African, Caribbean and Pacific Group of States

"COMESA SQAM Action Plan in 3 sectors: Cotton, textiles and garment, light engineering and chemicals and chemical products"

"ACP-EU TBT PROGRAMME"

(REG/FED/022-667)

Project code: EuropeAid 132552/D/SER/Multi

CHEMICAL AND CHEMICAL PRODUCTS NEEDS ASSESSMENT and IMPLEMENTATION PLAN REPORT

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NOVEMBER 2016

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ABBREVIATIONS AND ACRONYMS

ACP	AFRICA, CARIBBEAN AND PACIFIC GROUP OF COUNTRIES
CAB	CONFORMITY ASSESSMENT BODIES
COMESA	COMMON MARKET FOR EASTERN AND SOUTHERN AFRICA
EAC	EAST AFRICAN COMMUNITY
EU	EUROPEAN UNION
ISO	INTERNATIONAL ORGANIZATION FOR STANDARDIZATION
MDAs	MINISTRIES, DEPARTMENTS AND AGENCIES
NAB	NATIONAL ACCREDITATION BODY
NEP	NATIONAL ENQUIRY POINT
NICA	NATIONAL INSPECTORATE AND COMPETITION AUTHORITY
NMI	NATIONAL METROLOGY INSTITUTE
NNA	NATIONAL NOTIFICATION AUTHORITY
NQI	NATIONAL QUALITY INFRASTRUCTURE
NSB	NATIONAL STANDARDIZATION BODY
NTB	NON-TARIFF BARRIERS TO TRADE
OECD	ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT
PSF	PRIVATE SECTOR FEDERATION
QI	QUALITY INFRASTRUCTURE
QM	QUALITY MANUAL
QMS	QUALITY MANAGEMENT SYSTEM

REC	REGIONAL ECONOMIC COMMUNITIES
SANAS	SOUTH AFRICAN NATIONAL ACCREDITATION SYSTEM
SIDA	SWEDISH INTERNATIONAL DEVELOPMENT AGENCY
SMEs	SMALL AND MEDIUM-SIZE ENTERPRISES
SPS	SANITARY AND PHYTO-SANITARY
SQAM	STANDARDISATION, QUALITY ASSURANCE AND METROLOGY
TBT	TECHNICAL BARRIERS TO TRADE
ToRs	TERMS of REFERENCES
WTO	WORLD TRADE ORGANIZATION

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COMESA SQAM ACTION PLAN FOR CHEMICALS AND CHEMICAL PRODUCTS

1. INTRODUCTION

Chemicals and chemical products play an important role in the trade within COMESA countries. A breakdown of the intra-COMESA trade in chemical and chemical products is shown in Annex 1. Chemicals and chemical products are used in agriculture as fertilizers and pesticides, food manufacturing industries as preservatives and additives, plastics industry, as pharmaceuticals and in toiletries for example soaps and cosmetics.

The volume of trade is quite large and there is a need for standards to be developed to cover as much of the products in trade as possible. Despite the large trade volume the capacity of chemical testing laboratories is limited either by expertise, equipment or organizational prioritization. There is also a large disparity between different countries laboratories, especially the CAB laboratories in the scope of tests that can be done.

There is a need for a clear road-map of how the laboratories can be brought to a level whereby they are able to undertake their mandates effectively and efficiently.

2. CATEGORIES OF STANDARDS REQUIREMENTS

A standard as defined by ISO is a document that provides requirements, specifications, guidelines or characteristics that can be used consistently to ensure that materials, products, processes and services are fit for their purpose.

Based on the analysis of chemical and chemical standards, it is recommended that the standards required be developed under the following categories.

a) Specification

This is an explicit set of requirements to be satisfied by a material, product, system or service.

Examples of specifications include, but are not limited to, requirements for: physical, mechanical, or chemical properties, and safety, quality, or performance criteria. A specification identifies the test methods for determining whether each of the requirements is satisfied.

Rationale

Specifications serve to facilitate trade, to create standardization in production hence lowering manufacturing costs and, to provide technical data for product design and development.

b) Test Method

This is a definitive procedure that produces test result.

COMESA test methods found in the analysis are again adopted from international (ISO) test methods. It is imperative that test method be developed for most common products traded in the COMESA region.

Rationale

A test method usually includes a concise description of an orderly procedure for determining a property or constituent of a material, an assembly of materials or a product. All details regarding apparatus, test specimen, procedure, and calculations needed to achieve satisfactory precision and bias should be included in a test method.

In trade, it is important to be able to measure accurately the variable that adds value to a product. This eliminates disputes and maintains the value of a product and confidence in the trading parties. A good test method is also important in cases of disputes and disagreements over quality or adherence to specifications.

c) Codes of Practice

This is a definitive set of instructions for performing one or more specific operation that does not include a test result.

A practice underscores a general usage principle. Incidentally, practices are the few in selected chemical and chemical products and non-existent in the majority of these products in COMESA.

Rationale

In a situation where harmonization of standards is challenging due to diverse REC needs, codes of practice are usually a good beginning in building consensus before enactment of binding standards.

Practices include, but are not limited to: application, assessment, cleaning, collection, decontamination, inspection, installation, preparation, sampling, screening, and training. All these are present and urgent needs in the COMESA region.

d) Guide

This is a compendium of information or series of options that does not recommend a specific course of action.

A guide proposes a series of options or instructions that offer direction without recommending a definite course of action.

Rationale

For COMESA, guides can be important in increasing awareness of traders or users of various commodities concerning available techniques in a given subject area, while providing information from which subsequent codes of practice, specifications and testing programs can be derived.

e) Terminology/ Fundamental Standard

These are important documents comprising definitions of terms; explanations of symbols, abbreviations, or acronyms.

Rationale

This collection of definitions and, occasionally, symbols, abbreviations and acronyms give clarity to the other categories of standards by way of defining variables in a way that is understood by all concerned parties.

3. SITUATIONAL ANALYSIS OF STANDARDS TO BE ADOPTED/DEVELOPMENT IN CHEMICAL AND CHEMICAL PRODUCTS

Introduction

COMESA chemical and chemical products fall under the following categories:

Table 1: Classes Of Chemical And Chemical Products

CHEMICAL CATEGORY	CODE
Organic Chemicals	51*****
Inorganic Chemicals	52*****
Essential Oils And Resinoids And Perfume Materials;Toilet,Polishing And Cleansing Preparations	55*****
Plastics In Primary Forms	57****
Plastics In Non-Primary Forms	58****
Other Chemical Materials And Products	59****
Dyeing,Tanning And Colouring Materials	53****
Fertilizers	56****

Source: COMSTAT 2016

General Recommendation for Chemical and chemical products

The criterion for the recommendation of the type of standard required was based on the following.

i) Where products are traded rarely and only used by specialists-A guide was recommended.

ii) Where products have an impact on health and safety- A standards and test method was recommended.

iii) Where products have potential to result in economic loses- A standards and test methods was recommended

iv) Where product trade is still in development but expected to grow or is used mainly in manufacture as raw material with the final product to be tested-A code of practice was recommended.

Organic Chemicals

Organic compounds include plastics, synthetic fibers, elastomers, drugs, surface coatings, solvents, detergents, insecticides, herbicides, explosives, gasoline additives, and countless specialty chemicals. Organics in COMESA region are important for the following reasons

i) **Cleansing agents**: In industries and labs, organic solvents are widely used to clear of impurities. These include toluene, hexane and acetone for example.

ii) **Sterilizing agents**: These consist of sterilizing agents and disinfectants like phenol, formaldehyde.

iii) **Analytic substances**: Most substances like drugs, pesticides are analyzed qualitatively and quantitatively using different types of titrations, chromatography techniques, and spectrophotometry. The reagent used like acids or bases or oxidative reductive species are organic compounds.

iv) **Valuables:** These include diamonds, graphite and petroleum.

v) Hazards: Organic compounds released into the atmosphere deplete ozone levels and cause smog. These compounds are byproducts of burning and manufacturing. In particular, volatile organic compounds such as benzene, toluene and xylene create acid rain that destroys plants. These substances react with ozone in the atmosphere to deplete the area of the troposphere that protects life from ultraviolet radiation emitted by the sun

Recommendation

It is recommended that all CABs and Laboratories strive for capabilities to test for organic compounds. There **Test Methods Standards and Specifications** are recommended to ascertain safe levels. Furthermore, a code of practice for the handling, transportation, storage and disposal of these hazards is recommended.

Inorganic Chemicals

Inorganic chemicals include metals, minerals, and organometallic compounds. These form the bulk of chemicals used in the SME industry in COMESA.

Recommendation

Specifications and Test methods are recommended for raw chemical identification. The levels in final products will depend on that product. There should be codes of practice for the handling, transportation, storage and disposal of these hazards is recommended.

