



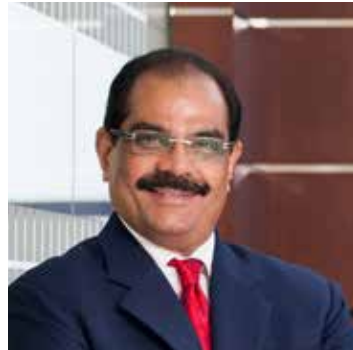
SPECIALIST GLOBAL SUPPLIER  
OF WORLD CLASS PIPING PRODUCTS

2015

DUBAI ONEHUNDRED  
SME مئة شركة

PIPES | FITTINGS | FLANGES | VALVES  
CARBON STEEL | STAINLESS STEEL  
SPECIAL ALLOYS | DUPLEX | SUPER DUPLEX

[www.pgpgroup.com](http://www.pgpgroup.com)



# Message from our President

We are extremely happy and humbled to be recognized as a top 100 SME in Dubai. This is a result of our hard work and commitment towards offering world class products and services to our esteemed clientele. This recognition is a step towards our goal to further enhance our capabilities and offerings as we expand our businesses globally. I would like to thank our customers and suppliers who have been our biggest support, and our team of dedicated professionals and all those involved who have helped us in this journey.

As a global supplier of piping products with turnkey services, solutions and project supply management, we now operate in the UAE, Singapore, Saudi Arabia, Kuwait, Qatar, Oman, India & China.

Our commitment to help our clients optimize costs and control risks on their capital projects has benefited several projects' bottom line in the region and beyond.

We further aspire to reach greater heights in serving our clientele and therefore rely on our hard work, dedication and engagement of our experienced and well-trained people. Our adaptability, innovation and customer centric approach are what makes us a company that stands out in today's dynamic market environment.

Thank you for allowing us to be part of your business success. We hope we can continue to earn your trust for many years to come.

Yours truly,

**Nazmuddin Mohammed (Nazim)**  
Group President

We are committed to our corporate social responsibility and follow highest standards of integrity when working with all stakeholders



## Conduct

- Comply with the laws, rules and regulations in the countries and communities in which we operate.
- Positive contribution to the societies in which we operate by providing employment, investing in infrastructure and supporting local initiatives
- Avoid any situation that may create, or may seem to create, a conflict between personal interests and the interests of the company.
- Avoid conflict of interest situations



## People

- Health & Safety
- Education and Training
- Employee Standards
- Equal Opportunity
- Work / Life balance
- Volunteering
- Sponsorship
- Culture & Sports
- Charity



## Environment

- Energy Saving
- Waste Management
- Advise clients on alternative eco-friendly options
- Reduce carbon footprint
- Support renewable energy projects (Hydro, Solar, etc)



## Economic

- Financial Performance
- Risk Management
- Resource Efficiency
- Supplier Relations
- Customer Satisfaction



## Specialist global supplier of world class piping products

We are a specialist global supplier of world class piping products together with turn-key services & solutions, project supply management and consultancy to the leading names in the Hydrocarbons, Enery, Power, Shipbuilding and utilities industries.

Our backbone is our human capital, highly trained and experienced professionals and a far sighted management team. Every member of the Petrogas team take ownership of their responsibilities to ensure that our clients get the best service at all times.

Established and head quartered in Jebel Ali, UAE with branches in Singapore, Abu Dhabi, Saudi Arabia, Kuwait, Qatar, Oman, India and China, we provide a complete package of piping products, services & solutions. In addition, we have our warehouse locations in Jebel Ali and Saudi Arabia.

Together with our strategic partners across the globe, we distribute Pipes, Flanges, Fittings, Valves, Gaskets and Stud Bolts in all steels and special alloys to various industries globally. PetroGas is specialized in providing the most reliable materials management solution on every project, regardless of size.



Quality products, Technical & practical capabilities, financial strength, network of facilities & manpower resources to deliver exceptional results





# Our global presence is key in driving innovation, improving speed to market & managing costs for our customers worldwide

With our Global Footprint spanning over six continents, we are one of the largest distributors of pipe, valve and fitting products and services to the leading names in the hydrocarbons, energy, oil and gas, power, water, construction, shipbuilding and utilities industries. With our global network and presence, we help in designing intelligent supply chain solutions, optimizing locations that offer the best combination of efficiency, flexibility and convenience.

