

QUALITY CONTRACT GUIDELINES

1. FOREWORD

Quality Management is growing in importance. Many customers from companies that process steel and metals are outsourcing the production of parts and components to their suppliers to an ever greater extent. The quality aspects of development and production of parts, especially in the automotive industry and their supply chain, has increased in significance as expectations of the end customers will stay high and disappointments concerning quality will lead to decline of business.

In this environment the cooperation between customers and suppliers, becomes more and more fundamental.

The common objective of minimisation of defects can only be reached by a quality strategy that is integrated and agreed between all involved parties.

The Quality Contract should serve this ambition by giving a guideline for agreements concerning quality that are balanced and should not discriminate one of the contractual partners.

2. SCOPE

The Quality Contract Guidelines describe the procedures that forging companies and their customers jointly agree in order to develop a successful partnership through the objective of pursuing a zero defect strategy and the minimisation of quality costs.

3. QUALITY MANAGEMENT SYSTEM

The supplier's Quality Assurance System shall be approved to ISO9001 or TS16949 certification achieved through a third party assessment performed by an accredited certification body.

If this approval is attained, customer audits should exclude the quality management system of the supplier.

If Audits related to other issues (e.g. claims, new processes, etc) are necessary or agreed between customer and supplier, procedures should be communicated among customer and supplier and accepted by both parties in advance of the Audit.

4. FORGING SPECIFICATION

All aspects of the forging specification shall be clearly defined through drawings and technical standards and supported by specific tolerances, including surface quality and surface defects.

As far as is possible, the parties should apply International Standards, such as EN 10021, EN 10243 parts 1 and 2, and EN 10254

Dimensions that have to be monitored by means of Statistical Process Control, plus any characteristics to which 'special tolerances' have to be applied, must be agreed between the supplier and customer prior to the order and, identified on the drawing.

On the other hand, the tolerances must take into account the limits of the forging and steel manufacturing processes, the state of the art, and of the checking devices.

The customer's (or subcontract machinist's) machine location points must be identified on the drawing as this enables the supplier to be aware of critical areas and dimensions on the part.

If not otherwise agreed between the parties, misforged items may only lead to a complaint when they adversely affect the further treatment or application of the part.

The request for "free of defects" is not a precise requirement and therefore must be interpreted as a similar principle as the "zero defect " approach and should not be included on the drawings.

5. CHECKING AND INSPECTION METHODS

Where practical, checking methods, including measuring devices and testing equipment, shall be agreed prior to manufacturing and should be compatible between the supplier and customer.

The supplier will perform all defined inspections and tests during manufacture and prior to shipment. These checks shall be agreed beforehand and determined as to whether the nature of the control is destructive or non destructive and on a sample or 100 % inspection basis.

The customer will perform checks that he considers appropriate on the receipt of parts from a supplier and during his own manufacturing processes.

6. PRODUCT OR PROCESS CHANGES

Modifications to the product, or to the manufacturing process, which could have an influence on product quality, either proposed by the forging supplier or the customer, must be notified to the other party with the objective of obtaining its approval before application. These changes should then be formally identified on specifications, drawings or technical documents after satisfactory definition.

A list of all of the changes involved should be recorded and maintained.

Procedures must be established to ensure that suppliers are informed of, and issued with, any new specifications and drawings or contractual documents and the manner of recording and controlling these amendments/modifications.

7. TRACEABILITY

A method of traceability must be agreed by both parties and arranged on both sides, in order to guarantee that the identification mode is maintained throughout all processes to the final product.

This guarantee of traceability will ensure that the amount of suspect parts, in the event of a potential defect being found at the customer's plant, is identified and minimised.

8. WARRANTY

In principle, Warranty aspects have to be addressed in Commercial Contracts.

Some issues related to warranty, like the determination of actions that are necessary for the containment of problems, are detailed in the following paragraphs.

9. REACTION IN CASE OF A PROBLEM

As a basis for an effective working process, in the event of a problem, a list of contact partners with responsibilities should be exchanged between supplier and customer.

If a problem arises on delivered pieces, the customer must report in writing to the supplier promptly after receipt of the suspect parts. A clear description of the problem, including the dimension or characteristic out of specification must be included in the written report.

This must also include identification (e.g. delivery number, see also section 6. "TRACEABILITY") of the suspect parts so that the supplier is able to check if there are any parts from the suspect batch in process or in the stock at the supplier or in the stock at the customer.

In reacting in this prompt manner, the supplier will be able to quickly investigate the nature of the problem and take measures to ensure that no further suspect parts are manufactured or shipped. In order to facilitate efficient root cause analysis of the problem, the customer will submit a representative sample or samples of the potential defect to the forging supplier as quickly as possible for a comprehensive technical evaluation. This process should be supplemented by photographs of examples of the defective condition on rejected parts being e-mailed to the supplier.

The supplier will promptly react and initiate appropriate countermeasures whilst working to eliminate the root causes of the problem. This may involve a visit to the customer's plant at the earliest opportunity to witness the problem first hand.

All activities and findings must be documented to the customer by use of forms requested by customers(e.g. "8 Disciplines report").

The preliminary analysis, made by the supplier through a complete examination of the manufacturing parameters and results of the forging process, must confirm if the problem is a "single defective piece" or if a number of parts are potentially defective amongst the work in progress (WIP) at the customer.