Essential Oils And Resinoids And Perfume Materials;Toilet,Polishing And Cleansing Preparation

Essential oils are naturally occurring, volatile aromatic compounds are found in the seeds, bark, stems, roots, flowers, and other parts of plants. are topical or oral (ex. Roaccutane) products, chemically related to Vitamin A, that are said to help with acne, anti-aging, and hyper-pigmentation.

While these products are closely related to medicinal preparations they are mostly sold in retail outlets. It is important that the active ingredients in these compounds are verified to promote fair trade.

Recommendation

It is therefore recommended that Standard Specifications and test methods to ascertain the active ingredients are developed.

Plastics In Primary And Non Primary Forms

Plastics in primary forms include liquids and pastes (emulsions and suspensions) and suspensions) and solutions, blocks or irregular shape, lumps, powders (including moulding powders), granules, flakes and similar bulk forms. These are then transformed to final products through techniques like injection moulding, compression moulding and extrusion. Plastics in Primary form account for the largest trade volumes in COMESA region. These are used in the SME for manufacture of various plastic materials including packaging material and containers.

Recommendation

Specifications and test methods for assessing the physical, mechanical, and chemical properties of the range of materials and products that are made of plastic and its polymeric derivatives is recommended. These standards will allow plastic manufacturers and end-users to ascertain and material or product of concern to ensure quality and acceptability towards safe utilization. Codes of practice are also recommended for the disposal.

Dyeing,Tanning And Colouring Materials

Dyeing and colouring material can be both natural and synthetic. Apart from concerns over their efficacy, the issue of safety also arises. This is especially so for dyes used in inks on food packaging material that may seep into food or contaminate the environment. Toxicity to living tissue and to the environment (soil and water) is also to be considered.

Recommendation

.Test methods and standard specifications are recommended and a code of practice for the disposal is also advised.

Fertilizers

A lot of work has been carried out on fertilizer especially “chemical fertilizers” and their use by agronomist and agriculturalist. Most COMESA fertilizer specifications are adequate except for Organic fertilizer and methods of test.

Recommendation

Due to the misuse of chemical fertilizer it is recommended that existing fertilizer standards be enhanced with aspects of soil testing. Standard specifications and test methods for soil and fertilizer should be done concurrently and also used together.

It is also recommended that standard specifications and test methods for organic fertilizers be also adopted.

A comprehensive analysis of specific standardization needs for chemical and chemical products is available in Annex 2.

4. ASSESSMENTS OF LABORATORIES AND ACCREDITATION CENTRES

Laboratories form an important part of the quality assurance process by certified the fitness for consumption aspect of food and feed. The presence of deficiencies in national laboratories can lead to erroneous results in the detection and presence of foodborne pathogens, toxins and pesticide residues leading to public health concerns and undesirable trade impacts.Many safety incidents in COMESA region have revealed that laboratories in the countries would benefit from additional personnel training

and proper fit-for-purpose equipment and facilities for testing for food contaminants (bacterial, viral or chemical). This is because laboratories, both private and public have given conflicting results from samples collected from the same consignement which has led to confusion and mistrust and inability for concerned authorities to make proper decisions. Laboratories in the region can be divided into the follwoing types. Bottlenecks caused by such laboratory testing of products and as a requirement for product registration for trade increases costs and endangers lives. Hence, the importance of adequate laboratory capacity is essential to ensuring public food safety and facilitating the smooth flow of trade.The full implementation plan for laboratories is found in Annex 3. Laboratories in COMESA can be divided into 5 types.

a) Research laboratories

These are found in learning institutions and research centers. Although they are primarily concerned with testing for research purposes, they have been from time to time been used to assist in testing for government, public and private entities.

b) Private commercial laboratories

These are specialized laboratories that operate in certain sectors to test products for private individuals for profit. They have been increasing in number in the last few years.

c) Medical laboratories

These are specific to hospitals and medical facilities but are frequently involved during food safety incidences.

d) Regulatory laboratories

These are government laboratories that are tasked with ensuring that products including food products adhere to national standards and requirements. These are the most common and active laboratories in the COMESA region with the highest scope in the testing of chemical and chemical products.

e) Industry laboratories.

These are laboratories that are found within factories and which are used for in-house quality checks.

. **f) Reference laboratories**

A reference laboratory is a laboratory that provides overall expert analyis in areas of difficulty or dispute or where advanced analytical techniques or specialised analysis or testing is required and which is competent and trusted to give results of the highest accuracy and precision that other laboratories are not able to give.

Needs assessment for the laboratories

For a well coordinated laboratory system the following challenges needs to be addressed;

1. The need for a formal national system for licensing and registration of chemical testing laboratories. This should include requirements for testing organisations in terms of personel training and competence, facilities, equipment and organisational arrangements. The system should also have a criteria for classification of testing laboratories and designated reference laboratories.
2. There is need for a harmonised and standardised for methods for sampling and testing at both national and regional levels.These protocols should be well validated and characterised in terms of accuracy and precission.
3. There is need for enhanced and innovative ways of regualtion and oversight including a national system for co-regualtion.
4. Testing laboratories should be encouraged and required to participate in quality assurance programs such as proficiency testing (PT) or accreditation schemes.
5. There is need for implementation of a system for sharing test results and to use these data in risk assessment and related excercises.
6. There is need for a national and regional testing capacity database that includes the names of laboratories, their locations and contacts and the range of tests offered.
7. There is a need to ensure that as many laboratories as possible are accredited. For laboratories to participate productively in ensuring food safety, it is important that they meet the basic requirement of accreditation.Accreditation is the one single factor that distinguishes a competent laboratory from a good laboratory. Accreditation is an internationally accepted, conformity-assessment tool for ensuring laboratory competence and confidence in the accuracy and reliability of test data. An accredied laboratory ensures that

   (i) There is a proper management system in place to run the laboratory professionally. This management system system will ensure there is proper documentation, controls, purchasing and supplies, customer relations, monitoring and continuous process improvement is in place and operational.

(ii) Technical aspects of the laboratory that ensure quality results are in place including well trained personel, calibrated equipment, proper sampling and proper test methods are used, participation in proficiency testing and proper reporting of results is done.

Assessment of laboratories was based on COMESA Strategic Plan for Standardisation and Quality Assurance (2015) needs assessment. It is contained Annex 3.

5. POSSIBILITY TO SET UP MUTUAL RECOGNITION AGREEMENTS BETWEEN CAB OF COMESA MEMBER BODIES.

A mutual recognition agreement (MRA) is an international agreements by which two or more countries agree to recognize one another's conformity assessments. A mutual recognition arrangement is an international arrangement based on such an agreement. For COMESA the MRAs are envisaged for highly traded goods and services. The most appropriate MRAs type should be a quality control MRA. The MRAs will promote trade in goods between the countries and facilitate market access. They will provide easier access to conformity assessment. The MRAs will outline conditions under which one party will accept conformity assessment results (e.g. testing or certification) performed by the other's party designated conformity assessment bodies (CABs) to show compliance with the first party's requirements and vice versa. The MRAs should include relevant lists of designated laboratories, inspection bodies and conformity assessment bodies recognised by the parties. Under COMESA, the harmonization of standards and strengthening of laboratories provides a good foundation for drawing up of MRAs especially in areas where there is heavy trade between the countries in the COMESA regionBased on the volume of trade in chemical and chemical products, the following countries should explore the possibility of setting up Mutual Recognition Agreements.

Table 2: Possible MRA Country Pairings

COUNTRY COMBINATION	TYPE OF MRA	AREAS OF MUTUALITY
Zambia and Congo DR	Conformity assessment	Standards and test methods
Egypt and Kenya	Conformity assessment	Standards and test methods
Zambia and Congo DR	Conformity assessment	Standards and test methods

Madagascar and Mauritius	Conformity assessment	Standards and test methods
Sudan and Egypt	Conformity assessment	Standards and test methods
Djibouti and Egypt	Conformity assessment	Standards and test methods
Rwanda and Kenya	Conformity assessment	Standards and test methods
Libya and Egypt	Conformity assessment	Standards and test methods

Pre-requisites to MRAs

i) An important initial activity would be to assess the capacities of the CABs in the trading countries since they form the bedrock of the MRAs.

ii) Carry out an analysis of existing NTBs encountered during trade in the commodity.

iii) Review of other existing trade agreements.