Our customers' businesses in Greenfield and brownfield are capital intensive and their operating processes and operating environments are often extreme. These industries and conditions are demanding and require a supplier that understands the importance of safety, quality and reliable service.

Our upstream market concentrates on the products used during the exploration, completion and production of oil, gas and natural gas liquids. Our branch locations, distribution centers and project groups strategically located around the globe service the midstream sector, which includes gathering, transmission pipeline, and natural gas utilities. In steel constructions, our pipe and tube material is used for a variety of different applications, such as Buildings, Bridges, Sports stadiums, Stations and Ships.

We aspire to reach greater heights in serving our clientele and therefore rely on our hard work, dedication and engagement of our experienced and well-trained people. Our adaptability, innovation and customer centric approach are what makes us a company that stands out in today's dynamic market environment.



Petrogas  
Global Footprint



# We provide the most reliable materials management solution on every project, regardless of size

**Carbon Steel**  
**Stainless Steel**  
**Low Temperature Carbon Steel**  
**Duplex/Super Duplex**  
**Nickel Alloys**  
**Chrome Alloys**  
**Specialty Metals**

With a large array of grades pipes, fitting and flanges in a variety of lengths, ODs, IDs and wall thicknesses, we can meet any of your project's needs - including which are very rare and in hard-to-find sizes.

From pipe and tubing to fittings and flanges, we have an extensive supply portfolio to fulfil your project's needs.

To complement our piping materials, we also design and provide cost effective fabrication processes with a high quality output and on time delivery.

In addition to mill run deliveries (including long lead items) we offer an extensive inventory, regularly stocking rare specifications, configurations and sizes. Combined with our logistical expertise, it's an inventory that's perfectly positioned to deliver critical materials when you need them most.

### PIPES

#### Type

CS  
Seamless/Welded

CS- Low Temp  
Stainless Steel

C.S- Ferritic Alloys  
CS - Very Low Temp  
Duplex/Super Duplex

Special Alloys/Nickel  
-Titanium Alloys

### FLANGES

#### Type

C.S-High-temperature/  
Low Temp Seamless Steel  
Alloy/CS/SS-High Temp/  
Low Temp

### FITTINGS

#### Type

CS-Forged/ Reinforced Fittings  
CS-Wrought-BW

SS-Forged  
SS-Wrought-BW

Alloys/CS/SS/DSS/SDSS-High  
Temp/Low temp Alloys

### VALVES

#### Type

CS-Forged(#800 to 1500)  
CS-Forged(#150 to 900)  
Cast & Forged

### GASKETS

#### Type

Metallic-Spiral Wound  
(Ring Type (Oval/Octagonal Non-Mettalic  
CNAF/Gasket sheets

### STUD BOLTS

#### Type

CS-High & Low Temp

### FABRICATION SERVICES

Shell & Tube Heat Exchangers  
Double Tube-sheet Exchanger  
Fixed Tube-Sheet Exchanger  
Columns / Pressure Vessels  
Atmospheric Vessels / Tanks  
Reactors  
Condensers / Chiller / Cooler  
Reboiler  
Column Exchanger  
Evaporator  
Air Fin Cooler  
Super Heater / Mini Crecker  
Flaker Drum Assembly  
Decanter (Water Treatment Plant)  
Fluid Bed Dryer  
Kiln Burner Assembly for Cement Plant  
Burner Tips  
Custom Built Process Equipment &  
Units (For All Sectors)  
Speciality - All products for industrial  
applications and Power plants

### CUSTOM BUILT STEEL STRUCTURES

Urban Infrastructure  
Energy  
Marine & Offshore  
Industrial Applications

### SERVICES

Erection of Steel Structures  
Design & Detailed Engineering





## By combining our capabilities, we increase our value to you

We also provide turn-key services & solutions, project supply management and consultancy to the leading names in the hydrocarbons, oil and gas, power, water, construction, shipbuilding and utilities industries.

