



AAM Global Supplier Tooling Guidelines

Tooling Policy Overview

This document defines American Axle & Manufacturing's (AAM) Global Supplier Tooling Guidelines and outlines requirements for AAM-owned or customer-owned special tooling located at a supplier's facility or facilities. Suppliers must follow these Tooling Guidelines in order to be reimbursed for special tooling. AAM's Terms and Conditions apply to tooling orders and prevail to the extent there is a conflict between AAM's Terms and Conditions and these Tooling Guidelines

1. Overview of Special Tooling

Generally a "Special Tool" is a finished or unfinished device such as a die, jig, fixture, mold, pattern special gauge, or device that is used, or is used or being prepared for the use, to manufacture a product for AAM and that cannot be used to manufacture another product without substantial modification of the device. Special tools are of such specialized nature that their utility and amortization cease with the discontinuance of the product or models for which the tools are used.

A special tool does not include, for example: (i) facilities (including buildings); (ii) loading bays; and (iii) machinery or equipment (even if it is customized, and even if used in conjunction with tools.).

AAM will only compensate suppliers for special tooling that is specifically designed for the production of, and is unique to, an AAM part.

2. Supplier Requirements and Obligations

The following offers information regarding various AAM rules and processes with respect to tooling and AAM-authorized engineering changes to such tools. AAM's suppliers are responsible for ensuring that their sub-suppliers comply with these guidelines as applicable.

Tool models and tool drawings are considered part of tooling and are AAM owned/customer owned.

AAM will only compensate suppliers for tooling that is specifically designed for the production of, and is unique to, an AAM part.

AAM will only reimburse the approved, actual tooling costs incurred up to the amount authorized by the Tooling Purchase Order. AAM will not reimburse suppliers for tooling costs in excess of the amount authorized or for tools that was not specified and authorized by the Tooling Purchase Order. If the actual cost incurred is less than the Tooling Purchase Order amount, the supplier must notify the AAM Buyer in writing to adjust the Tooling Purchase Order to actual cost(s).

Tooling Purchase Orders and amendments to Tooling Purchase Orders must be quoted and written such that each Tooling Purchase Order (and any amendment) includes sufficient detail and itemization.

Tooling purchased by AAM or its customers is AAM or customer property and held by suppliers on a bailment basis pursuant to AAM's Terms and Conditions.

A supplier is not permitted to use existing tooling that belongs to one customer (as identified on the tool) for the manufacture of parts for other customers.

The supplier is responsible for monitoring the content of all subcontracted tooling such as outsourced components, to ensure conformity to AAM requirements.

The supplier may NOT scrap any tools owned by AAM or AAM's customers without the written approval from AAM. If tooling is scrapped without AAM approval, the supplier may be responsible for replacing the tools or submitting payment to AAM for the scrap value of the tools.

The supplier must notify AAM of any movement of AAM/ customer-owned tooling to a different location not documented on the AAM Tooling Order. The supplier must submit a revised AAM-7F-601 tooling worksheet with the revised address and DUNS number of the new location. Additional detail may be required from the AAM customer. Approval must be granted by AAM or customer, as appropriate, prior to any tooling relocation. Once permission is granted, the supplier must submit a new PPAP/PSW for the new location.

Suppliers are required to hold in their possession all tooling, including post-production service commitments until approval is granted by AAM or the end-customer. Suppliers must contact the AAM buyer of record to initiate the process for scrapping of tools.

Suppliers to AAM WILL NOT communicate directly with AAM customers regarding tooling unless permission is granted in writing by AAM.

Directed Buys

If a customer instructs AAM to purchase parts and or tools from a "directed supplier", that supplier is contractually to follow AAM Global Supplier Tooling Guidelines and AAM's Terms & Conditions since the Purchase Order will be issued by AAM.

Additional Detail

AAM/Customer will purchase first set of forgings, castings, and aluminum die cast tools. The cost for refurbishment/ cavity replacement for additional tools will be amortized into the piece price.