6. IMPLEMENTATION PLAN

Introduction

Effective coordination is one of the key drivers of successful implementation of multi-agency interventions. This implementation plan is based on the understanding that the various institutions involved will commit themselves to the interrventions envisaged. The plan for chemical and chemical products to be adopted COMESA is derived from the "COMESA Strategic Plan for Standardization and Quality Assurance"2015. In this strategic plan, one of the key recommendations emanating from a needs assessment was to harrmonize COMESA standards, metrology, and conformity assessment and accreditation procedures to reduce costs, reduce waste, enhance compliance and develop trade opportunities. Strategic Objective 2 (3) states COMESA establishes and strengthens COMESA Standards harmonization system to support regional trade. The standard harmonisation sub-committee reported that 370 Standards have been interrogated by Member States but no consensus was reached. 165 Standards are undergoing review in accordance with the procedures for development of COMESA Harmonized Standards. From the review of chemical and chemical products volumes of trade, it is necessary for the COMESA SQA Unit/Agency, as mandated under the strategic plan to oversee the implementation of these standards.

The full implementation matrix for Chemical and chemical standards, Laboratories and Possibility of setting up MRAs is contained in Annex 6

List of activities

The COMESA SQA Unit/Agency should

i) Facilitate and provide logistical support for Committee on Standards to develop/adopt standards in the Identified areas for chemical and chemical products.

ii) Prioritize the adoption or development of standards that impact on the health and safety as analyzed above.

iii) It is recommended that for every chemical product sold in the COMESA region, there should be technical ability to test for that product to determine levels both for safety reasons and for fair trade (ascertain the right quantities) as agreed during the sale.

iv) It is recommended that there should be a general COMESA guide for trading in chemical products including handling, transportation, use and disposal.

Priorities

As observed in the analysis of standard needs (Annex 1), priority should be given to those products that are traded heavily and those that have an economic, health and safety aspect attached to them

Budget

The budget for this activity should be undertaken by COMESA. It is recommended that the COMESA standard harmonization be done with representation from the members of the tri-partite CBAs.

Responsibilities

The responsibility for the Implementation of these standards should be on SQA unit as indicated in the strategic plan 2015.

7. CHALLENGES ENCOUNTERED

a) Sme Requirement Needs

There was limited information of the compliance of SMEs. Data on operations of SMEs, including their products and production activities were not readily available hence an informed analysis could not be done objectively. The little information availed during interviews was not backed by any statistic and could not be followed up.

b) Limited resources

This exercise should ideally have taken double the amount of time allocated. It would also have been prudent to carry out the assessment in different locations (countries) where different stakeholders would have been interviewed.

c) Duplicated Objectives

Some of the objectives of the exercise for example laboratory needs assessment had been fairly well done and included in the COMESA SQA strategic plan 2015. This included visits and interviews with individual countries and another needs assessment may not have been necessary. A different aspect of the assessment could have been examined.

RECOMMENDATION

There should be a comprehensive, field study of SME needs, compliance and difficulties faced due to existing standards and their compliance requirements. This should be done in selected economies around the COMESA region in order to give a full picture of the issues facing SMEs.

ANNEX-1

LABORATORY NEEDS ASSESSMENTS

Table 3: Laboratory needs assessments

COUNTRY	LABORATORY NAME	NEEDS STATUS
BURUNDI	**Burundi Bureau of Standards**	***Infrastructures*** ***Human resources*** ***Accreditation of laboratories.*** ***Capacity building in Standards, conformity assessment and metrology.*** ***Quality information system.*** ***Establishing TBT/WTO enquiry centre.*** ***Funding for awareness of BBN services.*** ***Logistic problems in transport and communication***
	Laboratory for Chemical Analysis of Minerals (LACA)	***Participation in PTS.*** ***Awareness training in Quality Management Systems.***
	National Centre for Food Technology (CNTA)	***Further exposure of its staff in analytical work in order to build further capabilities.*** ***Facilitation to attend regional and international forums for food testing***

		Awareness in Quality Management System and accreditation ***Exposure in advanced metal analysis laboratories*** ***Participation in PTS***
ETHIOPIA	**Ethiopian Standards Agency – ESA**	***Capacity building for staff in Standardisation work*** ***Training of Trainers (Train the trainer course)*** ***Need to upgrade training room with equipment.*** ***Awareness raising to Stakeholders need to engagement in standards development.***
	Ethiopia Conformity Assessment Enterprise – ECAE	***There is a lack of awareness on conformity assessment activities – particularly from the Ministries that have the mandate to enforce compliance of products to standards.*** ***The government needs to invest more in ECAE, particularly in the purchase of equipment.*** ***Lack of coordination/ cooperation between ECAE and Regulators.*** ***COMESA needs to work on the issue of making governments aware of capacity building in the area of conformity assessment, particularly for the laboratories.***
	National Metrology Institute of Ethiopia - NMIE	***Lack of adequate equipment*** ***The NMI needs calibration in humidity, vibration and torque for support of the aviation industry and hardness for photometry and chemical metrology***

		There is also a need for certified reference materials
	Ethiopian National Accreditation Office – ENAO	***Most conformity assessment bodies are governmental organisations and therefore there is a need for commitment by the government to provide accredited services*** ***Awareness on the need of how accreditation can be used by Conformity Assessment Bodies for regulation*** ***Lack of Proficiency testing Schemes*** ***Certified Reference Materials is a challenge for Laboratories seeking accreditation***
	Ministry of Trade and Industry (regulatory function)	***There is need for capacity building*** ***Training of Inspectors*** ***Training in Market surveillance***
KENYA	**Kenya Bureau of Standards – KEBS** **a.) Standardisation Directorate**	***Training of Chairs and Secretaries of Technical Committees*** ***Negotiation skills*** ***Project Management***

	b.) Metrology & Testing Directorate	***Need for stakeholders to participate in the Standards development work The challenge that both testing and calibration have is in the staffing as there is a high turnover of experts*** ***Training in specialized scope of test*** ***Training in new technologies*** ***Need for Certified Reference materials***
	c.) Quality Assurance Directorate	***Practical Training in market Surveillance*** ***Reinforcement of legislation*** ***Need to develop a Risk Management System***
	Kenya National Accreditation Services – KENAS	***KENAS is still funded by the Government and they face challenges with funding but they hope to be independent in the next 4 years*** ***Cooperation with regulators is still a challenge and they need to conduct awareness to the regulators to show them how accreditation can support regulation*** ***There is need to ensure that the Accreditation focal points within the EAC /COMESA work well*** ***Whilst they await international recognition there is need to work alongside other accreditation bodies that provide this service in Kenya and avoid duplication of efforts*** ***There is need to keep the trained assessors busy otherwise they can lose their skills and this***

		could be a threat
	Weights and Measures Department	***Training of technical personnel in specialised fields like electronics, use of laser and optical technology in trade instruments.*** ***Training in fields of electricity metering, water metering and taxis metering technology*** ***Training in automated road truck weighing technology***
	Kenya Plant Health Inspection Services – KEPHIS	***Lack of harmonized regulations*** ***Training of personnel on SPS matters Under funding (regulations, testing and verification)*** ***Negotiations skills for use in trade negotiations***
MADAGASCAR	**Bureau des Normes de Madagascar (BNM)**	***Additional resources in terms of human resources, infrastructure, finances and equipment's*** ***Autonomy of the institution to carry out its mandate*** ***Training on Quality Infrastructure***
	Scientific, Industrial and Legal	***Technical Support to review legislation for control of Medicines***

	Metrology	***Training of Staff on Pharmaceutical Regulatory Sciences*** ***Additional Resources- Finances and human resource*** ***Streamline Medicines regulation processes through harmonization of technical regulations***
SWAZILAND	***Swaziland Standards Authority (SWASA)*** **a.) Standards Development and Information**	***Staff training on harmonisation procedures in the COMESA region*** ***Capacity building on WTO/TBT enquiry point operations*** ***Adoption of electronic templates for drafting of standards*** ***Acquisition of online standards sales programme*** ***Enhance participation of TC members*** ***Capacity on using and referencing standards (regional and national) in regulation***
	b.) testing	***Establishment of testing laboratories in the areas of Microbiology, Chemistry, Material and Electronics & Electricals*** ***Capacity building of testing officers on the implementation of ISO/IEC 17025, method validation and measurement uncertainty*** ***Have the laboratories accredited against ISO/IEC 17025***
	c.) Management systems certification.	***Fully operational management systems certification schemes to register companies to ISO 9001, ISO 14001, ISO 22000, OHSAS 18001 and HACCP*** ***Capacity building of auditors on lead auditing and practical auditing sessions to enable***

