# Table of Contents

Intel Quality Policy ................................................................. 3  
Introduction............................................................................. 4  
Intel Quality Management System.......................................... 5  
  Product Development.......................................................... 6  
  Technology Development..................................................... 7  
  Manufacturing..................................................................... 8  
  Supply Chain...................................................................... 10  
  Customer Support............................................................... 11  
  Corporate Processes........................................................... 12  
Conclusion.............................................................................. 13  
Additional Information.......................................................... 14
QUALITY POLICY

We strive to deliver world-class quality that is worthy of our customers' trust by

- Building safety, security, reliability, quality and compliance into our products, technologies, and services throughout our business operations

- Delivering products that support data integrity, system availability and a great customer experience

- Measuring our quality performance and driving systemic continual improvement

- Proactively and transparently engaging our customers

______________________ ______________________
Bob Swan Mohsen Alavi
Chief Executive Officer Vice President, Corporate Quality Network

Effective February 6, 2020
INTRODUCTION

Intel invents at the boundaries of technology to make amazing experiences possible for business, society, and for every person on Earth. As Intel and our customers usher in the data-centric era, the integrity of our products matters more than ever. Customers rely on our products to deliver energy efficient performance to collect, store and manage vast swaths of personal and business information for mission critical purposes. In this new era, trust is everything.

Intel is committed to relentlessly deliver platforms and technology advancements that people can trust to enhance the way we work and live. We are obsessed with meeting customer needs for our products and delivering quality worthy of our customers’ trust.

We are proud of our decades of innovation to bring customers products with leadership in technology and performance. We recognize that our work in quality is never done. We prioritize prevention and when a problem arises, we take action to resolve it in close collaboration with our stakeholders. Together with our partners and customers, we are continually learning and building the foundation for computing in a data-centric world.

Intel’s Quality Management System (QMS) is a rigorous framework for managing the activities used to develop and deliver products to satisfy customer and stakeholder needs. Our QMS is how we achieve and sustain quality outcomes. This quality manual document describes our QMS.

- Customer Obsessed
- Quality Built In
- Measured and Improving
Intel's Quality Management System is our foundation for customer satisfaction and continual improvement.

Our system includes 5 major processes that work together to deliver industry leading products, quality outcomes for our customers, and business success. These processes are briefly described in the following pages.

- Product development
- Technology development
- Manufacturing
- Supply chain
- Customer support

Intel leadership is committed to build quality and continual improvement into our work processes at all levels of our company. Quality is one of Intel's 6 core values. We strive to achieve the highest standards of excellence; do the right things right; continuously learn, develop, and improve; and take pride in our work.
Intel develops products to support many market segments, from silicon products such as CPUs and FPGAs to boards, systems, and software products. Our process to develop products follows a Product Lifecycle (PLC) defined in five distinct phases. To move from one phase to the next, acceptance criteria must be met and management approval secured. The PLC phases include:

- **Exploration** — A product opportunity is evaluated
- **Planning** — A program plan is established to enable the organization to commit funding and resources to the project
- **Development** — A product development team develops the product to meet its requirements, assesses the product compliance to requirements, and resolves non-compliances
- **Production** — Product is manufactured, sold and delivered to customers until the product is no longer manufactured.
- **Maintenance** — Customer support is provided for products until eventual product support discontinuance.

The product lifecycle includes understanding customer needs, designing, developing, testing, validating and qualifying products. Product qualification demonstrates that the product meets requirements. Typical qualification criteria include testability, manufacturability, reliability, stability, security, performance, responsiveness, features, safety, compliance and other product requirements. Although products cannot be completely free from the risk of logic bugs or processor errors, the product qualification process is used to measure, reduce and mitigate risk.

Learning from products are fed back into the product lifecycle systems to improve execution, expose future risks and issues, and enable proactive mitigation.
Technology Development Lifecycle

Technology Development is the process for developing new wafer fabrication, package, assembly, test, and board manufacturing processes. Technology development at Intel follows a cycle defined in four distinct phases: Pathfinding, Definition, Development, and Deployment. Technology certification demonstrates the quality and reliability of the technology and ensures that interactions between technologies (for example, between a silicon technology and a packaging technology) are understood. The Technology Certification milestone occurs between the development and deployment phases.