Petrogas works with world class manufacturers that meet and surpass all the latest quality and approval norms. We choose our manufacturers based on their ability to meet specific contractual requirements, in particular their product speciality, technical compliance, quality and delivery performance.

### **Our services include:**

**Project Management-** PetroGas Piping can support the project in Piping materials supply from the 1st Material take off (long lead items) until the site requirements (urgent materials off the shelf from our inventory locations globally). Since we specialize in Project Supply Management, we are able to supply piping materials throughout the complete procurement stage.

**Long Term Agreements (LTA)-** We specialize in price agreements with our clients for over a number of years. Fixed price for n number of years. Tailor made contracts as per project requirements, which include escalation clauses and buy backs.

**Maintenance, Repair and Operations (MRO)-** We hold inventory for clients which can be used on a day to day basis - Preventive maintenance / Operational maintenance / Corrective maintenance / Adaptive maintenance

Inventory Management / Logistics/ Online Solutions  
Internal ERP (RFQ Order) / Customer Portal (real time tracking of orders and online documentation (shipping, MTCs, etc)

### **OUR OTHER SERVICES INCLUDE**

#### **Prefabricated spools in all types of materials**

We are specialized in supplying pre-fabricated piping spools to various industries in Oil / Gas / Power sectors / Water sectors.

#### **Machining**

We facilitate the modifications of material through machining according to customers' needs in line with the international standards of ASME/ANSI & others. The materials are thoroughly inspected before delivery to customers.

#### **Testing**


We also facilitate our clients additional needs in order to meet project requirements in line with international material standards.

#### **Colour coding**

Apart from the standard material requirements we provide additional services such as marking, colour coding and low stress die stamping of customer marks.

#### **All vendor document requirements**

At the final stage/order completion stage, the project requirement is fulfilled by supporting it with the Vendor data books according to project requirements in customers specific formats.



Reliable materials management  
solution to hydrocarbons, oil and  
gas, power, water, construction,  
shipbuilding and utilities industries



## Advanced technology, financial stability, quality products-all of which means a better performance for our clients

Big or Small, Simple or complex, our business systems and processes seamlessly integrates sourcing and procurement, quality control, warehousing and logistics providing complete transparency to monitor the status of the material order from start to finish.

A highly trained and experienced team of professionals and farsighted management are the strength of Petrogas. Our sales force consists of techno-commercial engineers who are present at every stage of the decision making process and wherever vendor support is required.

Our sales team are adept in understanding the technical and commercial needs of a client and in proposing suitable materials. Based on the needs of a project in terms of cost and delivery, they are proficient in proposing substitute/alternative products that attune to project norms.

Expediting activities are systematically carried out according to a specific procedure that keeps the work process under control by means of periodic review of manufacturing schedules.

During surveillance, activities follow a specific check list that include :

- Review of the order content and evaluation of supplier's production capability.
- Review of contractual terms.
- Availability of the necessary material for the production and/or review of the scheduled time of arrival.
- Review of expediting activities of the supplier and the respective sub-supplier(s).
- Review of documents related to production and inspection.
- Actual production status and the production schedule, evaluation and review of the necessary time required for preparation of material for shipment, after final inspection.

Our comprehensive ERP system helps our people work faster and smarter. Clients are able to quickly access the information they need (i.e. Order tracking, Quality procedures, documentation retrieval) from any geographic location. We are now completely integrated on the Microsoft Cloud and boast a complete online documentation control. This enables us for a real time information from any remote location. Our capabilities include IT interconnectivity, detailed Supply Chain information, and instantaneous views of the precise status of project deliveries.

# Seamlessly integrated systems & process to monitor the status of the material order from start to finish





## Multiple, strategically placed capabilities and warehousing facilities to support regional & global customers

Our infrastructure includes state of the art warehouses and stocking facilities, Modern heavy-duty machinery & equipment, High safety measures & standards for our people and material, Value added services that extend across technical documentation, records control, material testing, marking, color-coding, most appropriate packing and transportation.

With over 30,000 metric tons inventory on ground and a strong and capable logistics infrastructure, we can cater to our clients requirements, any time.

