve or corner, that they have not been instructed to run slow or take it easy, and that they want to run.

To predict the quantity and cost of materials installed by a group of construction workers has some complications. Material prices will vary. As for the workers, they are sometimes asked to perform work in which they have limited or no experience, they are usually in variable physical condition, the weather is not always clear, their course is usually cluttered with obstacles, the work is seldom in a straight line, and no two projects are exactly the same.

THE PURPOSE OF THIS MANUAL

The purpose of Richardson's International Construction Factors Location Cost Manual is to:

1. Meet the need for reliable and objective global information to enable proper economic evaluations to be made for industrial construction in all phases of a potential project's life.
2. Continuously provide an updated manual so that current information is included for those countries already included and new countries are added as appropriate to meet users' needs.



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CDOL RICHARDSON INTERNATIONAL CONSTRUCTION FACTOR

3. Include information that is broad enough to be used for all phases of a potential project from sourcing studies through site selection, conceptual estimates, and detailed estimates.
4. Meet the different needs for data of owners, contractors, and consultants.
5. Publish a location factor for each country for which reliable and objective data is available. This is based on Richardson's typical process plant.
6. Include instructions for users to construct their own location cost factors from data presented for a different typical construction breakdown, or to compare with their own base city.
7. Be used by cost engineers, project managers, corporate planners, sales & marketing managers, financial managers, and purchasing people.

HOW TO USE THIS MANUAL

The table of contents for each country lists the extensive data included in the manual. Generally it can be grouped in the following categories:

- * Economic Information
- * Regulations regarding foreign business
- * Roles and contacts of regulatory agencies
- * Construction labor rates by craft
- * Shipping information and contacts

This current information can be used during all phases of a potential project life. Some of the uses are:

- | | |
|-------------------------|-----------------------|
| *Sourcing studies | *Economic evaluations |
| *Site selection studies | *Sales forecasting |
| *Conceptual estimates | *Conceptual schedules |
| *Project planning | *Procurement planning |
| *Detailed estimates | *Detailed schedules |

Base Location

In order to develop factors, it is necessary to have a standard point of origin. The standard point of origin for this manual is Richardson USA; a fictitious location that is an average of data from many locations throughout the USA and published in the Richardson Process Plant and General Construction Cost Estimating Standards.

Country Location Cost Factor

The calculated location cost factor included in this manual is an accurate (not necessarily precise) indication of construction costs in a particular country compared with building the same design in the base location using open shop labor.

In using this data to make estimates, adjustments need to be made for scope differences due to climate, legal requirements, local culture, building codes, remote location, accelerated schedules, etc.

The key input cost data provided in the manual for each of the countries included are:

1. Imported Equipment and Material
 - A. Additives required to the world price of imported equipment to obtain total cost delivered to the jobsite:
 - a. Duty and customs fees at the host location.

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- b. Freight cost from shipping plant to dock, ocean freight, unloading, storage, and delivery to plant location.
- c. Value-added taxes imposed by the host country.
- d. Other taxes imposed by national or local government.

2. Locally Supplied Equipment and Material

- A. The cost of local material is a percent of cost at the base location.

3. Labor

- A. The weighted average craft rate for a construction worker.
- B. The average labor performance factor attained in the country as a percent of that for the base location open shop operation. This reflects typical labor saving construction tools and equipment used in the host country.

The assumptions required to calculate a location cost factor are:

1. A construction cost breakdown of a typical process plant. The manual uses a chemical/refinery type operation with most equipment located outdoors.
2. Within this breakdown is a split between building and site work as one major system category, and process system being the other.
3. Each system is then split between labor and material. All construction costs, including indirects and construction management are allocated as labor or material.
4. Finally, material is allocated as local or imported based on knowledge of the host country procurement practices.

For index formulas, see Location Factors charts and tables beginning on page 5.

Exchange Rate for the above Wage Rates is in U.S. Dollars and includes Fringe Benefits, Overhead and Profit.

