



Oleohydraulic systems • Sistemi oleodinamici
Systèmes oléohydrauliques • Oleohydraulische Systeme



Quality Plan

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1 Company Profile

Denomination

Scoda srl (ATOS Group)

Registered office: Milan, Via Carducci, 31
VAT registration number: 07912650152
Comercial register: n. 248164
Headquarter: 21021 Angera (Va), Via San Gottardo, 14

Corporate Purpose

Design, manufacture and trade of equipments, on its own and on behalf of third parties, of machinery and industrial equipments generally.

Scoda srl - Company data

Personnel, total: 40 included temporary employees
The average age is 40 years old, 70% have high school or bachelor degrees

Turnover: 7,5 mio/€

The activity of the company is divided in four product lines:

- Standard power units
- Special power units
- Customised electrohydraulics blocks and systems
- Standard components and groups

Main manufacturing plants:

Angera plant - Italy
Surface under roof: 5000 m²



Angera plant

2 Purpose

This Quality Plan, edited in conformity to UNI ISO 10005:2007 norm, shows the procedures carried out by Scoda srl to comply with the quality requirements applied to the production of its products

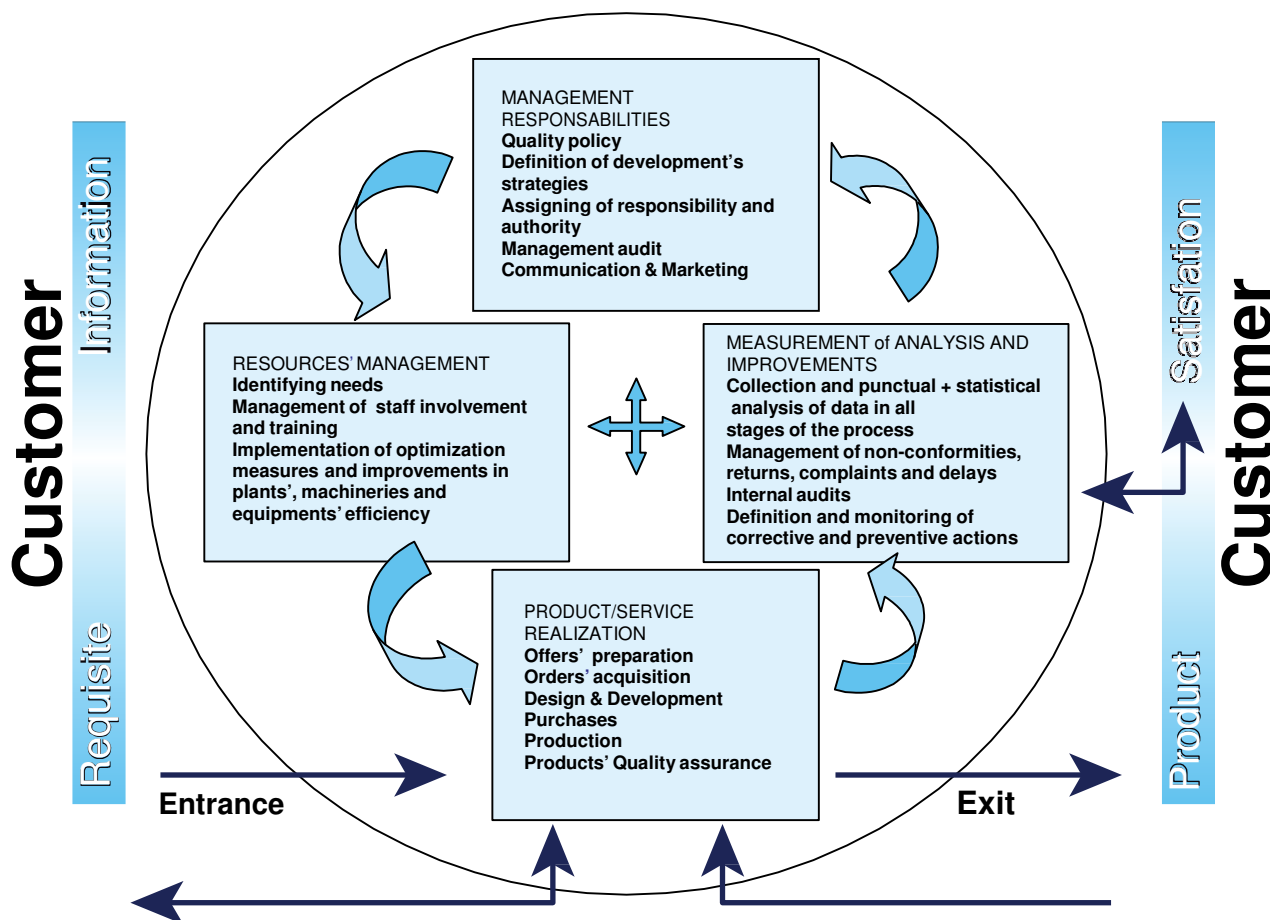
The document has been deliberately issued in synthetic form and with general purpose contents because specific information are just included into the Quality Manual.