Petrogas Piping currently possess three warehouses for the purposes of stocking Pipes and Fittings, Flanges, Valves, and other related piping accessories. The main covered warehouse is inside Jebel Ali Free Zone (South) and is attached to the Head Office. This warehouse is equipped with a dedicated staff and machinery to handle fittings, flanges, valves, gaskets and bolts, ranging from sizes 1/8" to 54" both in seamless and welded, for projects as well as shortfalls. Our State of the art stocking facility is world renowned and adopts the latest safety measures to ensure the safety of our workers and material.

The second warehouse covering an area of 30,000 sq. mtrs is at a close distance to the main warehouse, and is totally dedicated for the storage and handling of pipes, ranging from sizes 1/8" to 120". Equipped with the latest heavy duty machinery, pipes are handled for jobs and stock with utmost care and safety.

As a Saudi Aramco Approved Vendor and Stockist, we have two additional warehouses located in Al-Khobar (Dammam), Saudi Arabia, which caters predominantly for Saudi Aramco, SABIC and other KSA projects. All our stock materials confirm to specifications of major end uses.

We have tie-ups with overland transport companies and arrangements with shipping lines and freight handling companies to ensure the mobility of the material smoothly and at the earliest to your destination. We offer tailor-made transport solutions according to specific requests by customers. Moreover, our Expediting and Shipping departments are equipped with a professional team that has a clear understanding of INCO terms, custom, clearance and other procedures.



Big or small, Simple or complex, our state-of-the-art infrastructure can meet any demand





## No matter where you are or what your piping needs, we work together to deliver exceptional performance

As an ISO 9001:2008 certified company, we adhere to the latest quality standards with a core emphasis to customer needs and satisfaction. Our products meet all international standards, such as, ISO, API and ASME and are ably supported by an efficient procurement and project management team that is in constant touch with partnered manufacturers to provide the finest product choices at the most competitive price.

We are approved in all the oil majors, such as, SAUDI ARAMCO (and its affiliates), SHELL, ADNOC, GASCO, SABIC, Petroleum Development of Oman (PDO), Kuwait Oil Company (KOC), KNPC, Saudi Electric Company (SEC), MARAFIQ, and many more.

Petrogas Piping has maintained its position as a preferred choice by all the major EPCs and End Users from around the world with our supply portfolio spanning across six continents.

Petrogas has established a system which ensures the final product is in line with the customer requirements. All the stages that affect product quality are fully monitored and controlled by equipped competent personnel.

Petrogas believes in professionalism when approaching customer needs. Care has been taken to ensure our clientele get value added services including, but not limited to, technical documentation/records/material testing as part of relevant material specification or special requirements.

With our collaboration with qualified laboratories, we can perform any of the following tests on our supplied material when required by Project specifications:

- Tensile test
- Bending, Flattening, Flaring test
- Hardness test
- Impact test
- Chemical analysis
- Metallographic examination
- Corrosion tests via Huey, Strauss, Pitting, Crevice, HIC, SSC and SWC etc.
- X-Ray
- Ultrasonic examination
- Magnetic particle examination
- Dye Penetrate testing
- Final visual and dimensional examination

Lead and Turnaround time.  
Unsurpassed Material Quality.  
Qualified Technical Support.  
Efficient after Sales Service.



SI UNITS

ASME / ANSI Pipe Schedule  
SI Units  
ASME / ANSI B 36.10/ B36.19

OD = mm  
Wall thickness = mm  
Weight = kg/m  
Vol/m = m³

Upper figures- wall thickness in mm  
Lower figures- weight in kg per meter

1 kg/mtr = 0.671969 lb/foot  
1 lb/foot = 1.488164 kg/mtr

1. The carbon steel pipe:  
(OD IN MM – WALL THK IN MM) X (WALL THK) X 0.02466  
2. The stainless steel pipe:  
(OD IN MM – WALL THK IN MM) X (WALL THK) X 0.02504

