



**Echostar Technologies L.L.C.
Standard Operating Procedure**

Supplier Requirements Document

**105450
Revision AG**

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I. APPROVALS

Refer to “REVISION HISTORY”, section III

II. PREPARED BY

Ben Robinson Supplier Quality Manager
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III. REVISION HISTORY

This document and all procedures will be reviewed once each year to determine if changes are necessary. Changes to any of the systems described in this manual will require updating via the Engineering Change Order (ECO) system.

Date	Description of Change	Review Team
10-02-00	C6719 - Initial Document Release	Ben Robinson, Jill Blocher
12-14-01	C8962 - Document Update	Ben Robinson, Jill Blocher
6-25-03	C11380- Document Update	Ron Meier, Ben Robinson, Kolby Breitenstein, George Hansen
3-16-05	C15566- Document Update	Ron Meier, Ben Robinson, Kolby Breitenstein
10-9-06	C18405 – Document Update	Ron Meier, Ben Robinson, Kolby Breitenstein
4-16-07	C20846 – Document Update	Ben Robinson
7-2-07	C21443 – Identify 105026 as EchoStar internal only	Ben Robinson

IV. REFERENCES

Part Number	Description	Section
123473765-AA	Doc, Common Cosmetic Workmanship Standards for new Product	7.2.1
110956	Doc, Indoor Component Surface Criteria Inspection Templates for new product	7.2.1
105690	Outdoor Fastener Corrosion Specifications	7.2.1
121929/ 119602	Refurbished Products - Cosmetic inspection criteria	7.2.2
124214	Supplier AQL requirements for Components and Assemblies	7.3.3
123479049-AA	Corrective Action Procedure	7.4
105026	Quality Department Supplier (OEM) Program (EchoStar Internal only)	7.5
100664	SOP Labeling of Raw Material Shipping Containers, Packing Lists, and Bills of Lading	7.6
120313	ETC Pallet construction specifications	7.7
104791	First Article Inspection Procedure	7.8
108476	SOP Return to Vendor (RTV) Process for Purchased Material	N/A
117040	Controlled Production Build Document	N/A

1.0 Introduction

The purpose of this document is to describe the Supplier Quality System of EchoStar in Englewood, Colorado as well as the requirements of EchoStar suppliers. Written procedures have been established and referenced for implementing the policies described.

EchoStar understands that suppliers are ultimately responsible for the quality and production processes of the products they supply. However, the EchoStar team is willing to assist in any way to maintain the high expectations and standards provided to customers. It is the responsibility of all EchoStar suppliers to adhere to any referenced Supplier Related Document in section IV of this procedure.

2.0 Scope

This document applies to all suppliers that contribute to the manufacturing of EchoStar products. If the requirements stated in this document cause conflict with those of other documents, the following order of precedence shall be followed:

1. EchoStar Purchase Orders
2. EchoStar Engineering Drawings or Specifications
3. Supplier Requirements Document

Any product(s) not in compliance with this document is subject to rejection and return to the Supplier for credit, replacement, or check refund as decided by Echostar Supply Chain Management.

3.0 EchoStar Quality Policy

The EchoStar Quality Department is committed to continually improving processes and products in order to better satisfy the customers needs. The main goal of EchoStar Quality is to deliver 100% defect free products and services to DISH Network customers on time, every time.

4.0 EchoStar Quality Mission Statement

The mission of EchoStar Quality is to team with manufacturing suppliers to deliver peak performance, affordable satellite products to DISH Network viewers along with high quality customer service and product development.

5.0 EchoStar Quality Objectives

The following objectives of the EchoStar Quality Department are on going and accomplished in conjunction with manufacturing suppliers:

- Deliver 100% defect free products and services to DISH Network customers on time, every time.
- Communicate with suppliers on a regular basis to understand how problems are being handled and resolved, evaluate supplier performance, and evaluate product performance.
- Continue to improve and implement procedures to ensure products remain undamaged during transportation
- Constantly develop new ideas to improve the reliability and efficiency of manufacturing processes.
- Continue to analyze quality reports in an effort to capture potential problems and prevent the manufacturing of defective products.