Tooling for both AAM and its customers is expected to last the duration of the program including service requirements.

When the supplier builds new tools to replace the original set of tooling, that identification number must be permanently etched/transferred to the new tool so ownership is maintained and documented throughout the program life.

For all other tooling, AAM will reimburse supplier's cost for the first set of production tooling only. Duplicate tooling is not classified as tooling and therefore not reimbursed through a Tooling Purchase Order.

Preventative maintenance, refurbishment, or replacement of tooling will be at supplier's expense.

If capital equipment is discovered in the tooling line up or during the audit process, even after the Production Tooling Order has been written, AAM reserves the right to debit it out and no recovery will be allowed for amortization in the piece price.

The following is a list of items that are not tooling and therefore, AAM will not reimburse suppliers for costs associated with such items:

- Machinery and Equipment (M&E), whether dedicated or non-dedicated, including, but not limited to, stamping presses, weld presses (all variations), indexing machines, CNC machines, automated transfer, robots, handling systems or computer/CAD stations, tool room equipment, and lab equipment;
- Generic tooling, general-purpose items and equipment, even if these items are dedicated (i.e., fasteners, drills, etc.);
- Non-tooling-related expenses such as program management, employee travel expenses, layouts, sampling costs (PPAP, Tooling/process run-offs), general staff resources, set up costs, maintenance, spare parts, banking costs, etc.;
- Engineering costs;

- Computer hardware and software (which are considered to be supplier-owned equipment);
- In-process gages-unless documentation is provided demonstrating critical characteristics being measured on part drawings;

(However, unique computer software required directly for the production or gauging of the part is considered part of tooling and shall become the property of AAM. If requested, the supplier will provide a copy of the source code and related documentation for all software used by the supplier to operate, calibrate or service the tooling, along with all license rights. The license will be limited to use only in conjunction with tooling and cannot be used for any other purpose.)

Intellectual Property

AAM claims ownership of all tooling designs and tooling. Upon request, AAM shall have access to all tooling data and designs.

AAM and its customers will not reimburse a supplier for their tooling if they claim the tooling/ design is proprietary and confidential.

3. Tooling Cost Documentation

Each supplier must maintain an accounting system, in accordance with generally accepted accounting principles, to segregate, accumulate, and document expenditures for AAM/ customer-owned tooling. The supplier's accounting system must ensure that all eligible costs are documented adequately and include the following:

Material

Material requisitions that indicate quantities used and unit cost by Tooling Purchase Order must be made available. Material will be reimbursed normally at actual costs based on invoices. Material costs should be reduced for any such costs recovered from tooling authorized for disposal or for material used for prototype parts (that was purchased under a separate Tooling Purchase Order).

Labor Rates and Hours

The Toolmaker will complete the AAM 7F-601 tool cost breakdown form. The labor rate quoted on the tooling cost breakdown form shall include all overhead costs and profit associated with the design and manufacture of special tooling. The fully-burdened labor rate should be included in the supplier's tooling quotation. The fully-burdened labor rate must be competitive based on the point of origin.

Subcontracted Work

All work subcontracted to sub-suppliers must be supported by a Tooling Purchase Order, invoice, and proof of payment (including a waiver of claim or lien from the sub-supplier).

If tooling is obtained through or by a supplier-owned subsidiary or affiliate (50%+ supplier ownership); those costs will be regarded as "In-house tooling" costs and subject to verification.

In-House Tooling

If the supplier designs, develops or manufactures production tooling in-house, and the engineering center/tool room is budgeted as a separate profit center, a reasonable profit margin on the cost of design, development, and manufacture of the tooling will be allowed. All overhead costs and profit associated with the design and manufacture of the tooling should be included in fully-burdened labor rates. U.S. Labor rates would include pay rates grossed up to cover applicable vacation & holiday and employer taxes such as FICA, Federal and State Unemployment Taxes. These rules may differ in other countries. When a separate profit center is declared, the supplier is subject to a verification audit which may include a review of such things as organization charts and factory layouts (in-house tool operation); ledger and actual money transfers between units; and any documentation demonstrating that any in-house tooling costs are accounted for separately and not absorbed as overhead and SG & A.