		Figures based on carbon steel														Figures based on austenitic steel				Shipping
Nominal pipe size	OD mm	10	20	30	STD	40	60	XS	80	100	120	140	160	XXS	5S	10S	40S	80S	Vol/ m m3	
1/8	10.30				1.73 0.37	1.73 0.37		2.41 0.47	2.41 0.47							1.24 0.28	1.73 0.37	2.41 0.47	0.0001	
1 / 4	13.70				2.24 0.63	2.24 0.63		3.02 0.80	3.02 0.80							1.65 0.49	2.24 0.63	3.02 0.80	0.0001	
3 / 8	17.10				2.31 0.84	2.31 0.84		3.20 1.10	3.20 1.10							1.65 0.63	2.31 0.84	3.20 1.10	0.0003	
1 / 2	21.30				2.77 1.27	2.77 1.27		3.73 1.62	3.73 1.62				4.78 1.95	7.47 2.55	1.65 0.80	2.11 1.00	2.77 1.27	3.73 1.62	0.0004	
3 / 4	26.70				2.87 1.69	2.87 1.69		3.91 2.20	3.91 2.20				5.56 2.90	7.82 3.64	1.65 1.02	2.11 1.28	2.87 1.69	3.91 2.20	0.0007	
1	33.40				3.38 2.50	3.38 2.50		4.55 3.24	4.55 3.24				6.35 4.24	9.09 5.45	1.65 1.29	2.77 2.09	3.38 2.50	4.55 3.24	0.0011	
1 1 / 4	42.20				3.56 3.39	3.56 3.39		4.85 4.47	4.85 4.47				6.35 5.61	9.70 7.77	1.65 1.85	2.77 2.69	3.56 3.39	4.85 4.47	0.0018	
1 1 / 2	48.30				3.68 4.05	3.68 4.05		5.08 5.41	5.08 5.41				7.14 7.25	10.15 9.56	1.65 1.90	2.77 3.11	3.68 4.05	5.08 5.41	0.0023	
2	60.30				3.91 5.44	3.91 5.44		5.54 7.48	5.54 7.48				8.74 11.11	11.07 13.44	1.65 2.39	2.77 3.93	3.91 5.54	5.54 7.48	0.0036	
2 1 / 2	73.00				5.16 8.63	5.16 8.63		7.01 11.41	7.01 11.41				9.53 14.92	14.02 20.39	2.11 3.69	3.05 5.26	5.16 8.63	7.01 11.41	0.0053	
3	88.90				5.49 11.29	5.49 11.29		7.62 15.27	7.62 15.27				11.13 21.35	15.24 27.68	2.11 4.52	3.05 6.46	5.49 11.29	7.62 15.27	0.0079	
3 1 / 2	101.60				5.74 13.57	5.74 13.57		8.08 18.63	8.08 18.63						2.11 5.18	3.05 7.41	5.74 13.57	8.08 18.64	0.0103	
4	114.30				6.02 16.08	6.02 16.08		8.56 22.32	8.56 22.32		11.13 28.32		13.49 33.54	17.12 41.03	2.11 5.84	3.05 8.37	6.02 16.08	8.56 2232	0.0130	
5	141.30				6.55 21.77	6.55 21.77		9.53 30.97	9.53 30.97		12.70 40.28		15.88 49.12	19.05 57.43	2.77 9.46	3.40 11.56	6.55 21.77	9.53 31.97	0.0199	
6	168.30				7.11 28.26	7.11 28.26		10.97 42.56	10.97 42.56		14.27 54.21		18.26 67.57	21.95 79.22	2.77 11.31	3.40 13.83	7.11 28.26	10.97 42.56	0.028	
8	219.10		6.35 33.32	7.04 36.82	8.18 42.55	8.18 42.55	10.31 53.09	12.70 64.64	12.70 64.64	15.09 75.92	18.26 90.44	20.62 100.93	23.01 111.27	22.23 107.93	2.77 14.78	3.76 19.97	8.18 42.55	12.70 64.64	0.048	
10	273.10		6.35 41.76	7.80 51.01	9.27 60.29	9.27 60.29	12.70 81.53	12.70 81.53	15.09 95.98	18.26 114.71	21.44 133.01	25.40 155.10	28.58 172.27	25.40 155.10	3.40 22.61	4.19 27.79	9.27 60.31	12.70 81.56	0.074	