6.0 Supplier Quality Requirements

6.1 All suppliers are required to:

- Be either ISO certified or have a documented quality system implemented, EchoStar Quality may audit the system as needed.
- Identify and control their process and control points (inspection, testing, audits, etc.) to ensure that all product specifications are met and maintained.
- Manage the quality of their vendor's products.
- Report all significant process changes to EchoStar Quality.
- Provide First Articles to EchoStar for approval after significant process changes. (Refer 7.8)
- Allow all data provided to EchoStar (in order to satisfy Quality requirements) to be used freely under the conditions of applicable non-disclosure agreements.
- Implement and maintain continuous improvement methods.

6.2 All set top box suppliers are required to:

- Issue reports of their quality level to EchoStar quality on a weekly basis. The content and report format are provided by Echostar. These reports will include:
 - ✓ Process Yields
 - ✓ Sampling Audit Results
 - ✓ First Pass Yields
 - ✓ Top Five Failure Report by component and DPPM levels

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- Issue reports of pre-production runs (LPP) to EchoStar. These reports should include but are not limited to:
 - ✓ Process Yield Reports
 - ✓ Production Reports
 - ✓ Suggestions for process improvement to be evaluated by EchoStar
 - ✓ Description of any encountered process problems and what was done to solve the problems
- Issue reports of post production returns (CRM) to EchoStar. These reports should include but are not limited to:
 - ✓ Process Yield Reports
 - ✓ Production Reports
 - ✓ Suggestions for process improvement to be evaluated by EchoStar
 - ✓ Description of any encountered process problems and what was done to solve the problems

6.3 AVL (Approved Vendor List)

All set top box suppliers or suppliers of any EchoStar designed assemblies are required to:

- Build products using only EchoStar approved components from EchoStar approved suppliers.
- Purchase approved components from approved suppliers in the quantities (splits) defined by EchoStar.
- Contact EchoStar for instruction when approved components are not available from approved suppliers, for whatever reason, in a time frame that will allow forecast schedules to be met. In this condition EchoStar will provide, by deviation, instructions and conditions for using alternate components and/or alternate suppliers.

7.0 EchoStar Quality Procedures for Suppliers

7.1 Finished Goods Quality Standards

The quality standards for finished goods have been defined in Echostar, document number 123473765-AA. This document defines the cosmetic acceptance criteria for EchoStar products and should be used on new products only.

7.2 Non-Conforming Product

7.2.1 New Product Specifications

Product is identified and segregated to prevent its inadvertent use and release. Documented procedures describe the criteria of non-conforming new product. Reference Echostar document number 123473765-AA, 110956.

7.2.2 Refurbished Product Specifications

Non-conforming product is identified and segregated to prevent its inadvertent use and release. Documented procedures describe the criteria of non-conforming refurbished receivers returned to the service department. Reference Echostar document number 121929, 119602.

7.2.3 MRB Procedure

Non-conforming material may be returned to the supplier at the supplier's expense. The Material Review Board (MRB) dispositions all non-conformances found during receiving inspection and in-process inspection and the dispositions are maintained.

7.3 Quality Standards In-process

7.3.1 Receiving Inspection and Testing

EchoStar receives four categories of materials, each of which are inspected/tested in different manners:

- Raw materials require inspection. Certain parts and accessories require receiving inspection, which is noted on the Oracle database and on the purchase order. Quality inspects and tests these parts, using documented procedures, and the parts are held in quarantine prior to release. Any part found to be non-conforming is identified and segregated until disposition is made. Quality maintains all inspection results.
- New products and parts not requiring inspection are identified in the Oracle database and on the purchase order, and when received by EchoStar go directly to the warehouse. They are not inspected and/or tested until part of the final packout process (refer 7.3.2).
- Customer return product is sent to the service department upon receipt. The service department performs all inspections, testing, and disposition per documented procedures. The service department maintains all inspection and test records.
- Refurbished product received from the contract manufacturers is sent to the service department where a 100% visual and functional test is performed per documented procedures. Acceptable product is released for packout and shipment while defective product is processed per documented procedures. The service department maintains all inspection and test records.