If the supplier fabricated the tooling in-house, and a separate profit center is not established, AAM will pay only the actual cost of fabricating the tooling, plus allowable one-time only costs, if appropriate. There must be adequate breakdown details.

AAM and its customers do not permit a parts supplier to make a profit on production or prototype tooling designed and manufactured by a tool supplier. Additionally, incremental costs associated with procurement, follow-up, etc. are considered to be a portion of the parts supplier's overhead costs and likewise recovered in the burden percentage of the production piece price.

4. Global Tooling Database (GTDB)

GTBD is an on-line application that enables suppliers to submit required tooling data for AAM review, approval and subsequent invoice submittal. GTBD is meant to streamline the tooling data collection and verification processes. GTDB provides suppliers a central location to upload and update information regarding tooling. Suppliers must have iSupplier Portal access in order to sign into GTDB.

For those suppliers that already have access to iSupplier Portal, their Supplier Security Coordinator (SSC) is responsible for granting iSupplier Portal access to other associates within their company. GTBD Supplier is one of the responsibilities available to Supplier users.

For those suppliers that are new to AAM, the supplier onboarding process will require that at least one SSC be selected. At that point, the SSC is granted access to all responsibilities and can then grant appropriate responsibilities and access to other associates within the supplier company.

For existing Suppliers that DO NOT have iSupplier Portal access, they must request that a SSC be assigned. Forms for SSC access can be found at: <https://www.aam.com/suppliers/doing-business-with-aam/access-request-forms>

If unsure whether a given Supplier has a SSC, or who their SSC may be, Supplier representatives can contact their Buyer and ask for that Buyer to provide the name(s) of the SSC(s).

5. Requirements for Quoting Special Tooling & Tool Cost Evaluation

As part of the quote package, Suppliers must identify all tooling required to manufacture the components being quoted utilizing the AAM 7F-601 form. This applies to both customer-owned and AAM-owned tooling.

Listed below are the process steps for utilizing the GTDB:

1. AAM will issue the Blanket Purchase Order and the Tooling Purchase Order once all the required information is submitted reviewed and approved.
2. Supplier will receive notification from the Global Tooling Database (GTDB) to upload data into GTDB (this is the information from approved AAM-7F-601 - tooling worksheet form).
3. Data is approved and a tooling Identification number will be assigned for each tool for marking.
4. Once the tool is PPAP-approved, the supplier will receive notification to provide the following information (which is required before payment) either by sending it to the assigned AAM Tooling Auditor or uploading it into the Global Tooling Data Base (GTDB):
 - Supplier Invoice for Tooling Purchase Order
 - Tool photo(s) – picture of the permanent ID# or identification Tooling price breakdown – if tools are built in-house
 - Tool photo(s) – picture of tooling in open and closed position

See below instructions and example for marking each Special Tool:

6. Tooling Asset Existence Verification – Required for each Special Tool

AAM requires all tooling to be physically marked/identified to demonstrate ownership during the operational life of the tool including past model service parts. The physical mark must:

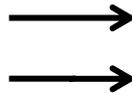
- a. Remain permanently affixed to the tool;
- b. Be durable in a manufacturing environment;
- c. Remain legible; and
- d. Not impair the operation of the tool

The following are **NOT** acceptable as a permanent mark:

- stenciling,
- painting,
- inking, or
- gluing of ID tags.

Tool Identification must include the following:

- Property of "Tool Owner Name"
- Tool Identification Number



The appropriate Tool Owner Name (either an "AAM Customer" or an AAM company / legal entity) will be provided in the AAM Tool Purchase Order. The Tool Identification Number will be provided by the AAM Tooling Auditor.

The Tool Identification Number should be permanently marked on the tool via etching, embossing, stamping, or welding of ID tags (unless further limited by AAM's Tooling Auditor).