Scoda manufactures two separate product lines, standard products and special products, consequently the Quality Plan differentiates the specific activities related to both production lines

If the contents of this document do not comply with the customers requirements, they can require a registered copy of the Quality Manual to the Scoda Quality Assurance Service.

This document is considered under “not controlled distribution”.

Quality Management system



2.1 Quality Highlights

Quality Policy

The main targets that Scoda aims to achieve and maintain, are linked to the philosophy of continuous Improvement, to be implemented as working style for growth of the company's activities.

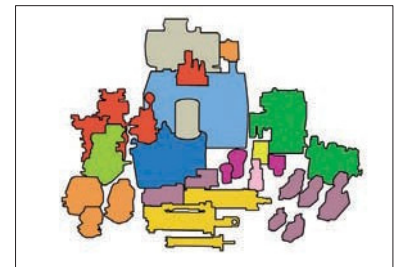
Through the constant support and motivation of mother Company Atos spa, the company has set-up the following guidelines in order to achieve the a.m. targets.

- Guidance to the Customer Satisfaction, namely the development of effective and proactive relationships providing a Quality Service based on product conformity starting from technical and commercial requirements
- Cost reduction of quality defects caused by the incorrect application of the Quality System; reduction of scraps and improvement of the efficiency of all activities in any Organization level by optimizing working methods and times
- Strict collaboration with suppliers to get progressive and constant improvements of the range of purchased products and services by increasing the Quality level and the competitiveness of overall costs
- Improvement of the sensibility, the team work attitude and the care of Quality targets in every level of personnel. It is taken good care of human resources management by qualifying the personnel through specific training courses
- Computerization of the production process and individual workstation throughout the company, in order to comply with requirements of traceability and production control

Quality and production requirements, design capabilities, Marketing activities and staff aspirations have to merge into a wide corporate project making persons aware of their responsibilities and more and more involved in a continuous growth of Scoda.

Quality System conforming to ISO 9001:2008 supplemented with applications and methods of IATF 16949 Technical Specification

In a more and more competitive global market, the Quality of product plays a basic role in customers satisfaction and therefore in having a successful business. In continuous improvement perspective, Scoda has decided to integrate the Quality Management System conforming to ISO 9001:2008 norm with applications and methods of IATF 16949 technical specification mainly applied in the Automotive market. The most significant methods used by Scoda are: **DFMEA, PFMEA, CONTROL PLAN.**



ISO 9001:2008 Certificate

Sharing of quality policy with all corporate levels

The Quality policy and the most significant trend indexes are shared with all operating services and departments. The main goal is to maximize the involvement and participation of all company personnel in regards to Quality subjects. Everyone has the right and duty to notify possible inefficiencies or nonconformities both of product and service. Each report will be always checked by services in charge; appropriate and corrective actions will be targeted and put in the field.



Partnership with Customers & Suppliers

Strong partnership with customers and suppliers

Scoda policy promotes strong partnership with customers and suppliers; close technical relationships with customers enable a thorough knowledge of products and applications, thus developing products able to meet all the requirements and suitable for the relevant application. The partnership with suppliers builds up and promotes their involvement in the company policy of continuous improvement; therefore the supplier becomes an active partner in the process of growth and improvement of Quality standards.

Personnel with high competence

Scoda, together with mother Company, invests a lot of resources in staff training at all corporate levels; the competence of staff plays a fundamental role to reach and maintain high quality standards over time and, in addition, to promote the policy of continuous improvement.