12	323.90		6.35 49.71	8.38 65.19	9.53 73.86	9.53 73.86	10.31 79.71	12.70 108.93	12.70 108.93	17.48 132.05	21.44 159.87	25.40 186.92	28.58 208.08	33.32 238.69	25.40 186.92	3.96 31.25	4.57 35.99	9.53 73.88	12.70 97.47	0.104
14	355.60	6.35 54.69	7.92 67.91	9.53 81.33	9.53 81.33	11.13 94.55	15.09 126.72	12.70 107.40	15.09 158.11	19.05 194.98	23.83 224.66	27.79 253.58	31.75 281.72	35.71 281.72	3.96 34.34	4.78 41.36	9.53 81.33	12.70 107.40	0.126	
16	406.40	6.35 62.65	7.92 77.83	9.53 93.27	9.53 93.27	12.70 123.31	16.66 160.13	12.70 123.31	21.54 203.54	26.19 245.57	30.96 286.66	36.53 333.21	40.49 365.38		4.19 41.56	4.78 47.34	9.53 93.27	12.70 123.31	0.165	
18	457.00	6.35 70.57	7.92 87.71	11.13 122.38	9.53 105.17	14.27 155.81	19.05 205.75	12.70 139.16	23.83 254.57	29.36 309.64	34.93 363.58	39.67 408.28	45.24 459.39		4.19 46.79	4.78 53.31	9.53 105.24	12.70 139.33	0.208	
20	508.00	6.35 78.56	9.53 117.15	12.70 155.13	9.53 117.15	15.09 183.43	20.62 247.84	12.70 155.13	26.19 311.19	32.54 381.55	38.10 441.52	44.45 508.15	50.01 564.85		4.78 59.32	5.54 68.65	9.53 117.15	12.70 155.13	0.258	
22	559.00	6.35 86.55	9.53 129.14	12.70 171.10	9.53 129.14		22.23 294.27	12.70 171.10	28.58 373.85	34.93 451.45	41.28 527.05	47.63 600.67	53.98 672.30		4.78 65.33	5.54 75.62			0.312	
24	610.00	6.35 94.53	9.53 141.12	14.27 209.65	9.53 141.12	17.48 255.43	24.61 355.28	12.70 187.07	30.96 442.11	38.89 547.74	46.02 640.07	52.37 720.19	59.54 808.27		5.54 82.58	6.35 94.53	9.53 141.12	12.70 187.07	0.372	
26	660.00	7.92 127.36	12.70 202.74		9.53 152.88			12.70 202.74											0.435	
28	711.00	7.92 137.32	12.70 218.71	15.88 272.23	9.53 164.86			12.70 218.71											0.505	
30	762.00	7.92 147.29	12.70 234.68	15.88 292.20	9.53 176.85			12.70 234.68								6.35 118.34	7.92 147.29		0.580	
32	813.00	7.92 157.25	12.70 250.65	15.88 312.17	9.53 188.83	17.48 342.94		12.70 250.65											0.660	
34	864.00	7.92 167.21	12.70 266.63	15.88 332.14	9.53 200.82	17.48 364.92		12.70 266.63											0.746	
36	914.00	7.92 176.97	12.70 282.29	15.88 351.73	9.53 212.57	19.05 420.45		12.70 282.29											0.835	
38	965.00				9.53 224.56			12.70 298.26											0.931	
40	1016.00				9.53 236.54			12.70 314.23											1.032	
42	1067.00				9.53 248.53			12.70 330.21											1.138	
44	1118.00				9.53 260.52			12.70 346.18											1.249	
46	1168.00				9.53 272.27			12.70 361.84											1.364	
48	1219.00				9.53 284.25			12.70 377.81											1.485	



