



# Liquid Chlorine Containers





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Safety through Design. Safety through Quality.

Isgec is a global leader in the designing and manufacturing of **Ton Containers** (also called Drums and Tonners) meant for liquefiable gases such as **Chlorine, Ammonia & Refrigerants**. We have supplied more than **300,000 containers** to over **60 countries** and have been granted Patents for such Containers in USA, Mexico and India.

The Containers are mass produced in our **Works** at Yamunanagar, Haryana (180 kms. north of New Delhi, India) using modern techniques of **fabrication, quality control and testing**. The Containers have been designed based on our wide experience in the field of Pressure Vessels and Process Equipment.



## Safety through Design

Models manufactured under International **Codes of Construction**

- 49 CFR DOT-USA
- ASME
- Transport Canada
- GOST 14249-89
- TRG Regulation
- EN 14208
- AS 1210

We have the following **Patents** for the manufacture of Containers:

- Indian Patent
- Mexican Patent
- US Patent

Isgec carries out stress analysis of Container design by **Finite Element Analysis** for reconfirmation of Total Safety and Design Stability.

## Safety through Quality Material

Isgec Containers are manufactured using fine grain material to specification **SA-516 Gr.60/70 (or equivalent)** both for Shell and Dished Ends of Containers.

- This material possesses excellent impact properties and ductility at low temperatures. All Steel Plates are procured from reputed Steel Plants in **Japan, Europe, India etc.**
- The material is **tested in the Steel Plants** itself to ensure **complete compliance** with the material specification. Each steel plate is inspected by reputed **Third Party Inspection** agencies such as **Lloyds & TUV**.
- Isgec stipulates restricted limit of certain elements such as **Sulphur, Phosphorus and Carbon** in the Steel Plates to avoid **embrittlement, ageing & corrosion**.
- Removal of the non-metallic and oxide inclusions done through **Vacuum Degassing** consequently improves grain structure and properties of steel against brittle failure.
- All plates are **normalised** to ensure refined grain structure which facilitates sound welds.
- **Strict raw material identification and material control** right from the initial stage enables us to fabricate and deliver a high quality product.
- To ensure 100% Safety, welds of all Containers are X-Rayed.



## Safety through Approval & Inspection



Prototype Containers are fabricated and tested to ensure that the Container delivers the level of Safety that we strive for and goes beyond what is prescribed.

Prototype tests are carried out in the presence of representatives of Lloyds as TPI, Chief Controller of Explosives and various Chemical Industries Representatives as per requirement. Isgec maintains strict adherence to **Stringent Quality Standards** for **Design, Engineering, Fabrication and Testing** of Containers.

Isgec has detailed **QMS** and dedicated **Quality Control & Inspection Teams** for regular and rigorous quality checks.

**Isgec Containers are inspected at over a dozen stages during manufacturing, which include:**

- Material Identification for Shell and Dished Ends.
- Material Identification for Couplings.
- All Longitudinal & Circumferential Seams set up prior to Welding.
- Visual Inspection of Internal Surface after Shot Blasting.
- Visual and dimensional inspection of Dished Ends, including verification of Heat Treatment charts and Ultrasonic Scanning of thickness at various places.
- 100% Radiography examinations of All Weld Joints.
- Hydro Testing of each Container and thereafter visual internal inspection to ensure complete drying.
- Simulation Testing for hot forming and post-weld heat treatment to analyze behaviour of material during service.

# Safety through 100% X-Ray

Isgec uses world class in-house facilities for both **Cold and Hot working, Machining, Welding, Heat Treatment and Testing** to ensure strict compliance to design and code requirements and to guarantee satisfactory performance of each Container.

- Each Container is subjected to 100% Radiography of all weld seams.
- The dished ends of the Containers are **Hot Pressed** within normalizing range and as such no separate normalizing is required.
- Each Container, after completion of welding, is subjected to **Post Weld Heat Treatment** to ensure removal of all weld stresses.



Such X-Rays further prove that all welds are sound. Today many of these are in digital form



## Our Clients

Isgec containers have found markets both in India and abroad. Isgec continues to receive repeat orders from many of its customers. A list of our valued customers can be furnished on request.





## Model - G

Design Data		
Code of Design		GOST 14249-89 + GOST 24755-89
Type of Vessel		Vertical / Horizontal
Design Pressure Int.	MPa / bar(g)	1.8 / 18
Design Temperature Int.	C°	50
Operating Pressure	MPa / bar(g)	1.5 / 15
Operating Temperature	C°	- 50 to + 50
Min. Design Metal Temperature for Impact Test	C°	- 50
Hydro Test Pressure	MPa / bar(g)	2.4 / 24
Hydro Test Temperature	C°	≥ 10
Pneumatic Pressure	MPa / bar(g)	1.5 / 15
Radiography / Joint Efficiency		1 / 1
Post Weld Heat Treatment (PWHT)		Yes
Fluid Filling Ratio		Chlorine / 1.2
Capacity	m <sup>3</sup> /ltr.	0.8 / 800
Insulation		No
Hydro Test Weight (Full of Water) / Empty	Kg	1445 / 645 (Approx.)



## Other Models

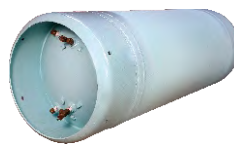
Model 'C'



Model 'D'



Model 'R'



Vertical Half Tonne



Refrigerant Variant 4



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