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3. Sample Submission and approval
4. Supplier Audit
5. Logistics, Delivery and Packaging
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7. Supplier Performance and Review
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9. Customer Property, tooling and machinery
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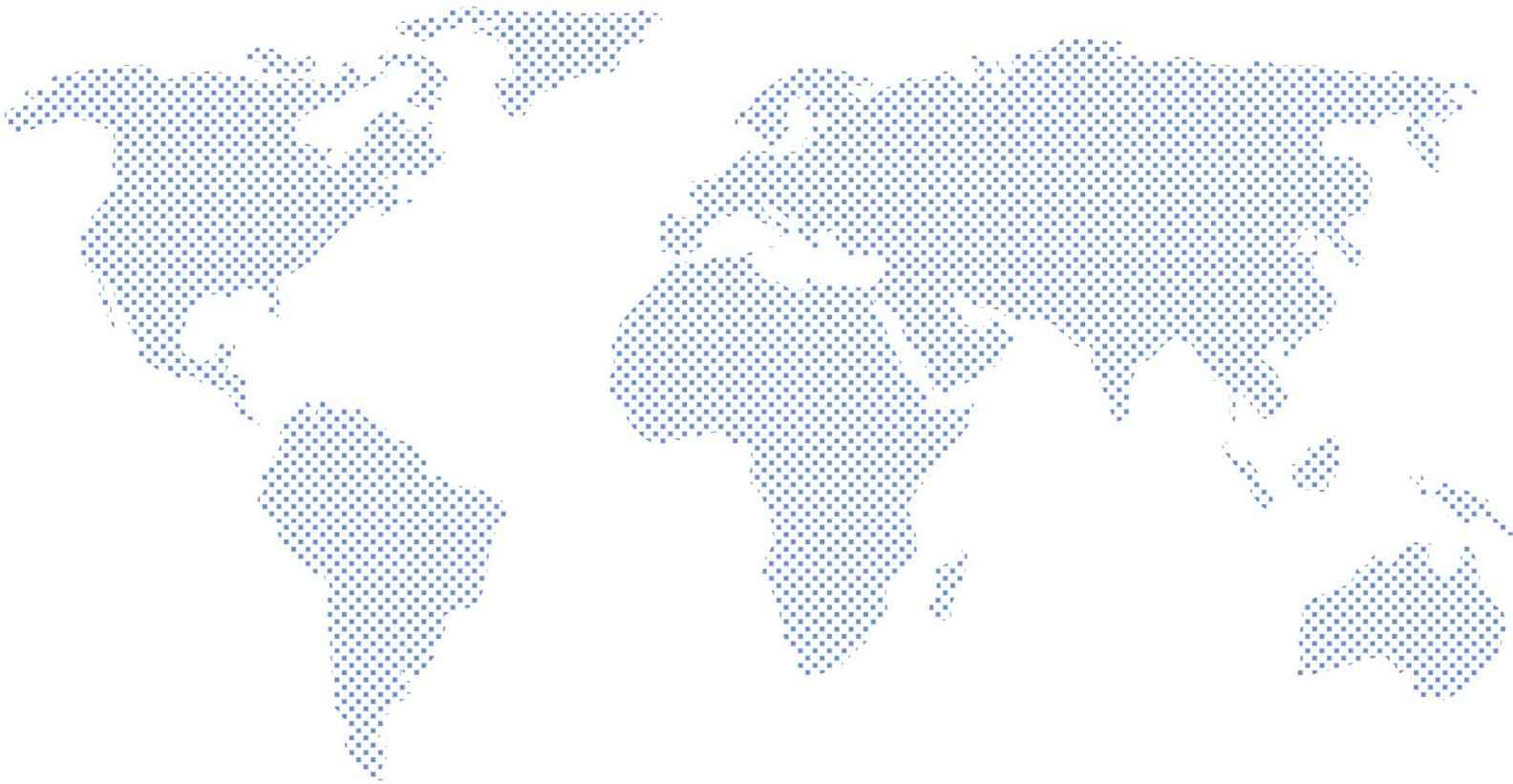
APOLLO FIRE DETECTORS

SUPPLIER HANDBOOK



Revision 1 : 2019

Welcome to the Apollo Fire Detectors Supplier Handbook…

This handbook is designed to define the processes, procedures, expectations, requirements and values involved in a relationship between a supplier and Apollo Fire Detectors.

It should provide clarity at every stage of the journey from being selected as a new supplier, through new product launch, to operations and quality requirements.

Apollo Company Profile

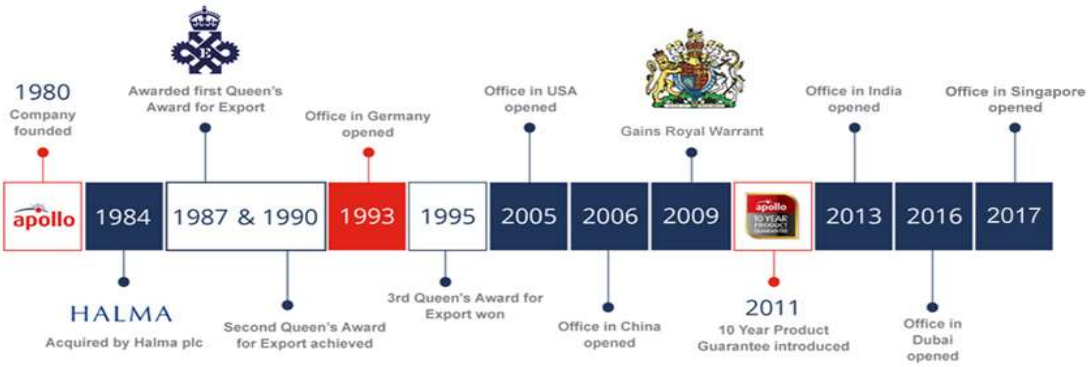
Apollo Fire Detectors Ltd specialises in the design and manufacture of high-quality fire detection solutions for commercial and industrial applications. From our base in Havant, near Portsmouth on the UK's south coast, we have, for over 40 years, designed and built products that save lives and protect property from the risk of fire.

In that time, we have broadened our capability from a straightforward focus on conventional fire detectors to the manufacture of sophisticated analogue addressable detectors and interfaces.

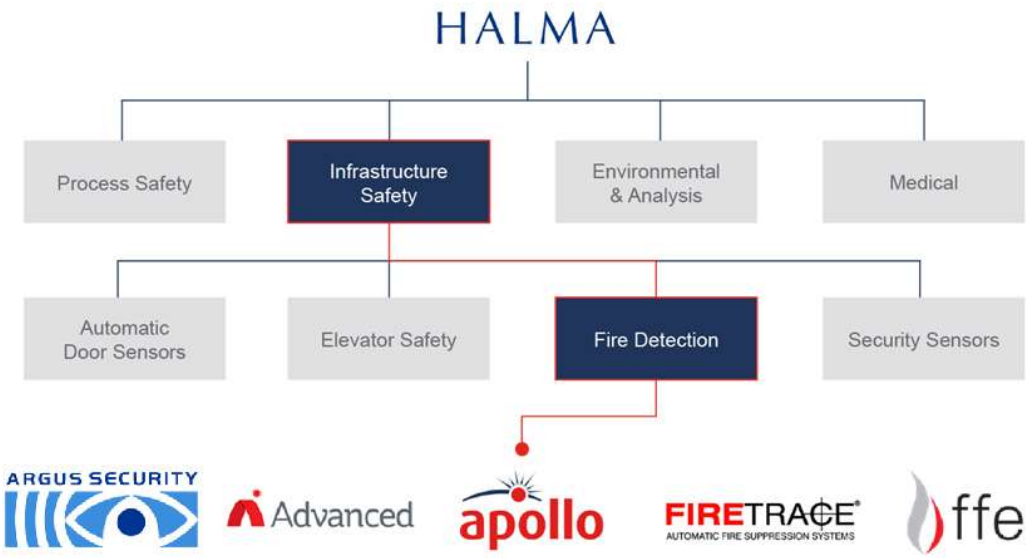
A relentless desire for innovation drives our company's product development programme; we are continuously exploring new technologies that help us deliver leading-edge fire detection solutions.

Through planned expansions, Apollo has reached a leading global position in the market for professional fire detection. With regional offices in the UK, America, China, Dubai, Germany and India, plus a network of partners and distributors on five continents, we have cemented our place as a world-class fire solutions provider.

We deliver to our customers tailored fire detection solutions, approved to local standards and regulations, wherever they are based in the world. Apollo fire safety products are used in prestigious locations across the globe: The Statue of Liberty, New York; The Royal Albert Hall, London; The Kremlin, Moscow, to name but a few.



In early 2009, we were awarded the Royal Warrant by Her Majesty, Queen Elizabeth II, in recognition of our official supplier status to the Royal Household. Apollo is no stranger to Royal approvals, having been the first UK company of its kind to hold three consecutive Queen's Awards for Export Achievement.



Apollo Fire Detectors is part of the Infrastructure Safety sector of Halma Group plc. Halma is a FTSE Top 100 listed PLC, with over 40 subsidiaries worldwide; all engaged in specialist engineering activities.

Manufacturing in **England**

More than **3000 international product approvals**

Direct delivery to more than **100 countries worldwide**

Production of more than **5,000,000 units** annually

Apollo Product Ranges

SOTERIA

DISCOVERY®

XP95®

series65™ 9-33V

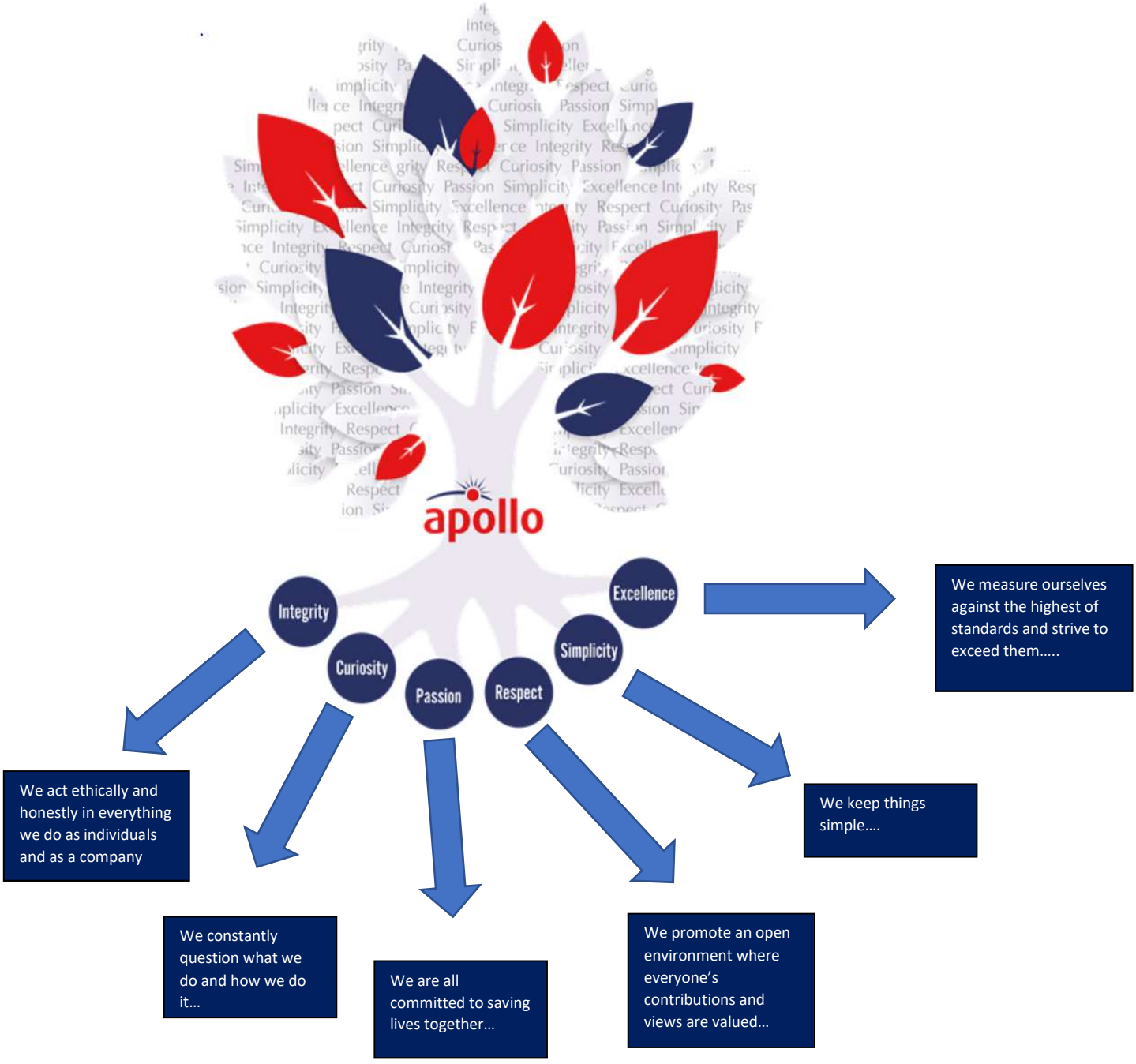
orbis®

XPANDER®

AlarmSense®

Apollo Values

Apollo's core values support the company's vision, shape our desired culture and reflect what the company really values. In essence, the values are Apollos company identity - the principles, beliefs and philosophy we follow as a collective. These apply to everyone throughout the organisation and also into our supply chain, both in how we aspire to deal with suppliers and in what we expect from them.