INCH UNITS

ASME / ANSI Pipe Schedule  
INCH Units  
ASME / ANSI B 36.10/ B36.19

OD = inch  
Wall thickness = inch  
Weight = lb/foot  
Vol/ft = ft³

Upper figures- wall thickness in inch  
Lower figures- weight in lb per foot  
1 kg/mtr = 0.671969 lb/foot  
1 lb/foot = 1.488164 kg/mtr

		Figures based on carbon steel												Figures based on austenitic steel								Shipping
Nominal pipe size	OD inches	10	20	30	STD	40	60	XS	80	100	120	140	160	XXS	5S	10S	40S	80S	Vol/ft = m3			
1/8	10.30				0.068 0.24	0.068 0.24		0.095 0.31	0.095 0.31							0.049 0.19	0.068 0.24	0.095 0.31	0.004			
1 / 4	13.70				0.088 0.43	0.088 0.43		0.119 0.54	0.119 0.54							0.065 0.33	0.088 0.43	0.119 0.54	0.007			
3 / 8	17.10				0.091 0.57	0.091 0.57		0.126 0.74	0.126 0.74							0.065 0.42	0.091 0.57	0.126 0.74	0.0011			
1 / 2	21.30				0.109 0.85	0.109 0.85		0.147 1.09	0.147 1.09				0.188 1.31	0.294 1.72	0.065 0.54	0.083 0.67	0.109 0.85	0.147 1.09	0.014			
3 / 4	26.70				0.113 1.13	0.113 1.13		0.154 1.48	0.154 1.48				0.219 1.95	0.308 2.44	0.065 0.68	0.083 0.86	0.113 1.13	0.154 1.48	0.025			
1	33.40				0.133 1.68	0.133 1.68		0.179 2.17	0.179 2.17				0.250 2.85	0.358 3.66	0.065 0.87	0.109 1.41	0.133 1.68	0.179 2.17	0.039			
1 1 / 4	42.20				0.140 2.27	0.140 2.27		0.191 3.00	0.191 3.00				0.250 3.77	0.382 5.22	0.065 1.11	0.109 1.81	0.140 2.27	0.191 3.00	0.064			
1 1 / 2	48.30				0.145 2.72	0.145 2.72		0.200 3.63	0.200 3.63				0.281 4.86	0.400 6.41	0.065 1.28	0.109 2.09	0.145 2.72	0.200 3.63	0.081			
2	60.30				0.154 3.66	0.154 3.66		0.218 5.03	0.218 5.03				0.344 7.47	0.436 9.04	0.065 1.61	0.109 2.64	0.154 3.66	0.218 5.03	0.127			
2 1 / 2	73.00				0.203 5.80	0.203 5.80		0.276 7.67	0.276 7.67				0.375 10.02	0.552 13.71	0.083 2.48	0.120 3.53	0.203 5.80	0.276 7.67	0.187			
3	88.90				0.216 7.58	0.216 7.58		0.300 10.26	0.300 10.26				0.438 14.34	0.600 18.60	0.083 3.03	0.120 4.34	0.216 7.58	0.300 10.26	0.279			
3 1 / 2	101.60				0.226 9.12	0.226 9.12		0.318 12.52	0.318 12.52						0.083 3.48	0.120 4.98	0.226 9.12	0.318 12.52	0.364			
4	114.30				0.237 10.80	0.237 10.80		0.337 15.00	0.337 15.00			0.438 19.02	0.531 22.53	0.674 27.57	0.083 3.92	0.120 5.62	0.237 10.80	0.337 15.00	0.459			
5	141.30				0.258 14.63	0.258 14.63		0.375 20.80	0.375 20.80			0.500 27.06	0.625 32.99	0.750 38.59	0.109 6.36	0.134 7.78	0.258 14.63	0.375 20.80	0.703			
6	168.30				0.280 18.99	0.280 18.99		0.432 28.60	0.432 28.60			0.562 36.43	0.719 45.39	0.864 53.21	0.109 7.59	0.134 9.30	0.280 18.99	0.432 28.60	0.989			
8	219.10	0.250 22.38	0.312 24.72	0.375 34.62	0.375 34.62	0.438 63.50	0.594 85.13	0.500 43.43	0.500 43.43	0.594 51.00	0.719 60.77	0.812 67.82	0.875 72.49	0.906 74.76	0.109 9.92	0.148 13.41	0.322 28.58	0.500 43.43	1.695			
