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<b>SEWS Supplier Engineering Standard</b>		
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## 1.0 PURPOSE

- 1.1** These specifications provide inspection guidelines and general drawing requirements for all components (metal stamped, molded components, fuses etc.) that are provided to Sumitomo Electric Wiring Systems by Tier 2 suppliers to ensure that material received at SEWS can be used efficiently and effectively as designed.

## 2.0 SCOPE

- 2.1** The scope of this work instruction covers general inspection and drawing requirements for material provided by SEWS suppliers to SEWS. Any specific requirements agreed upon by SEWS and the supplier for the product being produced will supersede and document the requirements defined in this procedure.
- 2.2** Any changes to this document will be highlighted in blue color. The changes from the previous revision will all revert to black.
- 2.3** SEWS Supplier is responsible for obtaining the latest version of all Supplier Engineering Standards (SES).
- 2.4** This document is used in conjunction with SQS-001

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### 3.0 DEFINITIONS


**3.1 Item** -A single part or material purchased.

**3.2 Class A Surface** – Defined as a Texture or Grained cosmetic surface that is defined by an OEM and specified on the part print specifications.

**3.3 DE = SEWS Design Engineering**

**3.4 Special Drawing Characteristics Identified by Symbol within Drawing –**

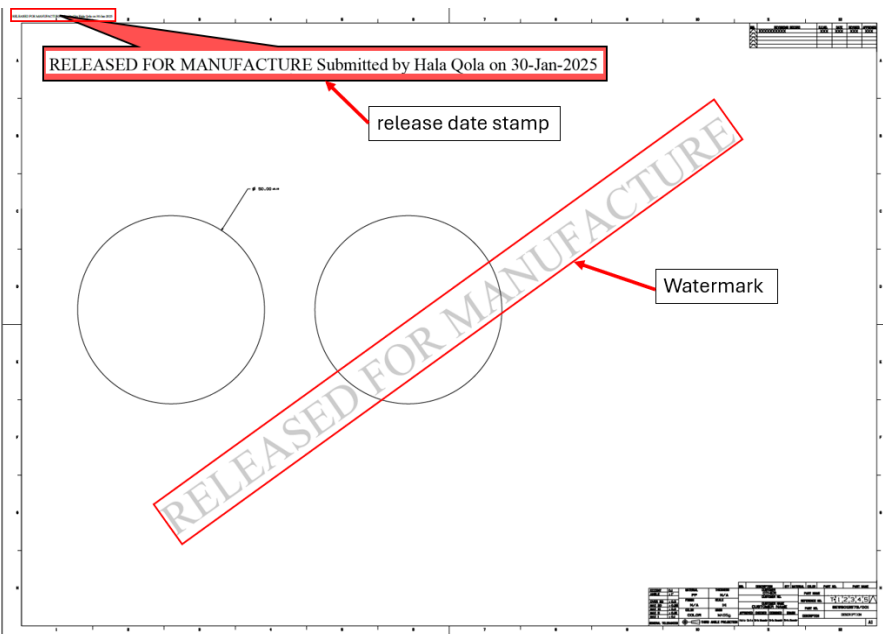

- a. # - Dimensions to be monitored, at minimum, at the beginning of each production lot and CPK data retained, added to the control plan and process specifications. CPK data is expected to be retained at the supplier unless requested by SEWS. Unless specified in the commodity specific tables below, the inspection quantity should be 30 pcs.
- b.  – Critical dimensions to be checked at time of PPAP and at annual layout, added to the control plan and process specifications. Annual measurements are expected to be measured and retained at the supplier unless requested by SEWS. Unless specified in the commodity specific tables below, the inspection quantity should be 5 pcs.
- c.  - Dimensions to be monitored, at minimum, quarterly and added to the control plan and process specifications. Quarterly measurements are expected to be measured and retained at the supplier unless requested by SEWS. Unless specified in the commodity specific tables below, the inspection quantity should be 5 pcs.
- d.  – Critical dimensions to be checked at time of PPAP and at beginning of each production lot and CPK data retained, added to the control plan and process specifications. Unless specified in the commodity specific tables below, the inspection quantity should be 5 pcs.
- e.  100% in process monitoring and verification. These check points will be added to the control plan and process specifications. 100% of checks or measurements are expected to be measured/checked and retained at the supplier unless requested by SEWS.


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#### 4.0 ENGINEERING/DRAWING REQUIREMENTS

- In addition to Tables A-J, see component drawings for specific engineering requirements.

**TABLE A – GENERAL ENGINEERING REQUIREMENTS**

A	<p>Only drawing with “Released for Manufacture” watermark and SEWS release date stamp in upper left corner are approved for tooling. All other drawings are to be considered as reference. Supplier is responsible for any cost incurred by any tooling or manufacturing from a drawing without watermark and date stamp.</p> 
B	For “Released for Quote” or “Released for Manufacture” drawings, if there are any questions or concerns with GD&T dimensioning scheme notify DE within one week of receiving drawing or supplier accepts the drawing as is.
C	All drawings are to be interpreted per ANSI Y14.5 standards.
D	Any changes from previously approved design, drawing, or process require prior DE approval
E	The 3D math is the master design. Unless specified otherwise  is required.
F	Prior to order fulfillment, at no cost to SEWS, supplier must provide a minimum of 10 samples per cavity for DE approval. Supplier can contact DE for a reduced amount for multi-cavity tools if applicable.
G	Part must gage freely with gage(s) built to inspect the size and location of characteristics marked “G” at maximum material condition. All gages must have DE approval prior to build.
H	Supplier to add 0.50±0.25 radii to all corners and edges that are shown sharp within CAD
I	All radii shown and unspecified are to be 0.50±0.20.
J	Dimensions that have (X.XX) are for reference only.
K	Supplier must submit 100%-dimensional layout and receive approval by DE prior to final tool approval for production and PPAP
L	Dimensional allowance charts shall not be used for new tooling or capacity tooling.
M	Sumitomo part number, revision level, date code, recycle code, source identification and cavity number must be molded into part (text height 3.0mm, proud 0.5mm).

