

EKC INTERNATIONAL FZE DUBAI-UAE



Clean Energy Solution Company

# HYDROGEN SOLUTIONS

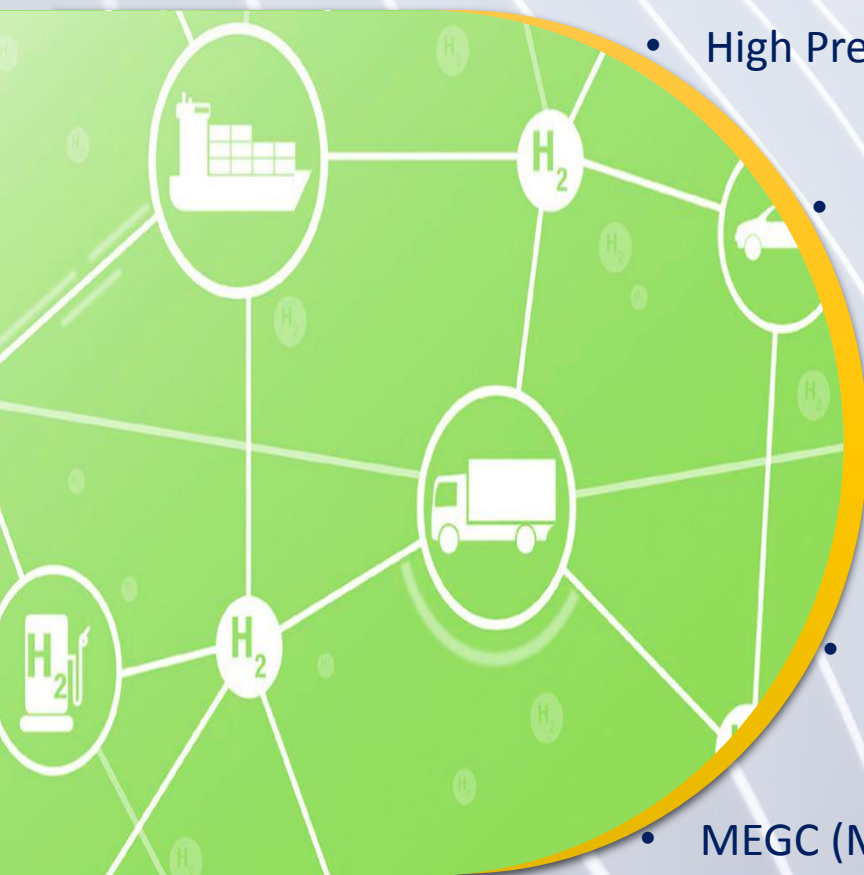


## *Hydrogen Benefits and Considerations*

Hydrogen is a colorless, odorless, non-metallic, tasteless, extremely flammable diatomic gas. Hydrogen is the most abundant chemical substance in the universe, constituting roughly 75% of all normal matter.

Hydrogen can be produced from diverse domestic resources with the potential for near-zero greenhouse gas emissions. Once produced, hydrogen generates electrical power in a fuel cell, emitting only water vapor and warm air. It holds promise for growth in both the stationary and transportation energy sectors

## EKC MULTI SOLUTIONS FOR THE STORAGE OF **HYDROGEN**



- High Pressure Seamless Cylinders
- Cylinders Bundle and Racks
- 500 & 1000 Bar Vessels\*
- Multi Vessels Assembly\*
- MEGC (Multi Element Gas Container)

