



# METALMATE

*innovation*



# METAL MATE

## A New Choice of Energy Usage

Metal Mate is the leader in manufacturing pressurized gas containers in Thailand. Founded by Prateep Nilvichien, whose thirty years of experience has propelled Metal Mate into a leading brand in manufacturing pressurized vessels. Over the years Metal Mate has earned acceptance and trust due to high standard of safety and quality products. Metal Mate client base doesn't only include Thailand's leading energy company. It also includes a large international base spread all over the world, including countries in Africa, South America, Europe and other Asian Countries. Furthermore, Metal Mate manufactures and exports refrigerant, BBQ, bulk and forklift cylinders to numerous clients around the world. Our innovation does not end here. We are constantly improving and innovating the cylinder market in Thailand and around the world.

## Company's Milestone

### 1997

Founded by Mr. Prateep Nilvichien with over 30 years of experience in gas cylinder manufacturing.

### 2004

Accredited with ISO 9001:2001; EN1442; AS2469, marking the start of gas cylinder exports.

### 2005

Began manufacturing automotive cylinders. Opened a branch in Surat Thani for repairing and developing products.

### 2006

Launched "Super series" (Automotive LPG Cylinders) and received a product design award. Supplied gas cylinders for PTT. We increased our registered capital.

### 2007

Metal Mate became the first in Thailand to conduct bonfire tests for cylinder combustion. We increased our registered capital.





## 2011

Metal Mate invested 30 million Baht over the last 2 years to become the first and sole manufacturer of CNG Type 3 cylinder.

## 2012

Open a repair factory in Bangpla district to prepare and support economic expansion.

## 2013

Opened an LPG cylinder factory in Bangpu district to support an increasing demand of export market.

## 2014

Further increased in registered capital. Launched a new automotive cylinder under a brand " VOLL ", and LPG composite house hold cylinder.

## Future

Our strategic priority is to create innovative gas cylinders to improve our customers' quality of life.



# PRODUCT OVERVIEW

## Domestic Cylinders

### Steel

Conventional welded steel cylinders, manufactured in two or three parts.

### Aluminum

Lightweight cylinder and more profitable, durable, corrosion free with excellent thermal conductivity.

### Composite Type 4

The cylinder lighter weight and easy to handle. 100% explosion-proof.

## Special Gas Cylinders

High pressure cylinders **made with composite materials help reduce weight for a broad range of usage**, such as SCBA (Oxygen cylinder for fire fighters) HOT (Oxygen cylinder use for patients recovering outside hospitals)

## Automotive LPG Cylinders

### Automotive Cylindrical LPG Cylinders

Aesthetically pleasing Capsule-shaped cylinders come in various sizes to fit a variety of automobile models. Metal Mate is the **only LPG cylinder manufacturer in Thailand that produces capsule gas cylinders that meet European certifications.**

### Automotive Toroidal LPG Cylinders

Automotive Toroidal LPG Cylinders **save both space and energy** in automobiles. Not only do they have innovative designs, they have been produced with European quality standards.

### VOLL

VOLL cylinders are new automotive Toroidal LPG cylinders that can be installed in **spare tire cradles and brackets**. They have a builtin valve from the manufacturer to insure that the entire assembly process is 100% safe.

## Automotive Composite CNG/NGV Cylinders

“NEIL” is a composite CNG cylinder produced using advanced technology. **It is lighter but still retains its safety.** At present, Metal Mate is the only cylinder manufacturer certified in producing automotive CNG composite cylinders in Thailand.

# OUR SERVICES

Metal Mate has a proven track record of providing LPG Cylinders, professional maintenance services, focusing on maintaining safety and quality. To ensure our customers' confidence, Metal Mate follows the standards set by the Industrial Institute (TIS.151-2539), which prioritizes safety. This requires every cylinder to undergo thorough inspection and scheduled maintenance, including a compression test to test for leakage, cleaning the inside of a cylinder and final quality check before distributing our products to customers.



To ensure accessibility to our customers, Metal Mate has built 2 satellite maintenance service stations as listed below

1. Metal Mate Company Limited (Surat Thani branch) in Surat Thani.
2. Gas Mate in Samut Prakan.

# DOMESTIC CYLINDERS

## Welded Steel Cylinders

Metal Mate welded steel cylinders are produced with advanced manufacturing. The welding process is controlled by robot overseen by experienced personnel. In addition, every production step has been quality-controlled such that all gas cylinders are strong, durable, and safe for everyday usage. We also make sure that our cylinders and processes are environmentally friendly.



