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"Complet" - Raufoss Composites AS - 10kg LPG composite cylinder - Application for exemption

RSPA-01-9731-1



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Raufoss 2001-04-17

Associate Administrator for Hazardous Material Safety,
Research and Special Programs Administration,
US Department of Transportation,
400 7th Street,
SW Washington DC 20591-0001
Attention: Exemptions, DHM-31

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General

Raufoss Composites AS (RAC) develops and manufactures different types of pressure cylinders in composite materials for defence-, automotive- and leisure markets. One main activity is manufacturing 10kg LPG composite cylinders (called Complet) for the leisure market (cottages, caravans, barbecue....). RAC would like to apply for an approval of this cylinder for transportation, filling and use in North America.

Short information about the product

The cylinder is made as an

- blow moulded HDPE inner liner,
- fully wrapped with glasfibre/vinylester composite and
- integrated in an injection moulded HDPE outer casing.

Complet has already got ADR-approval and type approvals in Germany, Norway, Sweden, Finland and Denmark. TÜV Bayem (Germany) did the original approval testing and certification. They also do third party inspection of the everyday manufacturing of the actual products.

The approval is based on prEN 12245 «Transportable gas cylinders - Fully wrapped composite cylinders», modified to include more extensive tests, e.g. drop tests at extreme temperatures and several drops from 3m. The standard prEN 12245 is very much similar to the newest draft of ISO 11119-3, covering transportable composite cylinders.

modules?

RAC have manufactured approximately 200.000 cylinders for the Scandinavian markets. We are now looking at new markets, and to be able to co-operate with potential customers, we would like to start the approval process. Our typical customers are big gas companies with experience from the business and with already established filling stations and distribution networks.

Short information about the company

Raufoss Composites is located in Raufoss industrial park, about 100km north of Oslo. together with Norsk Hydro, SAPA, Nammo and other companies within the Raufoss Group.

The company has more than 15 years of experience with developing and manufacturing fibre reinforced pressure cylinders for markets that acknowledge the special characteristics of composite materials - lightweight, high strength, especially good behaviour in fire, corrosion resistance to mention some.

The main activities today are

- Developing and manufacturing tubes for rocket motors and small high pressure bottles for use in various NATO defence systems
- Manufacturing cylinders for cars, trucks and busses.
- Raufoss Composites is the main contractor for development of prototype risers - that is tubes for transporting oil from the seabed to platforms or production ships.
- And of course - the company manufacture the new LPG composite cylinders

Please try our web-site (<http://www.raufoss-composites.com>) for information about the company, LPG-products, testing and approvals.

Application for exemption for "Compleat" - Raufoss Composites AS 10kg LPG composite cylinder

The Company

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The Independent Inspection Firm.



Phone (909) 682-4110 • Fax (909) 682-6090
e-mail: atitest@pe.net
Website: www.authorizedtestinginc.com

ref: Mr. Steven Hutchinson

will provide tests and inspection in accordance with 49 CFR 173.300a and also "Approval of non-domestic chemical analyses and tests" as described in 173.300b

Application and product description

The Company Raufoss Composites AS would hereby like to apply for approval for transportation, filling and use in all of USA for 10kg LPG composite cylinders (called Complet) for the LPG leisure market specified by the following documents:

- Materials and dimensions: RAC doc. 0147230-900 rev B "List of drawings LPG 10kg Gas Container"
- Manufacturing and testing: RAC doc. 0141295-1200 rev A "LPG Quality Assurance Program Plan"

The purpose for applying

is to be able to export the specified cylinders from Norway to USA for supplying major distributors of gas cylinders. All filling, transportation, use and service are planned to follow standard handling as for similar products in the leisure market. RAC will have no direct delivery to single end consumers. If the market shows a suitable potential, an increase in volume will most likely be manufactured in new establishments in North America in the future.

The appliance is limited to

- The product to contain
 - Propane - UN1978,
 - Butane - UN1011,
 - Liquefied petroleum gases - UN1075
 - Hydrocarbon gas mixture, liquefied n.o.s. - UN1965
- an unlimited number of products
- a lifetime of 15 years of the products

The exemption is sought based on the following references

- a) 49CFR Part 106
- b) 49CFR Part 107
- c) 49CFR Parts 171-180 (transportation and manufacturing), specially
 - 1) 173.34. (Qualification, maintenance....)
 - 2) 173.201 (Non-bulk packaging...PG1)
 - 3) 173.301 (General req. for shipment of...)
 - 4) 173.304 (Charging....)
 - 5) 178.35 (General requirements for spec...)
 - 6) 178.50 (Specification 4B welded or brazed steel) - exemption!
 - 7) 178.AA (DOT-3FC Standard for glass fibre composite cylinders)

The basis for submission

We recognise that a manufacturing Specification or Standard does not yet exist for this type of construction, so we would suggest the basis for this submission to be,

- Preferably in part, CEN standard prEN 12245 February 1999 "Transportable gas cylinders - Fully Wrapped composite cylinders",
- Alternatively the draft international standard ISO 11119-3 "Gas Cylinders of composite construction. Part 3: Fully wrapped fibre reinforced composite gas cylinders with non-metallic and non-load sharing metal liners" (the latest revision being January 2001 when writing this).

This base for testing and follow up is designed to secure the same level of safety as steel cylinders for the same kind of applications.

"Complet" - Raufoss Composites AS - 10kg LPG composite cylinder - Application for exemption

The duration for which the exemption is sought should be as long as it will be necessary till a new specification for this type of product will be obtained.

Complet has already got ADR-approval and type approvals in Germany, Norway, Sweden, Finland and Denmark. TÜV Bayern (Germany) did the original approval testing and certification. They also do third party inspection of the everyday manufacturing of the actual products.

RAC apply for DOT to, fully or in part, accept test results and reports from the approval work in Europe also to be valid for USA. Please, find enclosed the total summary of tests and the relevant European approval.

Best regards

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Ola Johnsrud
Quality Assurance Manager RAC

List of enclosures (The enclosures are confidential)

1. Product definition: RAC doc. 0147230-900 rev B "List of drawings LPG 10kg Gas Container"
2. Manufacturing and testing: RAC doc. 0141295-1200 rev A "LPG Quality Assurance Program Plan"
3. Test results: RAC doc. 108678-1555 - RAC LPG cylinder - homologation test summary
4. ADR and German Type Approval certificate