\* Manufacturing at CPI -USA

## High Pressure Hydrogen Storage Cylinders



| Working pressure (Bar) | Diameter (mm) | Water capacity range (Liters) | Approximate Weight (Kg) | Approx. Weight of Hydrogen @ 25° C (Kg) |
|------------------------|---------------|-------------------------------|-------------------------|---|
| 200                    | 229           | 25-80                         | 29-78                   | 0.36-1.16                               |
|                        | 267           | 30-110                        | 37-107                  | 0.43-1.45                               |
|                        | 325           | 50-165                        | 64-165                  | 0.72-2.32                               |
|                        | 356           | 55-200                        | 68-200                  | 0.87-2.90                               |
|                        | 406           | 70-250                        | 100-258                 | 1.01-3.62                               |
| 250                    | 229           | 25-80                         | 37-99                   | 0.44-1.32                               |
|                        | 267           | 30-110                        | 48-138                  | 0.53-1.76                               |
|                        | 325           | 50-160                        | 81-203                  | 0.83-1.82                               |
|                        | 356           | 50-190                        | 90-248                  | 1.06-3.34                               |
|                        | 406           | 70-240                        | 126-327                 | 1.23-4.22                               |
| 300                    | 229           | 20-80                         | 46-117                  | 0.41-1.54                               |
|                        | 267           | 30-100                        | 59-156                  | 0.62-2.05                               |
|                        | 325           | 40-150                        | 86-238                  | 0.82-3.08                               |
|                        | 356           | 50-180                        | 109-290                 | 1.03-3.70                               |
|                        | 406           | 70-240                        | 155-392                 | 1.44-4.93                               |
| 350                    | 229           | 20-75                         | 54-137                  | 0.47-1.63                               |
|                        | 267           | 30-100                        | 70-186                  | 0.70-2.33                               |
|                        | 325           | 40-150                        | 101-284                 | 0.93-3.26                               |
|                        | 356           | 50-175                        | 129-337                 | 1.17-4.08                               |
|                        | 406           | 70-240                        | 155-392                 | 1.44-4.93                               |
| 400                    | 229           | 20-70                         | 63-151                  | 0.52-1.82                               |
|                        | 267           | 30-100                        | 81-218                  | 0.65-2.46                               |
|                        | 325           | 40-145                        | 117-321                 | 0.91-3.63                               |
| 450                    | 229           | 20-70                         | 72-174                  | 0.57-1.85                               |
|                        | 267           | 25-90                         | 33-228                  | 0.71-2.56                               |
| 500                    | 229           | 20-65                         | 82-186                  | 0.62-2.0                                |
|                        | 267           | 30-90                         | 107-267                 | 0.72-2.77                               |

Working Pressure Range:

Working pressure From 200 Bar to 500 Bar.

Manufacturing standards:

ISO 9809-1 (PED & TPED), IS 7285, DOT 3AA.

\*Other sizes and manufacturing standards can be offered on request

EKC's High Pressure Seamless Steel Cylinders are best & safe for Hydrogen and Hydrogen Embrittling gases storage .

Special consideration in Design and stringent quality processes makes EKC Hydrogen cylinder most reliable and long lasting.



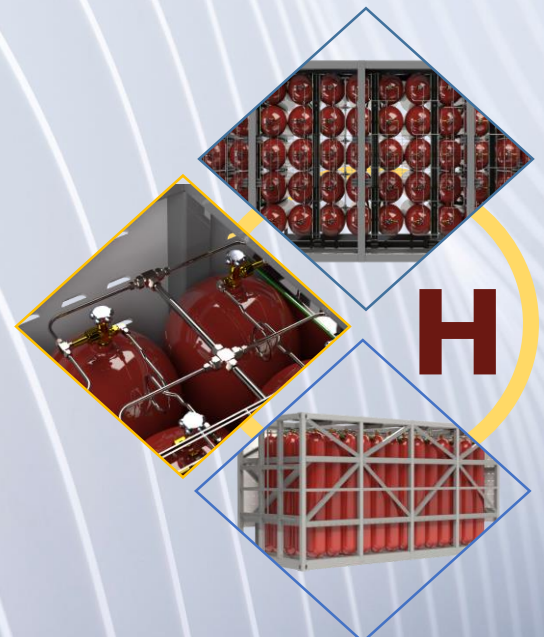
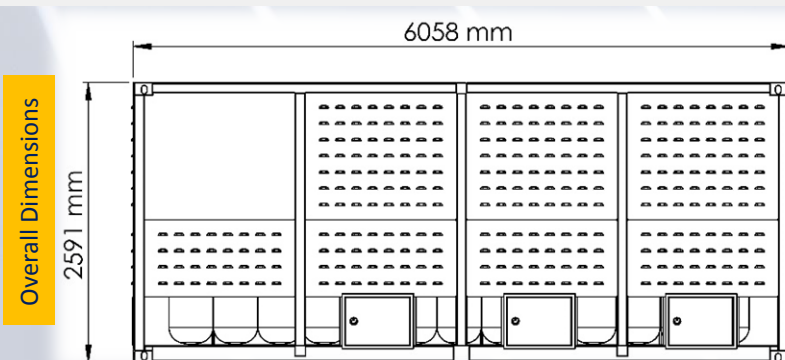
## MEGC for Storage & Transportation of Hydrogen



