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## Revisions

Date	Rev	Modification	Modified by:	Approved by:
2010-08-3	00	Initial release	TBD	
2011-03-11	05	Part number and part serialization marking rev.	LPM	PDE
2011-08-16	06	AQL link to KC marking; Document title	LPM	PDE
2011-10-21	07	Revision table, TOC added Notes about prototypes, note about cleanliness, marking table	PDE	DC
2012-05-04	08	Marking and traceability Shipping Authorisation	PDE	DC
2014-08-05	09	Supplier sub-contractors	DC	DC
2014-08-05	10	Dérog. Writing on parts	DC	JPG
2017-08-04	11	Modifications p.7 (section 11) and p.10 (section 18)	FDu	FD
2017-09-22	12	Modification P8 (section 10) Addition of the « no scale » criteria Removal of the foot page informations (Duplicate informations)	BP	JRD

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## 1. Purpose

CVTCORP recognizes the very important role our Suppliers have in the value we offer our customers. As an extension of our own operations, we rely on our Suppliers to provide material, products and services which meet all of the requirements of CVTCORP's purchase orders and applicable specifications.

CVTCORP serves diverse market sectors, such as industrial, construction/agricultural and automotive. The purpose of this manual is to inform CVTCORP's suppliers of the expectations we have regarding design requirements and manufacturing process controls.

We are committed to our customers to meet their quality needs and expectations. You as a supplier play a vital role in helping CVTCORP to achieve customer satisfaction. Suppliers to CVTCORP must assume responsibility for their products and services.

Though we try to maintain consistency, the expectations of our customers may supersede CVTCORP's policies and procedures.

## 2. Supplier Goals

CVTCORP expects our suppliers to continuously work to achieve the following:

- Delivery – 100% on-time delivery of products/services
- Quality – Defect free products


## 3. Mutual responsibilities and communication

CVTCORP's responsibilities to our supply base include:

- Communicating clear expectations and requirements
- Providing timely and accurate feedback on supplier performance
- Serving as a resource for suppliers

Supplier Responsibilities:

- Proactive communication regarding any concerns that may affect CVTCORP
- Consistently meeting CVTCORP's quality and delivery expectations
- Continuous improvement of operational performance, flexibility and customer service

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#### 4. Documents

Other documents in relation to this guideline<sup>1</sup>:

- Derogation Request Form (Demande de dérogation) – FO0315
- Cleanliness Specification – SP0100
- Cleanliness Procedure-Audit form (Formulaire d’audit de propreté) – FO0328
- Shipping Authorization (Autorisation de livraison) – FO0326
- Sampling Plan (Procédure d’échantillonnage) – PR0302
- MPI Inspection Requirements -- PR601
- 52100 Heat Treatment Procedure – PR603
- Rolling Elements Steel Quality Characterization Procedure (Procédure de caractérisation des éléments roulants) – PR605

#### 5. Drawings and requirements

All applicable drawings will be included with any new or revised purchase order and will have precedence over any other drawings or requirements (RFQ package drawings or other) that suppliers might have on hand and that could show discrepancies when compared.

#### 6. Part number nomenclature and Revisions

##### a. Part Number

Part number (P/N) is composed of 3 alphanumeric project defining digits (e.g.: **P06**), 4 numerical family & part definition numbers (e.g.: **-4301**) and a single variation definition letter (e.g.: **-C**), hence resulting in the complete part number as shown here:

CVTCORP part number: **P06-4301-C**

Note that a similar part number with a different last digit letter is a completely different part and need not to be confused with a revision. Hence, for the shown example:

CVTCORP part number: **P06-4301-D** is a different part than **P06-4301-C**

##### b. Revisions


The revision is composed of a numerical 2-digit suffix that appends the part number to indicate its revision state.

CVTCORP part number with revision number: **P06-4301-C-00**

Any change on part or assembly, physical or functional, specification or clarification change or addition, whether dimensional or cosmetic, will be communicated by mean of a revised drawing

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<sup>1</sup> These documents will be provided by CVTCORP upon request or on a needed basis.

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or specification and will increment the numerical digit. All changes since last published drawing will be indicated by either a redlined mark-up directly on the previous revision's drawing or a formal new drawing with triangular notes and change table indicating related modifications.