		registration with SAATCA[1] / IRCA[2] ***Accreditation of certification schemes to ISO/IEC 17021.*** ***Set up a pilot certification project to assist selected interested organisations implement ISO 9001, ISO 14001, OHSAS 18001 and ISO 22000 for certification. The project can include funding for training, implementation assistance as well as certification for the selected clients.***
	d.)Product certification scheme	***Fully operational product certification schemes*** ***Capacity building of auditors/ inspectors for product certification*** ***Accreditation of certification schemes to ISO/IEC 17065*** ***Set up a pilot certification project to assist selected interested organisations for selected products of export interest to include funding for training, implementation assistance as well as certification.***
	e.) Calibration	***Establishment of calibration laboratories and procurement of equipment in the areas of Mass, Temperature, Pressure and Volume*** ***Capacity building on understanding metrology (training will be needed to equip the identified trainees with the necessary theoretical and practical knowledge to become competent***

		metrologists in the fields of mass, volume, temperature, pressure and length) ***Creation of a ISO/IEC 17025 compliant quality system for commercial calibration***
	f.)Standard-based training	***Capacity building for training officers on management systems standards and auditing***
	Regulatory and Quality Infrastructure Development Department	***Training in provisions of development of Regulatory and Quality Infrastructure System*** ***Training in Quality Management Systems*** ***Policy development in regulatory framework*** ***Funding on development of National Quality Policy***
	Swaziland Environmental Authority (SEA)	***COMESA to develop environmental frameworks for the partner states.*** ***COMESA member states to harmonize the environmental regulations.*** ***Training to regulators to understand impact of environmental regulations.***
	Melkins Agricultural Research Centre.	***Capacity building in setting pesticides and chemical residues limits for Agricultural produce*** ***Quality management system*** ***Laboratories accreditation*** ***Extending the scopes of testing to include metal analysis***
	Mbabane City, Swaziland	***Assistance in QMS awareness***

		Funding for setting up testing laboratories for chemical and microbiology
UGANDA	**Uganda National Bureau of Standards (UNBS)**	***Capacity building programs for staff*** ***Additional staff*** ***Need for testing and calibration equipment*** ***Need for physical laboratory infrastructure (building)***
ZAMBIA	**Zambia Bureau of Standards (ZABS)**	***Awareness raising to Stakeholders/ industry on the need for standards*** ***Workshops on Stakeholder engagement in standards development*** ***Need for testing and calibration equipment to cover required scope*** ***Need of CRMs*** ***Training on equipment Maintenance*** ***Need for spare parts for equipment*** ***Training of qualified personnel in standardization, testing and metrology*** ***Under funding***
	Zambia Weights and Measures	***Requires additional sets of Classes M1, M2 and M3 masses.*** ***Needs balances and comparators***

	Agency (ZWMA)	***Needs modern National length Standard for trade in volume measurements, glass pipettes and metal pipettes*** ***There is an acute need for heavy mass verification truck fitted with lifting gears***
	Zambia Environmental Management Authority (ZEMA)	***Standards/Regulations on sector guidelines e.g. on National Parks roads, eco-buildings*** ***Training on specialized environment management e.g. on mining sector*** ***Setting up environment testing facility e.g. on gas emissions, effluent***

Source: COMESA SQA strategic plan 2015

ANNEX 2

IMPLEMENTATION MATRIX COMESA SQAM ACTION PLAN FOR CHEMICAL AND CHEMICAL PRODUCTS

	Table 4: Implementation Plan				
ACTIVITY	**RESPONSIBILITY**	**ACTION PLANS**	**TIME TO COMPLETE ACTIVITIES**	**OBJECTIVE VERIFIABLE INDICATORS (OVI)**	**PRIORITY**
ADOPTION AND HARMONISATION OF CODES OF PRACTICE STANDARD	**COMESA Member states NSBs** **COMESA SQA Subcommittee on Standards Harmonisation** **Private sector associations**	***Meetings to discuss recommended standards and agree on common standards***	**6 MONTHS**	**PUBLISHED COMESA STANDARDS**	**1**
LABORATORIES REQUIRING ACCREDITATION	**COMESA SQA** **Designated Laboratories**	***Audit of laboratories.*** ***Audit corrective action by laboratory.*** ***Closing of Audit to ensure corrective action done.*** ***Pre-assessment.*** ***Corrective Action.*** ***Closing of pre-assessment to ensure corrective action***	**1 YEAR**	**ACCREDITED LABORATORIES**	**2**

		done. ***Identification of Assessment Body.*** ***Assessment preparation.*** ***Assessment.*** ***Corrective action.*** ***Award of assessment Certificate.*** ***Total duration of exercise***			
LABORATORIES REQUIRING TRAINING ON METHODS OF ANALYSIS AND USE OF EQUIPMENT	**COMESA SQA** **Designated Laboratories**	***Training Needs Assessment*** ***Time-tabling of training in Common Deficient areas*** ***Conducting Trainings*** ***Evaluating effectiveness of the training including site visit***	**9 MONTHS**	**TRAINED PERSONNEL**	**3**
LABORATORIES REQUIRING ASSISTANCE ON EQUIPMENT MAINTENANCE.	**COMESA SQA** **Designated Laboratories**	***Identification of stalled but equipments*** ***Identification of Manufacturers, service providers and Maintenance support***	**1 YEAR**	**NO. OF MAINTAINED EQUIPMENT**	**4**

		Diagnosis of faults and repair ***Assisting of laboratories in setting up service level agreements***			
LABORATORY CERTIFICATION OF PERSONNEL FOR TEST METHODS FOR EXAMPLE GRADING.	**COMESA SQA** **Designated Laboratories**	***Training needs assessment including identification of test suitable for personnel certification.*** ***Setting up of "syllabi" and pre-requisites*** ***Training and competence appraisal*** ***Qualification and Certification of personnel*** ***Retraining and renewal of certification on update of skills***	**9 MONTH**	**NO. OF PERSONNEL CERTIFIED**	**5**
IMPLEMENTATION PLAN FOR MUTUAL RECOGNITION AGREEMENTS	**COMESA Member states NSBs** **COMESA SQA** **Private sector associations**	***Identify commonalities between countries in terms of volume of trade between countries and existence of NTBs***	**6 MONTHS**	**NO. OF MRAs SIGNED**	**6**

BETWEEN CAB OF COMESA MEMBER BODIES.		***Assess the CABs for abilities to undertake quality assessment of target products*** ***Draft Mutual Recognition agreements for discussion.*** ***Signing of Mutual Recognition Agreement***			

ANNEX 3

SELECTED INTRA-COMESA TRADE IN CHEMICAL AND CHEMICAL PRODUCTS

Congo DR

Table 4: Congo Trade Flow (Us$Million)

Partner Name	Trade Flow Name	Units	2011	2012	2013	2014	2015
Burundi	Imports	US$	1,793,343.00	3,140,697.00		19,229,499.46	3,256,198.19
	Exports	US$	768,794.00	506,752.00		274,398.38	229,915.17
Kenya	Imports	US$	29,853,102.00	28,136,550.00		28,082,567.06	
	Exports	US$	773,098.00	917,425.00		200,245.81	
Madagascar	Imports	US$	34,643.00	41,955.00			
	Exports	US$	14,862.00	31,951.00			
Malawi	Imports	US$	258,130.00	93,617.00	12,145.10	723,502.14	
	Exports	US$		580.00		252.71	399,719.40
Rwanda	Imports	US$	994,392.00	1,981,769.00	2,846,130.10	6,900,381.31	4,511,967.90
	Exports	US$	201,935.00	150,178.00	261,580.50	188,706.58	186,878.32
Swaziland	Imports	US$	195,303.00			38,260.68	
	Exports	US$		4,602.00		8,303.36	2,875.33
Uganda	Imports	US$	11,275,519.00	4,671,818.00	25,526,230.40	11,456,765.44	5,987,003.35
	Exports	US$	1,635,558.00	2,019,944.00	2,048,292.00	1,397,506.08	1,189,341.58
Zambia	Imports	US$	135,923,465.00	236,049,611.00	406,658,937.30	333,454,552.72	148,189,903.68
	Exports	US$	165,414,094.00	103,431,215.00	198,189,306.90	27,545,136.66	256,459,732.37
Zimbabwe	Imports	US$	79,952.00				3,259.87
	Exports	US$	132,181.00	13,848.00	17,082.00	2,423.28	11,187.60
Egypt	Imports	US$	4,146,940.00	8,243,316.00	4,094,944.70	9,365,792.63	11,705,707.96
	Exports	US$			1,836.00		

Zambia

Table 5: Zambia Trade Flow (Us$Million)

