



RAD SANE ATTI

Presentation
of

Rad Sane

high pressure full composite cylinders

CNG & LPG



➤ Our Company

Date of Establishment:

2009/09/07

Field Of Activity:

Production of High pressure composite cylinders

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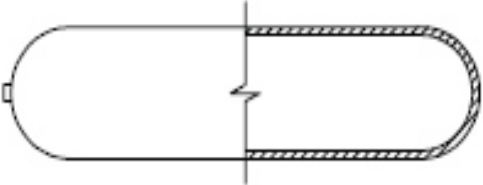
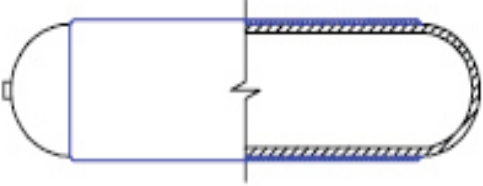
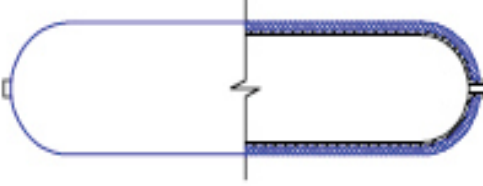
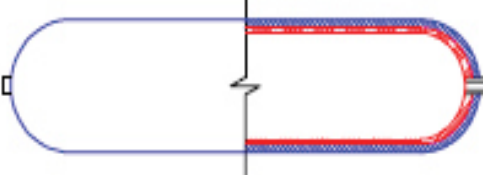
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➤ Type of CNG cylinders

	Type of cylinder	construction	Weigh per liter
I		Type 1 All metal aluminum or steel	0.9-1.3
II		Type 2 Metal liner reinforced by composite wrap (glass or carbon fiber) around middle	0.8 - 1
III		Type 3 Metal liner reinforced by composite wrap around entire tank	0.4-0.5
IV		Type 4 plastic liner reinforced by composite wrap around entire tank	0.3-0.4

➤ CNG composite cylinders (Type 4)

features

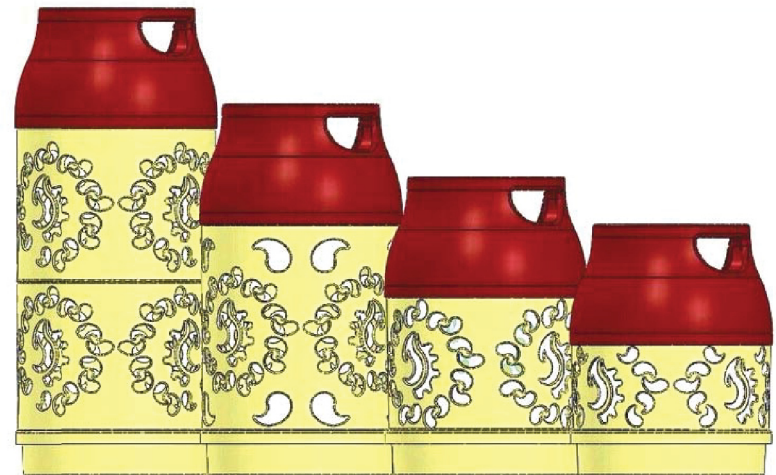
- Seamless polymer, welding free.
- Corrosion free PE liner.
- Fatigue resistant non metallic liner.
- 70% lighter than type 1, 2 and 3.
- Light weight reduces transport and work costs.
- Special design boss.
- 20 years service life.
- Application on wide range vehicles: cars, buses, trucks, forklifts, boats, ships, locomotives, etc



➤ LPG composite cylinders (Type 4)

features

- Light weight.
- Perfect design.
- Wall transparency provides gas level.
- Safe, explosion-proof under fire exposure.
- Resistant to UV, impact and environmental conditions.
- Wide range applications: at barbecue, camping, on boats and forklifts, etc.
- colorful outer casing.



➤ Parts of composite cylinder (Type 4)

Liner



High density polyethylene

Boss part



Aluminum

Composite



Glass or carbon fiber and Epoxy resin



➤ The challenge to make a composite cylinder (Type 4)

- ✓ The design of a **leak-free**, structural interface between the boss, liner, and composite is a key design challenge.
- ✓ Over **19 patents** for the liner-boss interface exist in the market.