7. Requirements for Payment of Tooling - Mandatory

The supplier's Tool Purchase Order Invoice will be paid only after all of the following items have occurred:

1. The supplier has fabricated or acquired the special tooling;
2. The supplier has satisfied AAM's PPAP approval process;
3. The supplier has submitted photographic evidence of each tool according to the direction of AAM and the customer has approved the information per their requirements.
4. The supplier has entered the required detail, including photographic evidence as described in the tool verification process, into the **Global Tooling Data Base** and it has been approved by AAM;
5. The supplier has otherwise complied with these Global Tooling Guidelines; and
6. The supplier has submitted its invoice, referencing the appropriate AAM Tool Purchase Order(s).

8. AAM Tooling Audits

AAM reserves the right to perform audits, both on location or via paper documentation, ensuring compliance with its requirements. Audits may be done at time of procurement or any other time during the program life including post production service commitments. Any tool noted as missing during an audit can be debited to the supplier's account until such time it is physically verified, or documentation recording the authorization of its disposal can be produced. Failure to properly identify tooling and location will result in delay of payment and/or debit back to Supplier.

All customer owned tooling must retain its ownership identification throughout the life of the tooling until the customer approves the disposal of said tooling.
If the Supplier replaces the tooling throughout its life, that tooling is still considered property of AAM/Customer and the tooling identification number must be transferred to that tool.
Should AAM conduct an audit of a supplier's tooling cost, the supplier must make available copies of purchase orders, invoices as proof of payment and any other supporting documentation requested by AAM. This documentation will be required to verify the actual and reasonable costs associated with the Tooling Purchase Order(s) and amendments selected for audit.

9. Tooling Payment Matrix

The following matrix provides additional information to assist suppliers in determining the difference between Capital Equipment & Machinery or facility costs and Special Tooling.
This matrix comprehends all AAM Customers' tooling requirements.
Use this list as a guide. It is not exhaustive and may not include all tooling. However, when in doubt, please contact your AAM purchasing representative or AAM tooling auditor for clarification.

Misc. Items, General Associated Costs	Tooling and Related Cost Items	
	Acceptable	Not Acceptable
Interest Carrying Costs		X
Launch Costs – The Supplier’s learning curve is not considered a Special Tooling cost		X
Taxes, Customs & Duties – only when assessed; not recoverable on Tooling Purchase Order	X Listed separately on invoice, not included in Tooling cost	
Installation Costs –Set up costs and adaptation (<i>i.e.</i> fitting production Tooling to manufacturing equipment)		X
Initial Freight – Generally limited to initial normal expenses required to obtain the Special Tooling being constructed. One-time charge	X	
Additional Freight - The cost of additional trips to certify, try out or adjust tooling.		X
Proprietary Parts/Processes - Tools and/or processes claimed as proprietary or deemed intellectual property by a Supplier are not reimbursable as Special Tooling by AAM or its customers		X
Patented Components – All machinery, equipment, and Special Tooling associated with the manufacture of components that are legally patented by a Supplier are not reimbursable as Special Tooling and are considered property of the Supplier		X

Stamping Dies	Tooling and Related Cost Items	
	Acceptable	Not Acceptable
Air Cylinders, Gas, and Nitrogen Pads - Integral part of die	X	
Automation – In most cases NOT acceptable. Exception: If integral part of Die, and if required to maintain part orientation, alignment, or position during the process.		X
Binder Development	X	
Blanking Dies/Trim Dies – Required for unique part(s)	X	
Blanking Dies/Trim Dies – Metal turning units, standard racks, and standard trim dies to blank trapezoid or rectangular blanks	X	
Bolster Plates – Including upper and lower plates for transfer dies		X
Tool Designs – Directly related to dies and designs including CAD and CAM	X	
Die Models – Exception: When no CAD data is available and model would be the "Master", or request from engineering		X
Die Risers – Must be integral part of die buildup	X	
Dies – Stamping - Coining; Cold Forming; Compacting (for powdered metal parts before sintering); Extrusion; Forging; Progressive; Sizing (for Powdered Metal parts before sintering); Blank, Form, Draw, Stretch Form, Trim, Pierce, Straightening; Transfer, & Warm Forming	X	
Extrusions Dies When used for semi-finished parts	X	
Maintenance – All maintenance costs including post repair tryout, spare parts, second dies sets, etc.		X
Pierce/Stud Insertion Heads – Feed units not allowed. Exception: when integral in die.		X
Roll Forming – Exception: if form details (anvils) which contact the material to form shape (including details for pre & post operations, and details that are created unique to the form)		X
Transport Rails - Standard (Non-Integral)		X
Transport Rails - Integral in Progressive Die	X	
Transport Rails - Locating fingers/details	X	
Transport Racks – Standard idle stations, in process racks, shipping racks		X
Painting of Dies (To AAM Standards) If required by AAM	X	

