Integrated Management System

Handbook

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1 GENERAL

1.1 OBJECTIVES AND PURPOSE

Purpose	ADVA has established, implemented and maintains an integrated Quality, Environmental, Energy and Business Continuity Management System. We utilize ISO 9001:2015/TL9000 RHB 6.3/MHB 5.7, ISO 14001:2015, ISO 50001:2018, ISO 22301:2019 as a framework for our organization to document and improve our operational practices in order to better satisfy the needs and expectations of our customers, stakeholders, interested parties and employees. This handbook should familiarize our customers, interested parties and employees with the controls that have been implemented, to assure that the integrity of ADVA's Integrated Management System is maintained and focused on meeting its intended outcomes. It describes the structure and interactions of our management system in reference to the international standards mentioned above and key organizational processes. Furthermore, it provides ADVA´s commitment to the Corporate Social Responsibility (CSR) program, included in ADVA´s Sustainability approach. The underlying methodology ADVA uses to develop the Integrated Management System is the "plan, do check and act cycle" to implement the process approach which delivers management system objectives, stakeholder requirements and customer satisfaction. The purpose of this Integrated Management System is to ensure product and service quality continues to meet the highest standards demanded by the organization and expected by our customers and other external interested parties, (e.g. communities). Furthermore, it describes the quality requirements for managers, process owners, and eventually for all ADVA employees to adhere to.
Goal / mission statement	*"Our mission is to be an innovation leader focused on our customers' experience by building better networking solutions."*

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1.2   CONTEXT OF THE ORGANIZATION

Internal and external issues influencing ADVA's purpose and strategy	ADVA is committed to define its position in the marketplace and understands the relevant factors arising from legal, political, economic, social and technological issues influence its strategic direction and organizational context. To ensure that our Integrated Management System is aligned with our strategy, whilst taking relevant internal and external factors into account; we initially collate and analyze pertinent information in order to determine the potential impact on our context and subsequent business strategy. For this, ADVA identifies, analyzes, monitors and reviews factors that may affect our ability to satisfy our customers and stakeholders, as well as; factors that may adversely affect the stability of our processes and the integrity of the management system. Issues include factors that are affected by our organization or are capable of affecting ADVA. ADVA considers such factors as shown in figure 1: Issues relevant to ADVA's purpose and strategy and external issues influencing ADVA's organizational context.
Issues relevant to ADVA's purpose and strategy and external issues influencing ADVA's organizational context	 They are monitored and reviewed regularly to ensure that a continual understanding of each group's requirements is derived and maintained.
Stakeholders relevant to the IMS	ADVA's ability to consistently provide products and services that meet customer and applicable statutory and regulatory requirements depends on these interested parties and their requirements that are relevant to the Integrated Management System. That's the reason why ADVA identifies and classifies its interested parties, based on current information and knowledge held within our industry. Each stakeholder is analyzed to determine whether any relevant needs or expectations exist, which could impact our business processes, and which must be adapted by the organization.

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| | Needs and/or expectations of the stakeholders are converted into requirements which become inputs to IMS planning and product and/or service designs. The outputs from this process are used to inform applicable processes of ADVA's Integrated Management System. |
| | We recognize that we have a unique set of interested parties whose needs and expectations change and develop over the time, and furthermore, that only a limited set of their respective needs and expectations are applicable to our corporate purpose. |

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1.3 SCOPE AND VALIDITY OF CERTIFICATION

Scope :	Our management system addresses and supports our wider strategies for "marketing, sales/services, design, testing, production, delivery, installation for optical equipment and software, carrier ethernet and network virtualization (NFV), as well as synchronization solutions for the telecommunication industry and time & frequency market". This handbook describes (together with all relevant and appropriate process documents and referenced policies, procedures, process maps, checklists, and instructions) the ADVA Integrated Management System. It is the basis for organizational controls and consequently is valid for all ADVA sites.

Limitation	The IMS as a whole and this handbook are limited to aspects with regards to:
	
	• Quality Management System (QMS),
	  → ISO 9001 / TL9000
	• Environmental Management System (EMS),
	  → ISO 14001
	• Energy Management System (EnMS),
	  → ISO 50001
	• Business Continuity Management System (BCMS),
	  → ISO 22301 (further described in the BCMS Handbook)
	• Corporate Social Responsibility (CSR),
	  →RBA-CoC
	
	and corresponding legal regulations and requirements of relevant International Standards.

Validity of certification	The scope of ADVA ISO9001/TL9000 registration involves all sites globally except for Chinese locations due to national regulations there.
	
	The **TL9000 product codes** applicable are:
	
	• 1.2.9.3 Access Routers
	• 3.2.2.1.2.2 WDM/DWDM/Optical Amplification
	• 4.2.2.1 Legacy On-line Non-critical
	• 4.2.2.2 Virtual Network Function Manager (VNFM)
	• 5.1 Synchronization
	• 8.2.4 Very High Complexity Electronic Assemblies
	
	The scope of ADVA **ISO 14001** registration involves
	
	    ADVA Optical Networking SE – Headquarters Campus Martinsried/Munich/DE
	    ADVA Optical Networking SE – Meiningen/DE
	    ADVA Optical Networking SE – Berlin/DE
	    ADVA Optical Networking Sp.zoo. – Gdynia/PL
	    ADVA Optical Networking North America Inc. – Norcross/US
	    ADVA Optical Networking Ltd. – York/GB
	    Oscilloquartz SA – Saint Blaise/CH
	
	The scope of ADVA **ISO 50001** registration involves
	
	    ADVA Optical Networking SE – Headquarters Campus Martinsried/Munich/DE
	    ADVA Optical Networking SE – Meiningen/DE
	    ADVA Optical Networking SE – Berlin/DE

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	ADVA Optical Networking Sp.zoo. – Gdynia/PL ADVA Optical Networking Ltd. – York/GB
	The scope of ADVA ISO 22301 registration involves: ADVA Optical Networking SE – Headquarters Campus Martinsried/Munich/DE ADVA Optical Networking SE – Meiningen/DE ADVA Optical Networking North America Inc. – Norcross/US ADVA Optical Networking Ltd. – York/GB Oscilloquartz SA – Saint Blaise/CH.
Maintenance of certification	The validity of the Quality Austria certificates will be maintained by annual surveillance audits and one renewal audit after three years.

1.4   RISK BASED THINKING

Risk management system	ADVA's Risk Management System or "RMS" describes and documents the organizational framework, elements, measures, duties, rights and responsibilities as required to identify and report the risks and opportunities for not achieving or overachieving ADVA's Strategic Goals, and to define, implement, document and continuously verify and improve an effective response to the most material risks.
	As a globally operating company ADVA implemented this by considering applicable laws and regulations, the particularities of its industry and business operations, as well as common international standards. In particular it consists of: • clear and specific strategic goals that cascade down into department, team and employee objectives and are reinforced by clearly and precisely defined roles and responsibilities and ownership, • structured identification of ADVA's risks and opportunities, reasonable, objective and comparable quantification of their potential impact, and definition, implementation and documentation of an adequate response to all those risks, • continuous monitoring of ADVA's most material risks, verification and improvement of the implemented response and its effectiveness, quarterly reported in the Management Review, and periodic and ad-hoc reporting of any material changes to the Vorstand and Supervisory Board, • periodic auditing of ADVA's RMS and its adequacy, efficiency and effectiveness, and structured and continuous improvement of the RMS on basis of the identified or otherwise reported weaknesses. Mitigation of risks is stratified down into processes. We control and monitor risks on the process level, while each process owner knows and understands his/her respective potential risk and reduces risk on this level. In addition, we are applying Failure Mode Effect Analysis (FMEA) in our product design and production qualification phases to mitigate risks in the development of our products and its entire supply chain. Documents: ADVA's Risk Management System