Special solutions are necessary for entering the markets as a new player



Rad Sane Atti design a special boss that has proven to be highly reliable



➤ Fully automatic Production line in Rad Sane Hidaj

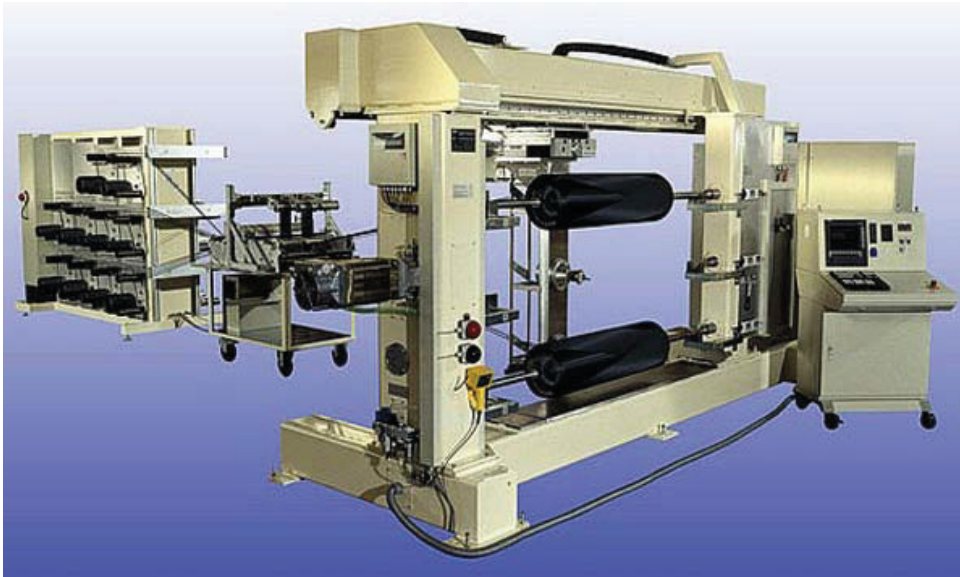
✓ Blow Molding Machines



✓ Full automatic blow molding machines to produce plastic liners with different sizes.