## 7. Traceability: Part Number Marking and Lot Identification

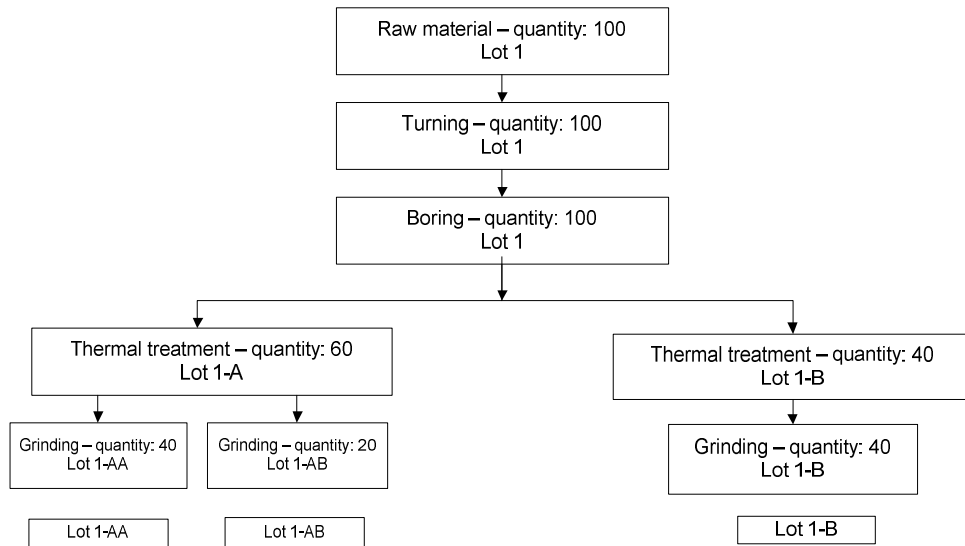
**Part number (P/N) with revision number marking is mandatory for all parts and must be positioned at area specified on drawing and preceded by your supplier's 4-digit number** provided by CVTCORP. You will find your supplier number in the header of our purchase order beside the word "SUPPLIER".

**All the manufactured parts also need to be identified with a lot number.** In the case where CVT Corp is buying subcontracting work (Item ZZ-xxxx), the lot number will be CVT Corp's work order number which can be found on the Purchase Order (Lot xxxx). In all other cases, the lot number is the CVT Corp Purchase Order number. A lot is constituted of parts made from the same raw material heat and manufactured in the exact same conditions.

If a lot needs to be split, parts from each sub-lot will be identified with the original lot number followed by: -A, -B, etc... Here is an example of how lots should be divided / followed if necessary:

100 pieces of part "X" are ordered. Four (4) distinct steps are required to manufacture this part: turning, boring, thermal treatment and grinding. At step 1 (turning), the 100 pieces are turned on the same continuous setup. At step 2 (boring), the 100 pieces are bored on the same continuous setup. At step 3 (thermal treatment): for some reason, only 60 pieces go in the oven. The original 100 pieces lot becomes a 60 pieces lot and a second one of 40 pieces. Then, at step 4 (grinding), the 60-pieces lot is divided again in two lots: a 40-pieces lot and a 20-pieces lot. You finally end-up with three different lots for the same order. Note that, under no circumstances, lots can be recombined. And here is a schematic illustrating the lot division process:

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In some cases, specific marking method will be specified on the drawing. When general permanent marking is called, the supplier shall use one of the permanent marking methods listed in Appendix A (methods 1 to 10). Upon request, other methods could be approved by CVTCORP.

Examples showing possible combination of P/N and L/N :

**1ABCP064301C00-1234**

or

**1ABCP064301C00**

**1234**

or


**1ABC-P06-4301-C-00-1234**

## 8. Assembly

When outsourcing is composed of an assembly, CVTCORP will provide the necessary information and specific assembly requirements. If a particular vendor is specified for standard components, no other vendor can be chosen unless approved by CVTCORP.

## 9. Material and 'Made with' hardware specification

Supplier must use the specified material or hardware unless otherwise authorized by CVTCORP by means of the **Derogation Request Form (FO0315)** (*demande de dérogation*).

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## 10. Cleanliness

Sharp edge deburring and part cleanliness is of great importance. In all cases, parts must be carefully deburred and cleaned by the supplier before being packaged. The presence of any scale including oxidation scale on metallic parts is forbidden

When requested on the drawing, parts shall be supplied per provided cleanliness specification. Refer to SP0100 specification. Part cleanliness will be audited per cleanliness procedure: FO0328.

## 11. Packaging

Unless otherwise specified, shipping and packaging is the supplier's responsibility. Parts shipped shall be packaged to protect from rust and damage during transport. The packaging shall also ensure parts maintain cleanliness specification.