Partner Name	Trade Flow Name	Units	2011	2012	2013	2014	2015
Burundi	Exports	US$	1,801.00	8,197.00	3,498.00		86,358.84
	Imports	US$	1,622.00			454,009.61	
Congo DR	Exports	US$	78,786,182.00	133,993,879.00	300,465,007.84	232,387,643.33	110,470,227.69
	Imports	US$	183,793,438.00	114,923,573.00	220,964,580.93	32,406,043.14	284,955,258.19
Ethiopia	Exports	US$			515.00		5,114.82
	Imports	US$	27,590.00		6,305.92		48,819.00
Kenya	Exports	US$	9,556.00	88,618.00	104,044.18	183,949.85	173,310.95
	Imports	US$	17,502,251.00	21,644,150.00	20,737,215.92	18,873,232.23	18,015,687.51
Madagascar	Exports	US$	6,546.00				
	Imports	US$			113,604.00		
Malawi	Exports	US$	23,021,582.00	12,306,277.00	12,364,384.97	13,365,898.07	8,063,449.57
	Imports	US$	3,251,900.00	2,676,230.00	5,766,026.69	3,852,308.79	2,049,256.71
Mauritius	Exports	US$		10.00	639.00		
	Imports	US$	3,268,179.00	4,322,995.00	6,776,511.93	13,991,921.11	27,332,808.66
Rwanda	Exports	US $				61,700.60	
	Imports	US$		329,227.00	8,390.71	2,268.57	
Seychelles	Imports	US$		18,811.00			
Swaziland	Imports	US$	7,785,596.00	15,892,021.00	14,660,430.33	10,973,287.66	14,086,294.60
Sudan	Imports	US$	2,707.00				
Uganda	Exports	US$		10.00	29,905.31	257,236.74	530.29
	Imports	US$	4,406.00	130,530.00	27,389.00	66,673.71	300,601.54
Zimbabwe	Exports	US$	29,873,501.00	8,441,181.00	17,561,461.88	19,390,538.20	27,616,479.44
	Imports	US$	11,386,801.00	6,659,148.00	20,339,918.39	6,462,159.57	7,902,415.66
Egypt	Imports	US$	2,522,116.00	5,307,674.00	2,333,737.09	1,787,670.19	2,321,325.24

Madagascar

Table 6: Madagascar Trade Flow (Us$ Million)

Partner Name	Trade Flow Name	Units	2011	2012	2013	2014	2015
Comoros	Exports	US$	128,423.00	211,721.00	215,099.77	114,909.60	137,921.00
	Imports	US$	1,414.00	22,108.00	1,633.31	1,023.43	11.34
Congo DR	Exports	US$	31,493.00	38,139.00			
	Imports	US$	16,513.00	35,502.00	2,267.19		
Djibouti	Exports	US$	848.00				
Eritrea	Imports	US$		3,979.00			
Ethiopia	Exports	US$			14,062.57		19,595.19
Kenya	Exports	US$			664,349.90	359,387.42	1,590,911.47
	Imports	US$	1,293,286.00	964,408.00	675,434.20	699,988.83	573,144.11
Malawi	Exports	US$	10.00	161,937.00		104,258.35	
Mauritius	Exports	US$	491,556.00	434,214.00	667,353.05	740,867.85	120,217.32
	Imports	US$	6,953,256.00	5,526,303.00	7,837,123.91	8,006,396.45	7,062,205.39
Rwanda	Exports	US$		2,108.00			
Seychelles	Exports	US$	3,142.00	3,965.00	699.66		
Swaziland	Imports	US$	6,269,363.00	6,897,071.00	6,008,422.59	6,648,160.11	7,896,826.33
Sudan	Imports	US$		10,954.00	26,343.14		
Zambia	Exports	US$		68,866.00			
	Imports	US$	37,632.00				
Egypt	Imports	US$	4,824,817.00	10,327,625.00	3,554,118.25	4,582,139.94	3,839,828.51

Mauritius

Table 7: Mauritius Trade Flow (Us$ Million)

Partner Name	Trade Flow Name	Units	2011	2012	2013	2014	2015
Burundi	Exports	US $				57859.57	
	Imports	US $					319.53
Comoros	Exports	US$	18728.00	257123.00	229395.27	103919.75	97111.66
	Imports	US$			40491.11	40573.44	23946.64
Ethiopia	Exports	US$		25241.00	67103.98	1525.49	
	Imports	US$		7773.00			747.97
Kenya	Exports	US$	385461.00	537364.00	490128.43	1196877.34	1378225.24
	Imports	US$	2043447.00	1875365.00	1466061.53	1661989.71	1437332.19
Libya	Imports	US$	49759.00	13206.00			
Madagascar	Exports	US$	4843275.00	5285062.00	5685113.11	5102146.22	5636062.47
	Imports	US$	669533.00	603856.00	566174.83	481777.19	534012.59
Malawi	Imports	US $				8610.95	
Rwanda	Exports	US$			51.92		
Seychelles	Exports	US$	1707712.00	1408521.00	1870266.37	1907486.78	1711202.84
	Imports	US$	102540.00	280886.00	4959.03	7846.90	39436.78
Swaziland	Imports	US$	44.00	74.00	1223.19		
Sudan	Exports	US$		113817.00	42647.56		
Uganda	Exports	US$		56380.00	99670.89		604448.46
	Imports	US$	632.00	105.00	146.41		
Zambia	Exports	US$	58.00	58187.00	58628.20	1790899.70	800695.66
	Imports	US$	129.00	244.00			
Zimbabwe	Exports	US$		1370.00			
Egypt	Exports	US $				1588.03	
	Imports	US$	4817733.00	2904041.00	3200132.16	2773082.01	2886382.64

Sudan

Table 8: Sudan Trade Flow (Us$ Million)

Partner Name	Trade Flow Name	Units	2011	2012	2013	2014	2015
Burundi	Imports	US$			12,503.00	113,613.00	24,478.00
Djibouti	Imports	US$	546.00				
Eritrea	Exports	US $				28,863.00	312,335.50
	Imports	US$	2805.00			163.00	1,020.00
Ethiopia	Exports	US$			137,057.00	315,935.00	390,815.50
	Imports	US$	539.00		44,181.00	41,688.00	204,882.51
Kenya	Exports	US $					8,950.00
	Imports	US$	956234.00	242,254.00	1,280,447.00	340,186.00	3,901,573.11
Libya	Exports	US$			10,021.00	24,678.00	32,401.00
	Imports	US $				43,607.00	3,667.00
Madagascar	Imports	US$		4,782.00			
Mauritius	Exports	US$		13,715.00			
	Imports	US$		3,974,263.00			
Seychelles	Exports	US $				1,030.00	
	Imports	US$	1050.00		22,910.00	225.00	16,834.00
Swaziland	Imports	US$	6178479.00	224,290.00	2,803,835.00	2,721,966.00	12,169,908.39
Uganda	Imports	US$	7150.00		21,147.00	195,106.00	22,419.74
Zambia	Exports	US $					1.00
	Imports	US $					3.00
Zimbabwe	Imports	US$	10903.00				
Egypt	Exports	US$	82063.00		1.00	1.00	13,452.11
	Imports	US$	94891081.00	99,585.00	70,603,973.00	83,895,637.00	104,786,552.85

Egypt

Table 9: Egypt Trade Flow (Us$ Million)

Partner Name	Trade Flow Name	Units	2011	2012	2013	2014	2015
Burundi	Imports	US$	1,272.00	14,544.00			
	Exports	US$	107,480.00	1,219,202.00	1,978,862.98	3,272,120.57	2,451,138.96
Comoros	Exports	US$	8,637.00	35,784.00	83,746.77		2,000.00
Congo DR	Imports	US$			2,034.03		
	Exports	US$	3,769,946.00	7,493,927.00	3,708,913.60	8,144,167.52	10,641,552.69
Djibouti	Imports	US$			12,094.00	150.78	
	Exports	US$	4,798,839.00	5,492,916.00	3,627,470.08	5,143,581.63	5,491,652.09
Eritrea	Exports	US$	13,691,657.00	11,625,633.00	11,569,613.82	12,152,542.58	8,977,098.04
Ethiopia	Exports	US$	10,468,774.00	14,724,485.00	19,550,206.64	27,989,802.74	33,290,259.75
Kenya	Imports	US$	1,015,911.00	597,272.00	1,025,518.23	1,324,638.28	678,467.92
	Exports	US$	49,995,107.00	64,417,383.00	63,862,068.37	74,518,005.08	61,083,635.94
Libya	Imports	US$	24,227,739.00	2,094,571.00	150,154.96	521,896.86	7,091,176.85
	Exports	US$	57,706,577.00	156,756,369.00	167,442,946.77	111,016,788.41	74,670,007.17
Madagascar	Exports	US$	245,287.00				
Malawi	Exports	US$	358,160.00	470,535.00	584,907.77	432,952.44	310,474.65
Mauritius	Imports	US$	398,330.00	83,334.00	103,377.41	60,843.13	442,540.88
	Exports	US$	3,057,994.00	2,470,054.00	2,484,532.66	2,342,984.41	2,160,023.02
Rwanda	Exports	US$	3,099,904.00	4,086,842.00	7,753,359.44	10,235,587.66	9,092,062.82
Seychelles	Imports	US $				7,132.42	
	Exports	US$	181,755.00	118,681.00	28,438.49	48,039.49	35,578.20
Swaziland	Imports	US$		16,649.00	5,031.43	39,611.03	4,399.75
	Exports	US$	90,065.00	28,880.00			2,861.74
Sudan	Imports	US$	112,592.00	135,894.00	871.87	26,418.05	424,328.56
	Exports	US$	104,820,636.00	107,591,196.00	127,387,817.41	109,354,118.58	114,326,020.12
Uganda	Imports	US$	2,431.00			64,193.96	
	Exports	US$	11,597,959.00	12,906,964.00	14,084,303.06	16,133,607.79	12,674,479.33
Zambia	Imports	US$			40,983.93		5,531.26
	Exports	US$	1,173,704.00	1,320,132.00	2,143,948.61	2,455,254.17	3,306,307.05
Zimbabwe	Imports	US$	4,451.00	6,884.00		41,924.55	
	Exports	US$	232,305.00	411,644.00	828,460.99	1,311,339.39	1,189,495.14