2 – Selection, sourcing and cost model

1.1 Sourcing/Supply Chain Team

Apollo Fire Detectors employ strategic sourcing specialists as part of the supply chain team to identify new suppliers and to optimise costs and performance within the existing supply chain.

In the case of new vendors to Apollo it is normal for one of this or the Supply Chain team to be the first point of contact for enquiries.

It is common for information and recommendations to be shared within the Halma group. It is mutually beneficial for suppliers and for Halma companies to consolidate supply chains. Therefore, a supplier who performs consistently well for one Halma company may find themselves recommended for business with others.

1.2 Methods of selection

Halma/Apollo sourcing specialists constantly benchmark and research new sources of supply, looking at factors such as costs, capability, supply chain logistics, risk mitigation and market forces.

It is common as well for our NPI team to search for suppliers to support new projects that may have a specific technical requirement. Where the team identify a new supplier, they will undertake the normal due diligence.

1.3 Requirements for selection

At Apollo we like to focus on long term partnerships with suppliers, so we try to search out partners with the same ethos. As a rule, our suppliers will be at least ISO accredited and have a strong focus on sustainability (Environmental, Health and Safety, Labour Ethics). Obviously as well our partners must be able to keep up with a fast moving and demanding supply chain so have a good logistics model, all of this whilst remaining competitively priced and willing to look at year on year cost reductions through efficiency and continuous improvement.

2.0 Quotes

When a new project is identified it is normal for at least three suppliers to be asked to quote for the work to ensure that we are always getting the best possible price and product. Suppliers can generally provide quotes on their standard format but in all cases, quotes should contain –

- **Cost**
- **Cost Breakdown**
- **Leadtime**
- **Quote reference**
- **Contact**
- **Payment terms and conditions.**

Quotes should be submitted as soon as possible on receipt of request.

2.1 Open Book Cost model (Moulding/Assembled Parts)

Apollo reserves the right to request the supplier to complete an open book cost model for production of parts. This is a very useful tool as it allows us to benchmark suppliers with complete visibility of supplier's costing structure. It also allows us to plug different tooling configurations, materials, order quantities etc into the model here at Apollo to ensure we are purchasing in the most efficient manner possible.

The cost model may appear complex initially, and the first attempt can take some time, but as many of the details remain the same, soon this becomes easy and convenient for both Apollo and suppliers.

Volume/Annum			PART		Tool		MATERIAL								
							Resin							Part	
Year 1	Year 2	Year 3	Apollo PN	Part Description	Imp	Runner (H/C)	Material Spec	Material type	Manufacturer	MPN	Description	cost/tonne (£)	cost /kg (£)	g/part	kg/part
			38531-990	2 Gig Lid	4	C	46000-005	PC	Makrolon	10346	6555 White	£2,590.00	£2.59	49.5	0.0495
															0.0000
															0.0000

The model will arrive as an excel spreadsheet. Columns in green should be completed by the supplier if not by already Apollo, columns in white are calculated by the sheet. There are different sections to complete which all combine to give a final part price.

1. Material Pricing

In many cases Apollo will negotiate a bulk price for raw materials with suppliers, which moulders can then utilise. In that case the cost model will have the material price added, if not then the moulder will get a material quote and add this here. Part weight and any runner weight should also be added. This will give the price for the material cost/part.

2. Primary Process

Supplier should enter set up cost, machine hourly rate and cycle time. Labour rate and efficiency (i.e. number of operators required to run a machine – if one operator runs two machines then efficiency will be 50%) Also yield should be entered here – NB: % defect should never exceed 2% and will usually be less – we expect our suppliers to have efficient enough processes to support this.

3. Secondary Processes (Inserting/Pad printing)

Details of any secondary processes should be added here in the same manner. There are sections for painting, printing and inserting. Where these are not relevant the columns can be hidden.

4. Other Costs

Supplier should complete packaging and delivery costs per part and administration and profit cost. Our sourcing team will agree a reasonable margin during this process which will be entered in this section.

When all sections are complete the final price per part will be calculated. The cost model can then be submitted to Apollo. Often several lines will be submitted on the same model.

The strength of this model is that once complete, initially the supplier and then Apollo can analyse where cost can be taken out of the process.

5.0 Costing Templates

The template above focuses on mouldings and assembled parts. For other commodities the template may vary but a similar level of transparency is required. Examples of information required for all commodities are shown in appendix 2.2

6.0 Quote decision.

Once all quotes have been reviewed by the sourcing team the supplier will be contacted and advised of any award of work. Wherever possible unsuccessful suppliers will also be contacted and given feedback to allow them to improve their quote on the next occasion.

7.0 Price Change Notification

Any price changes are to be communicated as per template provided in Appendix 2.1

Appendix 2.1 Price Change Back up Documentation Template

Customer Part Reference	XXXXX-XXX
Supplier Part reference	XXXXX
Date proposed increase will go into effect:	DD/MM/YYYY

	Cost - Applicable to last time selling price	Current Cost	% Difference	% Raw Material represents of the selling price	Impact on Previous Selling Price
Date	dd/mm/yy	dd/mm/yy			
Price increase element 1	price /UOM	price /UOM	%	%	%
Price increase element 2	price /UOM	price /UOM	%	%	%
Price increase element 3	price /UOM	price /UOM	%	%	%
….	price /UOM	price /UOM	%	%	%
….	price /UOM	price /UOM	%	%	%
….	price /UOM	price /UOM	%	%	%
Total Impact on Selling Price					%

Appendix 2.2 Open Book Costing Template

1 GENERAL REQUIREMENTS

1.1 Upon Apollo's request, regardless if it's an ongoing business or new quote request, Supplier agrees to produce a fully transparent open book costing in an agreed template incorporating – but not limited to materials, components, process, direct labour, overheads, profit and admin costs.

1.2 The Costing Template may vary depending on commodity.

2 EXAMPLE OF OPEN BOOK COSTING

2.1 Electronic Components

- 2.1.1 Base Price from Manufacturer
- 2.1.2 Distribution Mark up

2.2 Mouldings

- 2.2.1 Raw Material Cost,
- 2.2.2 Tool Set up Cost
- 2.2.3 Cycle Times
- 2.2.4 Material Weight
- 2.2.5 Scrap weigh
- 2.2.6 Yield %
- 2.2.7 Labour rate
- 2.2.8 Labour Time
- 2.2.9 Labour Efficiency
- 2.2.10 Profit %
- 2.2.11 Admin %
- 2.2.12 Packaing Cost
- 2.2.13 Shipping Cost

2.3 Factored Goods

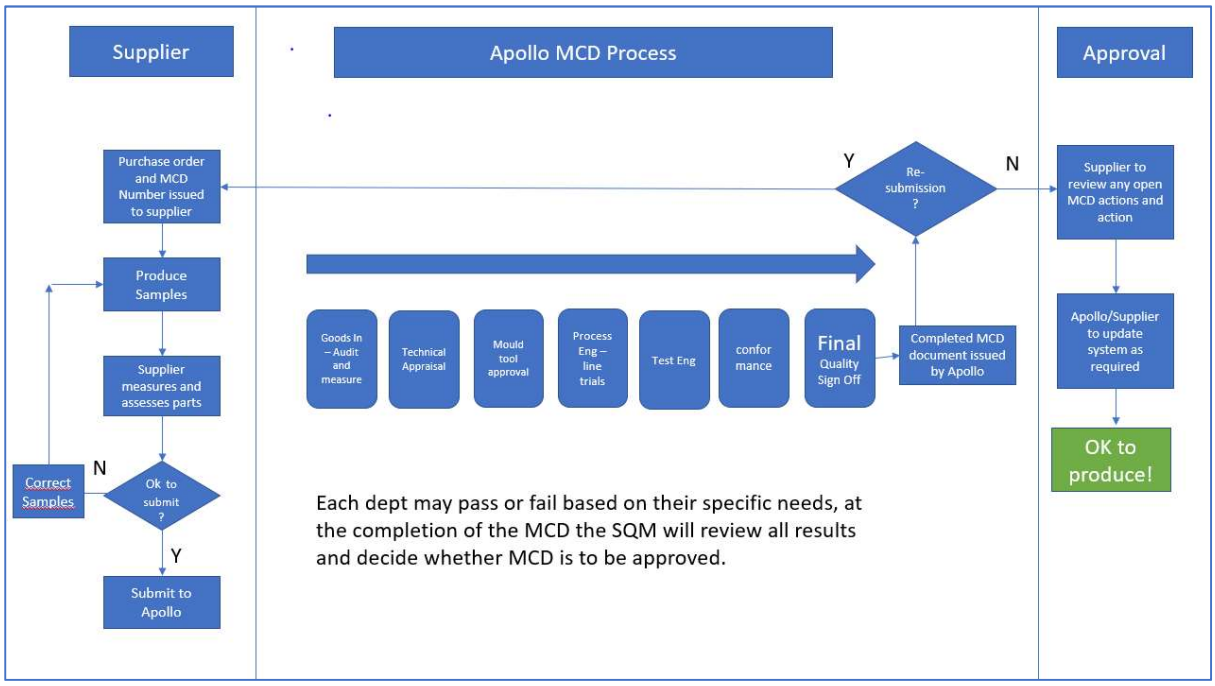
- 2.3.1 Material Cost
- 2.3.2 Labour Cost
- 2.3.3 Overheads Cost
- 2.3.4 Profit %
- 2.3.5 Admin%
- 2.3.6 Shipping Cost

3. Sample submission and approval

1.0 Sample Submission and Approval

In the case of submission of a new part, a changed part, replaced tool, or change of manufacturing process – it will usually be necessary to submit samples to Apollo for approval.

Apollo use the Material Control Document process (MCD) to control the approval of any new or changed parts.



2.0 Sample Submission Requirements.

Requirements for documentation to be submitted with samples may differ between commodities.

It is likely though that submissions will follow the table below.

Requirements for Initial Sample Submission								
	ISIR	**Datasheet**	**Material Certification**	**Capability Study**	**Control Plan**	**MSA**	**Microsection**	**Test Data**
Mouldings	■		■	■	■	■		
Metal Fixings	■		■	■	■	■		
Assemblies	■		■		■	■		■
PCB	■	■	■		■	■	■	
Electronic Components		■						■
Packaging/ labelling	■		■					

Apollo purchase millions of components each month, so our strategy is to keep inspection to an absolute minimum. We rely on our suppliers to provide conforming parts first time, with the data to support this. Having reliable data behind supply enables us to approve parts for production based on the supplier's control and measurement of components.

2.1 Sample Submission documentation

Further information on many of these documents can be found in section 8 – Process Control, and in many cases examples and templates for supplier use.

Documents should be submitted at the same time as samples unless otherwise agreed with Apollo. There will be no payment made by Apollo for any documentation or inspection/measurement work as part of a sample submission, unless there is additional measurement required above normal requirements.

2.2 MCD Process

The MCD Process is shown in the table on previous page. A brief description of the Apollo stages follows:

Goods Inwards Inspection

This will consist of auditing the documentation provided by supplier, coupled with measurement checks and cosmetic inspection as required. The stage will be marked as a pass or fail depending on the parts conforming to the relevant specifications or drawings.

Technical

Commonly used during NPI projects, the technical dept will review the GII data and decide whether to continue with the MCD in line with their project requirements. They may undertake laboratory or other testing to ensure that requirements/specifications are being met.

Mould Tooling

Parts and data will be reviewed to judge quality/accuracy of moulded components and marked pass/fail. In the case of any other commodities, this section will be omitted from the MCD.

Process Engineering

This will generally consist of fit/form/function builds and, in some cases, large batch pre-production trials – particularly important where components are being assembled on automated lines. Data from these runs will be forwarded to the Test Engineering phase. Notes from the production runs will be added to this section of the MCD including any assembly or performance issues.

Test Engineering

The Test Engineering team will review the test data collected from the production line during the trial runs and mark pass/fail accordingly.

Conformance

The conformance team will check against all regulatory requirements; i.e external approvals required, part marking, labelling etc. Where necessary they may choose to hold an MCD until all approvals are in place.

Quality

The Supplier Quality Manager will review all data from the previous stages and make the final decision on whether the components can be passed for production. Where there are errors or non-compliances to drawing, the following options can be taken -

1. Resubmission from supplier following corrective actions.
2. Change to specification/drawing to accommodate deviations.
3. Tool life deviation to accept deviations.
4. Accept under concession or MCD note in minor cases.

When an MCD pass is issued, a copy of the relevant documentation is issued to the supplier and parts will be approved for production.

Where a resubmission is required, a copy of the failed documentation is issued to the supplier and corrective actions should be taken to correct the indicated errors prior to resubmission. Apollo requires a corrective action timeline within 24 hours upon receipt of MCD failure.

In the case of a deviation of any kind – concession, deviation or acceptance, details will be sent with the MCD and agreed with supplier.

2.3 Sample retention

Apollo will retain “golden” master samples from each MCD submission. Supplier is required to retain a set of samples from MCD run as well as the MCD documentation from Apollo.

Master samples will be used to determine any dimensional or cosmetic changes from MCD standard.

4. Supplier Audit

1.0 Introduction

Apollo use different levels of auditing to ensure continuity and quality of supply and to identify any potential issues within the supply chain. As you would expect it is also a requirement of our accreditations that we audit and measure our suppliers. We have strong and experienced auditors throughout the company, who understand that an audit should be a positive, value added and constructive activity, so we expect our supply chain to fully commit and engage with all audit activities.