1.5   COMMUNICATION

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Internal	ADVA communicates relevant information internally about its Integrated Management System among the various levels and functions of the organization. Focus is given to facts and figures, as well as to improvements that were initiated and achieved. Internal communication channels include emails with standardized distribution lists, town hall meetings, conference calls, performance appraisals, blogs and the ADVA intranet. ADVA's communication process enables employees to perform their work under organizational control, which results in continual improvement.
External	In accordance to ADVA's communication process, ADVA cares deeply about its Integrated Management System and the established programs. For this, ADVA shares progress with customers, partners, suppliers and all other relevant stakeholders. As a listed company, all relevant data is published within the Annual Report or the Non-financial report, respectively. Customer satisfaction is collected annually either in face-to-face assessments on customer premises or remotely. Dissatisfactory results initiate actions that will drive improvement, and the customer is kept informed on the progress and success of actions taken. Further requests are triggered and controlled following the internal communication process.

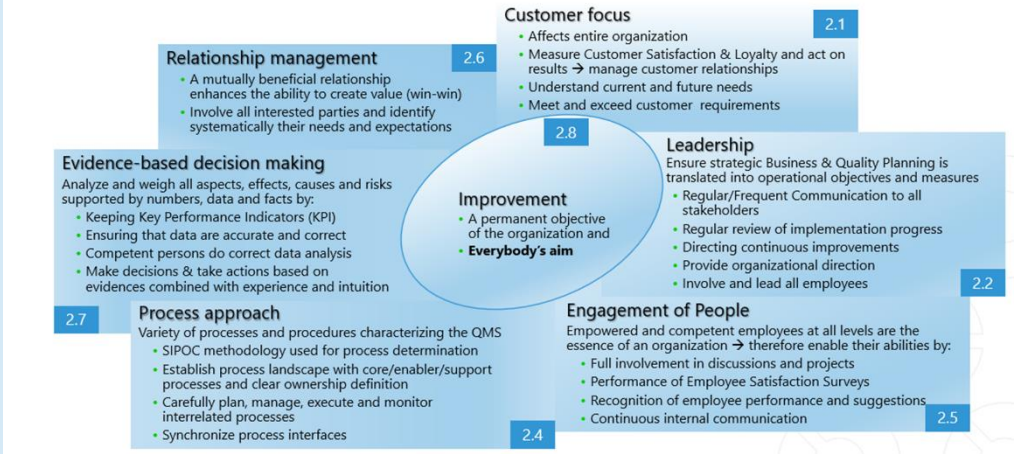| Author	Process Owner	Version	Rev	Date	Status	Page/Pages
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2 QUALITY MANAGEMENT SYSTEM

Quality system overview	ADVA´s quality system is built around the seven Quality Management principles shown and described below.

2.1 CUSTOMER FOCUS

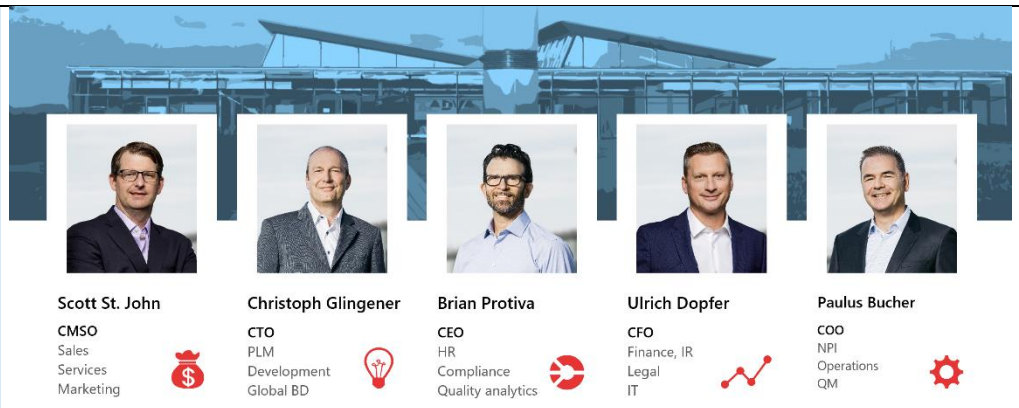| Customer satisfaction	ADVA continually strives to improve its responsiveness to its customers, to anticipate customer requirements, and to provide world class products and services.
	To succeed in these challenges, customer inquiries for our products and services are reviewed carefully to ensure that customer requirements and expectations are understood.
	Customer responses are managed through the Customer Satisfaction (CSAT) process, inclining annual surveys and the continual improvement processes. Data obtained are analyzed to identify product and process improvement initiatives. Upon completion, customers are informed of the progress made as a result of their feedback.

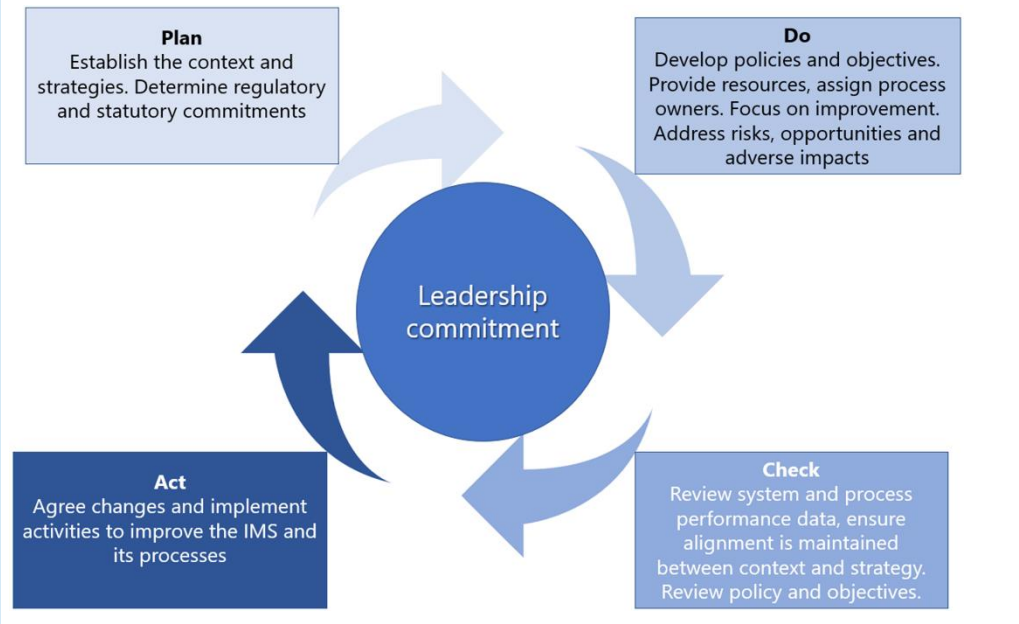### 2.2 MANAGEMENT RESPONSIBILITY

Top down responsibility	Top management is responsible for defining the overall company strategy and strategic goals and thus for implementing ADVA's IMS, including the development and deployment of ADVA's QUALITY, ENVIRONMENTAL, ENERGY AND SUSTAINABILITY policy, subsequent objectives and targets, and product specific plans which are customer focused. Corporate goals are cascaded down to all functional areas. Top management is also responsible for identifying and providing adequate resources to achieve these goals. The management board regularly communicates to the organization on the achievements of the company results, as well as the importance of meeting customer and regulatory requirements.