ANNEX 4

CHEMICAL PRODUCTS REQUIRING STANDARDS

Table 10: Chemical Products Standard Need Assessment

		Table 11: Chemical Products Standard Need Assessment		
S/NO	**CODE**	**PRODUCT/SERVICE NAME**	**USE/S IN COMESA REGION**	**TYPE OF INTERVENTION REQUIREMENT**
Organic Chemicals	51*****	Saturated acyclic hydrocarbons	Insecticides, cooking gas, steroids e.g. cholesterol	Specification/Test standard and Code of Practise required.
		Ethylene	Ripening of fruits	Code of Practise required.
		Propene	production of films, packaging, caps and closures production of other chemicals e.g. cumene Alternative fuel to acetylene in welding	Code of Practise required.
		Butene "butylene" and isomers thereof	Manufacture of industrial solvents, synthetic rubbers and plastics and some agricultural chemicals.	Code of Practise required.

		Buta-1,3-diene and isoprene	Production of synthetic rubber	Code of Practise required.
		Hydrocarbons, acyclic, unsaturated (excl. ethylene, propene "propylene", butene "butylene" and isomers thereof and buta-1,3-diene and isoprene)	used as fuel for combustion, particularly in heating and motor fuel applications used as organic solvents and cleaners	Code of Practise required.
		Cyclohexane	used as an organic solvent used for calibration of differential scanning calorimetric (DSC) instruments	Code of Practise required.
		Cyclanes, cyclenes and cycloterpenes (excl. cyclohexane)		Specification/Test standard and Code of Practise required.
		Benzene	used to make some types of rubbers, lubricants, dyes, detergents, drugs, explosives, and pesticides	Specification/Test standard and Code of Practise required.
		Toluene	Precursor to other chemicals, fuel, solvent e.g. in paints	Specification/Test standard and Code of Practise required.
		o-xylene	used in the production of phthalic_anhydride	Code of Practise required.
		Mixed xylene isomers	Manufacture of other chemicals, fuel component, solvent	Code of Practise required.
		Styrene	Precursor to polystyrene and several copolymers	Code of Practise required.
		Ethylbenzene	Added to gasoline as an anti-knock agent manufacture of pesticides, cellulose acetate, synthetic rubber, paints, and inks	Specification/Test standard and Code of Practise required.
		Cumene	An intermediate in the synthesis of other	Code of Practise

			industrially important chemicals, primarily phenol and acetone	required.
		Chloromethane "methyl chloride" and chloroethane "ethyl chloride"	Solvent in rubber production and petroleum refining Chloroethane is used in treating cellulose to make ethylcellulose, a thickening agent and binder in paints, cosmetics, and similar products.	Specification/Test standard and Code of Practise required.
		Dichloromethane "methylene chloride"	The food industry, it has been used to decaffeinate coffee and tea as well as to prepare extracts of hops and other flavorings Used as a solvent in many chemical processes	Specification/Test standard and Code of Practise required.
		Chloroform "trichloromethane"	Solvent, Reagent, Anesthetic	Specification/Test standard and Code of Practise required.
		Carbon tetrachloride	Insecticide and solvent in synthetic chemistry	Specification/Test standard and Code of Practise required.
		Ethylene dichloride "iso" "1,2 dichloroethane"	The production of vinyl chloride as well as other chemicals. It was formerly used in ore flotation, as a grain fumigant, as a metal degreaser, and in textile and PVC cleaning.	Specification/Test standard and Code of Practise required.
		Saturated chlorinated derivatives of acyclic hydrocarbons	Pesticides e.g. DDT and insulators	Specification/Test standard and Code of Practise required.
		Vinyl chloride "chloroethylene"	used in furniture and automobile upholstery, wall coverings, housewares, and automotive parts. Vinyl chloride has also been used in the past as a refrigerant	Specification/Test standard and Code of Practise required.
		Trichloroethylene	Used as an extraction solvent for greases,	Specification/Test

			oils, fats, waxes, and tars, a chemical intermediate in the production of other chemicals, and as a refrigerant	standard and Code of Practise required.
		Tetrachloroethylene "perchloroethylene"	Solvent for organic materials Used in dry cleaning	Code of Practise required.
		Ethylene dibromide "iso" "1,2-dibromoethane"	Used as an anti-knock additive in leaded fuels pesticide and reagent	Specification/Test standard and Code of Practise required.
		Chlorodifluoromethane	Intermediate in industrial organ fluorine chemistry, e.g. as a precursor to tetrafluoroethylene	Specification/Test standard and Code of Practise required.
		Dichlorotrifluoroethanes	Refrigerant	Specification/Test standard and Code of Practise required.
		Dichlorofluoroethanes	Refrigerant	Specification/Test standard and Code of Practise required.
		Chlorodifluoroethanes	Air conditioning	Specification/Test standard and Code of Practise required.
		Dichloropentafluoropropanes	Solvents	Specification/Test standard and Code of Practise required.
		Bromochlorodifluoromethane, bromotrifluoromethane and dibromotetrafluoroethanes	Fire extinguishing	Code of Practise required.
		Aldrin (iso), chlordane (iso) and heptachlor (iso)	Insecticide	Specification/Test standard and Code of Practise required.
		Chlorobenzene, o-dichlorobenzene	Intermediate in the production of commodities such as herbicides, dyestuffs,	Code of Practise required.

		and p-dichlorobenzene	and rubber.	
		Hexachlorobenzene (iso) and ddt (iso) (clofenotane (inn), 1,1,1-trichloro-2,2-bis(p-chlorophenyl)ethane)	Fungicide used in seed treatment	Specification/Test standard and Code of Practise required.
		Methanol "methyl alcohol"	Methanol is used primarily as a feedstock for the manufacture of chemicals, and as a fuel for specialized vehicles. As a common laboratory solvent, is especially useful for HPLC, UV/VIS spectroscopy, and LCMS due to its low UV cutoff.	Specification/Test standard and Code of Practise required.
		Propan-1-ol "propyl alcohol" and propan-2-ol "isopropyl alcohol"	In the laboratory for preservation and DNA extraction Used as a solvent	Specification/Test standard and Code of Practise required.
		Butan-1-ol "n-butyl alcohol"	manufacture of pharmaceuticals, polymers, pyroxylin plastics, herbicide esters, printing (e.g., 2,4-D, 2,4,5-T)	Code of Practise required.
		Butanols (excl. butan-1-ol "n-butyl alcohol")	Solvent for a wide variety of chemical and textile processes, in organic synthesis Biofuel	Specification/Test standard and Code of Practise required.
		Octanol "octyl alcohol" and isomers thereof	Precursor to perfumes, solvent	Code of Practise required.
		Dodecan-1-ol "lauryl alcohol", hexadecan-1-ol "cetyl alcohol" and octadecan-1-ol "stearyl alcohol"	Used to make surfactants, lubricating oils, pharmaceuticals, in the formation of monolithic polymers and as a flavor enhancing food additive.	Code of Practise required.