10	273.10	0.250 28.06	0.312 34.27	0.375 40.52	0.375 40.52	0.438 65.49	0.594 81.79	0.500 54.79	0.594 64.49	0.719 77.10	0.844 89.38	1.000 104.23	1.125 115.75	1.250 140.23	0.109 15.21	0.134 16.67	0.312 40.52	0.500 54.79	2.613			
12	323.90	0.250 33.41	0.312 43.81	0.375 49.61	0.375 49.61	0.438 65.49	0.594 81.79	0.500 54.79	0.594 64.49	0.719 77.10	0.844 89.38	1.000 104.23	1.125 115.75	1.250 140.23	0.109 15.21	0.134 16.67	0.312 40.52	0.500 54.79	3.673			
14	355.60	0.250 36.75	0.312 45.65	0.375 54.62	0.375 54.62	0.438 63.50	0.594 85.13	0.500 72.16	0.750 106.23	0.938 130.98	1.094 150.93	1.250 170.37	1.406 189.29	1.500 209.06	0.109 23.09	0.188 27.76	0.375 54.62	0.500 72.16	4.450			
16	406.40	0.250 42.09	0.312 52.32	0.375 62.64	0.375 62.64	0.438 65.49	0.594 81.79	0.500 54.79	0.594 64.49	0.719 77.10	0.938 109.38	1.094 125.61	1.250 140.23	1.406 159.48	0.109 27.93	0.188 31.78	0.375 62.64	0.500 81.79	5.827			
18	457.00	0.250 47.44	0.312 58.99	0.375 69.23	0.375 69.23	0.438 70.65	0.594 81.79	0.500 65.49	0.594 64.49	0.719 83.54	0.938 121.08	1.094 140.23	1.250 159.48	1.406 178.19	0.109 31.46	0.188 35.80	0.375 69.23	0.500 81.79	7.345			
20	508.00	0.250 52.78	0.312 64.27	0.375 74.62	0.375 74.62	0.438 70.65	0.594 81.79	0.500 65.49	0.594 64.49	0.719 83.54	0.938 121.08	1.094 140.23	1.250 159.48	1.406 178.19	0.109 31.46	0.188 35.80	0.375 69.23	0.500 81.79	9.111			
22	559.00	0.250 56.13	0.312 68.69	0.375 79.06	0.375 79.06	0.438 70.65	0.594 81.79	0.500 65.49	0.594 64.49	0.719 83.54	0.938 121.08	1.094 140.23	1.250 159.48	1.406 178.19	0.109 31.46	0.188 35.80	0.375 69.23	0.500 81.79	11.018			
24	610.00	0.250 63.47	0.312 74.71	0.375 84.71	0.375 84.71	0.438 70.65	0.594 81.79	0.500 65.49	0.594 64.49	0.719 83.54	0.938 121.08	1.094 140.23	1.250 159.48	1.406 178.19	0.109 31.46	0.188 35.80	0.375 69.23	0.500 81.79	13.137			
26	660.00	0.312 85.68	0.500 136.30		0.375 102.72			0.500 136.30											15.361			
28	711.00	0.312 92.35	0.500 146.99	0.625 182.90	0.375 110.74			0.500 146.99											17.833			
30	762.00	0.312 99.02	0.500 157.68	0.625 196.26	0.375 118.76			0.500 157.68							0.25 79.51	0.312 99.02			20.482			
32	813.00	0.312 105.69	0.500 168.37	0.625 209.62	0.375 126.78	0.688 230.29		0.500 168.37											23.307			
34	864.00	0.312 112.36	0.500 179.06	0.625 222.99	0.375 134.79	0.688 245.00		0.500 179.06											26.344			
36	914.00	0.312 119.03	0.500 189.75	0.625 236.35	0.375 142.81	0.750 282.62		0.500 189.75											29.487			
38	965.00				0.375 150.83			0.500 200.44											32.877			
40	1016.00				0.375 158.85			0.500 211.13											36.444			
42	1067.00				0.375 168.86			0.500 221.82											40.187			
44	1118.00				0.375 174.88			0.500 232.51											44.107			
46	1168.00				0.375 182.90			0.500 243.20											48.168			
48	1219.00				0.375 190.92			0.500 253.89											52.441			



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