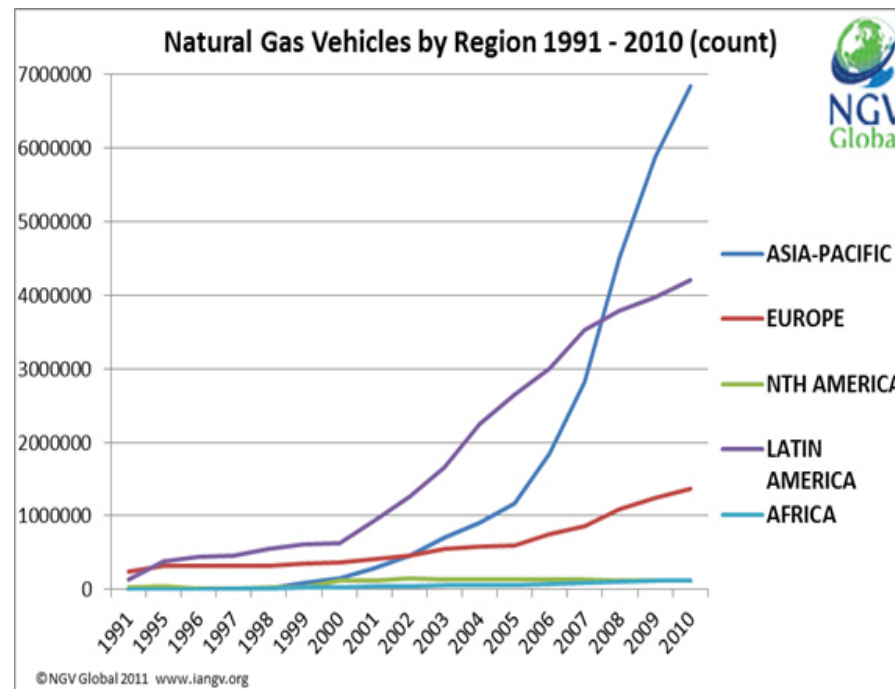
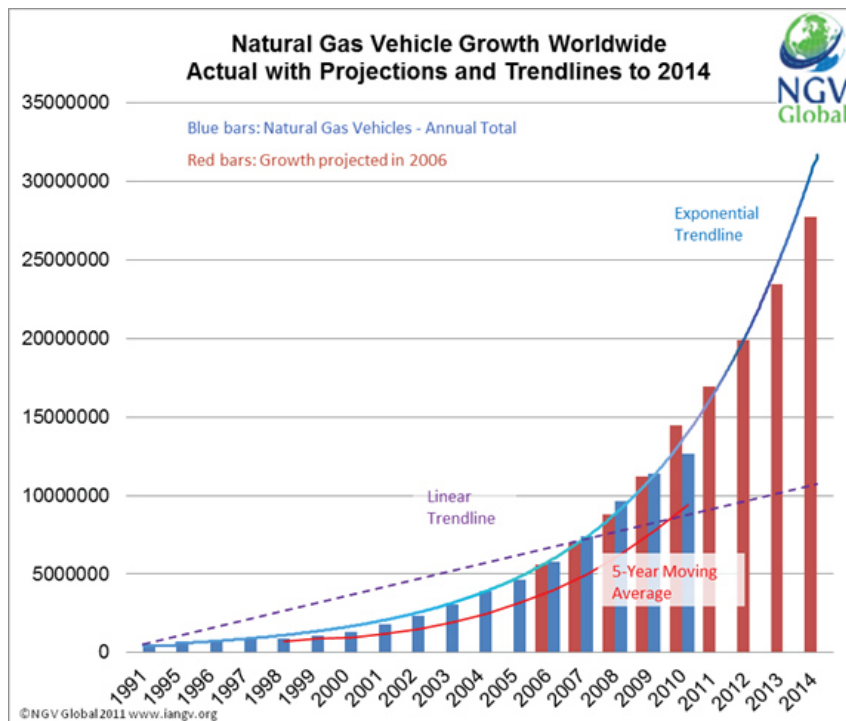
✓ Filament Winding Machines



✓ Full automatic Filament winding machines to fully wrapped the different plastic liners with glass or carbon fiber.