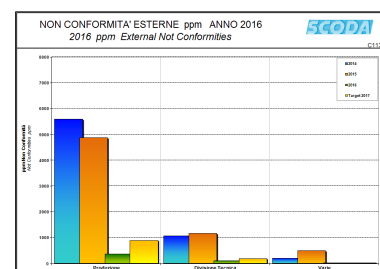
The training courses are planned with reference to the Skills Matrices, that point out and relate the individual skill to the running working activity, so any possible gap can be easily filled. In addition specific training are scheduled and focused on new methodologies learning (see IATF 16949) or on using of new working tools.



Technical session

Suppliers with certified Quality System

All suppliers are approved through joint Audit carried out by Quality and Purchasing specialists and their status of Scoda supplier is maintained by continuous monitoring of their trend indexes particularly the PPM (Parts-Per-Million) not-conformities. The evaluation of suppliers by Vendor Rating is issued every six months. Suppliers with underperforming VR index respect to Scoda' target are called to jointly define proper countermeasures to restore the targeted quality rating.



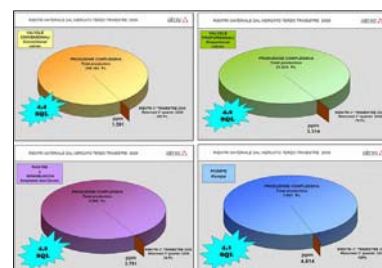
PPM Graphics - Not-conformities

Punctual Analysis of Not-conformities, for a continuous improvement

The nonconformities are split in three main groups:

- External not-conformities, reported by customers
- Internal not-conformities, reported by departments or services
- Not-conformities in material entrance, dependent on suppliers and detected in acceptance

Each not-conformity is promptly investigated, checked and solved by applying corrective actions according to the methodology of the Problem Solving. The Quality service draws up the analysis of not-conformities half-yearly; it is shared with all the company departments in charge, to jointly define and implement necessary and resolving actions.



Not-conformities analysis

Significant equipments at the R&D department

Scoda works together with Atos R&D, which is equipped with the necessary instruments to carry out functional and performance tests on products and components, moreover also specific machinery are available in order to simulate the most critical applications to which the components may be exposed. The functional tests are performed both during the feasibility study of a new product and on large serial production. The R&D plays a fundamental role in identifying functional limits and weak points of the product, allowing designers to work and focus on the improvement of Quality, Reliability and Performance standards.

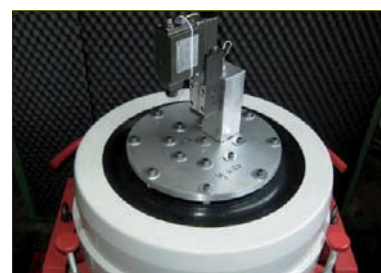
| TYPE OF INSTRUMENT | MODEL | TEST PERFORMED | REFERENCE STANDARDS | TEST DESCRIPTION |
|---------------------------|--|--|------------------------------------|---|
| SALT FOG CHAMBER | WEISS SC 450 | SALT SPRAY TEST CONDENSED WATER TEST | UNI EN ISO 9227 UNI EN ISO 6270 | Tests performed with a standardized solution of NaCl used to check corrosion resistance of coated samples |
| SHAKER | LING DYNAMIC SYSTEM V830-335 SPA16K | MECHANICAL STRESS AND VIBRATION ON 3-AXIS | EN 60068-2 DIN 40046 | Sinusoidal oscillation Random oscillation X/Y/Z Shock test |
| THERMAL CHAMBER | WEISS WT 120/70 | THERMAL TESTS RANGE -70°C + 180°C | | Functional tests of components with hydraulic and electric connection in real working conditions |
| IP PROTECTION DEGREE TEST | WEISS SWT 1000 | IPX6 ÷ IPX9K | DIN 40050-9 CEI EN 60529 | Analysis of IP protection class provided by enclosures of electronic components |
| INFRARED CAMERA | SAT-G 90 | -20°C ÷ +1500°C 7.5µ ÷ 13µ | | Photo and video in infrared wavelength. Resolution ±80mK a 30° |
| FATIGUE TEST | IMPIANTI VARI | FATIGUE TEST ON PRODUCTS FATIGUE TEST ON COMPONENTS | | 24/7 wear tests to verify reliability of products and components |



