

# Calibration Gas

## Demand and Supply



# Abstract

**Calibration gases are essential for making sure gas detection equipment is performing effectively. But keeping vessels fully stocked with up-to-date calibration gases can be challenging, costly and time consuming.**

This document looks at the process of supplying calibration gases and examines the common problems that vessels face. It also provides advice and guidance for potential solutions using real-life case studies to show how changes in procedure and suppliers can have an impact on operations.

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# Introduction

**Calibration gases (also known as span gases) are essential to the maintenance and performance of inspection equipment on board ship. They are used as a referencing tool and act as a comparative standard for calibrating analytical instruments.**

Exposing a detector or analyser to a verified concentration of a test substance will gauge whether the sensors are responding accurately so it's vital that calibration gases are exact and traceable to a national or international standard.

There are many different mixtures and pure gases available. Marine industry calibration gases typically comprise of: hydrocarbons and air mixtures; hydrocarbons and nitrogen mixtures; carbon monoxide or hydrogen sulphide mixtures; oxygen and nitrogen mixtures; and pure gases such as nitrogen (99.999% N<sub>2</sub>) and methane (100% CH<sub>4</sub>). Reputable calibration gas suppliers should supply a wide range of gas mixtures as well as different regulator flow rates, typically ranging between 0.5 and 3 litres per minute (LPM).

It's important to understand the limitations of the instruments, as well as their function and method of use, as each unit is usually calibrated for a specific gas. Handbooks from the manufacturer should always be consulted for full information and guidance.

The Chief Officer is responsible for identifying, calibrating, and adjusting all gas measuring instruments onboard. They must also make sure that an adequate amount of the correct grade of calibration gas is readily available.

# Common Problems

**Because of the instability and impurity of the gases used and the relatively poor quality of cylinders within the industry, most calibration gases have a short shelf-life of just 6-12 months. This leads to many problems when it comes to supply.**

This limited shelf-life means that gases need to be replaced regularly – regardless of how much remains in the cylinder. In addition to the wastage of gas that’s gone out of date, multiple re-stocking deliveries will need to be arranged for each ship incurring freight costs, dangerous goods charges and customs’/agent’s fees.

## **Hidden Costs**

Organising multiple deliveries and arranging schedules takes up valuable time. This is further complicated when using several suppliers as quality control can be an issue – different providers will all need to meet the same standards. Organising a reliable supply of calibration gas for a global fleet can prove a troublesome and time consuming process.

**This is time that superintendents could be spending on higher value and more critical vessel components.**

**‘We found that getting consistent availability of all the gas mixtures we use for calibrating our gas detection instruments, was very difficult worldwide.’**

**Palmali Group of Companies**

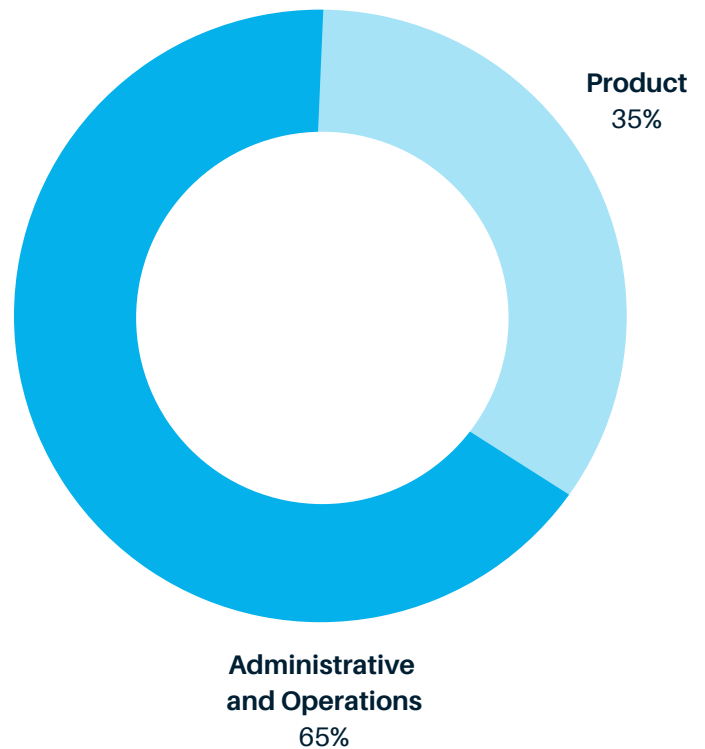
# Procurement Process

## Enquiry to delivery

1. Ship requisition
2. Buyer interprets information
3. Identification of potential suppliers
4. Raise and send RFQ
5. Suppliers seek clarification on RFQ
6. Buyer seeks clarification from the vessel
7. Ship sends clarification
8. Buyer chases suppliers
9. Review proposals and raise PO
10. Specification of destination port
11. Agree delivery charges
12. Dispatch goods

## Current Average Costs

(Administrative and Operational costs should be 10%)



'Buying calibration gas was a slow and costly process.'