NOTE: All Dies, Trim Dies, Cavities, and Inserts, must have their own unique serial number identifier

Welding and Assembly Fixtures	Tooling and Related Cost Items	
	Acceptable	Not Acceptable
Automated, "Turn-Key" Welding and Assembly Equipment		X
"C" Frames - Pedestal Welders and Press Welders		X
Hydraulic and Pneumatic Items: Exception: Unless integral part of Fixture)		X
Machine bases - Machine feeds, Safety items, and Guarding. Exception: Tooling Base		X
Projection Weld Fixtures – Exception: if specific locators		X
Motors		X
Ergonomic Handling Devices		X
Locating Fixtures – When unique and required for customer part	X	
Weld Spot Models	X	
Capital Welding Equipment – Weld Timers, Transformers and Cables		X
Weld Guns (ALL)		X
Operator Equipment – Includes Weld Guns, Stud Guns, Templates, Handling Devices, etc.		X
Weld Test Equipment/Fixtures	X	
Welding and Assembly Fixtures – Including Geometric fixtures, re-spot locating fixtures, and other dimensional holding fixtures	X	
Tables, Frames, and other Capital Equipment		X
Casters / Wheels		X
Table lift devices and turn tables		X
Laser Process – Exception: If part support (nest) designed for single part		X
Laser Fixture – Exception: Specific locating fixture including details to hold gap constant for welding	X	
Laser Cells – Includes Installation, Safety equipment, Exhaust equipment, etc.		X
Lighting and Ventilation		X
Light Curtains and other Safety Equipment		X
Fixture Pipe and Wiring		X
Transfer Nest		X

Tube and Bar Benders Tube and Bender acceptable only when special and unique to a specific Customer part and Computer Numerically Controlled (CNC) or bending is not practical due to part volumes, part configuration, etc.	Tooling and Related Cost Items	
	Acceptable	Not Acceptable
Design - Bender design only, excludes facility engineering design due to integration of benders into specific line operations at a Supplier's location	X	
Frame – Welded steel tubular construction	X	
Air & Hydraulic Cylinders – Only when they are an integral part of the bending operation	X	
Arbors, Mandrels, Slides – Special part holding and bending	X	
Hardware All Hydraulic, Air, Control, & Electrical lines (should be designed with quick disconnect) Surge Tanks (Tanks should be outside of frame and designed with quick disconnects) Solenoid (Should be designed with disconnects, not hardwired) Note: All disconnects should be located to a common header block for each system.		X
Safety Related Equipment – (e.g. shielding, fencing, guards, light curtains)		X

