

**HYDRAFLOW**

DOCUMENT NUMBER  
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REVISION  
**N/C**

**WORK INSTRUCTION**

TITLE  
**HYDRAFLOW WORKMANSHIP AND HANDLING  
CODE STANDARDS FOR VENDORS**

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## RELEASE/REVISION

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## 1.0 Purpose

The purpose of this work instruction is to provide visual inspection standards for machined parts and to establish and define general requirements for handling and packaging of parts received from Hydraflow vendors.

## 2.0 Scope

This procedure shall be used when machining, handling and packaging parts at a vendor.

## 3.0 Responsibility

Any Manager may recommend changes to the procedure.

## 4.0 General

This procedure expands on visual inspection parameters, handling and packaging codes to Hydraflow machine shop vendors that may not be defined in other work instructions, quality forms, etc. The contents described herein are meant to provide guidelines to all Hydraflow vendors involved in supplying parts to Hydraflow. In the event parts under evaluation require further review or the disposition is debatable, Hydraflow review board and/or vendor will be consulted for final disposition.

## 5.0 References

ARP4784      Definitions and Limits, Metal Material Defects and Surface and Edge Features,  
Fluid Couplings, Fittings and Hose Ends

## 6.0 Category

### 6.1 Machined Parts

6.1.1 Burrs/Sharp Edges: A sharp jagged edge or rough ridge of raised material at the intersection of two surfaces caused by machining or damage is **unacceptable**. All areas of the parts shall be free of burrs detectable by sight or feel.

- Edges shall be broken to the drawing requirement. A simple check for sharp edges or burrs is to drag the fingernail across the edge in question. The edge should be broken sufficiently so that no part of the nail is scraped away.
- Loose or hanging burrs are **never acceptable**.
- Tight, rolled over material that will not become detached and does not deviate from the drawing will not be interpreted as a burr and is **acceptable**.
- Only in functional and critical areas shall magnification be used to ensure compliance.

6.1.2 Chatter Marks: Repeated ridge marks from the vibration of a cutting tool against the work piece are typically unacceptable unless it is on a non-visible surface in the assembly and does not affect form, fit or function of the unit.

- Chatter marks on sealing surfaces are **never acceptable**.
- Chatter marks that may cause stress concentrations are **not acceptable**.

6.1.3 Corrosion: Characterized by a pitted or eroded surface caused by unwanted chemical or electrochemical action is **unacceptable**.

6.1.4 Drag/Gouge/Tear: Tool marks across the surface of a part caused by improper tool withdrawal or broken or dull tools are **unacceptable**.

6.1.5 Nicks/Dings: A small surface imperfection having raised sharp edges or corners and “v” impression at the bottom. This is usually caused by impact with a sharp object and is not interpreted as a crack.

- Nicks or dings up to .001 inch deep are considered non-interpretable and are **permitted** on non-critical surfaces; nicks or dings are **not permitted** on sealing surfaces or surfaces that call for less than 63 finish.
- Nicks or dings up to .003 inches deep may be allowed on non-critical surfaces, such as hex flats, as long as the part is cosmetically acceptable.

- The number of nicks or dings on any single non-critical surface is normally limited to one.

6.1.6 Scratches: A shallow depression that is caused by movement of a sharp object across a surface.

- Scratches on any sealing surface are **unacceptable**.
- Light scratches **are acceptable** on non-critical surfaces where a surface roughness of 125 or greater is allowed.
- Scratches on external machined surfaces are **not acceptable** if the cosmetic appearance is compromised.

## 6.2 Handling Codes

- All parts must be handled with care to prevent nicks and dings.

6.2.1 A: Normal handling is required:

- Parts that can be “**gently**” poured into a box or transferred from box to box. “**Gently**” poured means that the operator shall use some type of cushioning aid such as hand, plastic spatula or any other device that will aid the fall of these parts.



**FIGURE 1 - Parts are “gently” poured into a box.**



6.2.2 AA: Medium handling is required:

- Parts will be single layered and divided by corrugated pads to avoid damage to the parts. See Figure 2 and 3 below for an example.



**FIGURE 2 - Parts single layered and divided by corrugated pads.**



**FIGURE 3 - Parts can be layered in rows and divided by corrugated pads.**

- Parts can also be packaged by rolling up dividers into a tube shape to slide through circular parts.



**FIGURE 5 - Circular parts are slid through a rolled up divider.**

6.2.3 AAA: Special handling is required:

- Parts must be handled and packaged in egg crates to protect parts from making contact with one another. One part per compartment only. Egg crates can be layered on top of another in the box.



**FIGURE 6 - Parts are packaged in egg crates.**



- Parts that cannot fit in egg crates will be layered and divided by columns using corrugated pads or dividers.



**FIGURE 7 - Parts are layered and divided by columns using corrugated pads or dividers.**

6.2.4 AAAA: Critical handling is required:

- Parts must be boxed and bubble wrapped individually to avoid parts touching or hitting each other during handling or transportation.



**FIGURE 8 - Parts are individually boxed**