2.0 Audit Form

The full Apollo audit form is composed of three sections –
Company Data – General questions to give us all the information we need to contact suppliers and a summary of sites, facilities and accreditations.
Sustainability – Environmental, Health and Safety and Social Overview
Questions – There are approximately 70 questions to answer in this part of the form, but not all will be relevant, so the form allows the auditor or purchaser to filter questions to suit the nature of audit or business.
Each question has columns for the supplier to enter their score and comments prior to an audit by the Apollo team.

2.1 Types of Audit

2.2 Self-Assessment

All suppliers will be asked to complete the supplier self-assessment form at the beginning of a relationship with Apollo and then every 12 months to allow us to track any changes within the business.

The form is a shortened version of the Apollo master audit form and is made up of the standard 3 sections:

- Company Data
- Sustainability
- Questions

All sections must be completed. If any sections are not completed then the form will be returned to supplier by the auditor to be completed. Supporting documentation should be attached where requested in any of the questions, as a minimum this will always include

- RoHS statement
- REACH statement
- modern slavery/ Business Ethics statement
- Copies of all relevant certifications/accreditations including environmental/ Health and Safety.

Once submitted the form will be reviewed by the Apollo purchasing team who will decide whether any further action is required i.e. Full Audit, request for further information, corrective actions

2.3 Full Audit

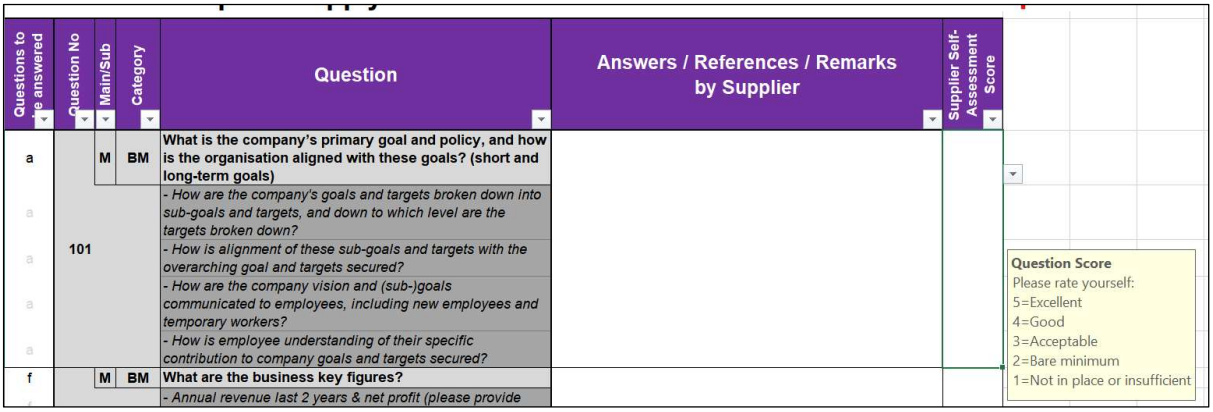
A Full Audit will be carried out when:

- Performance stays below 85% for 3 or more quarters
- Performance 1 quarter falls below 60%
- For Strategic and Bottleneck Suppliers, Every 5 years
- Significant business change – for example change of location
- Award of significant new business over £1m
- New Supplier to Apollo

When Apollo decides to undertake a full audit of a Supplier, we will normally give a minimum of 4 week's notice, unless there are pressing business needs or Apollo have serious concerns about continuity/quality of supply.

The audit form will be sent to the supplier as soon as the audit has been scheduled and should be returned with the self-assessment scores and comments completed not less than two weeks before the audit. This allows the audit team to review the form and pinpoint areas for focus prior to arrival.

2.4 Completion of Questions



Questions to be answered	Question No	Main/Sub	Category	Question	Answers / References / Remarks by Supplier	Supplier Self-Assessment Score
a	101	M	BM	**What is the company's primary goal and policy, and how is the organisation aligned with these goals? (short and long-term goals)**		
a				*- How are the company's goals and targets broken down into sub-goals and targets, and down to which level are the targets broken down?*		
a				*- How is alignment of these sub-goals and targets with the overarching goal and targets secured?*		
a				*- How are the company vision and (sub-)goals communicated to employees, including new employees and temporary workers?*		
a				*- How is employee understanding of their specific contribution to company goals and targets secured?*		
f		M	BM	**What are the business key figures?**		
				- Annual revenue last 2 years & net profit (please provide		

Question Score
Please rate yourself:
5=Excellent
4=Good
3=Acceptable
2=Bare minimum
1=Not in place or insufficient

The picture above shows the first question on the audit form. The Supplier should score themselves against the main question in the final column and add answer considering the hints/detail shown in italics below the question. Evidence can be attached where requested or relevant.

Each audited section should be scored as below using the dropdown menu:

1 = Not in place
2 = Bare Minimum
3 = Acceptable
4 = Good
5 = Excellent

2.5 Audit

The Supplier Quality Manager is responsible for the conduct of the Audit and will decide when key areas should be focused on based on the results of the self-assessment, and any business concerns. An agenda will be issued prior to the audit so that relevant personnel can be prepared.

Typically, an Audit will involve the following personnel:

- Supplier Quality Engineer/ Manager
- Buyer/ Senior Buyer
- Technical Specialist (optional)
- Apollo Lead Auditor (Optional)

During the audit it is expected that Apollo will be allowed access to all relevant areas and documentation that are pertinent to any section of the audit.

At the end of the audit the Apollo team will give a summary of findings onsite in a closing meeting. This will include details of the following –

MNC - (Major Non-Conformities) – Require immediate corrective action
NC – (Non-Conformities) – Require corrective action
Observations - (Opportunities for improvement), suggested actions
Strengths – Areas where business excels

At the end of the closing meeting Apollo will supply a date on which the completed audit report will be sent to the supplier. Dates/Actions for resolution of MNC's will also be agreed.

On receipt of report from Apollo, where required, the supplier will provide an action plan with dates for resolution of all actions. Corrective action reports should be submitted on or prior to this date, and evidence provided. It may be following this activity, that a follow up audit will be carried out to verify the actions carried out.

5. Logistics, Delivery and Planning Requirements

1.0 Apollo Logistics, Delivery, Packaging and labelling

1.1 Delivery Address

All goods should be supplied to the delivery address detailed on Apollo's Purchase Order.

1.2 Goods In Opening Hours

Mon – Thurs: 8.30am – 4.45pm
Fri: 8.30am – 4.00pm

1.3 Overseas shipments (Inc EU)

All goods should be supplied to the delivery address detailed on Apollo's Purchase Order.
Where Ex-works (EXW) applies, follow steps below.

- Supplier should contact their purchaser when goods are ready to ship.
- Paperwork should be emailed to imports@apollo-fire.com
- At this point Apollo will specify method of shipping (air/sea)
- Apollo purchaser will advise logistics company to be used.
- Supplier/logistics company will liaise to arrange collection/shipping to UK.
- On arrival in UK – Apollo's logistics company will arrange customs clearance and delivery time.

Apollo requires all items to be shipped with the following documentation:

- Commercial Invoice
- Bill of lading
- Packing Slip
- Declaration of origin
- Delivery Note
- Certificate of Conformance

Paperwork must be clear, legible and written in English. All paperwork should reference the purchase order number. If Apollo templates for delivery note, packing slip or C of C are required these can be supplied on request from purchaser.
Please refer to section 4.0 for information on Certificate of Conformity requirements.

Where shipment consists of a number of pallets, packing slip should detail parts and quantities on each pallet, and pallets should be clearly numbered. Different parts should be grouped together in a logical manner to minimise need for stripping down pallets on arrival at Apollo warehouse.
(See section 2.1 Pallet Do's and Don'ts)

1.4 UK Shipments

All goods should be supplied to the delivery address detailed on Apollo's Purchase Order.

Apollo requires all items to be shipped with the following documentation:

- Delivery Note
- Certificate of Conformance

Paperwork must be clear and legible. All paperwork should reference the purchase order number. Please refer to section 4.0 for information on Certificate of Conformity requirements

1.5 Country of origin

The supplier should make available details of the country of origin of any goods supplied to Apollo if requested. The supplier must provide a Certificate of Origin if requested

1.6 Harmonized System (HS) Codes)

The supplier should provide HS Codes whenever requested by Apollo. The Supplier will bear any costs incurred by Apollo as a result of incorrect information being provided.

2 Packaging

Where feasible, the preference is to minimise cardboard use and implement returnable packaging. This will be discussed with your purchaser at quote stage. Examples of returnable packaging are shown below.

Returnable Stillage

Tote Bins

Where returnable packaging is used, the supplier must identify packaging with an identifiable two or three letter code so that it can be returned to the correct vendor. The supplier must also remove all old labelling from packaging prior to each use.

The Apollo Goods In department deal with millions of incoming parts each month. It is expected that the supplier will work with purchasing and goods in to make the process as simple as possible.

Where more than one part is supplied on the same pallet, boxes should be consolidated together on pallet so as to minimise need to strip down pallet. All parts supplied should be listed on packing list where one is present. In this case pallets should be clearly numbered.

All reasonable attempts to protect parts on pallets should be taken, including secure wrapping and weatherproofing where possible.

2.1Packaging DOs and DON'Ts

Pallets, especially those that have a long way to travel, should be secure and robust. Below is an example of what not to do – our goods inwards dept see both extremes regularly. Please ensure that all efforts are taken to maintain the integrity of the packaging – please take the distance and method of transport into consideration.

No good **Good**

2.2 Returnable packaging

Where stillages are being used, goods should not be packed above the level of the stillage, so that stillages can be stacked and will fit into our racking.
Where totes are being used goods should be packed in a manner that allows lids to shut flush.

3.0 Labelling

As a minimum, all deliveries should contain labelling and documentation with the following information:

3.1 Delivery Note

All deliveries should be accompanied with a delivery note detailing;

- Supplier
- Apollo part number for each PO line
- Delivery quantity for each PO line
- Line quantity to follow
- Purchase order number
- Delivery number
- Date
- Revision number

3.1 Item label

Items, or item packaging should be labelled with;

- Apollo Part Number
- Part description
- Box quantity
- Date code
- Batch number
- Revision number

3.2 Carton Label

Each carton should be labelled with;

- Apollo company name & delivery address
- Purchase Order Number,
- Carton number (e.g. 1 of 2)
- Reel quantity (where applicable to electronic components)
- Revision number

4.0 Certificates of Conformity

Where applicable, Apollo suppliers will be required to provide Certificates of Conformity for goods supplied. The level of traceability required will be confirmed at quoting stage.

As a minimum the certificate of conformity will be a statement of conformity as part of the delivery paperwork.

To comply with our UL certification it will be necessary to supply a detailed certificate of conformity to meet UL requirements on raw material traceability. These certificates should show the following for each part number supplied.

- Material part ID
- Material description.
- Material supplier batch number
- % Content of reground material

Where this is required Apollo can supply suitable templates and advice.

5.0 Barcoding

Where barcoding of components or parts is required – usually for electronic components, this will be discussed with purchaser at the quoting stage and a suitable barcoding model will be agreed.

6. Planning, Stockholding and Kanban

1.0 Promise to Market

Apollo Fire Detectors commitment to customers is next day delivery on UK orders placed before 3pm, with the exception of some branded products. Combined with a focus on minimising our inventory and an output of up to 30,000 units per day, it is no surprise that feeding the Apollo supply chain can be challenging. Our planners constantly analyse historical data and market intelligence to provide the supply chain with as much forecasting and information as possible, however we do expect high levels of flexibility and responsiveness from our suppliers and, in fact, this is an area we score as part of the QBR process.

1.1 Forecasting

All suppliers will receive regular forecasts. These forecasts will give our predicted requirements for the following 12 months. It lists all open and planned orders. The forecast is based on 3 years' worth of sales history data and market intelligence. Outside this data there are always special projects and orders that are difficult to predict.

The forecast is created and reviewed based on sales history, seasonality patterns and market intelligence, incorporating appropriate algorithms for the type of product in question.

Some unforeseen spikes are natural in a project driven marketplace, however our forecasting process aims to minimise the impact through maintaining appropriate stock levels and utilising early-warning systems.

As our data is constantly updated the forecast is reissued each month. Suppliers should review this forecast on receipt and advise Apollo of any potential issues.

1.2 Forecast example

apollo

Run date 11/02/2019 11:16:45
Order Type Planned & Open Orders

Item ID	Order Type	Back Orders	Future Order	01/02/2019	01/03/2019	01/04/2019	01/05/2019	01/06/2019	01/07/2019	01/08/2019	01/09/2019	01/10/2019	01/11/2019	01/12/2019	01/01/2
xxxxx-xxx	Planned	0	158,000	6,000	10,000	22,000	10,000	12,000	16,000	12,000	14,000	14,000	14,000	16,000	12
xxxxx-xxx	Planned	0	142,000	6,000	9,000	21,000	8,000	10,000	14,000	11,000	12,000	12,000	13,000	15,000	11
xxxxx-xxx	Planned	0	143,000	7,000	8,000	21,000	8,000	11,000	14,000	11,000	12,000	12,000	13,000	15,000	11
xxxxx-xxx	Planned	0	150,000	7,000	9,000	22,000	8,000	11,000	15,000	12,000	12,000	14,000	13,000	15,000	12
xxxxx-xxx	Purchase	0	1,000	1,000											
xxxxx-xxx	Planned	0	158,000	7,000	9,000	24,000	9,000	11,000	16,000	13,000	13,000	14,000	14,000	16,000	12
xxxxx-xxx	Planned	0	1,100						100	100	100			100	
xxxxx-xxx	Planned	0	145,000		10,000	15,000	15,000	10,000	15,000	10,000	15,000	10,000	15,000	15,000	15

The forecast shows any unfulfilled back orders, the total annual demand and then a monthly breakdown of requirements for the next year.