CVTCORP recommends coating parts in a light mineral oil to prevent rust. For example: Mobil Velocite #3, Anticorit BGI 21-US (FUCHS), Castrol Rustilo 66 VCI (Castrol) or an equivalent as used to protect bearings by the bearing manufacturers.

Oil must be sufficiently light and sparsely applied to be dissolved by immersion in a solvent: White Spirit (Varsol) or Heptane/Propanol (Break Cleaner)

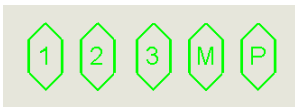
CVTCORP recommends the use of VCI bags or paper (corrosive inhibitor packaging). Indicating silica gel desiccant bags to prevent rust formation while packaged is also recommended.

Any additional labor (beyond immersion in a solvent) to remove rustproofing (such as the use of brushes, scrapers etc) will be billed to the supplier. In case of doubt, please contact CVT Corp for approval of packaging oil.

## 12. Inspection Requirements and Key Characteristics Marking

For every lot produced, we ask that one part be 100% inspected (that is, one result for every dimension / requirement of the detailed drawing /specification). These results will be provided with every shipment request. This sample will also be tagged as "F.A.I." (first article inspection) in order for CVT Corp to be able to trace the inspection results back to that one sample.

In addition to that first article, inspection, CVT Corp requires that some key characteristics be sample inspected as follows. Key characteristics are marked on the detailed drawings with these



symbols:

Criticality level specified inside the symbol is explained hereby:



Characteristic Level	Criticality description
<b>1</b>	Critical Key Characteristic
<b>2</b>	Higher level of criticality then level 1
<b>3</b>	Highest level of criticality; <u>Characteristic is related to product performance and/or a known failure mode</u>
<b>P</b>	Critical Process; Supply process certificate
<b>M</b>	Critical workpiece Material; Supply Mill Certificate

CVTCORP requires in-process inspection forms showing 100% inspection on key characteristic of level 3. Key characteristics 1 and 2 should be inspected following sampling plan requirements described in PR0302 Sampling plan.

If the supplier conducts capability studies, they need to demonstrate that processes are under control by showing a Cpk of **1.33** or higher on all key characteristics. Any other requirements, specification or general dimensions shall be checked by normal inspection process.

For critical processes (Heat treating, Nitriding, etc.) a process certificate is required.

For critical material (4340-HT ASTM-A434 class BD, AMS 6440 grade 52100, etc.), a mill certificate is required.


If there's any need to derogate from what is specified by the requirements, the supplier must get authorization by CVTCORP by means of the ***Derogation Request Form (FO0315)*** prior to shipping parts. A copy of the accepted and signed derogation request form shall accompany the shipped parts. **All non-conform parts have to be identified with: " déroq."**

### 13. Shipping Authorization

The supplier must obtain a signed ***Shipping Authorisation*** (FO0326) before shipping parts.

As soon as the supplier is ready for part shipment, it must advise CVTCORP's quality assurance supervisor by providing **electronically** the following:

- Completed Part shipment authorization (**Shipping Authorization, FO0326**)
- Applicable inspection results
- Material and special processes certificates, if applicable

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- A **Derogation Request Form (FO0315)**, if applicable.

CVTCORP may conduct on-site inspection directly at the supplier's facility. In those cases, it is the supplier's responsibility to:

- Have the parts readily available for inspection and cleanliness auditing to be carried by CVTCORP's quality controller;
- Provide adequate inspection area and tooling;
- Provide quality assurance support and supply required data or documentation.

Upon parts acceptance, the **Shipping Authorization (FO0326)** will be signed and transferred to the supplier.

If CVT Corp decides not to conduct a source inspection when supplier has inquired a shipment readiness and upon paperwork acceptance, CVTCORP will sign and send the **Shipping Authorization (FO0326)** authorizing the supplier to send parts specified on the authorization. This authorization is not a claim of part acceptance. The signed shipping authorization needs to accompany the parts being shipped.

#### 14. Sampling Plan and batch rejection

If non-conformity is found on supplied parts, CVTCORP will sample and accept or reject outsourced lots per CVTCORP standard **Sampling Plan, PR0302** (AQL standard).

