

DELIVERY REQUIREMENTS FOR RAW MATERIALS FOR RUBBER BONDING APPLICATION

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3	14.09.16	AE MD Vogeler	4 5 6	5.2 Regrind ratio 10 % deleted, 5.3 solvent based degreasing added 5.4 Storage time 8 Appendix
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* This document is valid without physical signatures, the approvals have been sent electronically. The evidences can be requested from MD.

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1. INTRODUCTION

Delivery and material requirements needed for Rubber- bonding with PA, Steel and Aluminum

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2. PURPOSE

This Operational Process Instruction describes the VC (Vibracoustic) delivery requirements for incoming raw materials needed for rubber bonding.

3. SCOPE

This procedure applies to all companies and sites of Vibracoustic facilities worldwide. The suppliers are committed to fulfill the drawing requirements which includes adherence to this OPI.

Supplements, exceptions to this OPI 01_7.4_006 and optional requirements like 5.1.1 and 5.1.2 shall be documented on the part drawing separately.

4. TERMS / DEFINITIONS / ABBREVIATIONS

VC –Vibracoustic

AE – Advanced Engineering

MD – Material Development Dept.

PD – Process Development Dept.

ID - Isolators and Damper

EM – Engine Mount

CM – Chassis Mount

TVD – Torsion Vibration Dampers

PA – Polyamide

GF – Glass fiber

PE – Polyethylene

TES – Technical Engineering Standard

Charmille 36 – see: VDI 3400, electrical discharge machining (EDM) surface

VCI – Volatile Corrosion Inhibitor

Supplier – Party, that provides goods of services

Customer – Party, that receives goods or services

5. PROCESS / METHOD / PROCEDURE

5.1 Usage of process aids and Release agents

It is not allowed to use silicone oil, silicon oil based process fluids, molybdenum disulphide, other molybdenum joining, zinc soap, graphite, or other process aids, not removable with standard VC degreasing processes documented in TES 10300. Exceptions possible, with special release from VC Material Development team and the Site Quality Manager of all sites affected.

For Plastic, no process aid and mold release is allowed.

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5.2 General Delivery requirements for unfilled and filled PA

Material characterization must be according the specification on the drawing. External recycling material or post-industrial types are not permitted.

An internal regrind ratio is permitted and must be documented in the certificate of conformity. If the supplier uses a regrind process, they must be required to verify the mechanical and physical material properties of the batch to the original material technical data sheet. (online re-processing of sprues and runners.)

Parts must be free of processing failures at surface and functional areas (cracks, welding lines, lack of material, burning marks, sinkholes, burrs etc.)

Boundary samples must be determined between VC engineering, VC Quality and supplier as part of the PPAP process.

No functionality loss due to burrs, injuries, respective residual dirt is allowed.

Dispersion of filler material (glass fibers, glass beads) has to be uniform. maximum deviation of <1% between 3 measurement spots per part is allowed.

Clean, lint-free gloves have be used when handling plastic parts. No bare hand contact of raw material and molded parts is permitted. Plastic parts have be stored in clean, covered container, to avoid any contamination by dirt, dust or grease. During storage and transport water condensation, due to temperature changes, needs to be avoided. Plastic parts in general have to be degreased before bonding agent application. Alternative procedures have to be released by MD.

5.2.1 Optional requirement: Water content

Special requirements for defining post molding water conditioning shall be defined on the drawing.

To avoid the fracture of PA.6.6 and its derivatives (due to embrittlement) by pressing, assembling process the water content of the polyamide has to meet the following requirement:

Material Marking acc. VDA 260	unit	PA6.6	PA6.6 GF20	PA6.6 GF25	PA6.6 GF30	PA6.6 GF35	PA6.6 GF40	PA6.6 GF50
stabilization		heat stabilized						
Filling ratio (DIN EN ISO 1172)	mass%	0	20±2	25±2	30±2	35±3	40±3	50±3
Density (DIN EN ISO 1183-1)	g/cm ³	1,14±0,0 2	1,28±0,0 2	1,32±0,0 2	1,36±0,02	1,40±0,0 3	1,44±0,0 3	1,55±0,0 3
Required moisture content before shipping*	mass%	2,5±0,5	2,2±0,5	2,1±0,5	2,0±0,5	1,6±0,5	1,4±0,5	1,1±0,5

VC customer requirements need to be taken into account.