Salt fog test



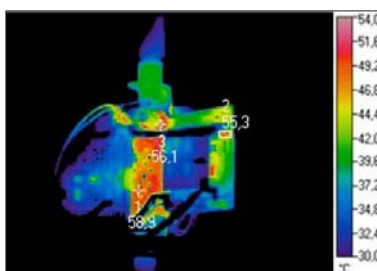
Temperature test chamber



Electrodynamic shaker



IP protection degree test



Infrared camera



Fatigue test

Significant equipments at Quality Assurance department

Scoda is equipped with an own division for control of incoming material, and it works together with ATOS for checking critical components, using their advanced control equipments that permit to check in automatic or semi-automatic way the conformity of components realised internally or purchased at suppliers.

The controls are defined according to the critical points of each component, and according to the supplier's VR. The quality and sampling plans are managed dynamically according to the number of conformed supplies and they are set on three levels: low, normal or intensive. Suppliers having high quality level maintained over the years, work under Free Pass; however all suppliers are required to prove and state the results of their own inspections and tests. The QA dept is capable of supporting suppliers as well as the internal operational departments whenever specific instruments or customized inspection are required.

| TYPE OF INSTRUMENTS | MODEL | MEASURING RANGE | RESOLUTION | FEATURE |
|------------------------------------|--------------------|--|---------------|--|
| 3D MEASURING MACHINE | DEA IOTA 0102 | X 910mm Y 610mm Z 410mm | 0.1 μ m | Renishaw probe PH10, SW TUTOR and PC-DMIS |
| 3D MEASURING MACHINE | DEA GLOBAL 071005 | X 700mm Y 1000mm Z - 500mm | 0.1 μ m | Renishaw probe PH10, SW TUTOR and PC-DMIS |
| OPTICAL SCANNER | HOMMEL-ETAMIC C310 | \varnothing 6 \pm 100mm Length - 350mm | 0.1 μ m | Measure outside diameters, SW TURBOPTIC 3 |
| PROFILE PROJECTOR | SCHNEIDER P500 | X 200mm Y 100mm | 1 μ m | Display MULTICOUNT 2000 magnification x10 x25 x100 |
| ROUNDNESS TESTER | MAHR MMQ44 | 180mm Z 500mm | 0.01 μ m | Automatic probe T7W, SW FORM-PC |
| ROUNDNESS TESTER | MAHR MMQ44 | X 180mm Z 350mm | 0.01 μ m | Semiautomatic probe T2W, SWFORM-PC |
| SPRING TESTING SYSTEM | EASYDUR DYNO | 0-300Kg 0-3000N | 0.001 Kg | Three load cells 300Kg - 50 Kg - 5 Kg |
| UNIVERSAL LENGHT MEASURING MACHINE | JENA 01-600C | Lunghezze 0-600mm | 0.01 μ m | Calibration of measuring instruments sw QM-SOFT |
| ROUGHNESS MEASURING STATION | MAHR MARSURF XR20 | X 120mm \pm 750 μ | 0.001 μ m | Probe GD 120, SW MAHRSURF XR20 |



3D coordinate measuring machine



Roughness measuring station



Optical measurement system



Roundness tester



Spring testing instrument



Universal length measuring machine

Products 100 % tested

All Scoda products are 100 % tested, this permits to detect possible functional non-conformities before the delivery to the final customers. The automatic testing benches, using CNC programmable electronic sequencers, enable the check of all functionalities and the recording of the tested performances.

Eventual products that are identified as not-conforming during the test are immediately sent to the involved divisions, for checking and repairing. The used fluid is properly thermostated and filtered, in order to ensure continuous monitored cleaning and alarm signals if contamination exceeds 18/15 (NAS 9) according to ISO 4406.



Automatic testing benches

Traceability of the testing and product data

All Scoda products are identified with serial numbers through a specific marking. This procedure permits a full traceability of each single product, enabling to manage and to monitor it from the phases of definition of the basic requirements of the series prototype and for the after-sales assistance.

Documentation for product use

All Scoda products are integrated with assembling Instructions and their respective declarations of incorporation, in accordance with Machine Directive 2006/42/CE. The documentation is also available in several languages and supplied also in electronic format, with Assembly 3D models, hydraulic and electric schemes, digital bills of materials (BOM) usable for being integrated into the technical book and final customer documentation.



