

Supplier Quality Performance Monitoring

Rules and Defect Codes

The supplier's process capability performance, based on deliveries of released material, is monitored and evaluated with the metrics

Incident is any non-conformed delivery, which creates a complaint towards the supplier, independent where the non-conformity has been detected in the process. It will be measured as Number of Incidents and calculated against the number of deliveries as Incident Ratio in percentage within a certain period, usually on a monthly time bases.

Defective Part is any non-conformed material, which creates a complaint towards the supplier, independent where the non-conformity has been detected in the process. It will be measured as Number of Defective Material and calculated against the number of delivered parts as Defect Ratio in ppm within a certain period, usually on a monthly time bases. All WABCO parts are treated equally, irrespective of their complexity. There is no classification into minor, major or critical defects.

WABCO defines an incident/a defect as non-conformance with the warranted or agreed quality as described in the Part Approval documents, which includes the agreed packaging. Any non-conformed delivery/material out of a WABCO or a customer process will be notified and measured, where WABCO's complaint is acknowledged from the supplier.

In order to distinguish the different cases to clean the supply chain of non-conformed material each complaint is indicated internally with an Incident 4-letter code, which includes related activities, an Incident Cost calculation rule, the number of non-conformed material to be notified and the Defect Ratio calculation rule (see also Reimbursement Policy).

The following list shows the Incident cases with its descriptions and the rules, a defect will be notified as ppm-relevant:

Incident Code	Description of Incident Code Actions Calculation of Poor Quality Cost	Place of Issue Notified Quantity of non-conformed material Defect Ratio Calculation rules
ADMI	<p>Re-sent lot directly after goods receipt</p> <ul style="list-style-type: none"> - analysis of deviation - communication with the supplier - tracing back action - preparing notification and inspection report - return deviated material (packaging, delivery note, invoice) - evaluation of 8D-report <p>Fixed charge</p>	<p>Incoming Goods Inspection</p> <p>Total number of non-conformed material</p> <p>Defect Ratio calculation (ppm calculation)</p>
DECO	<p>Deviation Concession</p> <ul style="list-style-type: none"> - analysis of deviation - obtain deviation concession request - communication with the supplier - preparing notification and inspection report - return of min. 1 deviated part (packaging, delivery note, invoice) - evaluation of 8D-report <p>Fixed charge</p>	<p>Incoming Goods Inspection Production Stock, Ware-house</p> <p>Total number of non-conformed material</p> <p><u>No</u> Defect Ratio calculation</p>

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SORT	Sorting on WABCO's premises <ul style="list-style-type: none"> - analysis of deviation - communication with the supplier - preparing notification and inspection report - supervisor activities in case of supplier or 3rd party action - return of sorted out material (packaging, delivery note, invoice) - evaluation of 8D-report sorting time * no. of persons * activity rate + fixed charge	Incoming Goods Inspection Production Stock Total number of non-conformed material <u>after</u> Sorting Defect Ratio calculation
REWK	Rework on WABCO's premises <ul style="list-style-type: none"> - analysis of deviation - communication with the supplier - preparing notification and inspection report - supervisor activities in case of supplier or 3rd party action - return of min. 1 deviated part (packaging, delivery note, invoice) - evaluation of 8D-report rework time * no. of persons * activity rate + fixed charge	Incoming Goods Inspection Production Stock Total number of non-conformed material <u>after</u> Rework Defect Ratio calculation
CONS	Sorting action related to Consignment stock material <ul style="list-style-type: none"> - analysis of deviation - communication with the supplier - tracing back action - preparing notification and inspection report - supervisor activities in case of supplier or 3rd party action - return of sorted out material (packaging, delivery note, invoice) - evaluation of 8D-report sorting time * no. of persons * activity rate + fixed charge	Production Stock Total number of non-conformed material <u>after</u> Sorting Defect Ratio calculation
EXPD	Special transport <ul style="list-style-type: none"> - analysis of deviation - communication with the supplier - preparing notification and inspection report - return of wrong delivery (packaging, delivery note, invoice) - organising special transport - evaluation of 8D-report invoice value of forwarder + fixed charge	Incoming Goods Inspection 1 part <u>No</u> Defect Ratio calculation
MACH	Processed Material in WABCO with hidden defects (e.g. material with porosities, lack of paint adhesion because of residues) <ul style="list-style-type: none"> - communication with the supplier - preparing notification and inspection report - return of scrapped material (packaging, delivery note, invoice) - evaluation of 8D-report machining time / part * activity rate * number of scrapped material + lost material + fixed charge	Machining / Painting shop Total number of non-conformed material <u>after</u> Machining Defect Ratio calculation
ASSY	Rework of assembled devices <ul style="list-style-type: none"> - analysis of deviation - communication with the supplier - preparing notification and inspection report - return of deviated material (packaging, delivery note, invoice) - Disassembly, assembly and function test - evaluation of 8D-report lost assembly time / device * activity rate * number of deviated material + lost material + fixed charge	Assembly shop Total number of non-conformed material <u>after</u> Assembly, <u>includes</u> stock material sorted-out Defect Ratio calculation