NB: The forecast is an estimate and is not a guarantee of purchase or intention.

1.3 Additional Forecasting and planning tools.

Where required, often for particularly high volume or critical supplied parts, Apollo purchasers may use additional tools to plan or forecast demand, or to adjust stock levels within Apollo or at supplier.

These may include a Line of Balance document. This document may be issued to supplier as required to provide additional analysis and information – example is below.

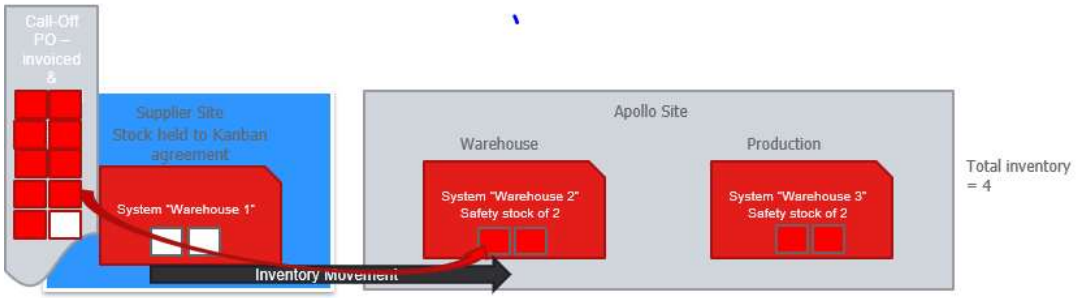
LOB -XXX				Wk 2							wk 3	
Date		05/01/2019	06/01/2019	07/01/2019	08/01/2019	09/01/2019	10/01/2019	11/01/2019	12/01/2019	13/01/2019	14/01/2019	1
Part number: xxx						P144804	P144804				P144804	P1
MOQs xxx	Delivery					40000	40000				40000	
Daily Safety stock xxx	Demand			122,000							160,000	
Lead time - xxx	Balance		280000	158000	158000	198000	238000	238000	238000	238000	118000	
Part number: xxx						P144805	P144805	P144805			P144805	P1
MOQs xxx	Delivery					2000	2000	2000			4000	
Daily Safety stock xxx	Demand			2,200							7,200	
Lead time - xxx	Balance		5000	2800	2800	4800	6800	8800	8800	8800	5600	
Part number: xxx						P144807	P144807	P144807			P144807	P1
MOQs xxx	Delivery					2000	2000	2000			2000	
Daily Safety stock xxx	Demand			2600							2200	
Lead time - xxx	Balance		12,000	9,400	9,400	11,400	13,400	15,400	15,400	15,400	15,200	

A line of balance is used to give the purchaser a detailed forecast of stock levels. This may be used where there are potential issues in supply or long lead times apply. It gives an easy to understand view of scheduled deliveries vs daily usage and allows purchaser and supplier to readily identify any gaps in continuity of supply.

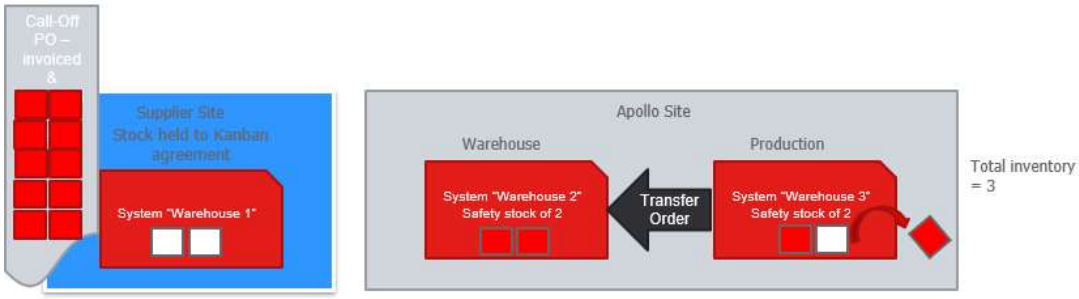
2.0 Kanban Replenishment

In order to fulfil the Apollo promise to market, a Kanban replenishment model is used with many suppliers. The sequence below illustrates how this works.

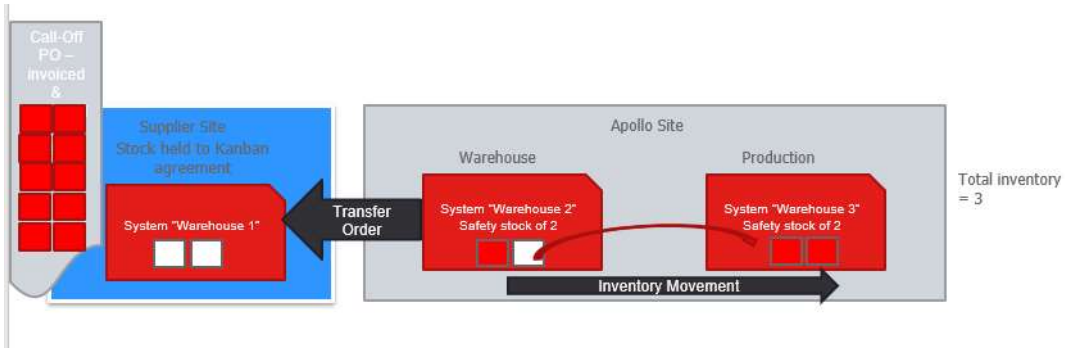
1. **Start point – Apollo are fully stocked from an agreed level held at supplier ready for call off.**



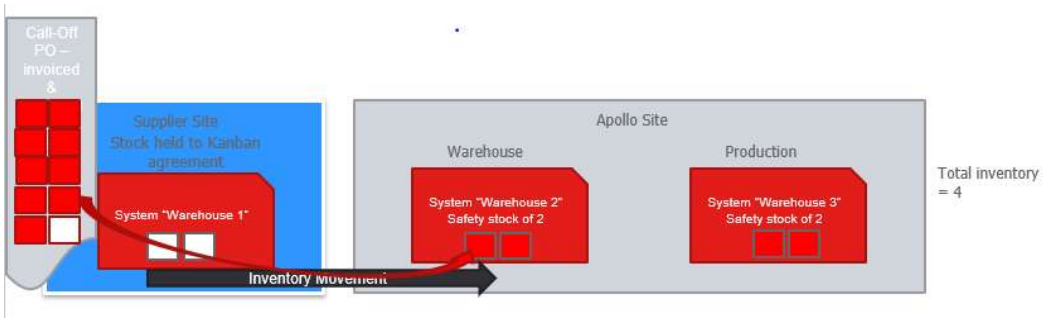
2. **When a unit is used in production a transfer order requests a replacement from Apollo Warehouse.**



3. **A release note is issued to supplier, ordering a replacement unit against the blanket PO.**



4. **Supplier delivers to Apollo from buffer stock to replenish Apollo warehouse.**



In this case the supplier agrees to hold buffer stock and to replenish Apollo stock levels to an agreed level as often as required, working from a call off/blanket purchase order. Apollo issue a release note when parts are required (as shown below). This is the preferred supply model for high volume parts and components.

Call Off Note

	Vendor		G100	
Item Number	Vendor	Box Qty	Quantity Required	Boxes Required
21888-025	G100	50	100	2
38531-772ION	G100	3300	0	0
38531-773	G100	3300	3300	1
38531-777	G100	1000	0	0
38531-780	G100	10800	0	0
38531-784	G100	5000	0	0
38531-788	G100	1000	0	0
38531-796	G100	1000	0	0

Where a Kanban model applies a “Kanban document” (Appendix 6.1) may be used. The Kanban Document is a working document and includes the rolling 12 month forecast and buffer stock quantities to be used in parallel with a stockholding agreement.

Apollo will send the Kanban document on a regular basis. The supplier should acknowledge the Kanban document within 5 working days of receipt. Apollo and the supplier will review stock and WIP Levels on a regular basis, against the rolling 12-month forecast.

2.1 Stockholding agreements

As part of the Kanban model, Apollo and the Supplier will enter into a stockholding agreement, an example of which is shown in (Appendix 6.2)

In these cases, usually a min/max level of stock to be held at supplier is agreed and Apollo guarantee purchase of finished goods and WIP against the Kanban forecast.

Where a stock holding agreement is in force Apollo reserve the right to audit stock levels at supplier’s site, providing reasonable notice is given.

2.3 Other Supply Models

Due to the varied nature of components used in the production process other supply models are sometimes used.

Vendor Managed Inventory

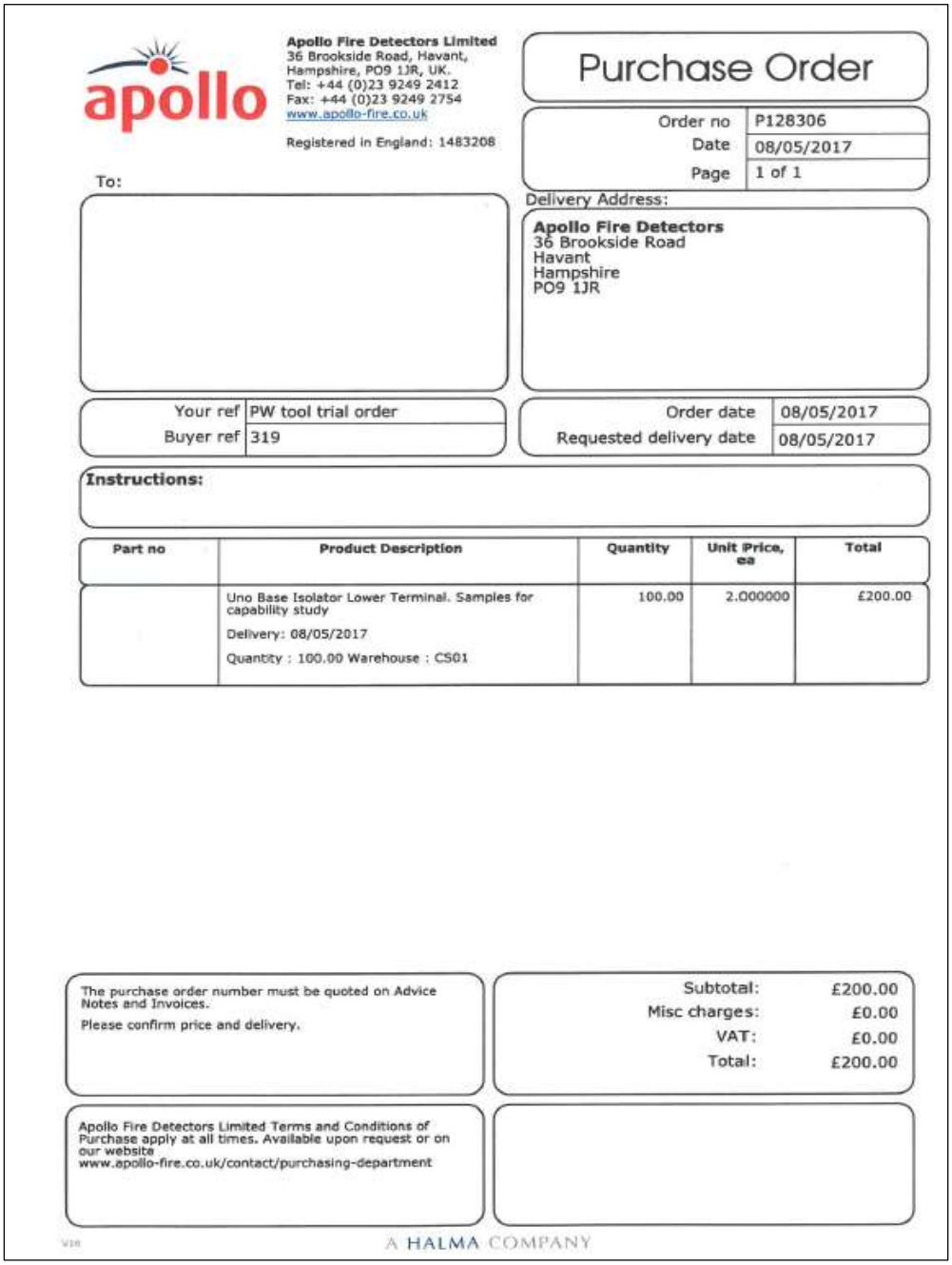
Some commodities, like packaging or screws for example are purchased using a VMI model. In this case the supplier is responsible for restocking the racks or production lines. The supplier representative will have access to Apollo warehouse or manufacturing areas as applicable.

Consignment Stock

In this case an agreement will be entered into which allows the use of an offsite warehouse to manage a consignment stock of parts. The stock usually remains the property of the supplier until called off by Apollo at which point the supplier may invoice. This is particularly useful where regular deliveries of a high-volume part are not possible due to logistics or geographical location.