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Scott St. John	**Christoph Glingener**	**Brian Protiva**	**Ulrich Dopfer**	**Paulus Bucher**
CMSO	CTO	CEO	CFO	COO
Sales	PLM	HR	Finance, IR	NPI
Services	Development	Compliance	Legal	Operations
Marketing	Global BD	Quality analytics	IT	QM

PDCA cycle of leadership commitment

Plan
Establish the context and strategies. Determine regulatory and statutory commitments

Do
Develop policies and objectives. Provide resources, assign process owners. Focus on improvement. Address risks, opportunities and adverse impacts

Leadership commitment

Act
Agree changes and implement activities to improve the IMS and its processes

Check
Review system and process performance data, ensure alignment is maintained between context and strategy. Review policy and objectives.

Organizational responsibility

Functional responsibilities and interrelationships are fundamentally defined through business processes and integrated process landscape, as well as organizational charts, job descriptions, corporate policies, and key system procedures.

Functional managers are responsible to ensure all members of their team understand corporate goals and objectives, the scope of the Integrated Management System, and the role of their team within that system.

Top management has appointed and delegated the responsibility and authority for managing our business processes to the QMS management to ensure that the necessary financial, technological and organizational resources are available to implement, monitor and maintain the IMS as required

Management system responsibility

The main goal of the QM department is to understand and meet/exceed customer expectations and is inherent to all business processes by concentrating on the avoidance, rather than just correcting of faults. This is accomplished by having a quality management system that ensures monitoring of all processes.

The Quality Management System (QMS) team is responsible for ensuring that the quality, environment, and business continuity systems are established, implemented and maintained per the goals and objectives set by the executive team, as well as in accordance with ISO 9001, TL9000 and ISO14001 and ISO 22301.

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The QMS team coordinates the performance of the integrated quality, environment, and business continuity management system, including our external partners who share in its efforts to excel in quality, environmental, business continuity and CSR aspects.

Management reviews

A global top management team (ADVA Engine) regularly reviews ADVA´s overall performance as part of the internal Management Business Reviews, especially focusing on the Integrated Management System.

Data is collected and assessed from different business processes to ensure conformity of products and services. Results are evaluated against established corporate objectives. Such periodic reviews are intended to determine whether the data is representative of a functional management system. Data collected for the review include metrics, customer satisfaction and feedback from our interested parties, the extent of achieving objectives, non-conformities including derived corrective actions, results of monitoring and measurements, as well as internal audits and process assessments, and the performance of external providers.
In addition, documented information is available for continual improvement activities, business changes, as well as corporate initiatives and programs influencing ADVA's Integrated Management System.

This review of the Management System ensures its suitability, accuracy, and relevance. Recommendations for improvements are presented to the Global Management Team (GMT) for discussion and approval. Derived action items are assigned to appropriate teams and support continual improvement objectives, as well as customer and employee satisfaction. Meeting minutes are used to communicate the effectiveness of our Management System and to follow-up improvement progress.

Quality planning

Quality Planning is a systematic process for designing and developing new products, services and processes that ensure customer needs are met. Characteristics determining the quality of ADVA products and services are translated into requirements and specifications for internal projects, processes and service provisions/plan-do-check-act (PDCA) cycle.

A systematic approach to quality planning steps includes the following.

1. Quality planning for R&D projects.

2. Creating processes to design goods and services to meet needs of its stakeholders (internal & external) by understanding what the customer needs are, and then design products or services that meet those needs.

3. Creating processes to control quality. Once designed, these products and services are produced to ensure compliance to the design criteria.

4. Creating a systematic approach for improving continuously through process audits and process assessments to discover weaknesses in the processes and resolve them.

5. Creating a function to ensure follow steps 1-4 listed above.

Also refer to chapter 2.8 on Continuous Improvement.

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Management system policy	Based on its nature as an Integrated Management System, the MANAGEMENT SYSTEM POLICY of ADVA comprises three aspects: Quality Management, Environmental, Energy & Sustainability.
Figure 1:	

QUALITY, ENVIRONMENTAL, ENERGY, BUSINESS CONTINUITY AND SUSTAINABILITY

Guiding principles

ADVA's mission is to be an innovation leader focused on our customers' experience and building better networking solutions.

ADVA understands that quality of processes, products and services is not only measured by interested parties/stakeholders, it is defined by them. Therefore, we continually strive to understand and meet their needs and expectations.

ADVA recognizes its commitment to provide all stakeholders with appropriate policies and objectives that ensure adequate controls over its activities.

We are committed to comply, as a minimum, with all legal, regulatory and other requirements and to provide our employees with resources to establish, implement, document, maintain and improve our integrated management system. This management system is intended to identify, eliminate, reduce and contain risks to the operations of business and to ensure that objectives and targets are set to achieve these goals.

The corresponding quality management system (QMS), environmental and energy management system (EMS and EnMS), business continuity management system (BCMS) and sustainability objectives are set by using the provided framework below:

▸ The international standards ISO9001/TL9000, ISO14001, ISO50001 and ISO22301 are baselines for our certified QMS, EMS, EnMS and BCMS comprising ADVA's integrated management system. ADVA continuously strives towards excellence in process, product and service quality, protection of the environment, improved energy performance and to assure business continuity;

▸ ADVA is committed to communicating this policy to employees and stakeholders, which creates both awareness and responsibility for quality, environment, energy, business continuity and sustainability;

▸ Commitment to customer satisfaction, customer experience and continuous improvement are the pillars of the performance of ADVA's integrated management system. Cross-functional teams, guided by a steering committee, drive improvement projects in support of our strategies;

▸ Data-driven business processes with well-defined ownership, controlled by critical-to-quality and critical-to-business parameters in all areas are supported by ADVA's risk management system;

▸ ADVA's business continues to grow through delivering the highest process, product and service quality to customers;

▸ Our external partners share our efforts to excel in quality, environmental, energy, business continuity and sustainability aspects, including procurement of energy-efficient, green products and services and green energy. External providers are evaluated by a supplier assessment system and concurrently supported in their development;

▸ Management reviews, measurements, internal audits and controls of any changes to our products, processes, activities or services that may impact quality, environment, energy, business continuity and/or sustainability are thoroughly planned and executed. This ensures the continuing suitability, adequacy and effectiveness of the integrated management system, aligned with ADVA's strategic direction;

▸ Products are being developed with a focus on sustainability, recognizing their environmental, energy and social impacts while monitoring the quality performance of our products throughout the entire product lifecycle;

▸ Requirements, objectives and these guiding principles are reviewed on a regular basis and are improved as needed to ensure compliance.