## Composite Cylinders for L.P Gas

Our latest cylinder is a plastic container coated with fiberglass and epoxy resin. The container comes with a jacket (HDPE) for protection and impact absorption.



### Characteristics :



**Safe:** 100% Explosion proof



**Lightweight:** 2 Times lighter than the conventional steel cylinder



**Ergonomic:** Simple and practical for everyday use



**Strong:** Resistant to corrosion and environmental conditions



**Manufacturing:** Requires no heat treatment, shot blasting and painting



**Ecological:** Cylinder is made of 100% recyclable materials



**Applications:** Camping, BBQ, Boats, Forklifts



# DOMESTIC CYLINDERS

## Seamless Aluminum Cylinders for L.P Gas

Metal Mate is the first and only manufacturer of seamless aluminum cylinders in Southeast Asia. Quality seamless cylinders are manufactured according to current regulations and are accepted worldwide. Our product range can be applied to both low pressure gases (Aluminum cylinders for LPG) and high pressure gases (CNG Cylinders for industrial gases).



Robust design gives this cylinder resistance to cracks and fissures to due a seamless body



Major Long-term profitability



Approved and distributed to Japanese markets since 1999



60% Lighter when compared with the conventional steel cylinders





## Seamless Aluminum Cylinders for L.P Gas

Light weight, thermally aged and rust-free pressure vessel. Has a consistent manufacturing process, and aluminum alloy. We highlight its high thermal conductivity and 100% recyclability at a low cost.



Seamless  
Body

Body is formed by multiple deep drawing processes to get the smooth body and hot spinning process for the necking.



Collar

Plastic collar is firmly secured to the neck of the cylinder by mechanical lock. Providing rigid and ergonomic plastic handles for the cylinder.



Footring

Footring for the cylinder can either be welded aluminum or plastic foot ring. Made of same rigid material with proven strength.



# AUTOMOTIVE LPG GAS CYLINDER

## Automotive Cylindrical LPG Cylinders

Automotive cylindrical LPG cylinders have been designed in various sizes to fit every automobile type. They are not only safe, but also economical and eye-pleasing. Metal Mate is the only automobile gas cylinder manufacturer that has been certified according to European Standards by the Federal Motor Transport Authority of Germany (Kraftfahrt-Bundesamt or KBA)

Metal Mate leads the market in safety testing. We are the first in Thailand to conduct the Bonfire test to ensure that our products can withstand extreme heat such as that in a fire. Due to our long experience in producing automotive LPG cylinders we are able to continuously improve our products to fit evolving designs of automobiles in Thailand.



## Automotive Toroidal LPG Cylinders

Automotive toroidal LPG cylinders are manufactured by European-Certified industry robots. We also provide different cylinder capacities based on different types of automobiles. Furthermore Metal Mate cylinders can be integrated with the a Liquid Injection system which helps enhance your driving performance.



# AUTOMOTIVE LPG GAS CYLINDER

VOLL

# VOLL

VOLL is a brand new automotive toroidal LPG cylinder from Metal Mate which holds a patent for its design. This new design addresses the weaknesses found in old models which have been in use for over 20 years. A Special-designed valve is unique to VOLL, making VOLL one of the most distinctive products in the market.



## Distinctive Properties



The 20% addition capacity of the cylinder installed in automobile tire cradles allows more distance to be driven.



Newly special designed package for spare tire cradle after the installation.



The valve for VOLL cylinder has been designby a valve specialist - manufacturing factory in Italy.



Designed the cylinder to fit any kind of cradles and brackets of your automobile.



Use high-tech robots in the welding process to ensure quality.



The advanced welding technique called ArCo Shield keeps the cylinder's interior clean.



All valves from Metal Mate have been subjected to a leak test.



Enhance the safety feature with 'Rockguard', Rockproof equipment installed under automobile.



Additional  
**20%**

# AUTOMOTIVE COMPOSITE CNG/NGV CYLINDER

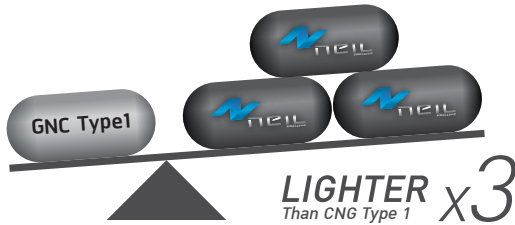
## Neil Composite CNG Cylinders (CNG Type 3)



NEIL automotive composite CNG cylinders (CNG Type 3 cylinder) are a perfect integration of the innovative technologies, using Seamless Aluminum Liners reinforced with carbon fiber. A material known for its durability commonly found in planes, space shuttles, and bullet proof vests. NEIL's distinctive features and safety owe to its lightweight and strength, which exceeds that of normal automotive CNG cylinder (CNG Type 1).