3.0 Purchase orders

For all models, at some stage of the process, a purchase order will be raised. Below is an example of an Apollo purchase order. When received a purchase order should be acknowledged, with confirmation of acceptance of delivery date, within 24 hours.



apollo

Apollo Fire Detectors Limited
36 Brookside Road, Havant,
Hampshire, PO9 1JR, UK.
Tel: +44 (0)23 9249 2412
Fax: +44 (0)23 9249 2754
www.apollo-fire.co.uk

Registered in England: 1483208

Purchase Order

Order no	P128306
Date	08/05/2017
Page	1 of 1

To:

Delivery Address:

Apollo Fire Detectors
36 Brookside Road
Havant
Hampshire
PO9 1JR

Your ref	PW tool trial order
Buyer ref	319

Order date	08/05/2017
Requested delivery date	08/05/2017

Instructions:

Part no	Product Description	Quantity	Unit Price, ea	Total
	Uno Base Isolator Lower Terminal. Samples for capability study Delivery: 08/05/2017 Quantity : 100.00 Warehouse : CS01	100.00	2.000000	£200.00

The purchase order number must be quoted on Advice Notes and Invoices.

Please confirm price and delivery.

Subtotal:	£200.00
Misc charges:	£0.00
VAT:	£0.00
Total:	£200.00

Apollo Fire Detectors Limited Terms and Conditions of Purchase apply at all times. Available upon request or on our website www.apollo-fire.co.uk/contact/purchasing-department

A HALMA COMPANY

Once PO is raised and acknowledged it is time to start supplying…….!

Appendix 6.1 – Kanban Document

Item Info			12 Month Forecast - Rolling												Buffer levels							
Product	Item ID	Price	1	2	3	4	5	6	7	8	9	10	11	12	WIP & Materials cover	Wip & Materials exposure	Stock holding - finished	finished goods exposure	Finished Goods Carryover	Adjustment	Buffer Stock Holding	Month Cover
															-	£ -	-	£ -	-			3
															-	£ -	-	£ -	-			3
															-	£ -	-	£ -	-			3
															-	£ -	-	£ -	-			3
															-	£ -	-	£ -	-			3
															-	£ -	-	£ -	-			3
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															-	£ -	-	£ -	-			3
															-	£ -	-	£ -	-			3
															-	£ -	-	£ -	-			3
															-	£ -	-	£ -	-			3

Percentage cover	WIP
80%	N

Agreement Exposure (£)	
Finished goods total	£ -
WIP Total	£ -
Grand Total	**£ -**
Exposure including Carryover	
Finished goods total	£ -
WIP Total	£ -
Grand Total	£ -

Appendix 6.2 - Stockholding Agreement

Stock Holding Agreement

Commencement Date: xxxx

BUYER:	**Apollo Fire Detectors Ltd**	**SELLER:**	**xxx**
Address:	36 Brookside Road Havant, Hampshire PO9 1JR United Kingdom	Address:	xxx
Telephone:	+44 (0) 2392 492412	Telephone:	xxx
E-mail:	xxx	E-mail:	xxx

This Agreement is valid from the Commencement Date and will remain valid until superseded by a replacement agreement countersigned by the relevant Buyer and Seller representative.

The objective of this agreement is to outline the Buyer and Sellers liability for stock held by the Seller against agreed Stock Levels.

Kanban Document

The "Kanban document" included in the appendix is an integral part of this agreement. The Kanban Document is a working document and includes the rolling 12 month forecast and buffer stock quantities. The buyer will send to the seller the Kanban document on a monthly basis. Seller agrees to acknowledge the Kanban document within 5 working days of receipt. The Buyer and Seller agree to review Buffer Stock and WIP Levels on a monthly basis, against the rolling 12-month forecast. For the avoidance of doubt the most recent Kanban document provided by the Buyer will supersede all previous Kanban documents once accepted by Seller. Kanban Document changes will be tracked on the table included in Appendix 1 of this agreement with each revision being assigned a sequential 'issue number'.

Finished Buffer Stocks

It is agreed that the seller will maintain the quantity of finished goods required by this agreement to within +/- 20% of the target buffer stock Levels. The buyer will be held liable for the agreed quantity of buffer stock held by the seller.

Seller agrees to replenish stock as appropriate to maintain the agreed buffer stock level. If after 6 months from the date of manufacture the buyer has not used the stock, or any balance thereof, the buyer will purchase the finished goods stock from the seller at the agreed purchase price at time of their manufacture. Where this is the case, the seller will not replenish the stock level unless specifically requested by the buyer. If the buyer request to reduce any buffer stock quantity, buyer agrees to purchase relevant excess stock from the seller to a maximum of the original target volume plus 20%.

Materials and Work in Progress

The Seller agrees to have sufficient material to meet the supplied forecast and buffer stocks. In the event that buyer reduces required quantities detailed within this agreement, Seller may require Buyer to purchase any excess raw material for which the seller is liable. The buyer agrees to underwrite the value of work in progress (WIP) as identified in the column headed "WIP and materials exposure" in the Kanban Document.

Appendix 6.2 - Stockholding Agreement Pg 2

Any disputes with regard to this agreement must be provided in writing to the other party within five (5) working days of the document being issued. In the event the buyer terminates this agreement, the buyer agrees to purchase all finished stock and identified WIP detailed within this agreement.

The buyer reserves the right to review and specify alternative design(s) when required, providing all finished goods are purchased, and to use material held under this agreement for alternative products.

The Buyer and seller's terms and conditions apply throughout.

Signed

……
xxx
xxx
For and on behalf of Apollo Fire Detectors Ltd.

Signed

……
xxx
xxxx
For and on behalf of xxx

Appendix 2 Stockholding Agreement Pg 3

Kanban Document Revision	Issue Date	Signed by Buyer	Signed by Seller
Apollo Kanban Document - Iss1			

7. Supplier performance and review

1.0 Supplier Performance Measurement

Apollo are committed to long term mutually beneficial relationships with their suppliers. As part of this strategy there is a commitment from Apollo to proactively manage relationships and to work with suppliers to drive continuous improvement. The first stage of this process is performance measurement. This is managed through the SPR process.

1.1 Supplier Performance Report (SPR)

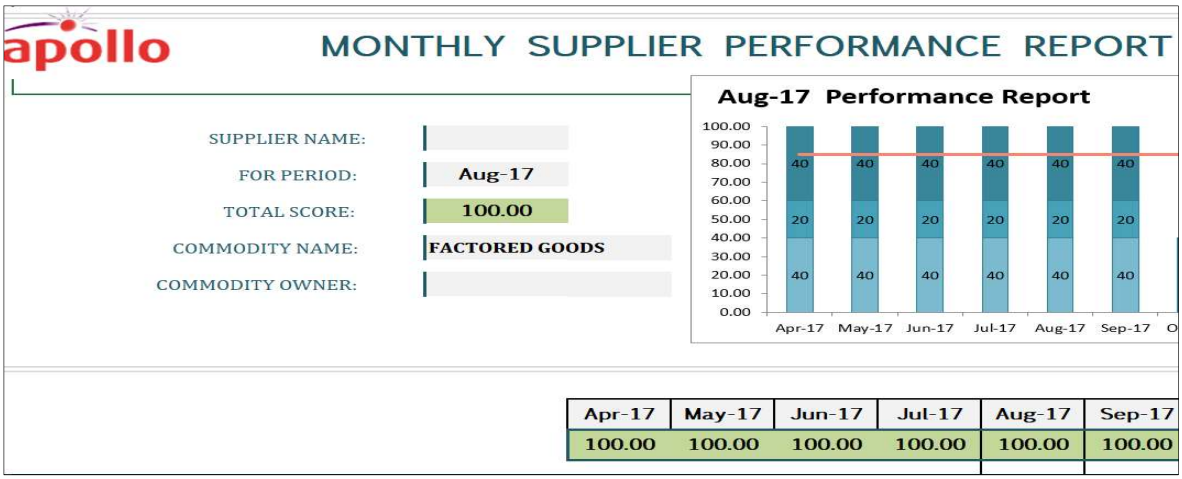
The Supplier's performance is examined against three key criteria which build to an overall measure out of 100. The measurements dimensions are weighted according to business impact and are added together to give a full picture of performance, based on the standard principles of Quality, Cost and Delivery.

1.2 SPR Measurement Criteria

Weighting of SPR categories:

Quality (40%)
Commercial (20%)
Delivery (40%)

Each measurement criteria consists of several sub-measures, which may have different weightings and combine to reflect performance in those criteria.



An example of a SPR overview sheet is shown above.

Quality inputs – These are based around the SIR process (see section K). Number of SIRs raised in a month are noted, as well as the quality of response, speed of containment, effectiveness of corrective actions, and impact of any issues. These scores are provided by the Supplier Quality Dept. The Quality section score of an SPR amounts to 40%.

Commercial inputs – The commercial section looks at invoice discrepancies each month, as well as the purchaser's perception of the Supplier's Flexibility and Responsiveness. This will, by necessity, be

subjective to a degree but will include ease of communication, willingness to “go the extra mile”, and ability to react quickly to issues as they occur. Commercial section of the SPR is 20%.

Delivery inputs – Delivery score is based on an On Time in Full calculation, which considers both early and late deliveries The Delivery section is worth 40%.

1.3 Performance Requirements

Apollo expects an overall SPR score greater than 95. Apollo defines ‘poor performance’ as a score of less than 80 in any scoring period; or less than 85 in three consecutive scoring periods.

Apollo will require an improvement and corrective action plan after notifying a supplier of poor performance. This plan should be reviewed and agreed with Apollo.

Following poor performance Apollo will withhold any new business from the Supplier until the score improves to 95 over the subsequent scoring period.

Apollo will use the data gathered as part of its SPR programme in awarding new business and reviewing the supply base.

1.4 Issue of SPR

Supplier Performance reports are not issued monthly as standard, however where required the relevant purchaser may issue an SPR by email. Upon receipt, the supplier should review the data contained within the report and return a signed copy to an authorised representative of Apollo no more than three Business days after receipt. If the supplier fails to respond, the score will be recorded as accepted.

2.0 Business Review

Apollo may decide to hold business reviews, no more than once per quarter, unless a supplier is deemed to have ‘poor performance’, in which case more frequent reviews may be required.

In these cases, Apollo expects an authorised representative of the supplier to be made available given no less than two weeks’ notice, either at Apollo or the supplier premises. This will normally be a review of three months performance as well as other agenda items. It will normally be attended by the relevant purchaser and any other Apollo representatives who may have input, i.e. Supplier Quality, NPI team, Logistics etc.

These reviews are also a chance for suppliers to give an update on any other projects as well as to get a business update from Apollo, or to air any issues or grievances which need attention.

8. Process Control and Measurement

1.0 Process Control and Measurement

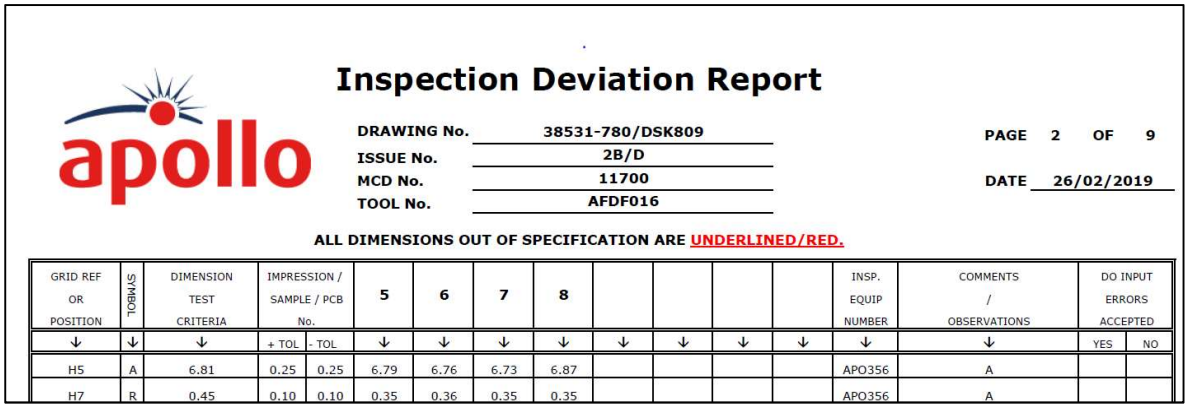
Apollo expect their suppliers to reliably control variance within their processes and monitor and measure outputs to a level that ensures parts always conform. As stated previously, the Apollo strategy relies not on incoming inspection, but on effective Quality Management throughout the supply chain which allows us to ship most parts straight to our manufacturing departments.

Before a product is released for production the supplier will be required to demonstrate the product meets specification and that they have control of variation in order to reliably produce good product. This will generally be addressed through documents submitted as part of the MCD process. (section C)

In all cases, the supplier may use their own documentation or an Apollo template. Where the supplier uses their own template, this should provide the same level of detail as the Apollo document.

2.0 Initial Sample Inspection Report

This will be completed as part of the initial measurement of parts. An example is shown in Appendix H1.



Inspection Deviation Report

DRAWING No. 38531-780/DSK809
ISSUE No. 2B/D
MCD No. 11700
TOOL No. AFDF016

PAGE 2 OF 9
DATE 26/02/2019

ALL DIMENSIONS OUT OF SPECIFICATION ARE UNDERLINED/RED.

GRID REF OR POSITION	SYMBOL	DIMENSION TEST CRITERIA	IMPRESSION / SAMPLE / PCB No.		5	6	7	8					INSP. EQUIP NUMBER	COMMENTS / OBSERVATIONS	DO INPUT ERRORS ACCEPTED	
↓	↓	↓	+ TOL	- TOL	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	YES	NO
H5	A	6.81	0.25	0.25	6.79	6.76	6.73	6.87					APO356	A		
H7	R	0.45	0.10	0.10	0.35	0.36	0.35	0.35					APO356	A		

The ISIR should cover all dimensions shown on the Apollo drawing. It should show dimension and location, nominal requirement, tolerances used, and inspection equipment used for traceability of calibration. The form used should highlight out of tolerance dimensions, so for this activity the Apollo form is recommended. Inspection will normally be carried out on 1 part, or where multi impression tooling is used – one complete shot of parts.