7.3.2 In-process Inspection and Testing/Final Inspection and Testing

Quality performs in-process inspection and testing, also considered final inspection and testing, on the packout line using documented procedures. The results of all inspections and tests are recorded and maintained by Quality. In addition, the packout line weighs each packed box as a check for missing components. All non-conforming products are identified and segregated. Non-conforming units are held until the non-conformance is corrected or dispositioned. All other product that is being packed out is normally released unless otherwise directed by Quality.

7.3.3 Supplier AQL Levels

AQL sampling by the supplier will meet or exceed those set forth from the following order:

1. AQL document #124214
2. EchoStar Engineering specifications. (Special occurrence).
3. EchoStar QA request --per sampling as found through EchoStar or supplier rejection rates.

7.4 Corrective Action Requests (CARs) and Failure Analysis (FAs)

All suppliers are responsible for implementing corrective action when non-conformance occurs.

7.4.1 CARs

CARs, whether formal or informal, are to be established and implemented in a “closed loop” fashion, following these guidelines:

- Identify the problem
- Understand the problem and root cause of the problem
- Identify and prioritize corrective action
- Implement corrective action
- Verify corrective action
- Contract Manufacturers are to report on the CARs they have issued and their status to EchoStar Quality on a monthly basis.

7.4.2 FAs

FAs, whether formal or informal, are to be established and implemented in a “closed loop” fashion, following these guidelines:

- Identify the failure
- Determine whether the failure was related to internal workmanship or to the component/assembly itself. If it is related to the component/assembly:
- Send sample parts to the component/assembly vendor requesting failure analysis
- Monitor the vendors progress
- Record and Report results to EchoStar Quality on a monthly basis

7.5 Supplier Audit Document

This is an EchoStar internal document. It is used when evaluating the process, capability, and procedures practiced by a potential or existing supplier. The supplier audit form is defined in Echostar document number 105026.

EchoStar will conduct audits of suppliers on an as-needed basis. These audits will cover all aspects of quality and production to ensure compliance with EchoStar requirements. The supplier will be required to correct any problems and prevent reoccurrence.

7.6 Packaging

Proper handling, storing, packaging and delivery are crucial to preventing product damage. Precautionary measures must be taken to prevent product from being damaged beginning at manufacturing and continuing through customer delivery. Procedures and engineering specifications define the methods for the handling, storage, packing, preservation, and delivery of raw materials and finished goods to prevent damage. The quality standards for packaging raw materials and finished goods are defined in Echostar document numbers 100664 and 120313.

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EchoStar expects suppliers to ship only conforming products; therefore, general Certificates of Compliance are not formally required.

7.7 Pallet Specifications

All pallet types/sizes must meet the criteria stated within document #120313.

7.8 First Articles

Quality specifications define the methods for first article submission, inspection and approval/rejection. The quality standards for first articles have been defined in Echostar document number 104791.

Submission of a first article will be required for all new components. EchoStar Quality requires first article reports and submission of first article for the following:

- New or Modified Tooling
- Process Change or change of Production Facility location
- Materials Change



**EchoStar Technologies L.L.C.
Standard Operating Procedure
Labeling of Raw Material
Shipping Containers, Packing Lists,
and Bills of Lading**

**100664
Revision AP**
(QA tracking rev- AA)

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I. APPROVALS

Refer to the Engineering Change Order for approvals.

II. PREPARED BY

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III. REVISION HISTORY

Part Number	Rev.	ECO	Date	Description
100664	AA			Formal Release to Document Control
100664	AB			Bulk Packaging Specifications
100664	AC			Air Freight Specifications
100664	AD	C6999	12/19/00	Format and packaging criteria info. added (3.1.3)
100664	AE	C8424	11/21/01	Format and packaging criteria/info/pics added (3.1.2, 3.2.2)
100664	AF	C8685	1/11/02	Inserted partial box criteria in 3.2.1, 3.2.2.
100664	AG	C9267	5/24/02	Inserted receiver serial number criteria in 3.2.2, pic 5
100664	AH	C9981	10/15/02	Added 3.5.1 Pallet spec. clarification, Scope- EchoStar ETC as a supplier definition, 3.7 Misc packing material approvals, pic 6
100664	AI	C10786	3/26/03	Removed pallet req. –referenced 120313, HDD packaging requirements added, misc corrections
100664	AJ	C11315	6/6/03	Section 3.2.2 additions per D4671
100664	AK	C12005	9/8/03	Section 3.2.1 additions for inner box identification
100664	AL	C14374	8/27/04	Added Jabil labeling code, clarify “service receiver” pallet wrapping requirements
100664	AM	C14374	10/20/04	Banding and pallet wrapping clarification added.
100664	AN	C20994	5/14/07	Ref. doc added, box criteria added, removed Thomson/SSCI Huntsville references, added Solectron/Kunshan, added sea-ship info, removed obsolete HDD box info and Accessories/pictures, shrink wrap improvements added.
100664	AP	C25463	12/01/08	Update section 3.2.2.3 with correct document reference and CM ID codes.