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For maintaining moisture content of parts on stock/ in transit, conditioned parts need to be stored in PE bags (foil thickness: min. 0,1mm). To adjust the required water content, deionized water is needed, to avoid contamination due to chalk or others.

Measuring method:

Weight difference evaluation of moistured parts vs. dried parts. Parts to be dried at 120°C for 48h. Digital moisture analyzer to be preferred.

5.2.2 Optional requirement: surface structure

Minimum **Ra 5** is required on surfaces to be covered by bonding agent.

Other requirements from point 5.1 and 5.2 above have to be fulfilled.

5.3 General Delivery Requirements Ferrous and Non-Ferrous Parts as steel, phosphated Steel, Aluminum, Zinc, Brass

The metal parts shall be free from corrosion and rust, scales, oil carbon, dirt and contaminations from burring processes (grindings etc.). Lubricants and corrosion protection agents which are removable with standard degreasing and washing processes as solvent based, aqueous neutral, acid and alkaline wash are permitted.

The corrosion protection chemicals, used by the supplier shall be stable and removable for at least 3 month. No gumming or solidification of corrosion protection oils is allowed.

Special process aids need special approval.

5.4 General Delivery requirements for chemical pretreated and electroplated parts

Parts shall meet surface tension ≥ 38 mN/m at delivery and documented together with the Lot No., production date and shipping data. On demand the supplier has to provide the data to the related VC dept. The pretreated parts shall be free from corrosion and rust, by products of chemical treatments like dust, sludge powder or oil and any kind of contaminations.

Black areas, dark spots due to electrochemical scorch effects are not allowed.

Parts for Rubber/Metal-Bonding must be free from any sealing chemistry.

5.4.1 Storage Conditions and Storage Time

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During storage no contamination by dirt, dust or grease is allowed. During storage and Transport water condensation, due to temperature changes, needs to be avoided. Storage time is defined in TES, which are determined on the part drawing.

5.5 Documentation

Production date, Lot-No., process parameters and part characteristics shall be documented according VC requirements and standards of the related quality departments. On demand the supplier shall provide the data to the requesting VC dept.

OPI 01_7.4_006 is replacing AA-ME_31 and VA 03 11 001 Delivery Instructions for the surface finish for vendor parts LC-FW

6. PACKAGING

Parts shall be stored in clean closed container/ packaging to avoid any contamination by dirt, dust or grease. Avoid any bare hand contact. Packaging shall be according purchasing and delivery conditions.

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7. RESPONSIBILITIES

Task / Function	AE	Engeneering	Quality / HSE	Operations	SCM
Application on Drawing	C	R	I	I	I
Application of OPI in Production	C	I	C	R	I
Application of TES	C	A	C	R	R
Application at Supplier	C	A	C	I	R

R = Responsible A = Accountable C = Consulted I = Informed

8. APPENDIX / ENCLOSURES

Additional information, notes, examples and the forms which shall be used could be listed in the appendix.

No.	Type of Document	Title / Description	Enclosure
1	OPI	Pretreatment and Bonding on Alu, Steel and Plastic	01-7.5_0022
2	TES	Steel Phosphating	10000
3	TES	Steel Plating prior Bonding Agent Application	10100
4	TES	Pretreatment corrosion resistant Aluminum	10201
5	TES	Pretreatment less corrosion resistant Aluminum	10202
6	TES	Degreasing	10300
7	TES	Grit Blasting	10400

9. VALID SUPPORTING / REFERENCE DOCUMENTS

A list of the documents which are necessary for the practical application or meaningful for use or which give further information on the topic. Example: Other documents, standards reference, customer brochures, customer's specifications, etc.

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10. DOCUMENTATION

Vibracoustic will keep this procedure on file. In case of a revision the latest edition will be kept for at least 3 years after revision.