Photos for illustration purpose only

### 20 Feet Multi Element Gas Container

| Size of MEGC  | Working pressure (Bar) | Total water capacity (Liters) | Total weight of Hydrogen @25°C (Kg) | Gross weight of MEGC (Tons) |
|---------------|------------------------|-------------------------------|-------------------------------------|-----------------------------|
| 20 Feet (STD) | 200                    | 17280                         | ~250                                | ~22                         |
| 20 Feet (STD) | 250                    | 16320                         | ~287                                | ~26                         |
| 20 Feet (STD) | 300                    | 13650                         | ~280                                | ~29                         |



#### Salient Features

- > Distinct design for Hydrogen application.
- > Having high quality S.S valves, fittings and gauges.
- > IMDG, ADR & CSC Approved MEGCs.
- > Frame made of High strength steel.
- > System equipped with safeties.
- > TPED/PED Approved cylinders.

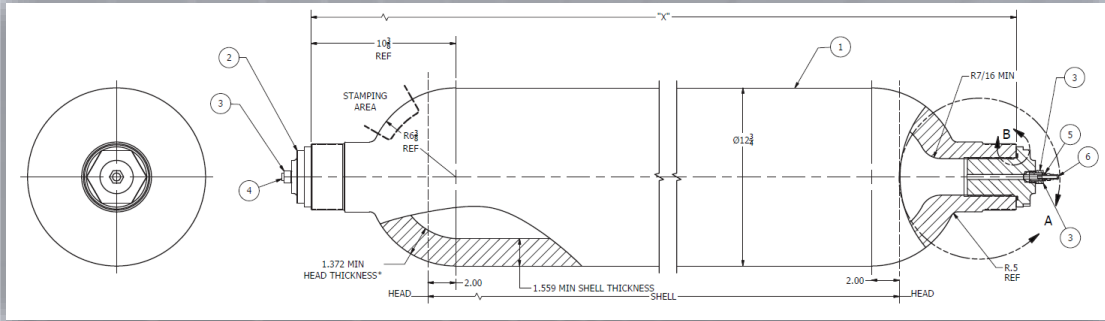


is one of the major plants of **EKC**, located in



**CP**

INDUSTRIES manufactures large, seamless steel pressure vessels to safely contain high-pressure **Hydrogen** that are designed and constructed in accordance with ASME, Section VIII, Division 1 and ASME, Section VIII, Division 3. Avoidance of sulphide stress cracking and **Hydrogen** embrittlement is inherent in design.



- *Single vessels and finished multi-vessel assemblies complete with valves and piping manifold*
- *Vessels with pressure up to 15000 psi (1034 bar)*
- *Vessel Certified for use in number of countries*
- *Multi-vessel assemblies can have vessel of different pressures*

## Hydrogen Vessels as per ASME

| Working pressure (Bar) | Diameter (mm) | Length (mm) | Water Capacity (Liters) | Hydrogen Weight (Kg) |
|------------------------|---------------|-------------|-------------------------|----------------------|
| 250                    | 610           | 12200       | 2716                    | 48.5                 |
| 500                    | 457           | 11700       | 1210                    | 34.7                 |
| 1000                   | 324           | 11700       | 486                     | 22.22                |



# EKC INTERNATIONAL FZE DUBAI-UAE

## EKC Plants

Tarapur, INDIA



Kasez, INDIA



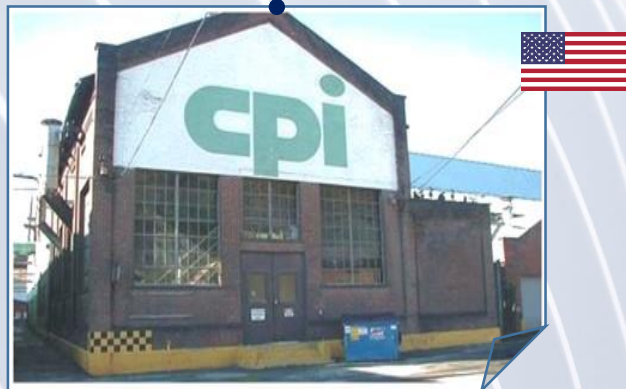
Plant 1 - DUBAI



Plant 2 - DUBAI



Pittsburgh, USA



Clean Energy Solution Company

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