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U.S. AVERAGE CREW RATES

CREWS USED IN THE RES ACCOUNT#	RICHARDSON CREW/CRAFT NAMES	RES CREW IN US DOLLARS
2-0	ASBESTOS WORKER CREW	\$74.93
3-0, 6-0 THROUGH 10-0	CARPENTER CREW	68.07
3-0	PLACING UNSUPPORTED CONCRETE CREW	55.64
3-0	PLACING SUPPORTED CONCRETE CREW	58.78
3-0	CONCRETE FINISHING CREW	55.48
3-0	CONCRETE TILTUP CREW	66.67
4-0	MASONRY CREW	63.36
5-0	IRONWORKER CREW	90.57
3-0, 6-0 THROUGH 10-0	LABORER CREW	55.64
9-0	PAINTING CREW	69.96
9-0	PLASTERING CREW	63.57
15-0	MECHANICAL CREW	90.02
15-0	PLUMBING CREW	83.87
15-0	INSULATION CREW	71.91
16-0	ELECTRICAL CREW	88.30
7-0, 15-0	SHEET METAL CREW	83.99
100-0	PROCESS EQUIPMENT CREW	87.79
3-50	PROCESS IRONWORKER	102.37
3-50	PROCESS CARPENTER	70.98
3-50	PROCESS LABORER	55.31

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Richardson Crew Table

Richardson Crew Names	Crew Mix
ASBESTOS WORKER CREW	10% Asbestos Worker Foreman 20% Asbestos Workers 10% Carpenter 50% Laborers 10% Painter
CARPENTER CREW	10% Carpenter Foreman 70% Carpenters 20% Laborers
PLACING UNSUPPORTED CONCRETE CREW	20% Labor Foreman 80% Laborers
PLACING SUPPORTED CONCRETE CREW	20% Carpenters 20% Labor Foreman 60% Laborers
CONCRETE FINISHING CREW	10% Concrete Finisher Foreman 70% Concrete Finishers
CONCRETE TILTUP CREW	10% Carpenter Foreman 30% Carpenters 10% Laborer Foreman 30% Laborers 10% Concrete Finisher Foreman 10% Concrete Finisher
MASONRY CREW	10% Bricklayer Foreman 40% Bricklayers 50% Laborers
IRONWORKER CREW	10% Ironworker Foreman 60% Ironworkers 10% Operating Engineer 10% Oiler 10% Laborer
LABORER CREW	20% Labor Foreman 80% Laborers
PAINTING CREW	10% Painter Foreman 90% Painters
PLASTERING CREW	10% Plasterer Foreman 70% Plasterers 20% Laborers
MECHANICAL CREW	10% Pipefitter Foreman 70% Pipefitter 10% Operating Engineer 10% Laborer
ELECTRICAL CREW	10% Electrician Foreman 70% Electricians 10% Operating Engineer 10% Laborer
SHEET METAL CREW	10% Sheet Metal Worker Foreman 60% Sheet Metal Workers 20% Laborers 10% Operating Engineer

PROCESS EQUIPMENT CREW

10% Ironworker Foreman
50% Ironworkers
10% Millwright
10% Operating Engineer
10% Oiler
10% Laborer

PROCESS IRONWORKER

100% Ironworker

PROCESS CARPENTER

100% Carpenter

PROCESS LABORER

100% Laborer

PLUMBING CREW

10% Pipefitter Foreman
60% Pipefitter
30% Laborer

INSULATING CREW

10% Asbestos Worker Foreman
20% Asbestos Workers
70% Laborers

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DEFINITIONS & ABBREVIATIONS

Break Bulk

Cargo which is too large (oversized) to fit in a standard sized container and is shipped on a loose basis.

Bulk Materials

Concrete, Wood Products, Block & Brick, Structural and Plate, Wire, Conduit, Pipe, Fittings, Valves and other related items.

Engineering Equipment

Carbon & Stainless Steel Tanks, Vessels, Pumps, Conveying Systems, Air Compressors, Electric Motors, Switch Gears, Instrumentation, Distributed Control Systems and other equipment used in manufacturing operations.

Feeder Service

Indirect shipment to destination port via another carrier.

Land Bridge

Transportation services from centrally located points to shipping ports (or visa versa) via rail or truck.

Loose Basis

On a pallet.

Maximum Weight (Total Gross Weight minimum Container Weight)

38,000 LBS 20' Standard Container

59,000 LBS 40' Standard Container

Total Gross Weight = Weight of Container + Weight of Cargo.

Standard Sized Containers

8'x8'x20'

8'x8'x40'

FCL Full Container Load

Cargo shipped in a standard sized container (i.e. 8'x8'x20' or 8'x8'x40') and priced per container regardless of cargo size, not exceeding maximum weight or dimensions.

FIC Freight, Insurance and Crating

JAB James Bent Associates Inc.

JEB John E. Barry, Inc.

LCL Less than Container Load

Cargo which is too small to justify shipping in a standard sized container (i.e. 8'x8'x20' or 8'x8'x40') and is shipped on a loose basis (i.e. on a pallet).

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LO/LO Lift On/Lift Off

Placing cargo onto (and removing from) a ship via crane service.