2.1 Capability Study

Where requested, during the qualification run and normally in parallel with the ISIR, the supplier will sample from an appropriate number of pieces that represent the distribution of the process. From these pieces the supplier will perform a capability study on all critical and process control dimensions highlighted on the drawing. This will be reviewed as part of the MCD approval process. Normally Apollo will aim for a Ppk value >1.33 as standard.

2.2 Quality Control Plan (QCP)

Where applicable, the supplier should compile a QCP describing how all process, quality and inspection steps will be executed and monitored throughout the process. The QCP is a map of the systems, tools, gauges and equipment used to control the quality of the part minimizing process and product variation. All control characteristics (e.g., critical, major, minor, significant, process control, etc.) and validation activity must be identified and addressed on the QCP. The QCP must be produced before release and then updated to reflect changes over the life of the product. Control plans should be available for Apollo to audit upon request.

2.3 Measurement System Analysis (MSA)

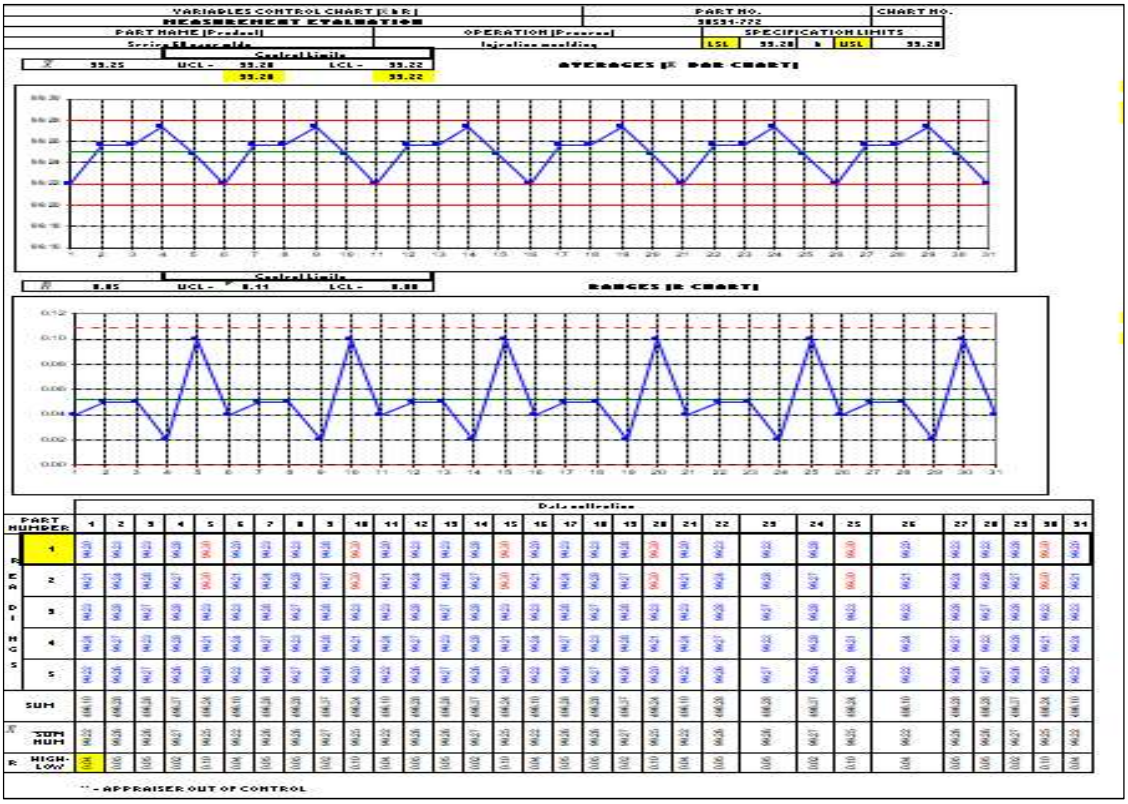
Where required, measuring strategies for CTQ variable control characteristics must be studied by applying MSA principles. All measurement gauges shall be calibrated and controlled by the supplier`s reference procedure. Gauge studies for variable measurements must use a minimum 3 operators, 3 trials and 10 pieces in a GR&R analysis. Attribute Agreement analysis must use a minimum 2 trials and 30 sample pieces.

Limits: All variable measurement systems must pass with a GR&R value less than 10%

2.4 In process control charts –

Throughout product life it is expected that the supplier will monitor their process using the process control dimensions noted on the drawing. As a rule, Apollo will only specify one process control dimension – this will be indicated by a clear diamond shown next to the dimension. Critical dimensions are indicated by a black diamond. Critical dimensions should be measured at the beginning of each run. During the manufacture of parts, the supplier should employ the use of control charts to monitor the process, as well as the control characteristics.

An example of a typical control chart is shown below.



5 parts are measured at regular intervals throughout the manufacturing run and the sheet will automatically plot control limits. Users of these charts should be sufficiently competent and trained to identify trends prior to parts moving out of tolerance. It is expected that suppliers will utilise tools of this kind to ensure that there is minimal variance within Apollo product.

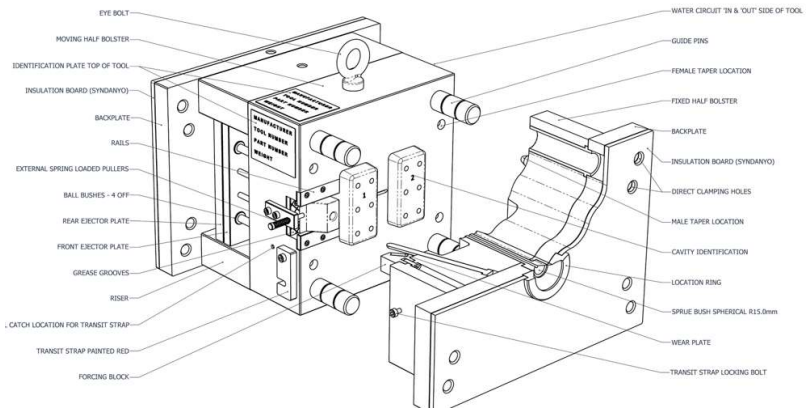
Where training in the use of control charts, templates or any further assistance is required, Apollo is happy to visit or accommodate suppliers to assist.

9. Customer Property, Tooling and Machinery

1.0 Introduction

As part of the Apollo Supply Chain, it will often be the case that tooling, machinery, jigs and fixtures will be required in production. Depending on the nature of the business or project, this equipment may be either supplier or customer owned – but in both cases will be critical to continuity of supply. In all scenarios there are expectations for both parties for how this equipment is purchased, maintained and replaced.

2.0 Mould tooling



2.1 Design and manufacture of Mould Tooling

Where it is necessary to design or replace mould tooling for injection moulded parts Apollo will commission mould tooling to be manufactured. Apollo will supply and own the CAD model of component design. This will be sent to toolmakers/moulders with details of tooling configuration suggested – suppliers should then respond with a quote.

The preferred business model for Apollo is for the moulder/toolmaker to manage and control the manufacture of tooling, though Apollo shall have the final say in choice of subcontract toolmaker.

Depending on circumstance, Apollo reserves the right to pay the toolmaker directly or pay supplier directly. If the latter, Apollo accepts no responsibility for contracts between supplier and third party.

During the tool design process, the supplier is expected to supply a comprehensive DFM (Design for Manufacture) for review with Apollo prior to tool design.

On completion of the tool design this will be reviewed and approved by Apollo and the supplier prior to manufacture of tooling.

All tools will be manufactured to the Apollo Mould Tooling Specification (SC0004) attached in Appendix 9.1. This will be issued to the supplier at the beginning of the project with the RFQ (request for quote).

Apollo reserve the right to attend tool trials as and when deemed necessary.

2.2 Care, Maintenance and Warranty of mould and press tooling owned by Apollo.

Tooling is a business-critical asset for Apollo and it is expected that our suppliers will take all required actions to ensure it is maintained and kept in good working condition.

2.3 Warranty of new tooling.

Warranty for new tooling will depend on many factors, but in general the following will apply as a minimum.

We expect that the supplier will guarantee, through good handling and regular tool maintenance:

- Where unfilled materials are used that tooling achieves a min of 1M shots or more
- Where Carbon Fibre filled materials are used that tooling achieves a min of 1M shots or more
- Where Glass Fibre filled materials are used that tooling achieves a min of 500K shots or more.

Apollo will not be held liable for any breakdown, repair or maintenance costs incurred during this warranty period. Details of exact warranty terms should be agreed at RFQ stage.

2.4 Transferred tooling

In the case of legacy tooling transferred from another supplier, agreement will be reached on all relevant conditions following inspection of tooling by Apollo and Supplier.

Where a transferred tool requires maintenance or repair following transfer from another supplier, agreement should be reached on costs for this with Apollo prior to work commencing.

2.5 Care/Maintenance of tooling

In most cases mould tooling will remain property of Apollo. Where this is the case the following will apply:

- All tooling paid for by Apollo will be the unconditional property of Apollo, and we reserve the right to obsolete, quarantine, move or transfer tooling in line with quality requirements or business strategy. All tooling is to be stored in a secure, safe area away from hazards and suitably covered by the supplier's insurance policy.
- Tools should be located in an easily retrievable manner, preferably grouped together in a designated Apollo location.
- As stated in SC0004 (Appendix 1) all tools will be initially manufactured with a plaque showing Apollo asset number and property plaque. This must always remain intact and legible. Supplier may identify tooling with their own tooling number in a clear, tidy and legible manner.
- The supplier will maintain the tools in good working order, implementing regular cleaning and maintenance programs, which may be viewed/audited by an Apollo representative if required. General maintenance costs and repairs relating to normal use (i.e. strip and clean, ejector pin/seal replacement etc) will be the responsibility of the supplier.
- The supplier will ensure that tooling is set up correctly, in accordance with the relevant specifications/material datasheets and will be responsible for repairing any damage to tooling due to incorrect tool or machine setting.
- The supplier will ensure that the tooling is readily available for inspection by Apollo at any reasonable time.

- The supplier will guarantee that the tooling will not be moved to any other premises, or modified in any way, without express written approval from Apollo.

2.6 Tool breakdown

- In case of a tooling breakdown then Apollo should be notified immediately using the email toolbreakdown@apollo-fire.com. No work should be commenced until the purchaser has confirmed that there is enough stock in place to release tooling for repair.
- Where a breakdown occurs that is outside warranty then Apollo will cover the cost of the repair. Apollo will reserve the right to select the toolmaker for these activities. The supplier should submit the most competitive possible quote for repair, and this should be approved by Apollo prior to any work being undertaken.
- On completion of repair tooling should be trialled at supplier's cost, this will often continue into a production run. Where Apollo have stipulated that repair work is carried out by a specified toolmaker other than supplier, minimal tool trial costs can be applied by supplier where the trial is unsuccessful.
- On completion of repair, approval of the work should be initially undertaken by supplier QA dept. Samples may also be submitted to Apollo for inspection if requested. Where samples are submitted they should be accompanied with the relevant inspection paperwork through the MCD process as detailed in section 3.

3.0 Machinery, Jigs and fixtures.

Often as part of a project it will be necessary to use jigs, fixtures and machinery to produce or assemble Apollo parts. Examples of this are –

Measurement Jigs
Pneumatic presses
Final test equipment
Automated assembly lines

- Apollo policy is that wherever possible this equipment will be owned and maintained by the supplier.
- Where assistance is needed with design then the Apollo manufacturing engineering team may assist with providing drawings or design assistance.
- Where capital investment is required then the responsibility, ownership of the asset and responsibility for repair will be negotiated at the start of the project.
- The supplier will maintain the asset in good working order, implementing regular cleaning and maintenance programs. which may be viewed/audited by an Apollo representative if required.
- The supplier will ensure that the equipment is readily available for inspection by Apollo at any reasonable time.
- General maintenance costs and repairs relating to normal use will be the responsibility of the supplier in all cases.

- The supplier should ensure that there is sufficient competency within the business to meet the repair/maintenance conditions required.

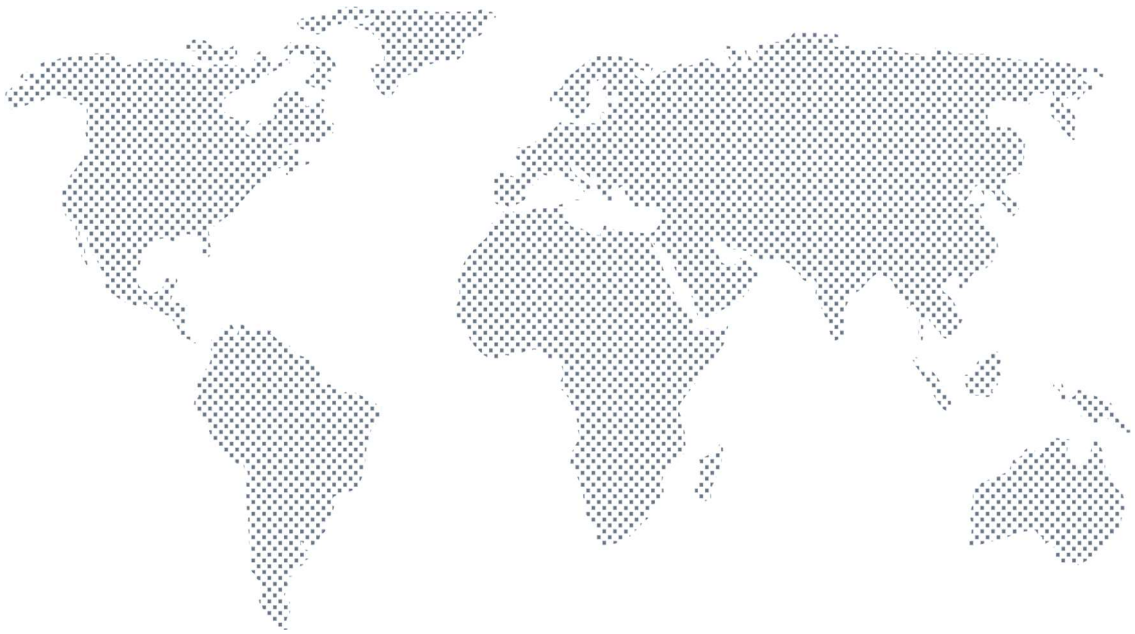
All machinery should be clearly identified with an individual asset number and details of ownership.