Brian Protiva, CEO — 25.01.2021 [Date]

Christoph Glingener, CTO — 25.01.2021 [Date]

Ulrich Dopfer, CFO — 25.01.2021 [Date]

Scott St. John, CMSO — 25.01.2021 [Date]

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File Name: QUALITY ENVIRONMENTAL ENERGY BUSINESS CONTINUITY AND SUSTAINABILITY

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2.3   SYSTEM ORIENTED MANAGEMENT
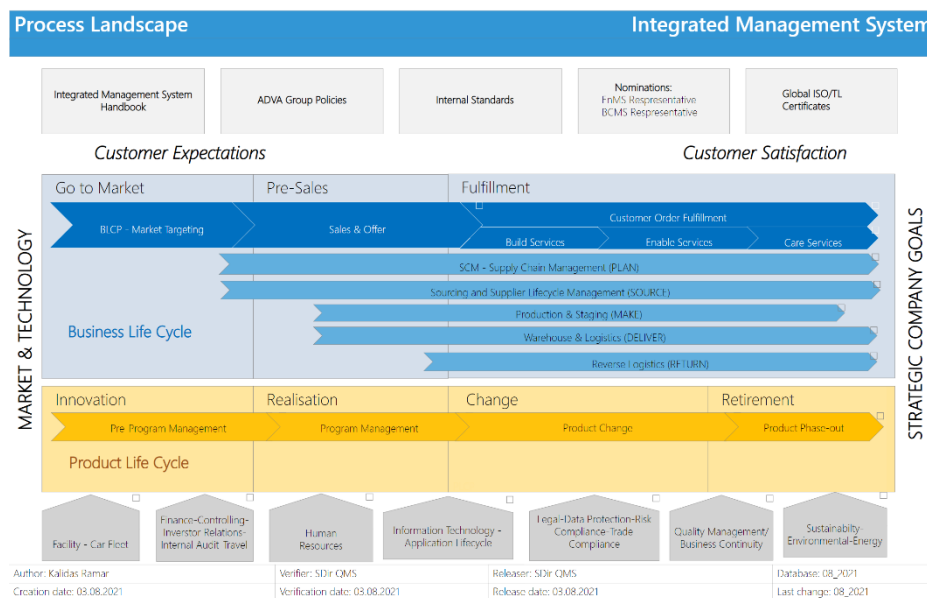
Process management	ADVA´s Integrated Management System is a process-oriented structure created in accordance with ISO 9001, TL9000, ISO 14001, and ISO 22301 requirements. It is divided in core, enabler and sub-processes. Pertinent supporting documents are linked and referenced. Different process map layers lead to the respective process and/or document level.
	The primary goal of the Integrated Management System is to reach the highest level of customer satisfaction by maximizing resource protection and in remaining compliant with the relevant international standards, as well as all legal requirements, (e.g. on environment and security).
Process landscape	The process landscape provides an overview of the Integrated Management System, the level of integration and the corresponding system documentation:

Document management	**Control of documented information**
	The Integrated Management System Handbook, associated policies, internal standards, processes, work instructions, specifications and references are controlled and documented in accordance with ADVA's Document Management System - internal standard.
	These documents and related changes are maintained under revision control and require approvals as defined in the original document.
	Changes to this Integrated Management System Handbook require CEO approval.
	Documents of external origin that are necessary for planning and operation of the Integrated Management System are identified and controlled.
	Uncontrolled documents

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As defined and described in ADVA's Document Management System - internal standard, printed copies of any documents are considered uncontrolled.

Original documents in accordance to ADVA's DMS are maintained in electronic form by the QM department.

Control of documents retained as evidence of conformity

Documents retained as evidence of conformity are protected from unintended alterations. It is required to provide evidence of ADVA's Integrated Management System to ensure continued suitability, adequacy, effectiveness and alignment with the strategic direction. These documents are identified, determined and maintained by the appropriate teams and stored and maintained in a manner that is readily accessible and minimizes deterioration, damage, or loss. These documents are maintained electronically with the appropriate security and/or network backup. After the minimum retention period, documents retained as evidence of conformity may be stored at an offsite location or destroyed.

2.4   PROCESS MANAGEMENT

Process structure	The process landscape is structured by • Core processes • Enabler processes • Sub-processes • Further important documents (i.e. policies, internal standards, instructions, forms, etc.)
Process performance	ADVA applies suitable methods for monitoring and where applicable, measurement of our business processes. These methods demonstrate the ability of the processes to achieve planned results. When planned results are not achieved, correction and corrective actions are taken, to ensure conformity of the process. Process improvement initiatives derive from a number of assessments and evaluative activities as listed below. • Customer assessment of our quality system • Customer satisfaction survey results • Management directives in management reviews • Internal quality audits • Internal process assessments • Review of metrics and trends; number of internal generated defects by release • Other self-assessments • Post-assessment of project reviews • Supplier Quality audits and Quarterly Business Reviews

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Business process management	ADVA ´s process model is based on the Supplier Input Process Output Customer (SIPOC) principle.
	Roles and responsibilities of process management are defined in the Business Process Management internal standard.

2.5   RESOURCE MANAGEMENT

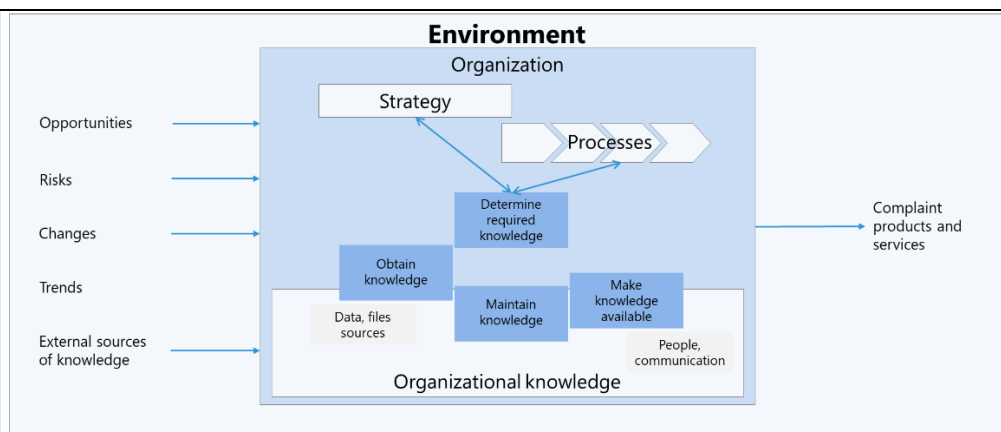| Allocation	When necessary, resources are allocated against forecasted requirements, and are reviewed and supplemented accordingly. Annually, as part of the budgeting exercise, the management team establishes the corporate business objectives including quality goals and requirements of interested parties, and evaluates the resources required to meet stated objectives.
	Resources at ADVA comprise people and specialized skills, infrastructure, technology, work environment and financial resources. The resource requirements for the IMS and activities necessary to enhance customer satisfaction are defined in our internal standards, business processes, work instructions and specifications.
People & culture	Employees are hired based on the defined qualifications for a position. Functional managers are responsible for reviewing employees training and needs, as well as identifying where additional training, support, tools, or resources may be required. Semi-annual reviews and goal setting are the basis for evaluating the competence and performance of all employees.
	ADVA's University program provides its employees the opportunity for development and constant broadening of knowledge. The training classes are developed in accordance with the Performance Appraisal and Development Plans prepared by the manager and employee during the performance appraisal review meetings. These training courses include but are not limited to internal and external, on-the-job/cross-site training, classroom style courses, webinars, lessons and individual or group training/activities.
	The sustainability of a training program is judged by observing improvement in job performance and/or product quality or reskilling of our employee base.
	Records of formal training are maintained by HR and kept on file as part of the employee's personal training record.
Organizational knowledge	Organizational knowledge is considered in the context of the organization.
	ADVA strongly emphasizes the importance on a meaningful knowledge management, which is necessary for the operation of its processes, and to achieve conformity of their products and services.

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Executive management provides strategic directive for knowledge management, as well as challenging goals.

Pertinence of knowledge is defined purposely and actively. For the determination, ADVA takes into consideration the context of the organization including established opportunities and risks.

Within the described individual business processes, specifically required knowledge and authority is being identified and defined to ensure that it is available timely and wherever needed.

ADVA's well-established "Performance Appraisal" process is used to ascertain available knowledge, and to identify the need for obtaining additional knowledge, and comparing necessary with available knowledge. The "Employee Training" process supports activities to acquire missing necessary knowledge and increase the competencies and qualifications of our employees. Consequently, ADVA conveys existing and deemed as necessary knowledge.