## Weight Comparison



Type	Pressure (Bar)	Capacity (Lts)	Weight (Kg)
Type 1	200	100	110
Type 2	200	100	80
<b>NEIL</b>	<b>200</b>	<b>100</b>	<b>33</b>
Type 4	200	100	31

When comparing 100 liters NEIL to a CNG Type 1 cylinder with the same capacity, the NEIL is 70% lighter, and 50% lighter than a glass wool CNG Type 2 cylinder. This is why NEIL cylinder is a perfect choice for an automobile that creates as little obstruction to the engine as possible.

## Distance Comparison



CNG Type 1 **220km.**

**NEIL 250km.**

Type	Capacity (Lts)	Average Speed (Km/Hr.)	Speed/HP	Mileage Performance (in city)
Type 1	100	100-120	3000/42	220 km.
<b>NEIL</b>	<b>100</b>	<b>100-120</b>	<b>3000/42</b>	<b>250 km.</b>

**Better Mileage 12%**  
Get More Than CNG Type 1

As NEIL has been made with Carbon Fiber, the same material used in space ships, it's superior to CNG Type 1 cylinder made from steel. With the distance driven on a full tank of gas, NEIL can cover 12% more distance than CNG Type 1 cylinder with the same capacity. This proves that NEIL is a more economical choice for cars than other type of cylinders.

# Always Ahead

# SPECIAL GAS CYLINDER

## SCBA Cylinder

SCBA Cylinder (Self Contained Breathing Apparatus) contains a back-carrying frame, hose, and full face mask. This makes it suitable for rescues, firefighting and other tasks where breathing normal air is dangerous, such as that in a fire accident or chemical leakage. The popular cylinders are made of composite material as it is ultra-light weight and convenient during transportation. (Service Pressure 152-310 Bar. 2,216-4,500 Psi.)



## SCUBA Cylinder

SCUBA tank is a cylinder contained nitrogen and oxygen used for divers. There are 3 types.

1. A steel cylinder – Heavy but cheaper compared to other types.
2. An aluminum cylinder – Lighter, convenient to use, but more expensive than steel cylinder.
3. A composite cylinder – Ultra-light weight, convenient to use, but the quality comes with a higher price compared to the other two. (Service Pressure 152-310 Bar. 2,216-4,500 Psi.)



## Dumpy Cylinder

Dumpy cylinders are large, industrial-grade containers, that can have a capacity of up to 210 Kg. (499 Liters), manufactured with specially designed process for large size cylinders using quality equipment along with precise seamless control to ensure a quality product.

In designing a 210 Kg. cylinder for long term and convenient use, the valves have to be welded in precise positions for efficient usage. Though they are bulky they could easily be transported through specifically designed handles for forklift trucks. Designed with a finish that will last through any wet or dry weather conditions.

Every 210 Kg. cylinder has to pass a number of processes and quality checks through the whole course of manufacturing. This is supervised by qualified Metal Mate quality teams as well as 3rd party inspectors for added guarantee and safety.



# CERTIFICATIONS AND REWARDS

## E1 (ECE 67R01)

European Standard (ECE 67R01) is a certified standard granted by European Regulation whose strictness varies from nation to nation. A certifying country's code can be noted from the number that follow letter E (e.g. E1-E58) E1 is the highest standard from Germany, a worldwide approval. LPG gas cylinder from Metal Mate is the only manufacturer in Asia that has been granted the E1.

## ISO 9001:2000

In 2004 Metal Mate received ISO 9001:2000

## MIT Design Award

In 2006 Metal Mate received the MIT Design Award from Ministry of Commerce



## Innovation Leader Award



BAI PO BUSINESS AWARDS  
PRAEWNIN NINVICHEAN, MANAGER OF  
METAL MATE CO., LTD

Metal Mate is Thailand's leading pressure vessel manufacturer and was the first in Thailand to innovate, and create outstanding high quality pressure vessels which have earned trust and confidence from both Thailand and abroad. With that reason, Metal Mate received a medal of honor from the 5th Bai Po Business Award by Sasin held by Siam Commercial Bank. Sasin Graduate Institute of Business Administration of Chulalongkorn University set this award to honor Thai traders for their outstanding business diversity. Metal Mate received this award from winning 3 business dimensions as below :

1. innovation
2. quality
3. value creation

Matal Mate won Bai Po Business Award by Sasin guaranteed our success and built a great trust for our company.



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