PF Performance Factor

RES Richardson Engineering Services, Inc.

RO/RO Roll On/Roll Off

Access to a ship by a self propelled vehicle via ramp. The vehicle is usually stored in a garage under the main deck.

USGC United States Gulf Coast

VAT Value Added Tax

Page Numbering

A special set of abbreviations was developed in order to better separate the country sections from each other. Each section is divided into three components: 1) Region - 2 letter abbreviation, 2) Country - 3 letter code, and 3) City - 4 letter code. The region and country abbreviations are listed below. The city abbreviations are simply the first four letters of the city name.

Regions:

AF	Africa
AU	Australia
AS	Asia
EU	Europe
ME	Middle East
NA	North America
SA	South America

Jap

Kuw
Mal
Mex
Mor
Net
Nig
Per
Phi
Pol
Rus
Saa
Sin
Soa
Sok
Tai
Tha
Tur
Uae
Unk
Usa
Ven
Vie

Japan

Kuwait
Malaysia
Mexico
Morocco
Netherlands
Nigeria
Peru
Philippines
Poland
Russia
Saudi Arabia
Singapore
South Africa
South Korea
Taiwan
Thailand
Turkey
United Arab Emirates
United Kingdom
United States
Venezuela
Vietnam

Countries:

Arg	Argentina
Aus	Australia
Bel	Belgium
Brz	Brazil
Can	Canada
Chi	China
Col	Colombia
Egy	Egypt
Fra	France
Ger	Germany
Gua	Guatemala
Ind	India
Ido	Indonesia
Ire	Ireland
Ita	Italy

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LOCATION COST FACTORS STATUS BY COUNTRY - RICHARDSON, UNITED STATES AS THE BASE
Labor Rates shown in the Base Currency - United States Dollars

CITY-STATE	EXCHANGE RATE	IMPORT MATERIAL				LMI	LABOR		LF
		DUTY	FREIGHT	VAT	OTHER		RATES	PF	
Richardson, USA	1.00 USD	0%	5%	0%	0%	1.00	\$ 72.86	1.00	1.00
Anchorage, AK, USA	1.00 USD	0%	5%	0%	0%	1.30	85.23	1.21	1.32
Fairbanks, AK, USA	1.00 USD	0%	5%	0%	0%	1.34	87.45	1.25	1.38
Huntsville, AL, USA	1.00 USD	0%	5%	0%	0%	1.04	47.86	0.99	0.95
Phoenix, AZ, USA	1.00 USD	0%	5%	0%	0%	1.05	49.26	1.06	0.98
Los Angeles, CA, USA	1.00 USD	0%	5%	0%	0%	1.08	78.60	1.12	1.11
Oakland, CA, USA	1.00 USD	0%	5%	0%	0%	1.11	85.10	1.23	1.18
Sacramento, CA, USA	1.00 USD	0%	5%	0%	0%	1.05	77.82	1.17	1.09
San Francisco, CA, USA	1.00 USD	0%	5%	0%	0%	1.11	88.24	1.29	1.21
Denver, CO, USA	1.00 USD	0%	5%	0%	0%	1.03	50.21	1.00	0.95
Atlanta, GA, USA	1.00 USD	0%	5%	0%	0%	0.97	47.31	0.96	0.90
Chicago, IL, USA	1.00 USD	0%	5%	0%	0%	1.06	96.84	1.21	1.18
Indianapolis, IN, USA	1.00 USD	0%	5%	0%	0%	1.03	64.36	1.05	1.01
Louisville, KY, USA	1.00 USD	0%	5%	0%	0%	0.99	53.44	0.97	0.93
New Orleans, LA, USA	1.00 USD	0%	5%	0%	0%	0.98	40.76	0.91	0.89
Portland, ME, USA	1.00 USD	0%	5%	0%	0%	1.04	52.78	0.97	0.97
Baltimore, MD, USA	1.00 USD	0%	5%	0%	0%	1.03	54.22	1.06	0.98
Boston, MA, USA	1.00 USD	0%	5%	0%	0%	1.04	89.80	1.24	1.13
Cape Girardeau, MO, USA	1.00 USD	0%	5%	0%	0%	1.03	60.43	1.13	1.01
St Louis, MO, USA	1.00 USD	0%	5%	0%	0%	0.99	72.96	1.09	1.01
Kansas City, MO, USA	1.00 USD	0%	5%	0%	0%	1.00	73.86	1.02	1.01
Charlotte, NC, USA	1.00 USD	0%	5%	0%	0%	0.98	34.05	0.90	0.86
Newark, NJ, USA	1.00 USD	0%	5%	0%	0%	1.07	91.00	1.25	1.17
Las Vegas, NV, USA	1.00 USD	0%	5%	0%	0%	1.06	69.74	1.13	1.07
New York, NY, USA	1.00 USD	0%	5%	0%	0%	1.06	117.57	1.38	1.31
Syracuse, NY, USA	1.00 USD	0%	5%	0%	0%	1.04	60.12	1.05	1.00
Cincinnati, OH, USA	1.00 USD	0%	5%	0%	0%	0.97	59.60	0.96	0.94
Portland, OR, USA	1.00 USD	0%	5%	0%	0%	1.08	69.75	1.13	1.09
Philadelphia, PA, USA	1.00 USD	0%	5%	0%	0%	1.03	92.07	1.14	1.11
Wilkes-Barre, PA, USA	1.00 USD	0%	5%	0%	0%	1.00	59.96	0.97	0.96
Spartanburg, SC, USA	1.00 USD	0%	5%	0%	0%	0.99	25.76	0.93	0.85
Knoxville, TN, USA	1.00 USD	0%	5%	0%	0%	1.01	44.17	0.93	0.92
Dallas, TX, USA	1.00 USD	0%	5%	0%	0%	1.00	38.44	0.92	0.89
Houston, TX, USA	1.00 USD	0%	5%	0%	0%	0.99	44.96	0.94	0.90
Sherman, TX, USA	1.00 USD	0%	5%	0%	0%	1.00	36.50	0.92	0.89
Seattle, WA, USA	1.00 USD	0%	5%	0%	0%	1.08	75.20	1.12	1.10
Green Bay, WI, USA	1.00 USD	0%	5%	0%	0%	1.03	83.22	1.01	1.05
Cayey, Puerto Rico	1.00 USD	0%	10%	0%	0%	1.26	37.74	1.54	1.06