The "Meet and Teach" method is offered globally and is used to share department, product and general knowledge within the organization. Other tools are available to document and communicate, or even to transfer available knowledge.

ADVA's executive management consistently reviews the organizational knowledge and authority because of changing needs and trends, ensuring that the required knowledge can be obtained, and authority is assigned.

To accomplish this, ADVA focuses on developing and acquiring new knowledge.

ADVA's training sources include:

- Internal experts and training
- External training and consultancy
- Insights from own experiences/occurrences (e.g., lessons learned)
- Customers and/or suppliers
- Cooperation with universities,
- Conference attendance

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2.6   SOURCE

Sourcing & supplier lifecycle processes	The Supplier Life Cycle Management (SLM) covers the rules, responsibilities and processes defining all activities to be performed in our interactions with suppliers and contract manufacturers.

It describes an integrated set of processes from strategic and operational perspective.

1. Commodity Management Process – strategic SLM

2. Supplier Life Cycle Process (SLCP) – operational SLM
   (E2E supplier/manufacturer lifecycle)

3. Request for Quote (RFQ) Supplier – operational SLM
   (supplier prices)

4. EMS (Electronics Manufacturing Service) Cost Management – operational SLM
   (EMS costs)

The Commodity Management Process defines the commodity strategy. The supplier strategy provides a clearly defined strategy for the operational SLM processes.

The RFQ Supplier process consists of component price updates for all materials negotiated by ADVA for internal purchasing or purchasing by our EMS partners

The EMS Cost Management process pertains to the cost calculation updates of products manufactured by our EMS partners based on ADVA negotiated prices

The Supplier Life Cycle Processes (SLCP) considers five main process steps related to the overall life cycle phases of a supplier and/or manufacturer. They are as follows:

Identify and select → Qualify → Evaluate → Develop → Phase-out

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2.7 MONITORING; MEASUREMENT, ANALYSIS AND EVALUATION

General requirements	Decision making is based on facts gathered through monitoring, measurement, analysis and evaluation. Frequency and methods by which this is done is determined and informed by: • Statutory and regulatory requirements • Customer feedback and specification requirements • Criticality for product conformity • Trends in non-conformities or corrective actions • Process performance and audit results • Level of risk and types of control measures. All monitoring, measuring and evaluation results are recorded and analyzed.
Monitoring & measurement of products	Normally products are not released or delivered until the planned inspections and tests have been completed and recorded to provide evidence of conformity with acceptance criteria and identifying the person(s) authorizing the release. In rare cases unverified product may be delivered under controlled conditions and, where applicable, approved by the customer. Product improvement initiatives can result from a number of evaluative activities such as: • Failure and root cause analysis of customer reported product defects or non-conformances (Field performance as well as service performance data analysis), • Review of metrics and trends; TL9000 metrics, • Management directives in management reviews, • Manufacturing quality audits, and • Manufacturing test yield data. ADVA performs random packaging and labeling verification by "out-of-the-box" audits to ensure that products are delivered in proper logistics quality (6R: right product, right quantity, right quality, right time, right price, right destination). Periodic re-testing is covered by extended system tests for new releases during SIT and SVT in order to validate continual meeting of product design requirements
Calibration	A global process is implemented describing rules, actions and responsibilities ensuring only measuring and test equipment with valid calibration and/or verification according to the defined requirements (internal and DIN EN ISO 9001, DIN EN ISO 10012) is used. This process is especially valid for measuring and testing equipment used in production, for product qualification in R&D, in test engineering, as well as in Technical Service in order to provide evidence of product conformity. Devices are protected from damage during handling, maintenance or storage and safeguarded from adjustments, which may deliver invalidate results.

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The validity of results from a nonconforming device is re-checked using a conforming device.

Computer software which is used for monitoring/measuring is validated prior to initial use and re-validated if necessary.

Measuring and test equipment is clearly identified with ID number and calibration status. Equipment data and regular calibration is supported and controlled by a measuring and test equipment data base.

Documented procedures and process:

Control of Measuring and Testing Devices

Internal audits

Internal audits and process assessments are planned based on current process performance data, feedback from customers, the process status in terms of maturity and stability, the results of previous audits/assessments and importance of the activity being audited. The audit frequency depends on the criticality of each process and the perceived need to be audited, nevertheless all processes and areas are audited at least once every three years. Process assessments are team oriented enhanced process audits involving all relevant stakeholders and focusing on customer satisfaction, well-defined interfaces as well as correct input and output definition.

The auditor's toolbox provides audit checklists and other information that helps to ensure that our audits and assessments address the necessary requirements. Checklists stand as a reference point before, during and after the audit.

ADVA uses audits and process assessments as such to provide assurance that processes are implemented as planned, provide information on the capability of the process to produce a quality output and identifies any opportunities for improvement and possible corrective actions.

Audit and assessment results including strength and identified potentials for improvement are reviewed by the audit team and functional area. Discussion includes the determination of corrective and/or preventive actions, as well as continual improvement opportunities. All audit and assessment results are recorded, and a summary of audit activities is reviewed as part of the Management review.

Documented procedures and process:

Internal Audit and Assessment Process

Complaint handling

The process for Complaint Management describes rules, responsibilities and procedures, activities, and tasks to be performed in case of occurrence of deviations/non-conformances to defined processes or process results (e.g. product malfunction, violation to product specification and/or unsatisfied internal or external customer expectation).

The principles of the 8D Methodology (8 disciplines for systematic problem solving) are applied, which also follow the Problem Solving & Decision Making (PSDM) rules of rational thinking processes by Kepner-Tregoe.

<u>Customer complaints</u>

- Individual 8D cases, customer complaints via Return Material Authorization (RMA)
- Technical Service cases, customer issues via Technical Assistance Center (TAC) related to product quality

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- Pareto analysis (statistics) ➔ *enhanced quality reporting*

Internal complaints

- Production/test fails (internal complaints – yield loss/repair)

- Pareto analysis (statistics) ➔ enhanced Quality Reporting

Supplier/contract manufacturer (CM) partner complaints

- Individual 8D cases (complaints – supplier caused)

- Pareto analysis (statistics) ➔ enhanced quality reporting

Documented process:

Complaint Management within ADVA Process

Control of non-conforming products	Top priority has always been to avoid non-conformities. The identified non-conforming material or product is clearly marked, blocked, contained and separated from conform items to prevent further product processing and/or shipments to the customer. To ensure this, purchase, production and/or shipments of any non-conforming material is stopped accordingly across the whole supply chain.

Fast and exhaustive investigation of non-conformity supports the identification of the real root cause and derivation of adequate corrective and preventive action to rectify fault and avoid recurrence.

In our processes, rules, actions and responsibilities are defined to decide based on risk assessment whether clearly identified and recorded non-conforming items are intended to be processed and/or to be shipped to customer. Non-conforming product is only shipped with customer's signed waiver, clearly stating the non-conformity and possible effects.

All non-conforming products, after repairs, are re-tested/verified in accordance to current specifications before shipment.