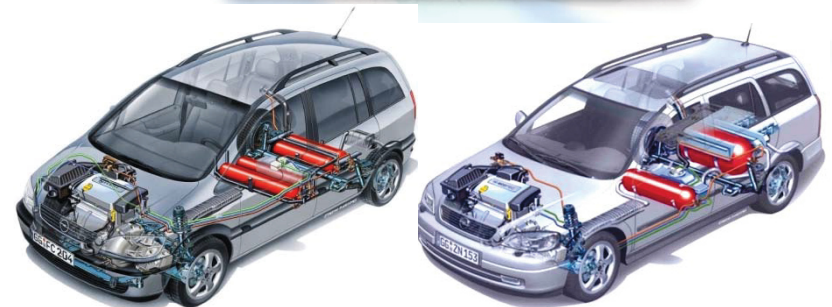


➤ Total natural gas vehicles



➤ Benefits of using Type 4 composite cylinders

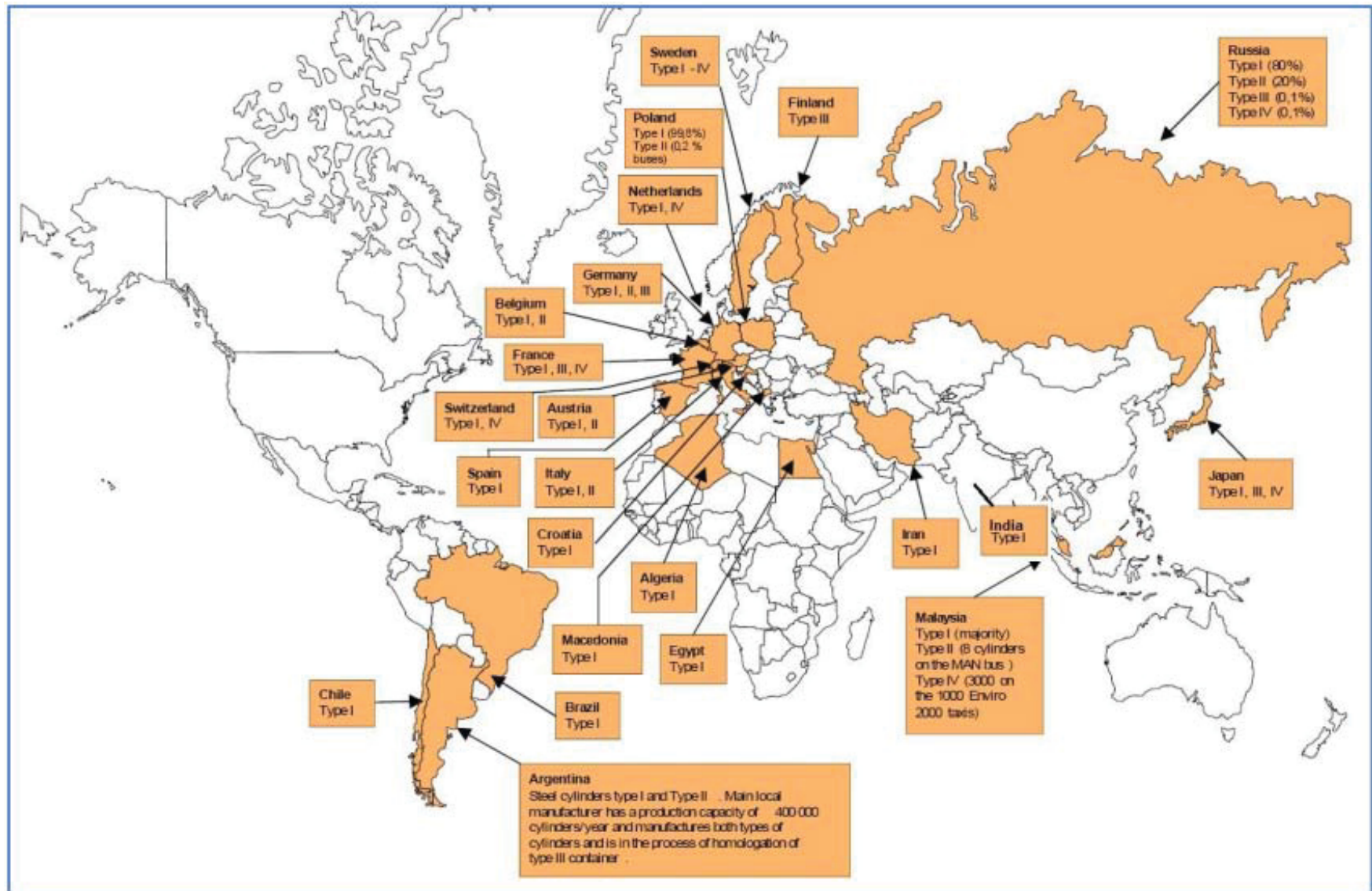
- Weight reduction : reduction in carbon emissions.
- High impact strength.
- Infinite fatigue life.
- Highest cycle life, 20 years visual inspection only.
- No record of an explosion till date.
- Fast fill and vent.
- Capable of being custom designed for applications.
- Can be designed for space available.
- Application on wide range vehicles: cars, buses, tracks, forklifts, boats, ships, locomotives, etc.



➤ Brands using Type 4 composite cylinders

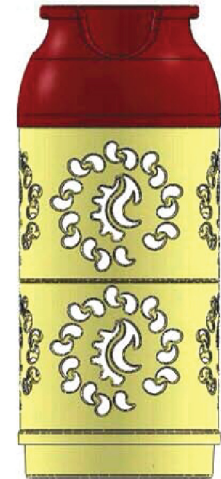


➤ Global CNG Gas cylinder market



➤ using of LPG composite cylinders

- colorful outer casing.
- Wall transparency provides gas level.
- Wide range applications: at barbecue, camping, on boats and forklifts, etc.



Thank you for your attention



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