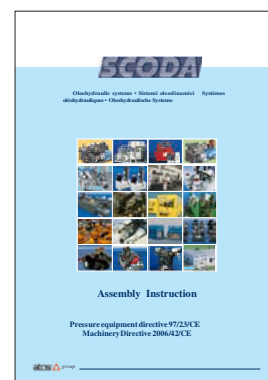
Identificative label

Risk analysis and product safety

All Scoda products are properly developed taking into account the regulations in force and supplying all required information about possible residual risks, general warnings, inspections, etc.

An example of the above mentioned regulations' compliance is the accordance with ISO 4413 for:

- Flexible pipes equipped with safety cables
- Reduction of noise pollution sources in order to bring plants into compliance with regulations through soundproof cabins, vibrating structures and balanced thickness carpentries
- Structures equipped with appropriate indications and with lifting and handling devices.



Product documentation



Example of ISO 4413 application

3 Scoda and quality assurance

The quality managements system certified since '98 in conformity with UNI EN ISO 9001:94, has been checked with positive results in 2010, according to UNI EN ISO 9001:08, through the certification body IMQ. To pursue the objective of continuous improvement, plans to control the productive processes have been established, to allow monitoring all the production phases.

The welding, qualified in accordance to EN ISO 9606-1 of 2014 through IMQ certification body, guarantees the quality levels required by current Scoda standards.

The painting processes are scheduled and executed according to ISO 12944, in order to ensure an expected durability independently of the operating environment corrosion classification.

The processes carried out are monitored through a series of checks such as the thickness test according to ISO 2178, the adhesion test according to ISO 2409 and environment resistance tests carried out in cooperation with Atos according to ISO 92227 and ISO 6270-2. Quality has been always a key point for Scoda, specifically matured by managing orders according to quality assurance requirements according to military provisions NATO AQAP-1 and IRIS for civil, naval, military applications and railway.

The ongoing target to improve the company quality standard leads Scoda to align its own quality management system according to IATF 16949 standards, introducing important activities mainly focused on customer satisfaction.



Paint inspections

Certificates and qualifications achieved in Quality system

Quality system:

- Dedicated Quality Plans to manufacture components in compliance with Atex and PED directives
- Registration into vendor lists of important groups operating in automotive, energy, steel industry and mining

Product certifications:

- electrohydraulic power packs certified according to 2014/68/UE
- safety blocks certified according to 2014/68/UE
- accumulators groups certified according to 2014/68/UE

All above mentioned certifications are available on our web site www.scoda.it on-line catalogue;

Main supplies:

Customer: OTO-MELARA LA Spezia

Role: sub-supplier Atos Spa

Supply: power packs to control stabilizing and balancing cylinders for SKY GUARD launching system

Reference Norm: NATO AQAP-1

Customer: Fiat Ferroviaria Savigliano (CN)

Role: sub-supplier Atos Spa

Supply: handling and lifting systems for EUROTUNNEL shuttle trains

Reference Norm: IRIS

Main supply programs, managed according to the Quality Plan:

- | | |
|--------------------------------|---------------------------------------|
| • Cameron - Voghera | • Flexa - Milano |
| • ZF Marine - Padova | • Enel - Pisa |
| • Alstom Power Italia - Milano | • Voith-Siemens - Milano |
| • Nuovo Pignone - Firenze | • CMD Transmissions - Cambrai Francia |
| • Tetra Pack - Luno Svezia | • BHS - Weiherhammer Germania |
| • Beijing Power - Pechino Cina | • Bystronic - Niederoenz Germania |
| • Valvitalia – Rivanazzano | • Petrovalves – Castellanza |
| • DVG Automation - Piacenza | • Alstom Power UK - Stafford |



PED Certificate



OTO-MELARA testing bench



Systems & power units

3.1 Design control

The design activity follows distinct operative lines in relation to the different product types. The design of a power unit, of a component or of a standard group (as per catalogue) is made through the issuance of a "Management Specification" prepared by the Technical Department and approved by marketing and general management. The design activity foresees, during its development, several stages of documented review, where the conformity of the activities' developments is verified. The main review is extended to all the involved business divisions, and customer approval is required.

The control and validation of the standard design are always carried out by testing one or more prototypes according to a qualification trial program.

Test and verifications reports are always registered into the "Management Specification".