Documents:

Handling of Non-conforming Products– internal standard
Quarantine Material Process
Special Clearance

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2.8 CONTINUOUS IMPROVEMENT

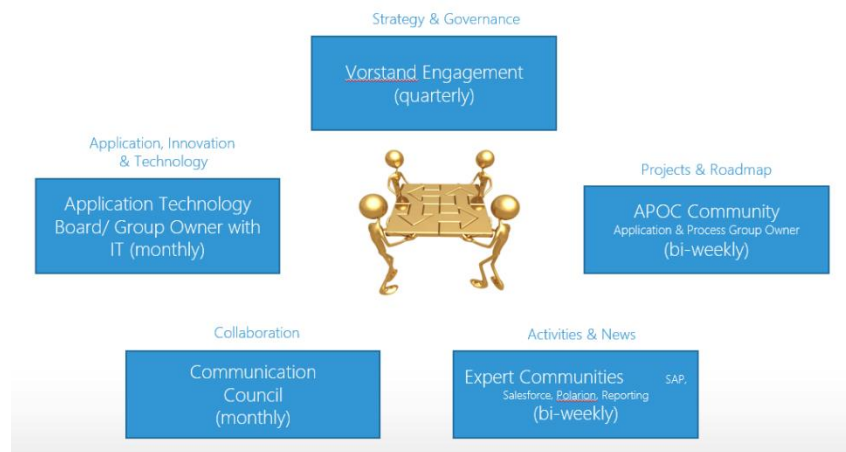|	
General	Processes, inspection, and test reports, supplier suggestions, results stated in internal and external audit reports, field service reports, and customer feedback are reviewed for continual improvement. Employees of all levels and in all functional areas, have the ability to propose and implement continual improvement activities using the Global Idea Bank (GIB)– ADVA's employee suggestion system. R&D utilizes popular and successful "Hack'n Play" sessions driving improvements as a team effort.
Executive level alignment	Corrective and preventive action requests are recorded and reviewed by the Global Management Team (GMT). A cross-functional team and two C-level representatives conduct ongoing reviews. Appropriate, corrective and/or preventive actions are taken to address potential problems, customer topics, or to prevent recurrence of non-conformances. Improvement projects are driven using Agile methodology as often as possible.

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3   CORE PROCESSES

3.1   PRODUCT LIFE CYCLE PROCESS

Product development	The Product Life Cycle Process (PLCP) defines activities required to manage products and solutions over their entire life cycle. This reaches from concept to implementation and successful market introduction over to maintaining the mature product and ultimately to the removal of the product from the market. The lifecycle methodology is applicable to all products being realized by development projects. It explains the lifecycle and how it must be practically applied for any project/ product being introduced, managed or withdrawn.

PLCP is a team-oriented management and delivery process. It is working on a cross functional organization structure following ADVA´s DevOps Strategy and utilizing agile development methodologies. The PLCP establishes the concept of "Key Dates and Phases".

Key Dates are gateways between the phases. PLCP defines requirements and deliverables for moving from one phase to the next phase. A cross functional team of people perform these activities.

Design and development inputs involve functional and performance requirements, applicable statutory and regulatory requirements stated form customers or suppliers, or information derived from previous similar designs. Outputs from the design and development phase are verified against the requirements/inputs and are approved prior to release.

Goals of the Product Life Cycle Process are:

- Improved planning, delivery schedules and predictability

- Reduced time-to-market for new products

- Improved product quality and Customer Satisfaction

- Increased customer involvement in product definition

- Improved revenue growth and business profitability

Supporting documented procedures and processes:

'DevOps PLCP internal standard' and associated sub-processes

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3.2   BUSINESS LIFE CYCLE PROCESS

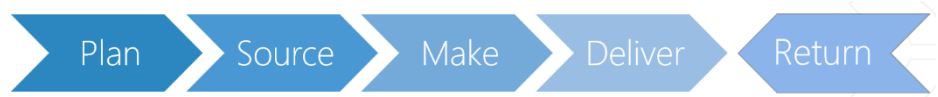| Sales	The ADVA Sales Model is optimized towards end-customer needs.
	Regardless whether selling direct or indirect the same ADVA principles are applied: it starts with the identification of actual and future Customer wishes, requirements and needs.
	The process includes the determination of requirements for product features, statutory and regulatory requirements, the agreement of terms and conditions as well as the determination of delivery and service activities.
	Sales representatives review challenges with departmental experts prior to giving a final commitment to supply products and/ or services. This approach ensures that the requirements are clearly defined and understood, contract or order requirements differing from those previously expressed are resolved and ADVA can meet the customer demands.
	The close interworking and integration with the Customer Service and Operations processes ensure the customer PO fulfillment in all respects regardless whether hardware, software or service related.
Customer service	ADVA provides a comprehensive service offering. Starting with technical consulting and designing customized solutions we install and integrate the products guaranteeing quick turn-up cycles and early ready-for-service dates. In addition, customer's staff will be trained, either in classrooms, on the job, or through web-based training courses; lastly our service offerings ensure that the customers' equipment will be operated and maintained at desired levels and beyond. All of the above are coordinated and managed by certified project and program managers.
	We have reflected this in our service portfolio, packaged in three service categories called BUILD, CARE and ENABLE. The portfolio has been developed flexibly so that it fully adopts to the needs of our customers and to the needs from our hybrid sales model.
	ADVA defines flexible sales models that support both direct and indirect business – our services follows this strategy. Service delivery is provided via own staff, via certified services partners and/or via the support teams of our service partners. Those external resources are enabled through our training courses, and backed up by our own experts, if required.
	ADVA´s Technical Service provides our customers with resolution of all technical issues raised against delivered products in accordance with Service Level Agreements (SLA). Technical Service takes the end-to-end ownership of all reported technical issues with the target to deliver efficient remote technical assistance and quick problem solving.
Operations	ADVA follows the traditional Supply-Chain-Operations-Reference-Model (SCOR), works closely with customer advocates in order to understand their needs. Production produces according to customers' needs, closely managed in ERP. Finally, Logistics transforms all that prior work into an invoiceable event by shipping the product to the customer.
	The processes are divided up into 5 main process streams:

- Planning & inventory (PLAN) – from sales demand via S&OP - supply / production planning until an effective order schedule.

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- SLM & purchasing (SOURCE) – from SLM processes (see Chapter 2.6) to an effective operational Purchase Order Process

- Production & staging (MAKE) – from launching production orders for unspecified and customer specific production (staging) to producing high quality products

- Warehouse & logistics (DELIVER) – from Inbound, picking and allocation of material from Warehouses to outbound processes with focus on customer needs delivered with guaranteed high quality

- Reverse logistics (RETURN) – from customer returns request via customer repair/supplier returns and spare part management to deliver repaired/replaced/refurbished products back to customer within SLA`s

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4 ENVIRONMENTAL/SAFETY MANAGEMENT PROGRAM

EMS representative:	A senior representative is nominated as the EMS Representative for ADVA globally.
EMS organization	
EMS program	Environmental objectives are established based on the determined significant environmental aspects. Objectives are translated into specific organizational targets. Responsibility for achieving these targets is given to the appropriate departments or cross-functional teams.
Process	The ISO14001 standard is the foundation for the environmental management elements of the Integrated Management System and provides a framework for conducting business in an environmentally responsible manner. At each company site, ADVA has established a cross functional Environmental Management System Team, responsible for determining aspects related to their functional areas and in driving improvements. Our global core Environmental processes include: • Environmental aspects and impacts process to identify and prioritize the significant environmental aspects associated with operations • Emergency preparedness and response process, which includes methods used to prevent and mitigate the environmental impacts that could be associated with emergency situations • Compliance and Legal have identified processes explaining how company shall comply with and communicate legal and other requirements Environmental objectives and targets are developed by considering significant environmental aspects, technology options and financial, operational and business plans. The views of interested parties are also taken into consideration, with the final goal being continual improvement. Documents: Environmental Requirements (Polarion, part of PLCP) Environmental & Energy Aspects Evaluation EMS & EnMS Communication Process Environmental & Energy Legal Requirements Process Procurement of hazardous substances Contractors Guideline