### Technology Development Lifecycle

<table>
<thead>
<tr>
<th>Pathfinding</th>
<th>Definition</th>
<th>Development</th>
<th>Deployment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exploring Options</td>
<td>Selecting Options</td>
<td>Establishing &amp; Characterizing the Process</td>
<td>Ramping Production &amp; Monitoring Performance</td>
</tr>
</tbody>
</table>

Technology Certification

In the Development phase of a new Technology, the development site establishes an initial process flow. The flow is characterized and the findings are used to refine and optimize the process to meet the technology target specifications. A detailed reliability certification plan is defined based on known or anticipated failure mechanisms. Quality and reliability characterization are an integral part of this iterative process; key learning are fed back to the Technology Development team for process optimization. When a technology meets the yield, manufacturability, quality, reliability, and other performance goals on a test vehicle and lead product, the technology is certified and moves into Deployment.
MANUFACTURING

The Manufacturing Quality System encompasses Intel products from silicon and components to boards and modules. To deliver products efficiently that meet Intel's customer expectations, Intel’s manufacturing organization transfers proven quality system fundamentals into each business area.

Copy Exactly
Fab, Sort and Assembly Test manufacturing organizations call this our Copy Exactly methodology. Copying the embedded learning from the development site is the key to minimizing output loss with process transfer, and enables consistent product regardless of manufacturing site. Intel performs continuous matching over time by using coordinated changes, audits, process control systems, and joint management structures.

Intel Wafer Fabrication and Assembly and Test sites, Post Sales Support, Intel Stress Labs, and Intel Programmable Solutions Group are registered to the ISO 9001 standard by a third-party registrar. See Intel ISO 9001 certificates.

Quality Monitoring
During manufacturing, product quality is continuously monitored to detect, isolate and resolve manufacturability issues as well as detect and quarantine potentially non-conforming product resulting from manufacturing issues. When non-conforming product is dispositioned, learning and preventive actions are completed or transferred to an organization/owner and monitored to assure the permanent solution is effective.

Our Manufacturing sites focus on issue prevention, detection, and containment. This focus is reinforced with assessments and audits of business processes and quality culture. The best-known methods captured through these assessments are shared.

Change Management
Change management begins in our development processes and continues after release of products to customers.
Traceability
All hardware products are assigned product identifiers to aid in traceability. Intel's product traceability system is used to trace ingredients that went into the creation of the product including materials, hardware, software and Intellectual Property (IP). The product traceability system enables product identification and tracking throughout manufacturing and storage using unit-level, lot level, or other identifiers that allow forward and reverse traceability of products.

Equipment Maintenance and Calibration
Intel maintains a maintenance system for all process equipment. For each equipment type, spare parts are identified and stocked, and sufficient resources and skills are provided for equipment and facility maintenance.

Intel's calibration program ensures the measurement capability of any instrument that provides quantitative or qualitative data on Intel products, including equipment used in manufacturing.

Product Preservation
During the manufacturing of the product until the delivery to customers, the product is carefully handled, packaged, stored, and protected in accordance with industry best practices and standards. Preservation includes coverage of steps such as identification, handling, baking, packaging, storing, and delivery precautions. These requirements also include security actions to prevent tampering or other unauthorized modification to products. Requirements are additionally enforced at suppliers' sites.
SUPPLY CHAIN MANAGEMENT

Planning & Logistics
Intel’s planning and logistics processes work to deliver quality service, better time to market, and reduced cost for our customers and Intel. The management of supply strategy, global transportation, warehousing, and reverse logistics are evaluated for success through the Order Fulfillment Quality (OFQ) program. The OFQ manages the delivery of Intel products and services to be complete, on time, and in agreed upon condition to meet customer expectations.

Supplier Quality Management Framework
Intel uses a rigorous and holistic framework for supplier quality management, called the Quality Operating System (QOS), to manage supplier and material quality. QOS is a standard set of processes, methods & specifications, tools and training used to execute our supply-chain quality strategies. This ensures predictable, consistent and repeatable quality from our suppliers and support services. Our QOS framework incorporates four distinct modules which include Supplier Selection & Development, Supplier & Materials Qualification, Supplier Process Control & Excursion Management, and Supplier Continuous Quality Improvement.

Suppliers are audited against our rigorous expectations and once qualified, are included on our approved vendor lists. Suppliers managed by the QOS framework, methods and tools consistently deliver products and services that meet and/or exceed the Intel expectations and have a competitive advantage in the industry.
Customer Support

Customer Quality Support
Customer support teams proactively engage prospective customers and support customers when issues arise. During the early exploration and planning phase, Intel focuses on soliciting and making sense of customer requirements and expectations. During the development phase, Intel's sales, applications and engineering teams proactively engage prospective customers to design Intel's products into customer systems, platforms and solutions. Some customers participate in co-validation and others may require product customization. Once a product is launched, customers can access Intel via various support channels for inquiries, documentation and issue support.