#### 15. Rework/Repair


The supplier must submit written rework instructions for approval for any rework or repair operations performed on CVTCORP's products. Under no circumstances shall the supplier rework or repair parts or material and ship them to CVTCORP without receiving prior written authorization. Any parts shipped prior to obtaining the appropriate written approvals may be rejected and returned to the supplier at its expense. All costs incurred by CVTCORP due to processing parts that have been repaired or reworked without obtaining the proper authorization will be the responsibility of the supplier.

#### 16. Third party outsourcing

For a third party service (e.g.: Nitriding), the service will be taken in charge by the supplier unless otherwise specified. The supplier ***must advise*** CVTCORP, on its quotes, of any sub-contractor that he will need to use. CVTCORP Tier 1 supplier is responsible to obtain and provide all the necessary quality information related to the sub-contracted services.

#### 17. Delivery


Upon shipping, the following information will be provided:

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- A Shipping Authorization signed by CVTCORP authorizing the shipment of parts
- If applicable, all the Derogation Request Forms approved by CVTCORP
- The inspection documentation already send electronically **is not** required with shipment

#### **18. Inquiry**

- RFQs, quality issues and shipment inquiry:
  - Purchaser – **Mr. John Dussault** (261)

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**Appendix A**  
Marking methods

Méthodes de marquage			Permanent marking
Standard associé: AS478 (Identification Marking Methods)			Non-Permanent marking
Marking method ID	Fr	En	Description
1	Estampage manuel	Hand stamping	A hand stamp is a rectangular piece of metal with a character engraved on one end. To create an indent of a character in an object, the character end is held against the product you wish to mark, while striking the opposite end with a hammer.
2	Burin manuel	Vibratory Pencil (Scribing)	Manual (hand writing) scribing of part ID by mean of indenting pencil.
3	Grenaillé (pointage automatique)	Dot Peen (Stylus)	Dot Marking is a micro-percussion marking technology. It uses a vibrating single-point tool that indents a series of dots to create characters, digits, and logos into metals, treated/untreated wood, and plastics. Dot peen is recommended for applications where the symbol must last the entire life cycle.
4	Marquage Electrochimique	Electro-Chemical Metal Marking	This process uses a low voltage current to mark the object surface. This is commonly used for low volume product runs.
5	Gravure chimique	Chemical Etching	Chemical etching is practical for creating the same mark every time, by using a caustic acid and silk screen to burn away a shallow mark on the part. However, the screen will eventually wear-out and require replacement. In addition, extreme care must be taken when handling the acid, as it is very caustic.
6	Marquage au laser	Laser Marking	Laser marking uses a laser beam to create a shallow character in the part. The advantage to this method is that there is no stress on the part and nearly any kind of font or graphic can be created to be produced on a part. However, the entire system must be enclosed to protect users from the laser beam and there is a high cost associated with laser marking. Clean, high resolution marks are produced making laser-etch well-suited for automated environments.
7	Moulé/Forgé dans la surface	Cast, Forge or Mold	Permanent embossment of part identification during casting or forging stage. Marking can be embossed on part surface or carved in part surface.
8	Fraisé en machine	CNC Engraving	Since grooves are cut in the product surface, the marking will not fade. Changing the marking content requires a lot of time and labor. Precision products cannot be marked because of the direct surface impact.
9	Plaque d'identification	Nameplate	Nameplate permanently assembled on part (riveted, screwed or glued).
10	Estampage à chaud	Hot stamping (plastics)	Hot Stamping essentially "brands" a product, by using a heated marking device with which to indent the material. To add color or decoration, a Hot Stamp Press with foil can be used.
11	Ensaché et étiqueté	Bag & Tag	If permanent part identification is impossible due to part size or requirement, each part is individually bagged and identification is made through labelling (tag inside bag or sticker on bag).
12	Étiquetage	Labelling	Attaching labels is not a method of marking information directly on products, but it is used for the same purpose. Since labels can be printed in a separate process, characters are clear and sharp. However, using many labels can be costly, and controlling label stock is an unexpectedly demanding task. Above all, peeling labels are a serious problem.
13	Pochoir	Stencil & Screen Printing	Thin sheet with letters/design cut from it, used to produce the part identification on the underlying surface by applying pigment through the cut-out holes in the sheet material.
14	Jet d'encre	Ink jet Marking	This type of marking uses small , dots sprayed directly onto the surface. Ink jet produces high contrast marks. Ink jet is not considered a permanent marking method.
15	Marqueur à la main	Marker (handwriting)	A worker writes necessary information on products with a pen. This is the easiest method and can be achieved at very low cost. It is effective when production is limited. However, human error and speed are some disadvantages.