Appendix 8.1

1	**Delivery time quoted should be from receipt of approval of GA.**
2	**DFM and Mouldflow will be conducted prior to production of GA unless otherwise specified by Apollo**
3	**It is the responsibilty of the supplier to ensure he has received all necessary information required to maintain the agreed delivery schedule.**
4	**The supplier must provide a full set of drawings relating to each individual tool detailing machine press specifications, mould shrinkage, feed gates, water, ejection and die material specification. Apollo must approve this tool GA by email prior to commencing manufacture of tooling.**
5	**Unless otherwise agreed the tool price is to include cost of tool trials prior to delivery. Tool will only be accepted when sample mouldings are acceptable - Minimum 20 samples or otherwise as discussed with supplier. Process settings to be supplied with tool trial samples prior to delivery of tool.**
6	**The tie bars of the specified Press to be superimposed on the tool GA**
7	**The supplier is to arrange delivery of tools to the address specified by Apollo.**
8	**Location ring size to suit relevant machine specification, supplied by Apollo.**
9	**The Tool shall be identified with Tool number, Part number, Tool manufacturer & Tool weight on the top and operator side of tool.**
10	**The tool shall be permanently marked "Property of Apollo Fire Detectors Ltd"**
11	**Tool materials will be specified as part of quote and agreed by Apollo. Toolmaker will supply steel certificates on request and as part of package.**
12	**Where requested toolmaker will provide a breakdown of quote into parts, machine hours, labour, shipping, margin etc.**
13	**Hot runner system/manufacturer will be agreed between supplier and Apollo.**
14	**Direct clamping holes to suit machine specified by Apollo.**
15	**Bolt holes for safe attachment of lifting straps.**
16	**Tools with side cores to be fitted with microswitch(s) on ejection.Ejector pins positioned beneath sliding cores to be held back with neoprene buffers.**
17	**Impressions may be marked with impression number, recycling mark, part number - per component drawing notes. Where date clocks are required, two clocks should be used – 1 for month, 1 for year.**

18	**Insulation plates to be fitted to fixed and moving halves.**
19	**Tools are to be fitted with positive fixed to moving half location (Tapered locks)**
20	**Vulnerable areas to be separately inserted for ease of replacement and maintenance. Areas to be inserted will be agreed at DFM stage with Apollo.**
21	**All main pillars are to be located in the mating half of the tool prior to the engagement of angle dowels & side cores.**
22	**Guide pins and bushes must go through backplates.**
23	**All tools to have efficient capability of automatic de-gating where possible.**
24	**All tools to be cooled with water unless otherwise specified. Waterways to be drilled and fitted with DME compatible water fittings. Water circuits to be clearly marked 'in' & 'out' and numerically numbered. Water connections must not be fitted on top of Tool - If possible position on opposite side to operator. If water connections are positioned on the bottom they should be counterbored otherwise appropriate protection or legs must be incorporated.**
25	**All sliding cores to have spring loaded pillars fitted externally to ensure cores are pulled back to open position.**
26	**All ejectors, cores and sliders to be identified**
27	**Eye bolt thread diameters: M16 = 700kg. M20 = 1200Kg. M24 = 2500kg. M30 = 3600kg.**
28	**Supplier must communicate immediately if any of these standard requirements cause issue with a particular tool design**
29	**Acceptance of PO will indicate the ability of the tooling to produce parts that conform to CAD data and 2D drawings. Deviations must be agreed by Apollo or corrected by supplier.**
30	**Tool to be provided into Apollo or specified address as per the following: Shipped securely in wooden crate Painted with anti rust oil and Provided with spare set of non standard/shaped ejector pins Provided with all final electrodes (where requested) and related drawings Mould tool and heat treatment certificates Mould trial set up sheets Any relevant tooling drawings and data**

10. SIR Process



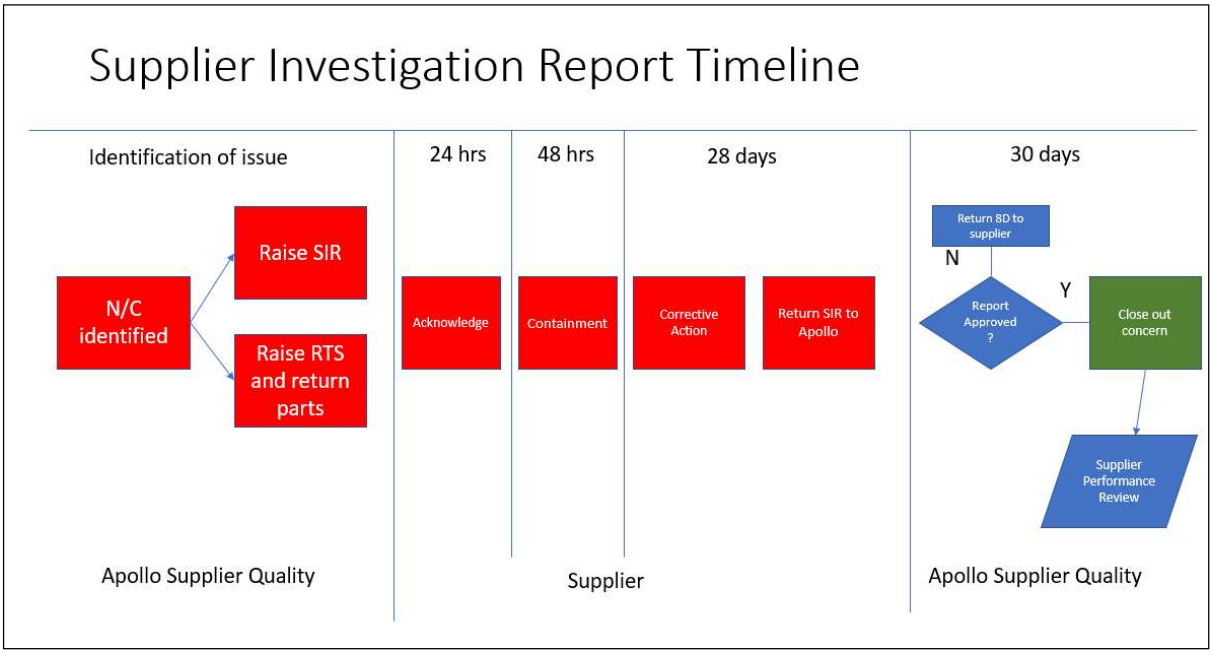
1.0 Introduction

While we all strive to achieve zero defect, we are not there yet so clearly there may be occasions when we encounter non conforming parts delivered from suppliers.

When this happens we use the SIR process to manage the return of parts and the corrective actions required.

This process is owned by the Supplier Quality Dept and the results of this are fed back into the Supplier Performance Reviews, so we do not just monitor the defect rate, but also the rate and quality of the response when something does go wrong.

The figure below shows an overview of the process with an all important timeline. Our aim is to close out all concerns within 30 days.



2.0 Identification Phase

When a non compliance is identified within Apollo, the Supplier Quality team will be notified, and they will decide on disposition of parts and further action.

Where corrective actions are required or parts are to be returned, normally an SIR will be raised. As Apollo try not to hold too much stock onsite, often a quick response to these reports is critical. Generally from the Apollo side, we aim to have raised report, and have goods ready for return on the same day as finding the fault.

3.0 Acknowledgement

Apollo expect that the SIR report will be acknowledged by email within 24 hours of receipt. The acknowledgement should go to the report originator and also to the email group SIR@apollo-fire.com" All correspondence relating to the SIR should be copied to this email address.

4.0 Containment

A key part of the process is containment, ensuring that Apollo stock is checked, no further non conforming parts are supplied, and that good stock is back in the supply chain as quickly as possible. It is imperative that the supplier response allows us to maintain continuity of supply. All good stock supplied following notification of an issue should be clearly identified as inspected and conforming. Close contact with the SQE who raised the report is very important during this phase. Containment must be in place within 24 hours.

5.0 **Report types**

In Appendix K1 is a copy of the report normally used for SIR process by Apollo. This is a basic corrective action report based on the 8D format. Suppliers may use their own 8D report if preferred, and in some cases where there is an in depth investigation required, Apollo may provide a more detailed 8D report for completion, an example of which is Appendix K2.

6.0 8D Completion

The SQE will review the 8D report provided to ensure that the actions are robust. If actions need improvement or more evidence is required, the report may be returned for resubmission. In this case the SQE will agree a timescale for this with the Supplier Quality representative. It is likely in the case of major issues that an Apollo SQE will visit to help verify the actions have been successful.

6.1 Containment Actions

Containment actions should include details of checking activity or rework, both at Apollo and supplier. Defect rate from containment should be included as this will be a baseline to show final improvement when corrective actions are in place. Identification method and date codes of conforming and non conforming parts should be included.

6.2 Corrective Actions

Corrective actions should be based on a verified root cause which has been proven and recreated. It is unlikely that Apollo will accept vague corrective actions such as “operator retraining” as a fix as, in our experience, these never work permanently. Actions should be mechanical or “poke-yoke” wherever possible**.** Actions should be put in place to verify them, and defect rate data from corrected production should be compared with the containment and definition data to prove that actions have been successful.

6.3 Preventive Actions

Preventive actions are designed to ensure similar issues do not occur in any similar parts or processes. The supplier should review all related product and all related manufacturing processes and ensure that verified corrective actions are carried over. Actions should also feature in risk analysis of any future similar projects.

7.0 Apollo Supplier Quality Team

The above notes are a very brief overview of how to complete a corrective action report. At Apollo we have a commitment to help with supplier development wherever possible. The Supplier Quality Team are always available to discuss corrective actions and issues. We would much rather advise on the actions during the process than return an unsatisfactory report. Contact details are in the communications section (L) or through your purchasing representative.

SUPPLIER INVESTIGATION REPORT

Apollo Record No:	
Date:	
Raised by:	
Supplier Name:	

Parts Status:

Part No:	Date Code:	Trace Code:	Supplier Insp. No.	Qty Rejected

Definition of Problem:

Remedial Action Taken at Apollo:

Time Taken at Apollo:

Initial Response (Inc. Containment) Due by:	
Corrective & Preventative Actions Due by:	

CORRECTIVE & PREVENTATIVE ACTIONS TO BE COMPLETED ON PAGE 3 OR SENT BY SEPARATE 8D REPORT (QUOTING THE APOLLO RECORD NUMBER) BY THE DUE DATE ABOVE UNLESS OTHERWISE AGREED

APOLLO FIRE DETECTORS LIMITED, BROOKSIDE ROAD, HAVANT,
HAMPSHIRE PO9 1JR. TELEPHONE: 02392 492412. FAX: 02392 492754

Supplier Containment Action:

Supplier Corrective Action:

Supplier Preventative Action:

Supplier Contact Name: **Date:**

8D PROBLEM SOLVING DOCUMENT

apollo WORLD CLASS FIRE SOLUTIONS

CUSTOMER:

Concern Description	Open Date		Status
			D1 :Team Identified
8D Next review Date	Article Description	Found at:	D2: Defined problem
	Article Number	Qty. Found	D3: Issue is 100% Contained
	Drawing Issue	Batch	D4: Identified Root Cause(s)
	Commodity	Who found it	D5: Chosen Permanent
	Date Found	Reported to	D6: Implemented Permanent
			D7: Prevent Re-Occurrence
			D8: Congratulate Team

ELEMENT 1: Team (Identify Cross Functional Team)

Team Member	Department:	Contact Number
Champion		

ELEMENT 2: Problem Definition (What is wrong with what)

Definition:

IS	IS NOT

ELEMENT 3: Containment Actions

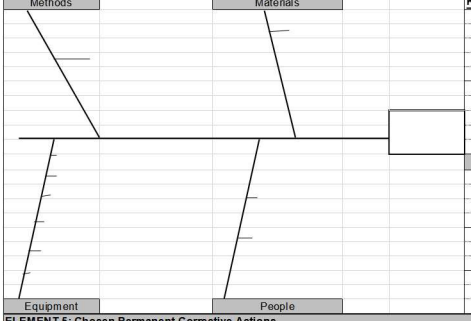
Implemented Actions	Date	Sequence / Batch	Qty Before	Qty After	%Effect

Process Map

ELEMENT 4: Root Cause (s) - 5 Why

Initial Failing		Secondary Failing	
Why 1		Why 1	
Why 2		Why 2	
Why 3		Why 3	
Why 4		Why 4	
Why 5		Why 5	