Product Safety & Regulatory
We protect people, property, and the environment through world-class product regulatory practices. Intel is committed to the safety of its employees, customers, and anyone who encounters our products. Our product design teams incorporate regulatory and safety compliance into the product regulatory lifecycle to ensure that we deliver the highest quality products to our customers and consumers. All safety and regulatory concerns and incidents are handled by Intel's Product Safety and Regulatory Council, which oversees investigations and escalates high risk matters to a Problem Response Team. The council ensures continuous improvement through education of and engagement with all employees about best practices.

Product Change Notification
Our customers will receive a Product Change Notification (PCN) to communicate product changes. Intel will follow the PCN rules regarding information, documentation, and qualification as defined by standards and guidelines for customer notifications of product and/or process changes where needed. More information can be found at Product Change Notification. For firmware/software, Intel releases changes to customers through Intel's designated portal or in some cases through the open source community. Release Notes are used to document the changes in the firmware/software which is a standard procedure in the software community.
CORPORATE PROCESSES

Business Objectives
Intel's executive management sets Annual Performance Goals, based on previous company performance, customer needs and competitive positioning. Progress to these goals are tracked and organizations are held accountable.

Risk Management
Intel seeks to consider all risks which could impact Intel's business and our customers. Intel assesses risk from many sources, including external scans, retrospectives, audits, customer feedback, and performance indicators. Intel identifies controls to prevent, detect, and if necessary, mitigate the impacts of realized risks.

Responding to Issues
Intel executive management directs action for resolution of high-impact customer issues. A well-established process is used to drive resolution to issues and communicate with customers.

Business Continuity
As a global corporation with locations and suppliers all over the world, Intel requires organizations to create, maintain and regularly test business continuity plans for all its sites, facilities, and operations. In the event of a disruption, our business continuity plans are designed to enable us to continue critical business functions. For more information, visit Business Continuity Practices.

Quality Records and Documentation
Intel has an extensive system for managing documented information using document control and engineering change control. Intel maintains quality records that demonstrate the effectiveness of our quality system and achievement of required quality standards.
CONCLUSION

Intel understands that quality is critically important to our customers and we are committed to delivering quality worthy of our customer's trust.

Intel uses a Quality Management System to prevent problems, deliver with predictability, and to drive organizational learning and continual improvement.

Earning our customers' trust requires listening to customers, collaborating transparently, and delivering with predictability and accountability. Each day presents us with new opportunities and challenges to maintain this trusted relationship amid a rapidly evolving and increasingly data-centric world. Together with our partners and customers, Intel is building the trusted foundation for computing in a data-centric world.

Whether you are a customer, supplier, partner, or Intel employee - thank you for your commitment to quality, for sharing your insights, and for participating in our ongoing journey to improve our QMS.
For additional information, explore these links.

**Intel Quality**

**Intel Customer Support**

**Product Information**

**Declaration of Conformity**

**Material Declaration Data Sheet**

---

**Acronyms**

AVL  Approved Vendor List
CE   Copy Exactly
DoC  Declaration of Conformity
IATF International Automobile Task Force
IP   Intellectual Property
ISO  International Organization of Standards
ISTA International Safe Transit Association
JEDEC Joint Electron Device Engineering Council
MDDS Material Declaration Date Sheet
ODM  Original Device Manufacture
OFQ  Order Fulfillment Quality
PCN  Product Change Notification
PLC  Product Life Cycle
POR  Plan of Record
QOS  Quality Operating System
QMS  Quality Management System
SCQI Supplier Continuous Quality Improvement
SDL  Security Development Lifecycle
<table>
<thead>
<tr>
<th>Date</th>
<th>Revision</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>February 2020</td>
<td>8.0</td>
<td>Full rewrite of all sections of the manual</td>
</tr>
<tr>
<td>April 2014</td>
<td>7.0</td>
<td>Reformatted for Intel Clear Font, new cover layout</td>
</tr>
<tr>
<td>December 2013</td>
<td>6.0</td>
<td>Chapter 1 - Removed reference to previous CEO, Paul S Otellini</td>
</tr>
<tr>
<td>June 2011</td>
<td>5.0</td>
<td>Minor edits within all chapters. Reformatted.</td>
</tr>
<tr>
<td>December 2009</td>
<td>4.0</td>
<td>Chapter 3 - Consolidated and reorganized content</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chapter 4 – Rewrite of PRQ Report Milestone paragraph, Section 4.3.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chapter 5 – Global replacement of the term Platform with Modules; Revised Figure 5.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chapter 7 – Rewrite of section 7.2.1; Revised section 7.2.5; Modified figure 7-1</td>
</tr>
<tr>
<td>September 2008</td>
<td>3.0</td>
<td>Added 48/14 content, completed other minor edits</td>
</tr>
<tr>
<td>August 2006</td>
<td>2.0</td>
<td>Updated corporate mission, modified section 7.2.3, revised typography and graphics, completed other minor edits.</td>
</tr>
<tr>
<td>November 2005</td>
<td>1.0</td>
<td>Released</td>
</tr>
</tbody>
</table>
Disclaimers:

The information contained in this document is provided for informational purposes only and represents the current view of Intel Corporation ("Intel") and its contributors ("Contributors") on quality, as of the date of publication. Intel and the Contributors make no commitment to update the information contained in this document, and Intel reserves the right to make changes at any time, without notice.

THIS DOCUMENT IS PROVIDED "AS IS." NEITHER INTEL, NOR THE CONTRIBUTORS MAKE ANY REPRESENTATIONS OF ANY KIND WITH RESPECT TO PRODUCTS REFERENCED HEREIN, WHETHER SUCH PRODUCTS ARE THOSE OF INTEL, THE CONTRIBUTORS, OR THIRD PARTIES. INTEL, AND ITS CONTRIBUTORS EXPRESSLY DISCLAIM ANY AND ALL WARRANTIES, IMPLIED OR EXPRESS, INCLUDING WITHOUT LIMITATION, ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, NON-INFRINGEMENT, AND ANY WARRANTY ARISING OUT OF THE INFORMATION CONTAINED HEREIN, INCLUDING WITHOUT LIMITATION, ANY PRODUCTS, SPECIFICATIONS, OR OTHER MATERIALS REFERENCED HEREIN. INTEL, AND ITS CONTRIBUTORS DO NOT WARRANT THAT THIS DOCUMENT IS FREE FROM ERRORS, OR THAT ANY PRODUCTS OR OTHER TECHNOLOGY DEVELOPED IN CONFORMANCE WITH THIS DOCUMENT WILL PERFORM IN THE INTENDED MANNER, OR WILL BE FREE FROM INFRINGEMENT OF THIRD PARTY PROPRIETARY RIGHTS, AND INTEL, AND ITS CONTRIBUTORS DISCLAIM ALL LIABILITY THEREFOR.

INTEL, AND ITS CONTRIBUTORS DO NOT WARRANT THAT ANY PRODUCT REFERENCED HEREIN OR ANY PRODUCT OR TECHNOLOGY DEVELOPED IN RELIANCE UPON THIS DOCUMENT, IN WHOLE OR IN PART, WILL BE SUFFICIENT, ACCURATE, RELIABLE, AND COMPLETE, FREE FROM DEFECTS OR SAFE FOR ITS INTENDED PURPOSE, AND HEREBY DISCLAIM ALL LIABILITIES THEREFOR. ANY PERSON MAKING, USING OR SELLING SUCH PRODUCT OR TECHNOLOGY DOES SO AT HIS OR HER OWN RISK.

Licenses may be required. Intel, its contributors and others may have patents or pending patent applications, trademarks, copyrights or other intellectual proprietary rights covering subject matter contained or described in this document. No license, express, implied, by estoppel or otherwise, to any intellectual property rights of Intel or any other party is granted herein. It is your responsibility to seek licenses for such intellectual property rights from Intel and others where appropriate.

Limited License Grant. Intel hereby grants you a limited copyright license to copy this document for your use and internal distribution only. You may not distribute this document externally, in whole or in part, to any other person or entity.

LIMITED LIABILITY. IN NO EVENT SHALL INTEL, OR ITS CONTRIBUTORS HAVE ANY LIABILITY TO YOU OR TO ANY OTHER THIRD PARTY, FOR ANY LOST PROFITS, LOST DATA, LOSS OF USE OR COSTS OF PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES, OR FOR ANY DIRECT, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF YOUR USE OF THIS DOCUMENT OR RELIANCE UPON THE INFORMATION CONTAINED HEREIN, UNDER ANY CAUSE OF ACTION OR THEORY OF LIABILITY, AND IRRESPECTIVE OF WHETHER INTEL, OR ANY CONTRIBUTOR HAS ADVANCE NOTICE OF THE POSSIBILITY OF SUCH DAMAGES. THESE LIMITATIONS SHALL APPLY NOTWITHSTANDING THE FAILURE OF THE ESSENTIAL PURPOSE OF ANY LIMITED REMEDY.

Copyright © 2000-2020, Intel Corporation. All rights reserved.* other names and brands may be claimed as the property of others.