Some examples of a "single defective part" are:

- Any part resulting from human error after a 100% control.
- Any part resulting from undetectable raw material defects.
- Any part resulting from machinery malfunctions as a single event.

According to the results, a decision will be taken, in agreement with the customer, as to the quantity of pieces potentially affected.

No sort out action shall be implemented in the case of a "single defective part" without agreement with the forging supplier.

If several other defective pieces are found, all of the suspect batch must be sorted, or returned to the supplier if the nature of the quality problem is such that inspection and rework at the customer plant is unpractical.

10. SORTING AND REWORKING

Before the commencement of sorting activities, other alternatives (e. g. machining trials, functional test, statistical investigations, etc) must be evaluated.

In the event of a problem being identified on received pieces, the supplier will be given the opportunity to inspect and rework or replace the batch involved.

Any sorting or reworking operations to be performed at the customer plant must be agreed with the customer before the commencement of this action.

The aim should always be to avoid stops of production, independent of where and how inspection and rework should be accomplished (under consideration of the features time, cost and quality).

In case of missing traceability information on the part of the customer, the responsibility of the supplier is limited to the identified suspect batch.

11. LIABILITY

In principle Liability aspects have to be addressed in Commercial Contracts the same way that Warranty issues have.

It has to be considered that for product liability there are legal regulations valid in the European Community that should not be supplemented or altered.

The question of liability as it is addressed hereafter is dealing with responsibility for root causes of problems.

In the case of a customer claim, if the liability resulting from the complaint cannot be agreed between the supplier and the customer, an independent or expert opinion must be sought.

Previous to any charge resulting from a field claim, either a “safety recall” or a “customer satisfaction measure”, the responsibility of the forging supplier must be clearly proved and agreed.

12. QUALITY COSTS OF COMPLAINT

Each complaint must be treated as a specific one and not in a generalised manner, with the objective of the two parties endeavouring to reach an agreement, on each independent case, acceptable to both parties.

This agreement will deal with additional expenses (such as added value), warranty costs and responsibilities.

In all cases, loss of profit or other financial damage incurred by the customer, will be excluded from additional costs.

Also, standard punishment fees or lump-sum costs (cost of complaints, administration cost for complaints, cost for internal effort and expenses and other similar formulations) will be excluded from additional reimbursement costs. Reasonable costs incurred by the customer (e. g. machine trials, functional test, etc) will be reimbursed by the supplier.

In the case that the supplier is not responsible for a problem, after the final results of the root cause analysis, the customer has to reimburse all quality costs caused by scrap, rework and unscheduled deliveries.

13. CONFIDENTIALITY

In order for the supplier to be able to reveal “know how details”, should the question arise during customer conducted process or product audits, a non-disclosure agreement must be settled.

Other issues of Confidentiality have to be addressed in Commercial Contracts.

14. QUALITY DOCUMENTATION

The documentation and technical records to be retained shall be those detailed in the supplier’s quality system.

The requirement for the retention of other documents and records shall be subject to agreements between both parties.

The normal period of retention of quality related and technical documentation and records shall be 5 years, though, in the case of safety critical parts, this will be extended to 15 years.

15. PPM RELEVANT REJECTS

The monitoring of PPM ((Defective Parts per Million) as an indicator for the quality performance of a supplier has been established throughout the automotive industry.

PPM targets should reflect the complexity of the products to be supplied and must be agreed between the contractual partners for a fixed period of time. Suppliers should be informed regularly about their performance level to enable them to react in an appropriate manner in the case of a deviation from the objective.

Measures and actions in consequence of a certain PPM performance shall be adequate and must also be agreed between customer and supplier.

It has to be considered that requirements concerning capability indices (e.g. $cpk > 1,33$) are already involved in setting up targets concerning PPM. The targets for PPM and capability indices shall not be inconsistent.

The final PPM target, as a matter of principle and as a commitment to the philosophy of Continuous Improvement, with respect to rejected parts, should be to approach Zero PPM.

Nevertheless it must be taken into consideration that it is not realistic to set a Zero PPM level as a requirement.

On the other hand PPM commitments do not release the supplier from the responsibility for defective parts.

In cases of uncertainty about the root cause of a defect (i.e. at which process – at supplier or customer – it has occurred), PPM may not be recorded against the supplier.

16. RAW MATERIAL RELATED PROBLEMS

Steel as the raw material for the processes of the forging industry is of major interest and steel works have to work together with their customers to implement the most effective measures to strive for the zero-defect target.

Nevertheless, it is necessary to take into account the undetectable residual defects in steel products. These defects (e. g. infused cracks, subsurface inclusions) are often not detectable during the steel manufacturing processes or with the state of the art downstream inspection activities.

To minimise the risk of having these defects undetected in an advanced manufacturing stage of the product it is essential to analyse the complete development phases of the final part and set up inspection processes where the residual defects can be determined with the highest confidence limit.

As this can be reasonable along the complete supply chain it is necessary that those inspection processes are agreed between customers and suppliers.

Aspects like “Traceability”, “Warranty”, “Reaction in case of a Problem”, “Sorting and Re-working”, and “Liability” should be handled the same way as described in the analogical paragraphs of these Quality Contract Guidelines.

In instances where the customer of the final product has defined the steel source, all special aspects of this customer-supplier relationship should be addressed in commercial contracts.

Bilbao, November, 2006