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LIST	<p>Assembly Stop of a scheduled Reference (Line Stop)</p> <ul style="list-style-type: none"> - analysis of deviation - communication with the supplier - tracing back action - preparing notification and inspection report - return of deviated material (packaging, delivery note, invoice) - re-scheduling of the assembly line - evaluation of 8D-report <p>lost production time * activity rate + fixed charge</p>	<p>Assembly shop</p> <p>Total number of non-conformed material</p> <p>Defect Ratio calculation</p>
CUST	<p>Customer complaint (isolated case)</p> <ul style="list-style-type: none"> - analysis of deviation - communication with the supplier - tracing back action - preparing notification and inspection report - return of deviated material (packaging, delivery note, invoice) - evaluation of 8D-report - communication with claims handling department - preparing of customer 8D-report <p>fixed charge</p>	<p>Customer premises / Field</p> <p>Total number of non-conformed material</p> <p>Defect Ratio calculation</p>
CAMP	<p>Customer complaint (campaign)</p> <ul style="list-style-type: none"> - analysis of deviation - communication with the supplier - tracing back action - preparing notification and inspection report - return of deviated material (packaging, delivery note, invoice) - evaluation of 8D-report - communication with claims handling department - preparing of customer 8D-report <p>campaign cost</p>	<p>Customer premises / Field</p> <p>Total number of non-conformed material</p> <p>Defect Ratio calculation</p>

- Remark 1** After analysing of deviation and before starting an particular action the supplier shall be informed from WABCO concerning necessity, volume and expected costs (e.g. via e-mail). The absorption of costs has to be confirmed by the supplier in a written form (e.g. via e-mail).
- Remark 2** In case of sorting or rework actions the supplier shall be invited in order to execute the action on WABCO's premises.
Agency assistance has to order directly from the supplier.
The supplier has to bear WABCO's costs for supervision of agency staff (fixed charge).
In case of WABCO staff assistance the supplier has to bear the expected action costs.
The absorption of costs has to be confirmed by the supplier in a written form (e.g. via e-mail).
If information towards the supplier would not be not possible (2nd or night shift), an action from WABCO staff has to be executed as small as possible, only that the manufacturing could be kept in process.
- Remark 3** If additional conformed material has to be scrapped (e.g. a permanent sub-assembly), the value of this material has to be added (lost material) to Incident Cost.
- Remark 4** Without the supplier's approval any actions within the consignment stock are not allowed (The supplier is owner of the material).
Material in the consignment stock are not included in the defect ratio calculation.
- Remark 5** Lost assembly time includes time for assembly and time for disassembly.

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In order to describe the defect in a short way a 3 digit code is used, which is linked to the predefined defect descriptions.

The following list shows the codes with the descriptions of defects:

Code Defects	Code Defects
Quality defects	Quality defects
101 porosities	601 adhesion (bonded parts, paint,
102 parting line	602 riveted joint
103 burrs	603 stamped joint
104 delaminated	604 welding
201 leaking part	605 soldering
202 damaged / cracked part	606 screw connection
301 dimension	701 mechanical function
302 form/position	702 electrical function
303 roughness	703 wrong programming
304 mechanical joint (thread, bayonet)	704 electrical cut
305 electrical joint (pin, pad)	705 short-circuit
306 customer joint (thread, bayonet,	Logistic defects
401 coating (corros.-resist, thick,	801 delayed delivery
402 printing	802 wrong packaging
403 residues (chips, grease,	803 quantity vs. delivery docs.
501 force	804 identification
502 hardness	805 mixed parts
503 material	806 dirty parts
504 appearance	807 dirty packaging
	808 damaged packaging
	809 delivery documents
	810 forwarding supplier