IV. REFERENCES

Related documentation

Part Number	Description
120313	SOP for Pallet specifications
140209	Re-painted cover packaging standards
163291	Data File Requirements for Production of and Shipping NEW and REMAN EchoStar Products

1. Introduction

The purpose of this document is to establish the EchoStar requirements for the labeling of raw material Shipping Containers, Packing Lists, and Bills of Lading.

2. Scope

This procedure applies to any *supplier that ships raw or finished goods material to an Echostar facility. It is intended to document the labeling and information requirements for Shipping Containers, Packing Lists, and Bills of Lading.

*Echostar may also be defined as a supplier, when product is shipped from one EchoStar facility to any other location.

Exceptions: Any exceptions to these specifications must be approved by EchoStar Engineering and Quality Assurance Departments prior to acceptance.

3. Procedure (Packaging Requirements)

3.1.1 EchoStar requires the supplier to package the raw materials in the following manner.

3.1.1.1 For boxed materials, label each box with the information described in section 3.2.1

3.1.1.2 For air shipment of bulk packed items, externally package each pallet with the information described in section 3.6.1.

3.1.1.3 For boxed or bulk packed items, label each pallet with the information described in section 3.2.2.

3.1.1.4 Pallet construction is detailed in section 3.5.

3.1.1.5 To keep the boxes from shifting during shipment, do not column stack the boxes. Change the orientation on each level so the boxes are interlocked.

3.1.1.6 Use the same size box, same quantity per box, and same quantity per pallet for each shipment. Do not change box size, quantity per box, or quantity per pallet without notifying the EchoStar Logistics Department.

3.1.1.7 Once boxes are stacked on the pallet, limit the overall height to 40 in. (102 cm) for bulk packed items, and 44 in. (112 cm) for boxed items.

3.1.1.8 Stretch wrap the boxes to the pallet. The stretch wrap over the top of the product is not to exceed three inches. Stretch wrap should be a minimum of 3 layers.

3.1.1.9 See section 3.1.4 for HDD packaging.

3.1.2 For bulk shipments of Antennas, Mast and Polar mounts, and miscellaneous antenna pieces, EchoStar will require the Antenna Manufactures to comply with the following:

3.1.2.1 All shipments are to be made up of matched sets of components except when specifically requested by EchoStar. (Antenna/Mast assy's/Polar assy's, etc)

3.1.2.2 Pallets for Antenna components are to be constructed per pallet specification 120313.

3.1.2.3 Hardware bags to be packaged at 500 quantities per box.

3.1.2.4 No packaging to overhang pallet edges.

3.1.2.5 Packaging needs to withstand double pallet stacking.

3.1.2.6 Bulk Packaging to meet or exceed testing requirements of ISTA Project **3E** for each pallet.

- Testing on pallet load basis.
- Testing each and all-individual pallet configurations (i.e. antenna; polar plate; mast assembly; y-adapter).
- Submit approved test reports from certified ISTA facility for external package results.

- Submit approved test reports from Quality Inspector evaluating internal packaging/product results.

Weight of any completed pallet not to exceed 1500 lbs.

All pallets must be labeled in accordance with E.T.C. SOP 100664 (Section 3.2)

3.1.3 EchoStar requires that the supplier to package materials/equipment to Echostar or other specified vendors in the following manner.