Molds and Patterns	Tooling and Related Cost Items	
	Acceptable	Not Acceptable
Designs Directly Related to Molds and Patterns	X	
Development Plasters (If unique to AAM part)	X	
Mold Flow Analysis		X
Molds – for Rubber, Plastics, Foam, Nonferrous and Ferrous Metals	X	
Water Jet Nests	X	
Patterns – Castings	X	
Foam - Models, Patterns, ILD Blocks, Templates	X	
Gas Counter Pressure /Vacuum Systems – (Intellimold, etc.)		X
Water Manifolds - unless integral to mold block or rails		X
Quick Change Mold Plates - reimbursement for cost of conventional clamp plate only		X
Quick Change Connectors - (Staubli type, etc.)		X
Cavitation beyond minimum required for production volumes		X
Hot Runner Controllers / Manifold Controllers and Connectors - (Capital Equipment)		X
Pneumatic / Hydraulic Controllers and Connectors		X
Robots / Automated Pickers		X
End of Arm Tooling - (Grippers, Fingers)	X	
Insert Holder Blocks		X
Eye Bolts (Standard or Swivel)		X
Gas Assist Controllers and Connectors (Gain, Epcon, etc. Through Nozzle or pin)		X
De-gating or Routing fixtures (Nests only)	X	
Clip and Fastener Fixtures (Nests only)	X	
Cooling Racks		X
Spare Parts - The Supplier is responsible for maintenance / replacement.		X
Part Layout / Dimensional Studies – These are PPAP costs and therefore part of burden expenses		X

Casting Tools	Tooling and Related Cost Items	
	Acceptable	Not Acceptable
Design directly related to the actual Tool (i.e. detail drawings of Tool steels, plan of die, section views, etc.)	X	
Development Patterns	X	
Cavitation / Tool sets beyond minimum required for production volumes		X
Spare Cavities / Inserts – (Already included in piece price)		X
Internal Engineering Changes – Supplier is responsible unless driven by EWO and must be documented		X
Engineering Related Costs – Not acceptable, already included in burden and piece price.		X
Gas Counter Pressure / Vacuum Systems		X
Quick Change Mold Plates		X
Quick Change Connectors - (Staubli type, etc.)		X
Manifold Controllers and Connectors		X
Pneumatic / Hydraulic Controllers and Connectors		X
Robots / Pickers / Manipulators		X
End of Arm Tooling - (Grippers, Fingers only)	X	
Process Tooling - (Nests and part touching details - must be unique)	X	
Eye Bolts (Standard or Swivel)		X
Gas Assist Controllers and Connectors (Gain, Epcon, etc. Through Nozzle or pin - Capital Equipment)		X
De-gating or Routing fixtures (Nests only)	X	
Leak Test Tooling (Nests, and Calibration Master)	X	
Inspection Fixtures / Test Fixtures – Only when specified by AAM requirements – Not in-process	X	
Final Inspection Gages – When inspection gage is a purchased electric device; only the nest and any part specific probes will be accepted.	X	
Spare Parts - The Supplier is responsible for maintenance / replacement.		X
Part Layouts / Dimensional Studies - These are PPAP costs, therefore part of burden		X

Forgings, Castings, and High Wear Tooling	Tooling and Related Cost Items	
	Acceptable	Not Acceptable
CCR (Continuous cavity replacement) Tooling funds accumulated in the piece price are to be used to purchase replacement Tooling for Tooling that has been paid for by customer through an original Tool PO		
Replacement Cavities, Inserts, Cores, and related Tooling; that replace existing Tooling purchased through a Tool PO		Recovered in the piece price
Replacement Retainer(s)		X
Ejector Pins – Only when replacing cavity/core		X
Maintenance of the Die Cast Machine; Trim Press		X
Trim Die, Blades, etc.		X
Robots		X
Clean and Lube Fixtures, Auto sprayers, auto lube, etc.		X
Casting Machine Components – Replacement		X
Spray Manifolds – Replacement		X
Die Modifications that improve on quality of the part, Die life, Continuous Improvements		X
Try-Out Costs		X
Internal Indirect Labor		X
Normal Tool Maintenance		X

