

HYDRAFLOW

DOCUMENT NUMBER

WI-09-69

REVISION

A

WORK INSTRUCTION

TITLE

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

PAGE 1 OF 12

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PAGE 2 OF 12

RELEASE/REVISION

CURRENT REV.	RELEASE DATE	RELEASE/REVISION INFORMATION	SIGNATURES
		For previous revisions see Permanent Records.	
A ESR: 21-1027	10/18/21	Para. 2.0 added “/or” Para. 4.0 deleted “machine shop” and “In the even parts under evaluation require further review or the disposition is debatable, Hydraflow review board and/or vendor will be consulted for final disposition”. Changed “other work instructions” to “purchase order flow downs” Paras 6.2.1 thru 6.2.4 updated to match WI-15-02.	<u>Approved by:</u> Q. M.: (S) L. Lozano OPER. MGR.: (S) B. Adame <u>Date:</u> 10/15/21 10/15/21

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TABLE OF CONTENTS

ParagraphPage

	Title Page	1
	Release/Revision Page	2
	Table of Contents	3
1.0	Purpose.....	4
2.0	Scope.....	4
3.0	Responsibility	4
4.0	General.....	4
5.0	References.....	4
6.0	Category	5

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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/or 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 vendors that may not be defined in purchase order flow downs, quality forms, etc. The contents described herein are meant to provide guidelines to all Hydraflow vendors involved in supplying parts to Hydraflow.

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.

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- 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

This handling code shall be used on parts or hoses whose surfaces cannot be damaged easily (i.e. no critical surfaces). Parts can be “gently” poured into a box.

“Gently” poured means that the employee should use some type of cushioning device such as hands, plastic spatula or any other device that will prevent nicks and dings to the part. **NO parts should be POURED without some type of cushioning device.**



FIGURE 1 - Parts Are “Gently” Poured into A Box

6.2.2 AA - Medium Handling

This handling code shall be used on parts that do not have critical exposed surfaces. This can be applied to parts that have internal threads, critical I.D. surfaces, etc. Parts are okay to be touching one another (metal to metal contact) as long as there are no critical surfaces that can be damaged based on the packaging method.

There are many different packaging methods for medium handling, below are a few examples to follow:

- Parts can be single layered and divided by corrugated pads to avoid damage.
- Parts can also be placed into egg trays by having one or more part per compartment. This will depend on the size and weight of the part.
- Hardware or springs can be bagged and sealed, if necessary.
- Parts can also be packaged by rolling up dividers into a tube shape and sliding the parts through the tube and placing the tubes next to one another and dividing the layers with a corrugated pad. This method will only be effective if the tubes are tightly securing the parts to prevent parts from sliding/moving during transportation or handling and ensuring that there is no critical I.D. surface.



FIGURE 2 - Parts are singled layered and divided with corrugated pads.



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



FIGURE 4 - Round parts can be slid through a tightly rolled up divider.

6.2.3 AAA – Special Handling

This handling code shall be used on parts that have a critical surface or surfaces. This applies to parts that have external threads, O-ring surfaces, sealing surfaces, parts being sent for outside processing such as brazing, anodizing, plating, dry lube, and etc. Parts shall not be touching each other (no metal to metal contact) during storage, handling, or transportation to prevent nicks and dings. Parts can be capped and/or bubble wrapped to ensure extra protection, if necessary.

There are many different packaging methods for special handling, below are a few examples to follow:

- Parts can be packaged in egg trays to protect parts from making contact with one another. Only one part per compartment. This applies to smaller parts that are able to fit into the compartment. Egg trays can be layered on top of another.
- Parts that are larger than the egg tray compartment (example: FS's) can utilize the egg tray method. Keep in mind that the parts should be tightly secured and there should be no movement between the parts. If there may be any movements between the parts, parts will need to be capped to prevent damage.
- Parts can also be packaged by rolling up dividers into a tube shape and sliding the parts through the tube and placing the tubes next to one another with dividers between the tubes and dividing the layers with a corrugated pad. This method will only be effective if the tubes are tightly securing the parts to prevent parts from sliding/moving during transportation or handling and ensuring part's critical surfaces won't be touching one another during transit.
- Parts may be packaged by segregating each part by the use of dividers. Each part shall have its own compartment.

Note: Vendor can request caps, egg trays, and etc. from your Hydraflow Buyer.



FIGURE 5 - Flanged FS's are packed securely in egg trays.



FIGURE 6 - Parts are secured using a rolled up divider with a divider between the tubes.



FIGURE 7 - Parts are packed in egg trays



FIGURE 8 - Flanged FS's are packed securely in egg trays.



FIGURE 9 - Parts are secured using a rolled up divider with a divider between the tubes.



FIGURE 10 - Parts can be segregated with the use of dividers to ensure critical surfaces are not damaged, caps are used.

6.2.4 **AAAA – Critical Handling**

This handling code shall be used on parts that are complex, heavy, easily damaged, critical surfaces and etc. Parts must be boxed/bagged individually with the use of caps and/or bubble wrap, if necessary. Best effort must be made to avoid parts touching or hitting each other during handling, storage and transportation. These parts are not to be stored on top shelf in the stockroom, stacked on carts or in vehicles during handling and transportation.

Note: Vendor can request caps, egg trays, and etc. from your Hydraflow Buyer.



FIGURE 11 - Parts are either boxed or bagged individually.