COST DATA ON LINE, INC.

CDOL RICHARDSON INTERNATIONAL CONSTRUCTION FACTOR

LOCATION COST FACTORS STATUS BY COUNTRY - RICHARDSON, UNITED STATES AS THE BASE
Labor Rates shown in the Base Currency - United States Dollars

CITY-STATE	EXCHANGE RATE	IMPORT MATERIAL				LMI	LABOR		LF
		DUTY	FREIGHT	VAT	OTHER		RATES	PF	
Melbourne, Australia	1.20 AUD	20%	21%	0%	0%	1.20	\$ 57.70	1.20	1.18
Perth, Australia	1.20 AUD	20%	18%	0%	0%	1.20	50.87	1.20	1.15
Sydney, Australia	1.20 AUD	20%	21%	0%	0%	1.20	59.68	1.20	1.19
Beijing, China	7.52 CNY	8%	23%	17%	10%	0.80	12.13	2.25	0.95
Guangzhou, China	7.52 CNY	8%	21%	17%	10%	0.70	10.78	2.20	0.88
Shanghai, China	7.52 CNY	8%	24%	17%	10%	0.80	12.32	2.25	0.95
Bhopal, India	40.51 INR	50%	27%	0%	0%	1.10	4.23	3.00	1.02
Bombay, India	40.51 INR	50%	27%	0%	0%	1.10	4.23	3.00	1.02
Jakarta, Indonesia	9,235 IDR	10%	21%	0%	0%	1.30	9.16	2.25	1.09
Kobe, Japan	115 JYY	7%	21%	0%	3%	1.40	51.53	1.10	1.26
Tokyo, Japan	115 JYY	7%	21%	0%	3%	1.40	51.53	1.10	1.26
Kuantan, Malaysia	3.47 MYR	5%	21%	0%	0%	1.40	14.68	2.40	1.14
Manila, Philippines	46.01 OMR	20%	21%	0%	0%	1.40	5.94	3.00	1.17
Singapore, Singapore	1.52 SGD	0%	21%	0%	0%	1.30	20.49	1.30	1.08
Seoul, South Korea	930 KRW	8%	21%	0%	12%	0.85	33.71	1.90	1.06
Taipei, Taiwan	33.03 TWD	12%	21%	0%	7%	0.80	15.18	1.80	0.87
Samutprakam, Thailand	31.94 THB	33%	21%	0%	0%	1.35	9.08	2.90	1.22
Binh Duong, Vietnam	15,956 VDG	12%	21%	0%	15%	0.95	8.00	2.50	1.05
Calgary, Alberta, Canada	1.03 CAD	3%	8%	7%	0%	1.00	83.41	1.10	1.06
Montreal, Ontario, Canada	1.03 CAD	3%	8%	7%	7%	1.00	67.68	1.20	1.05
Toronto, BC, Canada	1.03 CAD	3%	8%	7%	7%	1.00	86.29	1.20	1.12
Vancouver, BC, Canada	1.03 CAD	3%	8%	7%	7%	1.00	81.67	1.20	1.10
Windsor, Ontario, Canada	1.03 CAD	3%	8%	7%	7%	1.00	82.43	1.20	1.11
Winnipeg, Manitoba, Canada	1.03 CAD	3%	8%	7%	7%	1.00	79.23	1.20	1.09
Mexico City, Mexico	11.40 MXP	15%	8%	0%	0%	1.25	5.58	1.70	1.01
October 6th City, Egypt	5.58 EGP	0%	27%	0%	0%	1.20	16.56	1.75	1.08
Kuwait City, Kuwait	0.28 KWD	0%	27%	0%	0%	1.20	18.03	1.75	1.09
Dammam, Saudi Arabia	3.75 SAR	0%	27%	0%	0%	1.20	8.09	1.75	1.04
Jeddah, Saudi Arabia	3.75 SAR	0%	27%	0%	0%	1.20	8.09	1.75	1.04
Gebze, Turkey	1.27 TRL	17%	27%	0%	0%	0.90	6.82	2.70	0.84
Abu Dhabi, U.A.E.	3.67 AED	5%	27%	0%	0%	1.20	12.10	1.75	1.08
Buenos Aires, Argentina	3.14 ARS	18%	16%	30%	0%	1.25	11.66	2.00	1.12