Machining	Tooling and Related Cost Items	
	Acceptable	Not Acceptable
Specific machining Tooling items are acceptable only when special and unique to a specific part, model, or product and are not acceptable when a standard shelf type item. Must not include computer terminals, keyboards, printers, "smart" columns, or electronic readouts.		
Air Cylinders		X
Arbors - Special Part Holding	X	
Broach Cutters- Only first complement	X	
Broach Holders		X
Duplicating Aids	X	
Drill Plates	X	
Cams – Unique	X	
Jaws – Special clamping portion only (jaws, collets, etc.) and only the first complement. (Chucks are NOT ACCEPTABLE)	X	
Cutter Bodies – When special design and negotiated with vendor Tooling	X	
Design - Fixture design only. Excludes facility engineering design due to integration of fixtures into specific line operations at Supplier location.	X	
Part Holding Fixtures - All Special types	X	
Forming Tools - Only first complement	X	
Gang masters - Camshaft Contour	X	
Grinding Wheel – Perishable Tooling		X
Grinding Wheel Tooling – Cam follower is acceptable when a specific/unique form configuration is required and only the first complement of wheel.	X	
Heat Treatment Racks		X
Hydraulic & Pneumatic Items		X
Jigs - (only when specific to an AAM Part number)	X	
Motors		X
Spindle Heads		X
Machine Detail		X
Multiple Sets of Tools		X

Electric & Electronics	Tooling and Related Cost Items	
	Acceptable	Not Acceptable
Components, assembly and Testing		
Grease Application Equipment		X
Injection Molds - required for components unique to AAM	X	
Nesting" Fixtures - that hold components during (Automated/Manual) assembly operations and material handling Tooling unique to AAM requirements	X	
Test Equipment - (Capital in nature) - Continuity Analyzers, TSK Boards, Indicators/Meters, Verification Type Equipment, etc.		X
Hardware - Instruments (shelf bought) - Computers (Inc. Monitor & Keyboard) - Cabinets - Cables - Automatic Stampers		X X X X X
Software - Operating System - Application Software - Test Code (specific to module under test)	X	X X
Software Development - When custom software is required by AAM/Customer or is a normal part of the Supplier's manufacturing or tool building technology, such as the development of CAM programs for use in CNC equipment, it is an acceptable cost. It must also be unique to a specific part, model, or product identified on the Tooling Order as Software Development	X	
Software & Programming - associated with Suppliers production process (i.e., Manufacturing, Quality actions, SPC, etc.)		X
Software & Programming - Unique to (and owned by) AAM/ Customer for requested design requirements	X	
Test Chambers - Burn-In - Refrigeration - Environmental - Additional Requirements - Racks - Rack Fixtures - Test Fixtures	X X X	X X X X

Other	Tooling and Related Cost Items	
	Acceptable	Not Acceptable
Air Tools (single nut-runners, drills, etc.)		X
Multiple Spindle Air Tools (used for simultaneous fastening of a bolt pattern)		X
Multiple Tooling – Exception: When a capacity study is submitted by the Supplier and approved in advance by the Tooling Auditor		X
Balconies - Control Panels, Railings, Stairways, Surge Tanks, and Overhead Lifts		X
Compression Costs – Exception: Incremental premium direct labor charges are acceptable only when it's necessary to improve Tool timing. These charges must be approved by the buyer and identified separately as a line entry on the Tooling Contract. Fully loaded labor rates will not be acceptable for premium compressions timing charges.		X
Control Devices & Error Proofing - That regulate machine functions, line functions, and/or automated handling mechanism functions -		X
Embossing Rolls - (Unique patterns/masks including unique engraving)	X	
General and Special Purpose Automation Equipment		X
Load and Unload Fixtures, Transfer Fixtures, or Turnover Fixtures – Exception: When unique to a specific part, model, or product and required to perform another necessary operation, e.g., inspect, locate, position, etc. and are not capital in nature.		X
Masks (painting or tin plating) for Custom Integrated Circuits - (IC's) Exception: When unique to a specific part, model, or product, and cannot be used for other customers' requirements.	X	
Material Handling Equipment – Conveyors, Hi-lows, Automated Guided Vehicles, etc.)		X
Microprocessors - Integrated Circuits, Chips, Modules, etc.		X
Microprocessor Controls - Commercially available programmable devices (e.g., PLC's, weld controllers, etc.)		X
:		
- Computer Equipment		X
- Printer		X
- Recording Devices (Audio and/or Video)		X
- Vision and Laser Equipment		x
Tooling Changes - Only as authorized by AAM Engineering Work Order (EWO) on items defined as Special Tooling per these guidelines	X	