Order management specification

3.2 Documents and data inspection

All Scoda documents are identified according to qualified criteria of codification. The code is always provided by the index of revision.

The data management is done both on paper (less and less used) and on data processing supports according to the ongoing softwares for management, design and usual practice. The external documents (norms, technical specifications of customer) are registered into special lists issued and periodically updated by quality assurance.

3.3 Purchasing

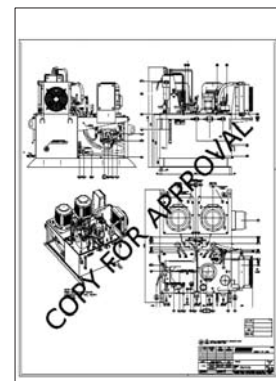
The purchases are managed by the purchasing department in cooperation with technical services. The Scoda suppliers are preliminarily verified by the quality assurance dept. in order to analyse their features and suitability.

Scoda do not ask their suppliers for the achievement of the ISO 9000 certification, but Scoda checks if they comply with the relevant operating prescriptions and requirements through dedicated inspection audits.

The vendor rating is set up and delivered to the suppliers twice a year in order to monitor their performances in terms of quality of supplying and also their reliability in terms of delivery time, flexibility and technical support forwarded to Scoda.

Scoda call suppliers having a quality index not aligned to a fixed benchmark in order to agree on necessary corrective actions and to restore a quality standard suitable for the needs of Scoda.

Scoda carried out specific frame agreements with suppliers having a quality index higher than a fixed benchmark; this agreement includes self-certification and free pass. The purchase orders are formalized on specific numbered forms, including the contract terms fixed in the relevant supplier's contracts.



Project approval



Acceptance label

3.4 Inspection of products supplied by customer

The products supplied by customer are handled separately respect to Scoda standards ones. Their storage is managed in separated warehouse areas.

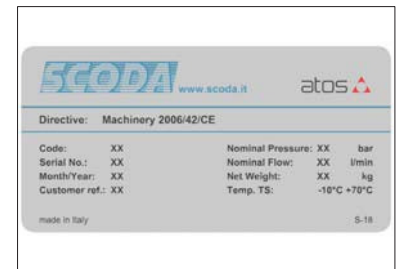
3.5 Identification and traceability

The identification of parts and products is usually carried out by affixing the identification labels on the components themselves.

The critical parts are marked by punching marking (special items, subplates for blocks, others...)

The “finished products” identification is carried out by affixing a metal label on which the Machine Directive required data are printed, in order to have a unique product code, the serial number identification, etc.

The “finished products traceability”, applied on all Scoda products, allows to identify the name of the inspector, the time and the testing procedures that have been applied.



Product identification label

3.6 Process control

The process control is usually carried out directly by the operative personnel according to structured control plans.

The control of the manufacturing processes executed in the Company is carried out in accordance with the working and control cycles, in which the operation's sequence and the working parameters are registered.

The control of the mounting activities is carried out both through visual instructions finalized to describe and represent the execution procedures and through the indications contained in the reference documents, in which the operative guidelines and reference documentations are required.

3.7 Inspections and tests

Inspections and tests concern three different phases.

Acceptance sampling: is done by the acceptance control department according to a sampling plan. Drawings and, where necessary, operative and visual instructions are adopted as reference documents. The sampling results are registered on a specific form.

On line controls: performed by the production workers and by the production manager according to sampling plans. The on-line controls are performed in accordance with the constructive design and with the production technical specifications; the results are registered on the specifications for order management.

Final functional tests: are performed on all components by testing personnel, according to product's test specification, and are registered on both the specifications for order management and related forms.

The objective proof of the functional tests' execution is granted by the presence of the “product traceability code” marked directly on the body components and by the “data matrix code” printed into the identification label.

3.8 Control of metrology and testing instruments

All the instruments used to control and test components are encoded and registered on specific master registration cards. Their suitability is constantly verified by the QA personnel through the relevant controls established in the same master registration cards. The instruments verifications are carried out by relying on Atos SpA laboratories or by external accredited laboratories by using primary samples SIT, DKD, NAMAS

3.9 Test conditions

The status of trials, controls and tests of components is realized by marking or punching of parts and, whenever not applicable, through identification labels.