**GEDEN LINES**



FastCalGas has the highest gas production standards of any calibration gas on the market and is a world first in offering a 27-month manufactured shelf life on all reactive mixtures.

### Quality

FastCalGas uses advanced materials and a mass spectrometer to analyse and verify the quality of every cylinder. In 30,000 deliveries, only two defects have ever been reported – a quality yield of over 99.993%.

### Compatibility

FastCalGas is guaranteed to be compatible with all the leading brands of gas detectors. Because Martek has over 100 years of gas detection experience and knowledge, we understand gas detection in the marine industry.

### Service

Martek's customer service is renowned in the maritime industry. You can expect technical experts with a full set of language skills who are proficient in organising the handling of dangerous cargo.

### Switching suppliers

Simply pass on the inventory of gas detectors on board your fleet or let us contact the ships directly to get the information, we take care of the rest.

'Previously we struggled to get 10 months lifetime on our quad gases, the ones you have sent us have 24 months.'

**Atlantic Towage**



**An inventory management service that makes it easier and more cost effective for operators to supply their vessels with calibration gas.**

1-2-1 is designed to cut down on carriage and agents' charges as well as the hidden costs that come from the time spent on administration. It simplifies the process into one order, two years' supply and one delivery.

Martek effectively takes over the management of supplying your fleet with FastCalGas. We review your gas detectors' usage to determine your requirements and run on-going checks with vessels, contacting each ship to arrange re-stocking after twenty-one months. In the unlikely event of your supply running low because we've under-calculated your usage, we'll re-stock for free.

The cost can be spread evenly in eight instalments over twenty-four months or you can make savings with a discounted price that's paid with the initial delivery of gas to each ship.

Automatic re-stocking reminder service





# Case Study:

## K Line

**Fleet:** 9 x LNG CARRIERS

**Previous calibration arrangement:**

Purchasing large refillable cylinders on an ad-hoc basis.

**Problem:**

The administration and logistical challenges of shipping these large cylinders around the world was a time consuming, complicated and a costly process. There was also a significant health and safety risk – the crew were carrying these large cylinders around the vessels to calibrate the fixed gas detection systems.

**Solution:**

We challenged K Line’s thinking about why they were using large gas cylinders. These cylinders are expensive to buy, difficult to transport and – because of the huge volumes they hold – resulted in large amounts of wastage due to gas expiring. By analysing the current inventory on each vessel, we simplified the supply by consolidating many different mixtures into single mixtures and part numbers. Then we arranged a two year single supply to the vessels, freeing the technical and buying functions from having to organise calibration gas.

'K-line chose to change their calibration gas supplies to Martek/FastCalGas because it delivered a number of distinct advantages to our fleet of LNG carriers. The single two year covering order delivers time and cost savings on the significant logistics and administration overheads attributable to normal calibration gas supply arrangements. The extended warranty of the calibration gases means there is no worry of our gases expiring before use.

Martek have been professional and responsive from the sales staff to the after sales team. We would recommend their use to other ship owners.'

**R Brooks, Superintendent**



# Case Study:

## Chemikalien Sea Transport (CST)

**Fleet:** 43 Tankers

**Previous calibration arrangement:**

CST carry a large and varied inventory of gas detectors across its fleet which required a wide range of calibration gases.

**Problem:**

Multiple suppliers provided a varying quality of services and products. This was causing the buying team lots of time consuming administration due to problems with deliveries, quality and expired gas.

**Solution:**

CST had been using the FastCalGas service for a number of years and we worked out that they would benefit from even bigger savings by converting to the 1-2-1 model. We analysed the inventory of detectors as well as the order history through FastCalGas to simplify things by providing a full two years supply per vessel. We then arranged a single supply for each ship which we estimated would make savings in direct costs and administration of over US\$100,000.

'The 1-2-1 calibration gas service from Martek saves us the massive costs of placing individual gas orders for each of our vessels at regular intervals. The minimum 24 month warranty of the gases means we now don't have gas going out of date. CST, are an innovative market leader in our sector and this innovative solution means we have effectively cut over US\$30,000 of unnecessary expense per year by using this service.'

**N Weissgerber-Kastner, Purchasing Manager**



# Conclusions

**Maintaining an up-to-date supply of calibration gas is particularly challenging for fleets operating on a global scale. If not carefully controlled, the process can be complicated, time-consuming and expensive.**

Without a reliable supplier, there can be quality issues with the product. The limited shelf-life - usually of just twelve months - is also a significant issue and approximately 55% of current costs are wasted.

Using products with a significantly longer shelf-life can make a great deal of difference. Further improvements to the procurement process can be made by using a calibration gas inventory management service that will take control of the ordering and supply process, cutting down on costs and scheduling to leave operators with more time to concentrate on higher value areas of the business.



**Martek Marine**

Adwick Park

Manvers

Rotherham

South Yorkshire

S63 5AB

[info@martek-marine.com](mailto:info@martek-marine.com)

UK Office: +44 (0) 1709 599 222

Singapore Office: +65 6331 6790

[www.martek-marine.com](http://www.martek-marine.com)