		Acyclic terpene alcohols	Antibacterial	Specification/Test standard and Code of Practise required.
		Unsaturated monohydric acyclic alcohols (excl. acyclic terpene alcohols)	Alcoholic beverages Antifreeze, Antiseptics, Fuels, Preservative and Solvents	Specification/Test standard and Code of Practise required.
		Propylene glycol "propane-1,2-diol"	Used as a humectant (E1520), solvent, and preservative in food and for tobacco products	Specification/Test standard and Code of Practise required.
		2-ethyl-2-"hydroxymethyl" propane-1,3-diol "trimethylolpropane "	Used as building block in the polymer industry.	Code of Practise required.
		Mannitol	In food as a sweetener and analytical chemistry	Specification/Test standard and Code of Practise required.
		D-glucitol "sorbitol"	Sweetener, Laxative in food to make fish paste	Specification/Test standard and Code of Practise required.
		Glycerol	Food and beverages, glycerol serves as a humectant, solvent, and sweetener, and may help preserve foods. antifreeze and internal combustion fuel	Specification/Test standard and Code of Practise required.
		Tri- and other polyhydric acyclic alcohols (excl. 2-ethyl-2-"hydroxymethyl" propane-1,3-diol "trimethylolpropane ",	Used widely in the food industry as thickeners and sweeteners.	Specification/Test standard and Code of Practise required.

		Menthol	Flavor in some cigarettes and medicinal uses	Specification/Test standard and Code of Practise required.
		Cyclohexanol, methylcyclohexanols and dimethylcyclohexanols	Feedstock in the polymer industry	Code of Practise required.
		Sterols and inositols	Nutritional supplements	Specification/Test standard and Code of Practise required.
		Phenol "hydroxybenzene" and its salts	Precursor to a large collection of drugs, most notably aspirin but also many herbicides and pharmaceutical drugs and plastics	Code of Practise required.
		Octylphenol, nonylphenol and their isomers; salts thereof	Products such as paints, coatings, adhesives, inks, and products containing Rubber. Octylphenol is also present in detergents and surfactants used in some household, industrial, and pesticide products, and in some personal care products, such as cosmetics, body lotions, soaps, face creams, and Hair products.	Specification/Test standard and Code of Practise required.
		Hydroquinone "quinol" and its salts	Antioxidant and in the photography industry	Specification/Test standard and Code of Practise required.
		4,4'-isopropylidenediphenol "bisphenol a, diphenylolpropane" and its salts	Making plastics	Specification/Test standard and Code of Practise required.
		Pentachlorophenol "iso"	Herbicide, insecticide, fungicide, algaecide and disinfectant.	Specification/Test standard and Code of Practise required.

		Dinoseb "iso" and its salts	Herbicide	Specification/Test standard and Code of Practise required.
		Diethyl ether	Fuel, anaesthetic, laboratory solvent.	Specification/Test standard and Code of Practise required.
		2,2'-oxydiethanol "diethylene glycol, digol"	Cryoprotectant, solvent	Specification/Test standard and Code of Practise required.
		Oxirane "ethylene oxide"	Cosmetics, detergents and surfactants	Specification/Test standard and Code of Practise required.
		1-chloro-2,3-epoxypropane "epichlorohydrin"	Precursor to monomers of resins and polymers	Code of Practise required.
		Dieldrin "iso" "inn"291040	Insecticide	Specification/Test standard and Code of Practise required.
		Methanal "formaldehyde"	Disinfectant and biocide	Specification/Test standard and Code of Practise required.
		Ethanal "acetaldehyde"	A precursor to acetic acid	Code of Practise required.
		Benzaldehyde	Almond flavor in food	Specification/Test standard and Code of Practise required.
		Vanillin "4-hydroxy-3-methoxybenzaldehyde"	Flavoring in sweet food and perfumes	Specification/Test standard and Code of Practise required.
		Ethylvanillin "3-ethoxy-4-hydroxybenzaldehyde"	Flavorant used in the production of chocolate	Specification/Test standard and Code of Practise required.
		Paraformaldehyde	Fumigant, disinfectant and fungicide	Specification/Test

				standard and Code of Practise required.
		acetone	Solvent	Specification/Test standard and Code of Practise required.
		Butanone "methyl ethyl ketone"	Solvent and plastic welding agent	Specification/Test standard and Code of Practise required.
		4-methylpentan-2-one "methyl isobutyl ketone"	Extraction of gold and silver	Code of Practise required.
		Cyclohexanone and methylcyclohexanones	Precursor to nylon	Code of Practise required.
		Phenylacetone "phenylpropan-2-one"	Intermediate in production of pesticides	Specification/Test standard and Code of Practise required.
		Anthraquinone	Bird repellant in seeds, dyes	Specification/Test standard and Code of Practise required.
		Quinones (excl. anthraquinone)	Dyes and reagents in organic chemistry	Specification/Test standard and Code of Practise required.
		Formic acid	Preservative and antibacterial agent in animal feeds, production of leather	Specification/Test standard and Code of Practise required.
		Acetic acid	Solvent, ester production	Specification/Test standard and Code of Practise required.
		Acetic anhydride	Wood preservative	Specification/Test standard and Code of Practise required.
		Ethyl acetate	Solvent and in perfumes	Specification/Test standard and Code of Practise required.

		Vinyl acetate	Precursor to polyvinyl acetate a polymer in industry	Specification/Test standard and Code of Practise required.
		n-butyl acetate	Used as a synthetic fruit flavoring in foods such as candy, ice cream, cheese etc.	Specification/Test standard and Code of Practise required.
		Dinoseb acetate "iso"	Herbicide	Specification/Test standard and Code of Practise required.
		Propionic acid, its salts and esters	Preservative for animal feeds and food for human consumption	Specification/Test standard and Code of Practise required.
		Butanoic acids, pentanoic acids, their salts and esters	Animal feed supplement and food additives	Specification/Test standard and Code of Practise required.
		Palmitic acid, stearic acid, their salts and esters	Produce soaps and cosmetics	Specification/Test standard and Code of Practise required.
		Binapacryl (iso)	Miticide and fungicide	Specification/Test standard and Code of Practise required.
		Benzoic acid, its salts and esters (excl. inorganic or organic compounds of mercury)	Food preservative	Specification/Test standard and Code of Practise required.
		Benzoyl peroxide and benzoyl chloride	Antibacterial agent used in acne medication	Specification/Test standard and Code of Practise required.
		Oxalic acid, its salts and esters (excl. inorganic or organic compounds of mercury)	Cleaning agent for removal of rust	Specification/Test standard and Code of Practise required.
		Adipic acid, its salts	Precursor to nylon	Code of Practise

		and esters		required.
		Azelaic acid, sebacic acid, their salts and esters	Lubrication and plasticizers	Specification/Test standard and Code of Practise required.
		Maleic anhydride	Applied in coatings and polmers	Code of Practise required.
		Lactic acid, its salts and esters (excl. inorganic or organic compounds of mercury)	Used in food to produce sour flavor e.g. in milk. Used in detergents	Specification/Test standard and Code of Practise required.
		Tartaric acid	Leavening agent in food preparation	Specification/Test standard and Code of Practise required.
		Citric acid	Flavoring and preservative in food and beverages	Specification/Test standard and Code of Practise required.
		Gluconic acid, its salts and esters	Food additive	Specification/Test standard and Code of Practise required.
		Chlorobenzilate "iso"	Pesticide and acaricide	Specification/Test standard and Code of Practise required.
		Salicylic acid and its salts (excl. inorganic or organic compounds of mercury)	Food preservative, bactericide and an antiseptic	Specification/Test standard and Code of Practise required.
		2,4,5-t "iso" "2,4,5-trichlorophenoxyacetic acid", its salts and esters	Herbicide	Specification/Test standard and Code of Practise required.
		Tris"2,3-dibromopropyl" phosphate	Flame retardant in plastics	Specification/Test standard and Code of Practise required.

		Parathion "iso" and parathion-methyl "iso" "methyl-parathion"	Insecticide and acaricide	Specification/Test standard and Code of Practise required.
		Methylamine, dimethylamine or trimethylamine and their salts	Making pesticides e.g. carbaryl	Code of Practise required.
		Ethylenediamine and its salts	Fungicides e.g. Zineb	Specification/Test standard and Code of Practise required.
		Hexamethylenediamine and its salts	Production of plastic	Code of Practise required.
		Diphenylamine and its derivatives; salts thereof	Building block in organic synthesis	Code of Practise required.
		1-naphthylamine "alpha-naphthylamine", 2-naphthylamine "beta-naphthylamine" and their derivatives; salts thereof	Preparation of dyes	Code of Practise required.
		Diethanolamine and its salts	Used as a surfactant and corrosion inhibiter	Specification/Test standard and Code of Practise required.
		Monoethanolamine and its salts	Used as feedstock in the production of detergents and emulsifiers	Code of Practise required.
		Triethanolamine and its salts	Emulsifier and surfactant, making cement etc.	Specification/Test standard and Code of Practise required.
		Lysine and its esters; salts thereof	Additive in animal feeds	Specification/Test standard and Code of Practise required.