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N	A 0.15mm radius is allowable on all text Sumitomo part number, revision level date code, and recycle code must be separately insertable.
O	Recycle per SAE J1344

**TABLE B - ENGINEERING REQUIREMENTS FOR PLASTIC INJECTION MOLDING SUPPLIERS**

A	All moveable or flexible molded locks need to be flexed 10 times to full stop or full travel as design intended motion within each lot to assure no breakage, damage, or degradation. The inspection frequency is to be documented on all control plans and PFMEA for proper monitoring.				
B	Living Hinge Specification (if applicable): Living hinges shall satisfy the table below <table border="1" style="margin-left: 20px;"> <thead> <tr> <th style="text-align: center;">Test</th> <th style="text-align: center;">Criteria</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">-10C for 2 Hours, Then Cycle 10 Times</td> <td style="text-align: center;">No Crack</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>- Supplier must cycle living hinges 3 full times immediately out of press by automated process</li> <li>- No weld line allowed in living hinge area</li> </ul>	Test	Criteria	-10C for 2 Hours, Then Cycle 10 Times	No Crack
Test	Criteria				
-10C for 2 Hours, Then Cycle 10 Times	No Crack				
C	All Parting line location must be pre-approved by SEWS engineering before start of tooling.				

**TABLE C - ENGINEERING REQUIREMENTS FOR METAL TERMINAL SUPPLIERS**

A	Plating thickness must meet tolerance defined on Drawing
B	Dimensions marked with “*” are considered to be insertable and adjustable within tool.
C	Dimensions marked with “**” are required to match after solder assembly.
D	Stamped terminal identification marks on each terminal within cavity set will have a different identification mark. These identification marks need to be visible after solder assembly.
E	Blade tip per USCAR EWCAP-001.
F	Terminal punch direction should be towards reel core.
G	Plating per USCAR EWCAP-001. Electroplated silver. Temp Class IV, Vibration Class 3.
H	Use Olin Brass Copper Alloy Guide for tensile hardness requirement values reflect after all post process steps.
I	SEWS recommends terminal manufacturers to include station towards end of progression die to assure flatness, sharp corners, squareness where terminal interfaces with PCB and meets dimensions (example: shaving process).
J	Stampings carrier strip locations need prior approval by SEWS design engineering prior to tool build.

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**TABLE D - ENGINEERING REQUIREMENTS FOR CASTING SUPPLIERS**

A	All text and symbols should be positioned as indicated on drawing. All text and symbols locations must be pre-approved by SEWS engineering before start of tooling.
B	Masking process prior to coating (Example E-Coating): Areas to be masked prior to coating will be indicated on the drawing.
C	Screw depth shall be confirmed using go/no-go gauge at the following intervals: N=1/day, N=1/first, middle and last piece, and N=1 before and after changing the threading tools. Screw depth gage should be equivalent to ISO Grade 6H or better.
D	Inner diameter shall be confirmed using go/no-go gauge at the following intervals: N=1/day, N=1/first, middle and last piece, and N=1 before and after changing the threading tools. Plain plug gage should be equivalent to ISO Grade 6H or better.
E	Machining of female should be done with roll cutting and airflow so that no chips remain in the holes.
F	100% of castings must be fully submerged in cleaning bath/equipment post all machining processes to remove all oil, contamination, debris, grease, dirt, machining chips, etc.

**TABLE E - ENGINEERING REQUIREMENTS FOR STEEL STAMPING SUPPLIERS**

A	Unspecified radius, ribs, stiffeners, and gussets per 3D math
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**TABLE F - ENGINEERING REQUIREMENTS FOR METAL BUSBAR SUPPLIERS**

A	See drawing for specific engineering requirements.
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**TABLE G - ENGINEERING REQUIREMENTS FOR FASTENER SUPPLIERS**


A	See drawing for specific engineering requirements.
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**TABLE H - ENGINEERING REQUIREMENTS FOR HIGH CURRENT FUSE**

A	Samples must be provided to SEWS manufacturing for approval before part order fulfilment.
B	Size 5.5x5.5mm Minimum, Barcode to be a minimum of 1mm away from any edge. Samples must be provided to SEWS manufacturing for approval before part order fulfilment
C	Must meet SEWS drawing spec and samples must be provided to SEWS manufacturing for approval before part order fulfilment

**TABLE J - ENGINEERING REQUIREMENTS FOR LABEL SUPPLIERS**

A	See drawing for specific engineering requirements.
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**5.0 REVISION HISTORY**

REVISION DATE	DESCRIPTION OF REVISION	Responsible
4/15/25	Initial Document Creation	C.Hicks