Quality/PPAP Costs – Any costs related to part quality attainment including but not limited to PPAP		X
Rearrangement - Supplier-Owned Machinery and Equipment - including design and assembly, and the rework of electrical, pneumatic and hydraulic attachments.		X
Robots - All types including "Pick and Place" and reprogrammable robots.		X
Robot Arm End Effectors - Only when unique to a specific AAM part, model or product.	X	
Transport/Racks – Standard idle stations, in process racks, paint racks, shipping racks,		X
Try Out – Initial Tool tryout only	X	
Tryout Material		X
Poke – Yoke Equipment (Error Proofing)		X
Software Development - (Unique) Exception: When custom software is required by AAM or is a normal part of the Supplier's manufacturing or Tool building technology, such as the development of CAM cutter tapes for use in computer-controlled equipment, it is an acceptable cost. It must also be unique to a specific part, model, or product identified on the AAM Tooling Purchase Order as Software Development.		X
Temporary Tooling – Exception: If required to support production saleable builds and due to timing constraints resulting from late engineering changes or expedited program timing and containment in hard Tooling is not feasible.		X
Test Equipment - (for "Test Fixtures" - refer to "Gages" Section): - Computer Test Equipment - Environmental Chambers - Printer (including barcode label prints) - Recording Devices (Audio and/or Video) - Vision and Laser and X-Ray Equipment -Sequencing related equipment		X X X X X X
Vision Systems (cameras, arms)		X
Benders (Tube and Rod) (Tooling details only when designed as a dedicated machine)	X	
Cut-off Tools – (Only when unique to a AAM design)	X	
Heat Staking Fixture (nests and horns)	X	
Vibration Welding Fixture (Nests and Horns)	X	

Sonic Welding Fixture (Nests and Horns)	X	
Work In - Process Containers		X
Simulation (general simulations such as robot, cycle time, line simulations, not specifically Special Tooling related.)		X
Integration costs		X
Dunnage or Packaging		X
Leak Testers - Frames, Electronics, Lighting, Safety Equipment, Pneumatic/ Hydraulic Equipment, Casters, Table, etc. Exception: Nests or part holding fixtures.		X
Special Racks, Hooks – Only when required to locate part in process	X	
Masking devices – Only when required for unique AAM part application	X	

Gages	Tooling and Related Cost Items	
	Acceptable	Not Acceptable
Gage Tooling used on AAM Final Assembly End Items is acceptable. (Any gages for components of sourced assemblies are considered in process - gages and are the responsibility of the Supplier).		
Holding Tables / Carts		X
Certification (if required by AAM/customer)	X	
In-Line Gages		X
Final Inspection Gages Only (Attribute, SPC Data Collecting, Templates)	X	
In-Process Gages- Duplicate gaging for validation, and/or gages for components of an assembly, are the responsibility of the Supplier.		X
Measurement Equipment Programming – (Initial program only)	X	
Master – Used to set/check dial, air, electrical/electronic adjustable gages	X	
Measurement Program (edits on-going maintenance, Engineering Changes, development of measurement points, concept development, measurement reports, etc.)		X
Optical Measurement Equipment – (Laser, Stereo optical measurement systems).		X
Test Fixtures – Only when designed and built to achieve compliance with AAM Engineering Specification (ES) performance requirements and unique to a specific part, model, or product (Tooling Only). The Special Tooling is defined as only the holding fixture/nest within the test fixture to nest and/or hold the part. Other peripheral equipment such as panels, tables, PLCs, printers, electronic, automation, etc., are NOT allowed as Special Tooling	X	
Standard Equipment for Gages		X
Statistical Process Control (SPC) Equipment		X
Automatic Inspection Equipment		X
In Line / End of Line Gage Equipment		X
Duplicate Final Gages		X