Operative instructions



Test module



Production policy

3.10 Identification of products' non-conformities

The products' non-conformities both for simple part faults as well as finished product defects are always identified with coloured labels.

The not-conformity is always registered by the quality personnel on a specific form. The analysis of not-conformity management procedures are in charge to the acceptance control dept. in cooperation with purchase dept., for what concerns not-conformities issued at the acceptance of materials delivered by suppliers, while they are in charge to the staff responsible for quality in cooperation with the technical dept. for not-conformities issued during production phases.

For not-conforming parts that can be repaired or accepted in derogation, the management procedures are defined exclusively by the technical dept.

The management of not-conformities highlighted by customers is usually managed according to 8D reporting method, according to IATF 16949 norm.

3.11 Corrective and preventive actions

Corrective and preventive actions start from the analysis of product or system not-conformities and they are registered through the internal and external not-quality complains.

The relevant areas interested in such an analysis are: not-conformities in acceptance and production, customers' claims, not-conformities found in the product overhaul, internal and external quality audits.

3.12 Handling, warehousing, packaging and transport

All the parts managed in the Company are handled, stocked and preserved through specific equipment and protections. The preservation against ambient decay is granted by coating protective products.

Packing for the shipment is realised by using different protections related to the package weight, the selected way of transport and particular customer requirements.

3.13 Control of quality registrations

Quality documents are registered and managed by the same departments in charge of the specific activities.

Documentation of the quality will not be disclosed to entities outside the company unless agreed in the "review of the contract" with the end customer.

These documents are stored for 10 years.

3.14 Quality audits

Quality audits are constantly carried out by the QA personnel both within the Company structure and organisation as well as at the external suppliers.

The results of the inspections are always registered on specific forms, that are integral part of the quality system documentation.

3.15 Training

The personnel training involves the analysis of the job description that identifies, for any activity, the required preparation level.

The required skills are compared to the effective knowledge of the employee responsible of the activities, highlighting the need to start training courses held both by Scoda staff and external staff.

Training programs are registered and verified periodically by QA people.



Not-conforming product



Packing machine



Components warehouse



Training

3.16 Customer service

Scoda customer service is composed by qualified personnel usually involved in the R&D activities.

Each service intervention is registered into specific forms and service reports are always forwarded to the customers.

Also **Scoda**, thanks to his experience on plumbing systems, gained in over thirty years of activity, **offers** to coincide with an annual intervention of general maintenance, a predictive maintenance based on the analysis of physical parameters significant service and monitoring of the specific tendencies of application in order to perform or indicate the programming of specific corrective actions as a function of the working machine (24h continuous operation cycle).



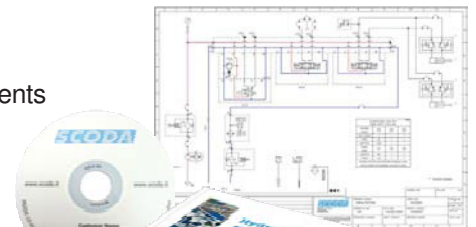
Customer service

3.17 Statistical techniques

Statistical techniques are applied to check quality problems that can be verified through the analysis of Quality registration documents.

Particularly, the following company areas are analysed:

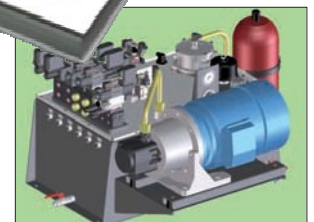
- Controls and tests at material entry and in production
- Not-conformities generated by customers' claims or by company's departments
- Customers' claims
- Delivery delays
- Missing parts in production



4 Application software used by Scoda

4.1 Design engineering

- Workstation Platform
- ONE SPACE DESIGNER for 2D and 3D design
- X-PIPING for piping advanced design
- E3 workstation for hydraulic/electric schematics
- Model Manager (Drawings management)



Documentation and technical support

4.2 General application

- UNIX Server Platform
- Software for factory management Asco, including:
 - General accounting
 - Assets accounting
 - Balance analysis management
 - Production (stock, cost analysis, etc.)
- ACT (configurator of codes, price lists and product part lists)
- SAP Software management
- Microsoft PC Platform
- Applications (WORD, EXCEL, ACCESS, POWER POINT)
- Applications Adobe Illustrator, Quark Express

Web services and e-mails are self-managed