The EMS organization diagram contains:

Environmental Management System Representative
EMS Coordinator / EMS Team Leader

Legal Responsibility

China	Germany	Poland	UK	USA	Israel	Switzerland	India
CFO	CEO	CFO	CFO	CFO	SVP	SVP	VP

Local Site Representatives

| Shenzhen | Meiningen | Berlin | Munich | Hannover | Gdansk | York | Atlanta | Richardson | Raleigh | Boston | Tel Aviv & Yokneam | Saint-Blaise (OSA) | Bangalore |

Consolidated support by Global Facilities

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Health & safety	ADVA is dedicated to the health and well-being of their employees; therefore, the organization defines the scope and documents the commitment of management to provide and maintain a healthy and safe environment at all locations.
	We aim to remove or reduce risks to health, safety and welfare of all external workers, contractors and visitors, and anyone else who may be affected by our business operations at all ADVA locations.
Energy management system	Throughout ADVA we implemented an Energy Management System to reach a sustainable energy usage and -acquisition according to ISO 50001 and the European Energy Directive (EED), which goal is to enhance energy efficiency by 20% until 2020.
	The global Energy Management Team includes employees from various areas of responsibility and regions.
	We see this as a fundamental instrument and requirement to increase energy efficiency by decreasing specific energy consumptions, decrease CO_2-emissions, implement and use new technologies economically and also consider life cycle costs of energy sources used in new projects and products.
	Whenever possible we will reduce our dependency on fossil energy sources by introducing renewable sources.

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5   SUSTAINABILITY

"Anyone who believes exponential growth can go on forever in a finite world is either a madman or an economist."
Kenneth Boulding

CSR & sustainability representative:	The Global Sustainability Department – is nominated to be the CSR & Sustainability Respresentative for ADVA globally.
Sustainability approach	TIA / QuEST Forum Sustainability model

We follow the holistic sustainability approach from the TIA / QuEST Forum. This constitutes a common umbrella model which covers all relevant sustainability aspects. The aim of this model is not to replace all other standards but to give a guideline as to what the most relevant aspects to be followed are. The model covers 10 sustainability segments and is basically split into three superordinate segments. These three super-segments are referred to as Operational, Organizational, and Commercial.

The *Operational* super-segment covers aspects that are mainly related to the (production) sites of the company under consideration. It covers three segments which consider Environmental Compliance, Resource Management, and CO_2 (and Ozone depletion).

Relevant Environmental-Compliance aspects are air emissions, discharge to water, and waste going to landfill. Here, tracking against a credible standard, (e.g., ISO14001) is necessary.

Resource Management considers energy and water usage and efficiency. This includes strategies and plans that lead to an increasing amount of renewable resources (raw material, energy). It also covers reduction of waste disposal.

The CO_2 and Ozone-depletion segment considers the complete organization's CO_2 footprint as well as strategies for its reduction. This covers the Greenhouse Gas Protocol's Scope 1 to Scope 3. As such, it covers all active products, which is a major contribution.

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The *Organizational* super-segment contains the aspects of Stakeholder Engagement, Corporate Social Responsibility (CSR), Supply Chain Management, and Organizational Capability and Engagement.

Aspects relevant for Stakeholder Engagement are the identification of key stakeholders and related sustainability issues. This includes engaging the stakeholders on issues identified by a materiality analysis.

The CSR segment covers the reporting entity's engagement regarding its employees and within its communities. This includes compliance with relevant standards, (e.g., the EICC Code of Conduct). Relevant aspects include (but are not limited to) staff turnover and satisfaction, and Health & Safety. This also includes supply chain CSR audits.

Supply Chain Management includes regular communication with suppliers on all aspects of sustainability. This also means setting of related targets, including verification by audits.
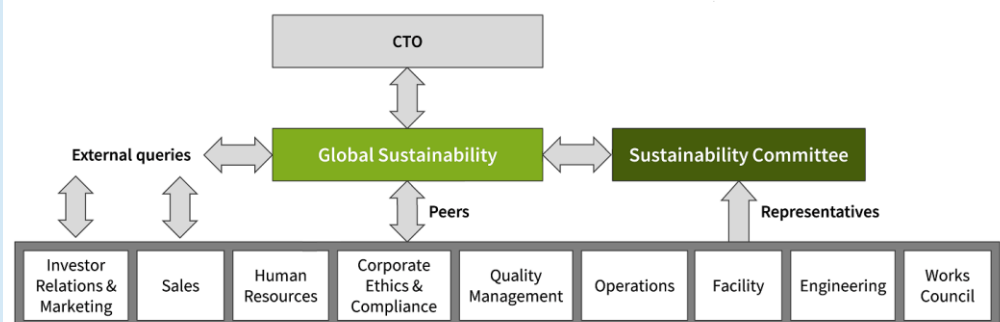
Organizational Capability and Engagement refers to structural capabilities of the reporting entity (e.g., existence of sustainability-related responsibilities and competences), as well as to the existence of a sustainability strategy that is regularly communicated internally and externally by senior management.

The *Commercial* super-segment includes the aspects of (product) Eco Design, End-to-End Logistics, and finally Circular Economy.

Eco Design covers, amongst aspects like energy efficiency, the specific design for recycling, refurbishment and reuse. This must be supported by Life-Cycle Analysis (LCA). Eco Design has also to be linked to sustainable manufacturing, i.e., the aspects covered in the Operational super-segment. Eco Design is part of the PLCP (Environmental Requirements).

End-to-End Logistics cover those aspects that are covered neither in Eco product design nor in the Operational super-segment. This includes CO_2 and other impacts from the end-to-end supply chain, logistics service providers and packaging, but also aspects like in-life / customer support, spares, reverse logistics etc.

The Circular Economy (CE) segment refers to a strategy and action plan, covering all relevant products, which ultimately lead to Circular-Economy business. This includes engaging the end customers in the related business models (e.g. leasing and take-back).

Structure

To support and institutionalize our CSR & Sustainability efforts, we built a management structure around them. Today, ADVA has a cross-functional CSR & Sustainability board that steers its activities to ensure a balanced drive, so all growth under each of these pillars makes sense and is distributed equally.

Members of the CSR & Sustainability board come from Human Resources, Investor Relations, Marketing, Operations, Engineering, Facility, Corporate Ethics and Compliance,