- 3.1.3.1 For boxed or crated materials/equipment, label each container with the information regarding the internal components as noted in 3.2.1 (where applicable), and any notable damage.
- 3.1.3.2 For air shipment of bulk packed items, externally package each pallet with the information described in section 3.6.1 (where applicable), and any notable damage.
- 3.1.3.3 For boxed or bulk packed items, label each pallet with the information described in section 3.2.2 (where applicable). Use common sense for bulk packing sensitive equipment.
- 3.1.3.4 Use a 48-in. x 40-in. (122 cm x 102 cm) pallet. (Pallet construction is detailed in pallet specification 120313), when shipping large boxes, or 2 +.
- 3.1.3.5 To keep the boxes from shifting during shipment, do not column stack the boxes. Change the orientation on each level so the boxes are interlocked.
- 3.1.3.6 Once boxes are stacked on the pallet, limit the overall height to 40 in. (102 cm) for bulk packed items and 44 in. (112 cm) for boxed items. Use common sense when stacking sensitive equipment, to avoid crushing.
- 3.1.3.7 Do not use packing peanuts as they have a tendency to find their way into a unit (vents, fan openings, etc). All equipment must have bubble wrap, foam-in-place or manufacturer supplied protection on all surfaces.
- 3.1.3.8 Stretch wrap the boxes to the pallet. The stretch wrap over the top of the product is not to exceed three inches.
- 3.1.3.9 All shipped equipment must be audited per procedure as stated by vendor shipping/quality personnel, and documented on the packing slip as having been inspected by stating “Packaging Audited by (*full name goes here*)”.

3.1.4 For shipments of Hard Drives, the HDD suppliers also require EchoStar and partners to comply with the following packaging:

Drive Return Preparations

All HDD product returned to the HDD supplier must be properly packaged in the original container or the supplier approved packaging to prevent physical and electrostatic damage while in transit. Improperly packaged drives may cause warranty invalidation. Contact the EchoStar quality dept. for any further details on packaging and handling requirements as stated below.

Write the RA on the outside of the container and on all shipping documents. Material received without an RA clearly marked, cannot be identified and may be returned to sender. **Remove all accessories, brackets, enclosures or cables prior to shipping, as these items do not fit properly in the boxes, and will additionally not be returned.**

Packaging

All HDD's returned to the supplier must be properly packaged in supplier approved packaging. Improper packaging can result in the voiding of any warranty on the drive(s).

Not Approved:

- ◇ Bubble Wrap
- ◇ Spray Foam
- ◇ Styrofoam Peanuts

Approved Packaging Materials:

- ◇ HDD "supplier only" boxes
- ◇ Non ESD conducting dust bags
- ◇ Non ESD conducting foam inserts
- ◇ Seashells (Seagate only- 3.5" drives only)

Ask your Service Administrator or Account Manager for ordering instructions on ordering HDD packaging material. Also ask the QA/Training dept for posters/videotapes, and/or training seminars for more detailed handling tips.

3.5" x 17mm Products	Quantity
Drives per box	25
Drives per layer	225
Total drives per pallet	900
3.5" x 25mm Products	
Drives per box	20
Drives per layer	180
Total drives per pallet	720

	Packaging specs
Boxes per layer (pattern)	9 (3 x 3)
Boxes per pallet (pattern)	36 (3 x 3 x 4 high)
Approx. box size (outside dims)	15.63" x 12.75" x 8.9"
Approx. overall cube size	47" x 38.25" x 35.6" (w/o pallet) 48" x 40" x 40.6" (with pallet)
Approx. weight, full pallet	17mm: 1085 (492 kg) 25mm: 1067 (484 kg)
Pallet configuration	Arrows on boxes should all be facing correct direction (up). Boxes can be stacked 4 high only.
Label configuration	<ul style="list-style-type: none"> • Labels for center column of boxes will be 'hidden' • Labels for outer 2 columns will face outward (visible from the outside of pallet).