ELEMENT 4: Root Cause (s) - Fishbone



Key Potentials from Fishbone Analysis

	Reproduce Failure / How	When	%Cont

Escape Cause (s)	Reproduce Failure / How	System / Procedure causes	%Cont

ELEMENT 5: Chosen Permanent Corrective Actions

	Verification	How Validated:	Champion:	Target Date	%Effect

ELEMENT 6: Implemented Permanent Corrective Actions

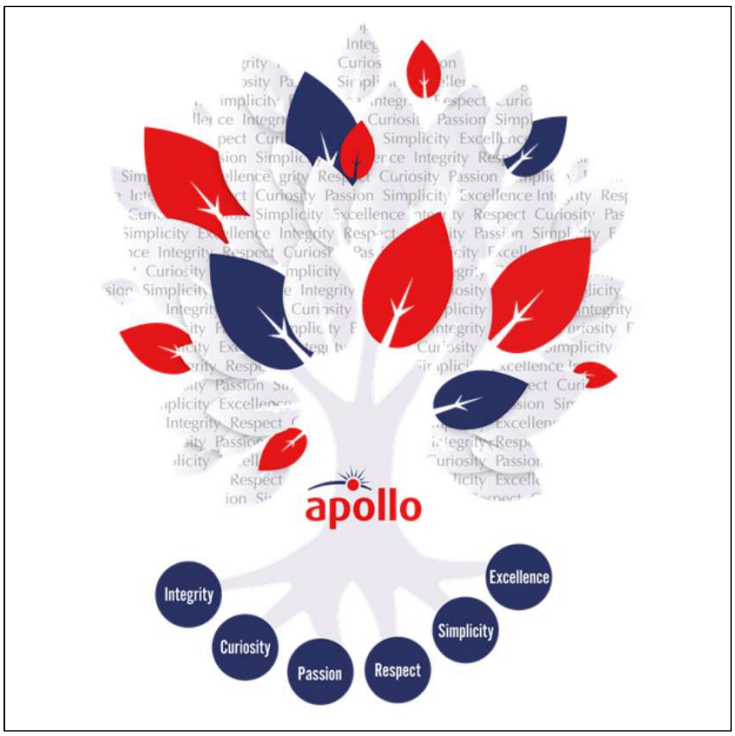
	Impl Date	Seq / Batch Details	Serial Number	QTY Prod	Reject QTY	%Effect	Comments:

ELEMENT 7: Actions To Prevent Re-Occurrence

Procedural Updates:	By	Date	Comments
FMEA			
Work Instruction			
Procedures			
AX - order hold/inspection status?			
Audit Plan			
Other			

ELEMENT 8: Congratulate The Team	Telephone:	Date
Sign Off Quality Manager:		

11. Sustainability, CSR, policies and values



1.0 Values

Apollo and Halma have very clear values and we encourage these to filter down through our supply chain. We also make a commitment to adhere to these values during all dealings with our supply chain, and we welcome your feedback on how we get on in achieving this.

The Apollo values are shown above, no apologies for it being the second time they feature in this book, we really want the message to get across……

2.0 Quality, Environmental and Health and Safety policy

Apollo operate an integrated Quality system which outlines our approach to these important aspects of our company. A copy of this can be seen in appendix (11.1).

3.0 Sustainability

As with our values, we have a very clear strategy on all aspects on sustainability. We expect that our suppliers also have policies and strategies in place to mirror this. Certification where applicable is encouraged, and while this is not a requisite, Apollo will always strive to engage with suppliers who hold the same values as us. Our audit form has a section on sustainability which we will expect supplier to complete prior to any further engagement with Apollo.

Below are extracts from the Apollo statements and policies on key aspects of sustainability and Corporate Social Responsibility.

3.1. Corporate Social Responsibility Statement

A copy of the Apollo CSR statement is attached in appendix. This details our aims with respect to RoHS, REACH, Conflict Minerals and Modern Slavery legislation. Suppliers are expected to conform with activities undertaken by Apollo to ensure compliance.

3.2 RoHS (Restriction of substances Hazardous to Health)

The RoHS directive 2011/65/EU restricts and regulates the use of certain materials in manufacturing including phthalates, lead, mercury, cadmium, chromium, biphenyls and diphenyls.

Apollo send annual questionnaires to our suppliers requiring declaration and technical support data where appropriate to prove compliance. We assess all responses, and use a risk-based methodology to test components and PCBA's where we feel there is a need for further data. This questionnaire should be returned promptly, failure to co-operate with these activities will have an effect on vendor rating reports.

3.3 REACH (Registration, Evaluation, Authorisation and restriction of Chemicals)

Although Apollo is not required to report under this legislation as we do not import sufficient quantities of listed substances, we undertake due diligence throughout our supply chain to ensure that our suppliers meet these requirements. Declarations should be submitted when requested as part of the annual questionnaire.

3.4 Conflict Minerals

Conflict minerals legislation is designed to ensuring that all supplied components are ethically sourced and that within these components there are no minerals sourced from Central African areas that may be involved in human rights abuses, or where the sale of such minerals finances armed conflict. This generally applies to electronic components. Apollo complete a CMRT (Conflict Mineral Reporting Template) annually for their customers. Affected suppliers are expected to do the same and submit to Apollo annually on request.

3.5 Modern Slavery/ Labour conditions

The Halma Group observes the ILO Declaration on Fundamental Principles and Rights at Work which upholds basic values in four areas:

1. Forced Labour
2. Child Labour
3. Freedom of Association and the Right to Collective Bargaining
4. Discrimination.

As part of completion of the Apollo supplier self-audit (sustainability section), suppliers are required to give information on their compliance to the UK Modern Slavery Act 2015 and on labour law and policy. This will be verified by Apollo during on site audits.

During any audit or visit Apollo will look for evidence of compliance to all relevant legislation and for alignment to Apollo values.

Full details of all policies can be found on the Apollo website.

https://www.apollo-fire.co.uk/about/directives-policies

Appendix 11.1 CSR statement

Apollo Fire Detectors – Corporate Social Responsibility Statement

- **General**
- Apollo Fire Detectors is committed to ensuring that its supply chain, products and processes comply to, or exceed, the requirements of all applicable directives. Our vision states we aim to be "*a socially responsible world class manufacturer, operating to the highest ethical and quality standards*". Compliance to RoHS, REACH, Modern Slavery and Conflict Minerals legislation form part of this aim. This statement details the measures taken to ensure conformance and achieve our vision.
- If you require any further information on any of this statement please contact Apollo on 02392 442512 or email AUKcompliance@Apollo-fire.com

- **RoHS Directive 2011/65/EU**
- Apollo is aware of the recent changes to the RoHS Directive 2011/65/EU to add additional restrictions to regulate the use of phthalates in manufacturing. Whilst reviewing the recent changes (also known as RoHS 3), the decision was taken to undertake a full review of how Apollo manages RoHS compliance.
- Apollo achieves RoHS compliance by assessment of documentation and declarations from our suppliers. This will now be reviewed and refreshed annually in order to capture any changes within the supply chain or further updates to the directive. In order to exceed, rather than merely meet, these requirements, Apollo now also requests that all suppliers return their declaration specifically listing all components supplied.
- Furthermore, a risk based methodology is now used to identify areas or components that may require testing or extra technical documentation based on the recommendations in BS EN 50581.

- **REACH Directive**
- REACH applies to substances manufactured or imported into the EU in quantities of 1 tonne or more per year. As Apollo Fire Detectors does not import substances under these conditions it is not necessary for Apollo to register any substances as part of REACH legislation.
- However, in order to exceed our regulatory requirements, Apollo conducts due diligence to ensure compliance throughout the supply chain. Declarations are requested from all suppliers and these are renewed annually.
- In addition, the Apollo supplier audit form contains questions to verify compliance to the REACH directive. This audit form is completed by all new suppliers, and periodically by existing suppliers.

- **Conflict Minerals**
- Apollo is committed to ensuring that all components are ethically sourced and that within these components there are no minerals sourced from Central African areas that may be involved in human rights abuses, or where the sale of such minerals finances armed conflict. Apollo requires all electronic component suppliers to provide a company level list of approved smelters used, by submitting a CMRT template as recommended by the Responsible Minerals Initiative.
- The data supplied is collated into an Apollo CMRT and this is made available to customers and interested parties on request. Again, this data is refreshed and reviewed on an annual basis, and the supplier audit form requests Conflict Mineral declarations during the supplier selection and audit process.

- **Modern Slavery**
- Apollo Fire Detectors and its parent company, Halma plc, fully support the provisions set out in the Modern Slavery Act 2015. As a company with a turnover of more than £36m, Apollo is obliged to publish an annual statement detailing steps that have been taken to ensure that slavery and human trafficking do not take place in our business and supply chains.
- Through the Halma Code of Conduct, and online training, awareness of Modern Slavery legislation has been heightened across the group.
- The Apollo supply chain sources components worldwide and regularly undertakes audit of suppliers. Prior to engaging with suppliers, due diligence and vetting procedures are in place to ensure that they will meet our ethical standards.
- In 2017/18 Apollo's supplier audit process was expanded to include confirmation from suppliers on their compliance to the act, and new supply contracts now include a standard requiring adherence to the Modern Slavery Act. Nominated compliance experts at Apollo are available to advise suppliers on this legislation.

Appendix 11.2 – Integrated Policy

APOLLO UK POLICY FOR QUALITY, ENVIRONMENT AND HEALTH & SAFETY IN THE WORKPLACE

As a Leadership Team, it is recognised that we have an important responsibility to represent the company and its employees. This is not just being a custodian for today, but also to make positive change for the future. As part of this responsibility, the areas of **Quality**, the **Environment** and **Health & Safety** are core;

The Apollo Vision states,

"....to be a socially responsible World Class Manufacturer, operating to the highest ethical and Quality standards".

Quality is vital in maintaining Apollo's position as a leader in the global market of fire system components. We operate in a life safety environment which is a responsibility we take extremely seriously by providing products of utmost quality and reliability to our customers, enabling them to deliver leading edge life protection systems. Quality is a responsibility of all employees and is not a term to be confined to individual job titles. The key points of our Quality policy are;

- Diligent maintenance of all required regulatory approvals and supporting processes
- Maintaining a set of KPI's and Objectives to support continuous improvement
- Encourage a culture of Quality across the entirety of the organisation.
- Adherence to and continuous development of a Quality Management System.

This commitment includes ensuring that we encourage full cross-functional cooperation to develop a quality culture. This will ensure that all our activities and processes are designed and implemented to drive quality "in everything we do".

The **Environment** is something that all companies and all employees need to take seriously. Our intention is to regularly review the impact of our activities, endeavour to reduce our overall environmental impact and prevent waste using best practice techniques. Given what we do, this is no easy task, but we are committed to monitoring resource efficiency which includes our use of water, energy and raw materials.

The **Health and Safety** of our employees, contractors and visitors is of utmost importance and is reviewed on a daily basis to ensure we not only escalate issues and resolve concerns raised, but that we also proactively look for solutions to prevent risk in the workplace. All our employees are trained, informed and are aware of how to carry out their tasks safely in the workplace. A safe, well maintained environment is paramount to our expectations of being an employer of choice in the local area.

Our overall commitment to these policies include ensuring;

- All the laws and regulations in force are met, maintained and exceeded where possible wherever we conduct business.
- All our employees understand their responsibilities in the development and implementation of our Quality, Environment Management Systems and Health & Safety.
- We work closely with both our customers and suppliers to help us achieve all the above.

We commit to make this policy known and understood by all people operating within the company as well as by all external parties involved in the company activity.

Managing Director: ***Date:*** 14/5/2018

Operations Director: ***Date:*** 14/5/2018

Sales & Marketing Director: ***Date:*** 14/5/18

Technical Director: K. Water ***Date:*** 14-5-2018

Head of Global HR: ***Date:*** 14.5.2018

12 - Communications

Authorised Representatives

Name	Position	Telephone Number	Email address	Escalation
Kristel Vickers Lopez	Buyer (mouldings /fastenings)	02392 442813	Kristel.vickers-lopez@apollo-fire.com	1st Point of contact
Mandy Bradshaw	Buyer (electronics)	02392 442776	Mandy.bradshaw@apollo-fire.com	1st Point of contact
Wesley Goddard	Head of Supply Chain Operations	023 9244 2874/ 07788 312 957	Wesley.Goddard@Apollo-Fire.com	Escalation point of contact
Tooling breakdown	Email group	N/A	toolbreakdown@apollo-fire.com	N/A
Import Documentation	Email group	N/A	imports@apollo-fire.com	N/A
SIR correspondence	Email group	N/A	SIR@apollo-fire.com	N/A

The contact details below can be used to contact authorised Apollo representatives.

Any disputes that are not resolved through the above channels should be sent in writing to:, Wesley Goddard, Head of Supply Chain, 36 Brookside Road, Havant, Hampshire, United Kingdom, PO9 1JR

Other Contacts:

Name	Position	Telephone Number	Email address	Escalation
Phil Wieneke	Supplier Quality Manager	07970 235912	Phil.Wieneke@Apollo-Fire.com	N/A
Chris Burrows	Accounts Clerk		Chris.burrows@Apollo-fire.com	N/A

Supplier Handbook Receipt

On completion of review, please sign and return this page to your purchaser.

I acknowledge receipt of, and agreement to, the terms and conditions described in Apollo Supplier Handbook Revision 3

Received on (Date)

……..

Agreed by (supplier representative)

……..

Agreed on (Date)

……..