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	Works Council and Quality Management. Their goal is to drive accountability and to make it public.
Reporting	ADVA cares deeply about its Sustainability strategy and program, and we want to share our progress with our customers, partners, suppliers and other critical audiences. We have selected the GRI (Global Reporting Initiative) Standard as framework for our sustainability and non-financial reporting. These reports are available on our website, and we also upload them to the GRI platform. That allows to evaluate performance improvements period-to-period and also benchmarking against other companies. Our non-financial reporting also complies with the HGB, the German Commercial Code. These reports are complemented by yearly detailed carbon emissions reporting on the Carbon Disclosure Project platform and by CSR reporting on the EcoVadis platform.
Operational	**Environmental-Compliance**
	Performance is monitored in regular management reviews and further improvements are initiated as necessary. Our EMS and quality management system (QMS) are both integrated into our global Integrated Management System, and all relevant locations are certified according to ISO 14001.
	CO_2 and Ozone Depletion (ODS)
	For ADVA, caring for the environment is an integral part of our sustainability considerations. Here, our carbon dioxide emissions play an important role. We seek to reduce these during the lifetime of our products, in our daily life, at our sites, and with regard to travel and logistics. ADVA tracks and reports most contributions that fall into the GHG protocol's Scopes 1 to 3.
	In order to fully eliminate the use of ODSs throughout the supply chain, the respective awareness must be created, and ODSs be tracked. We have successfully started this process, considering both our own sites and our suppliers. Like similar engagement processes – conflict minerals, REACH, RoHS – we've already had positive feedback, but completion of this is ongoing work.
	Resource Management
	The group makes efforts to reduce energy and water consumption globally, despite company growth. Metering is constantly improved to identify electricity consumers. successes. We reduced waste disposal in several relevant areas over recent years. Also, optimization of transport and logistics, packaging optimization with regard to the environment as well as cost, is one of the focus areas of our sustainability activities.
Organizational	**Stakeholder Engagement**
	Stakeholder engagement is relevant in the sustainability context in that it helps with identifying stakeholders' expectations and updating focus on sustainability-related activities (BT BFSF, QuEST SI Initiative).
	We are in bilateral cooperation with our Key Stakeholder (Customers, Suppliers, Business Partners, Employees, Local Communities and Shareholders). Relevant action areas identified in a materiality analysis.
	Sustainability Supply Chain Management
	We are complementing the SCM / CSR (audit) process by several sustainability aspects beyond risk and CSR. This is based on a globally available platform, IntegrityNext. This

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complements our audits by the possibility of supplier self-assessments. Our audits ensure we are constantly engaged with our suppliers, helping them to move forward and remain within our Supplier Code of Conduct.

Conflict Minerals

ADVA follows the US due diligence requirements and tracks its suppliers accordingly. Due to incomplete answers from our supplier base, so far, we do not have 100% visibility on the use of conflict minerals in our supply chain. Therefore, this is ongoing work.

CSR

ADVA is an equal opportunity employer and has an on-going commitment to the creation of a workplace free of discrimination and harassment. The company recruits, hires, trains and promotes individuals on all job levels without regard to race, religion, ancestry, sexual orientation, marital status, national origin, age, gender and physical or mental disability.

Health & Safety

We support a flexible, diverse, and casual work environment, which stimulates change and motivates our highly efficient people. We have designed our *work and life program* around our people because we know that they will spend the majority of their life at work.

Social Engagement / Volunteerism

Volunteering takes on many forms and is performed by a wide range of people. Our volunteers serve on an "as-needed" basis, such as in response to natural disaster, marathons or runs for the cure of illnesses, and the needs of our communities.

Commercial

Eco Design

Product Eco Design is important in that it helps reducing the environmental footprint of our products. This footprint is calculated by life-cycle analysis (LCA), which considers all relevant aspects of a product throughout its entire life (i.e., from extraction of raw materials via production and distribution to its use and finally end of life, reuse or recycling). Eco Design is part of the PLCP, in the form of the Environmental Requirements.

End-to-End Logistics

Logistics are a main contributor to the end-to-end segment. In 2015, the group continued its efforts to reduce its transport-related environmental impact (i.e., reduce where possible air freight). All goods transported are checked for alternative methods, be it sea freight or ground transport (trucks, railway). The logistics model is still in its introductory phase and further trials are ongoing.

Another area of consistent sustainable improvement work in logistics relates to the packaging the group uses. Packaging is continuously optimized regarding size, weight, reusability, recyclability, plastic reduction, and other functionalities..

The Circular Economy (CE)

The concept is necessary to reduce, over time, the amount of raw material and energy consumption and waste generation that is associated with any products and services.

We've established a Take Back Repair and Recycling Model at the Meiningen site. All equipment is being analyzed for potential parts reuse and refurbishment. If this is not given,

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it is being recycled. Depending on the degree of reuse potential, the components or systems get into respective stocks for new, refurbished or spare-parts-only equipment.

Lifetime extension and reuse are supported by life-cycle assessments in order to avoid that old equipment with obsolete energy efficiency is used to long.

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REFERENCES

Table 1: Reference list to ISO 9001:2015 / TL 9000 RHB 6.3 / ISO 14001:2015.

Chapter in this manual	Chapter ISO 9001 / TL9000	Chapter ISO 14001
1. GENERAL	4.	4.
2. QUALITY MANAGEMENT SYSTEM	4.3/4.4	4.3/4.4
2.1 CUSTOMER FOCUS	5.1.2/5.1.2.C.1	4.2
2.2 MANAGEMENT RESPONSIBILITY	5.1/5.2/5.3	5.1/5.2/5.3
2.3 SYSTEM ORIENTED MANAGEMENT	4.3/4.3.C.1/4.3.C.2	4.3/4.4
2.4 PROCESS MANAGEMENT	4.4/7.5	4.4
2.5 RESOURCE MANAGEMENT	7.1.6/7.2	7.1/7.2/7.3
2.6 SUPPLIER LIFE CYCLE MANAGEMENT	8.4	8.1/8.2
2.7 MEASUREMENT, ANALYSIS AND IMPROVEMENT	9	9
2.8 CONTINUOUS IMPROVEMENT	10	10
3. CORE PROCESSES		
3.1 PRODUCT LIFE CYCLE PROCESS	8.1/8.3	8.1
3.2 BUSINESS LIFE CYCLE PROCESS AND TECHNICAL SERVICE	8.2/8.4	8.1
4. ENVIRONMENTAL / SAFETY MANAGEMENT PROGRAM		6
5. CORPORATE SOCIAL RESPONSIBILITY (CSR)	Electronic Industry Citizenship Coalition (EICC)	

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Integrated Management System
Handbook

Document owner	Senior Director Quality Management System

7 Validation

Areas of validity	Global all ADVA with regards to:
	• Quality Management System (QMS)
	• Environmental Management System (EMS)
	• Energy Management System (EnMS)
	• Business Continuity Management System (BCMS)
	• Corporate Social Responsibility (CSR)
Range of products	All purchased, designed and manufactured products and services sold and marketed by ADVA.

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Document history and approval

Version & Date	Description of Changes
3.0 / April 2013	TL 9000 QMS Handbook: To address the needs of the aimed audience of this document, the former TL9000 Handbook was completely reworked and renamed into 'Integrated Management System Handbook'. ISO 14001 EMS Manual: The main topics from the former 'ADVA EMS Manual' were integrated in this document to address the needs of the aimed audience of this document. The 'EMS Manual' became obsolete with the official release of this document.
4.0 / October 2014	ADVA Integrated Management System Handbook is revised with the following main changes: Quality, Environmental and Corporate Social Responsibility Policy was revised and renamed as Quality, Environmental and Corporate Social Responsibility Guiding Principles. Minor changes made due to the new Business Process Management Internal Standard. New description added to explain ADVA's new Sustainability and Corporate Social Responsibility program.
5.0 / April 2015	Org chart "Top management" updated (page 6)
6.0 / January 2017	AEE cancellation integrated New standards ISO 9001:2015, TL 9000:2016 RHB 6.0 and 14001:2015 applied Updates on EMS/CSR/Sustainability/BCMS, updates DEVOPS, changes PLCP Org structure changes (CSO), Neuchatel New process landscape
7.0 / August 2017	Context of the organization, interested parties and issues, risk management updates, wording and schemes adapted
8.0 /August 2019	New template and multiple updates (pictures, charts, new focus areas)
9.0 /December 2021	Multiple updates (pictures, charts, content)

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Release:

Role	Name	Function / Department
Author	Silke Lindner	Principal Quality Management
Verifier	Kalidas Ramar	Quality Management Manager
Approval	Bernd Weber	Senior Director Quality Management
Approval	Brian Protiva	Chief Executive Officer, Vorstand

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