		Glutamic acid and its salts	Flavor enhancer in foods such as cheese	Specification/Test standard and Code of Practise required.
		Lecithins and other phosphoaminolipids, whether or not chemically defined	Used in animal feeds and the pharmaceutical industry and a food additive	Specification/Test standard and Code of Practise required.
		Saccharin and its salts	sweetener	Specification/Test standard and Code of Practise required.
		Chlordimeform "iso"	acaricide	Specification/Test standard and Code of Practise required.
		Methionine	Supplements in animal feeds	Specification/Test standard and Code of Practise required.
		Tetrahydrofuran	solvent	Specification/Test standard and Code of Practise required.
		2-furaldehyde "furfuraldehyde"	Solvent and Adjuvant in herbicides	Specification/Test standard and Code of Practise required.
		Furfuryl alcohol and tetrahydrofurfuryl alcohol	Wood preservation	Specification/Test standard and Code of Practise required.
		Lactones	Flavors and fragrance, plastics	Specification/Test standard and Code of Practise required.
		Malonylurea "barbituric acid" and its salts	ingredient in manufacture of riboflavin	Code of Practise required.
		Melamine	fertilizer	Specification/Test standard and Code of Practise required.

		Vitamins A and their derivatives, used primarily as vitamins	Used in Nutrient Supplements	Specification/Test standard and Code of Practise required.
		Vitamin B1 and its derivatives, used primarily as vitamins	Used in Nutrient Supplements	Specification/Test standard and Code of Practise required.
		Vitamin B2 and its derivatives, used primarily as vitamins	Used in Nutrient Supplements	Specification/Test standard and Code of Practise required.
		D-pantothenic or dl-pantothenic acid "vitamin b3 or b5" and their derivatives, used primarily as vitamins	Used in Nutrient Supplements	Specification/Test standard and Code of Practise required.
		Vitamin B6 and its derivatives, used primarily as vitamins	Used in Nutrient Supplements	Specification/Test standard and Code of Practise required.
		Vitamin B12 and its derivatives, used primarily as vitamins	Used in Nutrient Supplements	Specification/Test standard and Code of Practise required.
		Vitamin C and its derivatives, used primarily as vitamins	Used in Nutrient Supplements	Specification/Test standard and Code of Practise required.
		Vitamin e and its derivatives, used primarily as vitamins	Used in Nutrient Supplements	Specification/Test standard and Code of Practise required.

		Vitamins and their derivatives, used primarily as vitamins, unmixed (excl. vitamins a, B1, B2, B3, B5, B6, B12, C, E and their derivatives)	Used in Nutrient Supplements	Specification/Test standard and Code of Practise required.
		Provitamins and mixtures of vitamins, of provitamins or of concentrates, whether or not in any solvent, and natural concentrates	Used in Nutrient Supplements	Specification/Test standard and Code of Practise required.
		Ester gums	Food additive	Specification/Test standard and Code of Practise required.
Inorganic Chemicals	52*****			Specification/Test standard and Code of Practise required.
		Acrylonitrile	Used as a monomer to prepare polyacrylonitrile	Code of Practise required.
		1-cyanoguanidine "dicyandiamide"	Fuel in explosives and a curing agent for epoxies	Code of Practise required.
		Isocyanates	Manufacture of pesticides	Code of Practise required.
		Thiocarbamates and dithiocarbamates (excl. inorganic or organic compounds of mercury)	Pesticides	Specification/Test standard and Code of Practise required.
		Thiuram mono-, di- or tetrasulphides	Rubber accelerators	Specification/Test standard and Code of

				Practise required.
		Captafol "iso" and methamidophos "iso"	Fungicide	Specification/Test standard and Code of Practise required.
		Tetramethyl lead and tetraethyl lead	Antiknock agent	Specification/Test standard and Code of Practise required.
		Acrylonitrile	Used as a monomer to prepare polyacrylonitrile	Code of Practise required.
		Diazo-, azo- or azoxy-compounds		Specification/Test standard and Code of Practise required.
		Isocyanates	Manufacture of pesticides	Code of Practise required.
		Thiocarbamates and dithiocarbamates (excl. inorganic or organic compounds of mercury)	Pesticides	Specification/Test standard and Code of Practise required.
		Thiuram mono-, di- or tetrasulphides	Rubber accelerators	Specification/Test standard and Code of Practise required.
		Tetramethyl lead and tetraethyl lead	Antiknock agent	Specification/Test standard and Code of Practise required.
		Tributyltin compounds	Anti-fouling paint	Specification/Test standard and Code of Practise required.
Essential Oils And Resinoids And Perfume Materials;Toilet,Polishi	55*****	Rose oil Olive oil		Specification/Test standard and Code of Practise required.

ng And Cleansing Preparations				
		Eucalyptus oil	primary cleaning/disinfecting agent added to soaped mop and countertop cleaning solutions; it also possesses insect and limited vermin control properties	Specification/Test standard and Code of Practise required.
		Lavender oil	Production of perfume	Specification/Test standard and Code of Practise required.
		Balsam of peru	is used in food and drink for flavoring, in perfumes and toiletries for fragrance	Specification/Test standard and Code of Practise required.
		Tee tree oil	Cosmetics and skin washes	Specification/Test standard and Code of Practise required.
		Sandalwood oil	used in perfumes, cosmetics, and sacred unguents	Specification/Test standard and Code of Practise required.
		Octanol "octyl alcohol" and isomers thereof	Precursor to perfumes, solvent	Specification/Test standard and Code of Practise required.
		Phenylacetic acid and its salts	Perfumes and medicine	Specification/Test standard and Code of Practise required.
		Piperonal	Fragrances	Specification/Test standard and Code of Practise required.
Plastics In Primary Forms	57****			
		m-xylene	The manufacture of isophthalic acid, which is used as a copolymerizing monomer to	Specification/Test standard and Code of

			alter the properties of polyethylene terephthalate (PET), making PET more suitable for the manufacture of soft drinks bottles	Practise required.
		p-xylene	Manufacture of terephthalic acid for polyester. Its polymer is known as parylene.	Specification/Test standard and Code of Practise required.
		m-xylene	The manufacture of isophthalic acid, which is used as a copolymerizing monomer to alter the properties of polyethylene terephthalate (PET), making PET more suitable for the manufacture of soft drinks bottles	Specification/Test standard and Code of Practise required.
		Hexamethylenediamine and its salts	Production of plastic	Specification/Test standard and Code of Practise required.
Plastics In Non-Primary Forms	58****			
		Phthalic anhydride	Intermediate in production of plastics	Code of Practise required.
		Terephthalic acid and its salts	Precursor to the polyester PET used to make clothing and plastic bottles	Code of Practise required.
		Dimethyl terephthalate	Production of polyesters	Specification/Test standard and Code of Practise required.
		Phthalic anhydride	Intermediate in production of plastics	Code of Practise required.
Other Chemical Materials And Products	59****			Codes of Practise required.

Dyeing,Tanning And Colouring Materials	53****			
		Benzene	used to make some types of rubbers, lubricants, dyes, detergents, drugs, explosives, and pesticides	Specification/Test standard and Code of Practise required.
		Toluene	Precursor to other chemicals, fuel, solvent e.g. in paints	Specification/Test standard and Code of Practise required.
		Chloromethane "methyl chloride" and chloroethane "ethyl chloride"	Solvent in rubber production and petroleum refining Chloroethane is used in treating cellulose to make ethylcellulose, a thickening agent and binder in paints, cosmetics, and similar products.	Specification/Test standard and Code of Practise required.
		Chlorobenzene, o-dichlorobenzene and p-dichlorobenzene	Intermediate in the production of commodities such as herbicides, dyestuffs, and rubber.	Specification/Test standard and Code of Practise required.
		Naphthols and their salts	Production of dyes	Specification/Test standard and Code of Practise required.
		Hydroquinone "quinol" and its salts	Antioxidant and in the photography industry	Specification/Test standard and Code of Practise required.
		Anthraquinone	Bird repellant in seeds, dyes	Specification/Test standard and Code of Practise required.
		Quinones (excl. anthraquinone)	Dyes and reagents in organic chemistry	Specification/Test standard and Code of Practise required.
		Aniline derivatives and their salts	Rubber processing, dies etc.	Specification/Test standard and Code of

				Practise required.
		1-naphthylamine "alpha-naphthylamine", 2-naphthylamine "beta-naphthylamine" and their derivatives; salts thereof	Preparation of dyes	Specification/Test standard and Code of Practise required.
		Anthranilic acid and its salts	An intermediate in the production of dyes and saccharin	Specification/Test standard and Code of Practise required.
Fertilizers	56****			
Organic fertilizer		Blood meal	Source of nitrogen	Specification/Test standard and Code of Practise required.
		Bone meal	Source of calcium and phosphorous	Specification/Test standard and Code of Practise required.
		Shellfish fertilizer	Source of calcium, phosphorus and many trace minerals	Specification/Test standard and Code of Practise required.