Rio de Janeiro, Brazil	1.92 BRL	50%	16%	0%	0%	1.15	19.89	1.70	1.08
Medellin, Colombia	2,753 COP	20%	16%	0%	0%	1.10	13.09	1.75	1.04
Guatemala City, Guatemala	7.54 GTQ	15%	16%	0%	0%	1.30	9.77	2.00	1.10
Lima, Peru	3.09 SOL	35%	16%	0%	0%	1.35	15.56	1.60	1.18
Caracas, Venezuela	2,146 VEB	10%	16%	0%	0%	1.10	15.36	1.90	1.04
Brussels, Belgium	0.72 EUR	0%	16%	17%	0%	1.25	43.53	1.50	1.19
Paris, France	0.72 EUR	5%	16%	17%	0%	1.20	45.34	1.20	1.13
Frankfurt, Germany	0.72 EUR	5%	19%	17%	0%	1.15	54.56	1.10	1.10
Dublin, Ireland	0.72 EUR	0%	16%	17%	0%	1.40	44.03	1.70	1.30
Milan, Italy	0.72 EUR	0%	21%	17%	0%	1.15	37.83	1.80	1.20
Amsterdam, Netherlands	0.72 EUR	5%	19%	17%	0%	1.15	81.44	1.15	1.20
Warsaw, Poland	2.74 PLN	10%	21%	22%	0%	0.80	21.23	1.70	0.96
Moscow, Russia	25.40 RUB	45%	37%	0%	0%	1.45	8.06	2.50	1.47
Barcelona, Spain	0.72 EUR	0%	16%	17%	0%	1.20	43.53	1.20	1.12
London, United Kingdom	0.49 GBP	0%	16%	17%	0%	1.20	111.71	1.30	1.38
El Hassania, Morocco	8.06 MAD	10%	27%	0%	0%	1.40	12.78	2.00	1.15
Ibadan, Nigeria	124 NGN	5%	27%	0%	0%	1.35	18.45	2.75	1.21
Johannesburg, South Africa	7.12 ZAR	0%	27%	0%	0%	1.10	31.62	1.70	1.09

NOTES: (1)Indonesia, Russia, Brazil, Argentina and Venezuela - Rate of exchange and inflation volatile - USE WITH CARE.



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Richardson™'s 4,000 page, Process Plant Construction Cost Estimating Standards (PPCES) is available on CD-ROM in Adobe Acrobat PDF file only (read or print only and non-database) and on line at CostDataOnLine.com. PPCES offers the complete and current cost estimating standards for Chemical Plants, Manufacturing Facilities, Solids Processing, Water Treatment Plants and General Construction.

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Also included are developed construction cost factors formulas, cost and availability of local skilled labor, currency exchange rates, climate, natural resources, land area and uses, population and demographics, national holidays and much more general information. ICFM provides formulas to be used to adjust US-based estimates for process plant industry construction to these 34 countries.

Thank you for reviewing the Richardson International Construction Factors Manual™

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