- Pallet level label will be same as current

3.2 Shipping Container Labeling Requirements

3.2.1 For boxed materials, EchoStar requires the supplier to place the following information on each Shipping Container.

- 3.2.1.1 EchoStar part number—See *Note*
- Written with at least 1 in. (2.5 cm) tall numbers
 - Bar code (3 of 9)
- 3.2.1.2 Quantity per box—See *Note*
- Written with at least ½ in. (1.25 cm) tall numbers
 - Bar code (3 of 9)
- 3.2.1.3 Date of manufacture and lot number
- Written with at least ½ in. (1.25 cm) tall numbers

Note:

- Partial boxes must be clearly marked as such (eg. With a 3x5 or 4x6 label that says ‘Partial’). Quantity on partial box must also be clearly indicated
- Partial boxes must be stacked on the top layer of the pallet, & the partial tag must be clearly evident.
- All inner carton boxes designed for further shipment from EchoStar must be labeled with part number, barcode and quantity per box. Label to contain the same information as 3.2.1.1 and 3.2.1.2 but may be re-sized as needed to fit the side of the box.

3.2.2 For boxed or bulk packed materials, EchoStar requires the supplier to place one sheet of paper with the following information on each of the four sides of the palletized materials.

- 3.2.2.1 EchoStar part number
- Written with at least 1 in. (2.5 cm) tall numbers
 - Bar code (3 of 9)
- 3.2.2.2 Quantity per pallet (Receiver manufacturers see notes below)
- Written with at least 1 in. (2.5 cm) tall numbers
 - Bar code (3 of 9)
- 3.2.2.3 Date of manufacture and lot number
- Written with at least 1 in. (2.5 cm) tall numbers

Note:

- Partial boxes must be clearly marked as such (eg. with a 3x5 or 4x6 label that says ‘Partial’). Quantity on partial box must also be clearly indicated
- Partial boxes must be stacked on the top layer of the pallet, & the partial tag must be clearly evident.
- Receiver manufactures are required to include the following on the labeling of the pallets:
 - Barcoded (3 of 9) and human readable Serial Number list attached to the pallet
The serial number prefix must also be present--see example pic 1 below.
 - Barcoded (3 of 9) & human readable pallet ID # (must include 3 alphas from the following table to identify the manufacturer plus 6 numerics). Contract Manufacturers must ensure that pallet ID’s are not duplicated or reused (reference Data File Requirements for Production of and Shipping NEW and REMAN EchoStar Products, 163291).

SSCI Guadalajara	: GDL
SSCI Kunshan	: KUN
Tiger Technologies	: SHA
Jabil	: PUN

Foxconn : CHI

- Country of origin.

3.3 Packing List Information Requirements

3.3.1 EchoStar requires the supplier to place the following information on the Packing List.

- 3.3.1.1 EchoStar part number
- 3.3.1.2 Product description
- 3.3.1.3 Total quantity
- 3.3.1.4 Purchase order number
- 3.3.1.5 Purchase order release number

3.4 Bill of Lading Information Requirements

3.4.1 EchoStar requires the supplier to place the following information on the Bill of Lading.

- 3.4.1.1 EchoStar part number
- 3.4.1.2 Product description
- 3.4.1.3 Total quantity
- 3.4.1.4 Purchase order number
- 3.4.1.5 Purchase order release number
- 3.4.1.6 EchoStar requires the shipping carrier to call for a delivery appointment at:
(Denver) 303- 723-3454; (Atlanta) 678-482-1908 ext 3788.

3.5 Pallet Construction Requirements---See 120313 for pallet requirements.

3.6 External Bulk Packaging for Air Freight

3.6.1 EchoStar requires the supplier to externally package bulk air shipments in the following manner:

- 3.6.1.1 To ensure support, inset material one inch on pallet.
- 3.6.1.2 To support during shipping, use cardboard as well as corner supports on each of the four sides of the palletized materials.
 - Minimum of two layers cardboard covering sides and top.
 - Stronger materials (plywood, particleboard, etc.) may be used to replace cardboard.
 - Cardboard should be 275 pound c or s flute or higher.
- 3.6.1.3 For boxed or bulk packed materials, label with information described in section 3.2.2
- 3.6.1.4 Stretch wrap the boxes to the pallet with at least 6 layers of stretch wrap.
- 3.6.1.5 To ensure boxes are handled properly, place “*This end up*” and “*Fragile*” stickers on each of the four sides of the palletized materials.
- 3.6.1.6 To monitor handling of boxes, place tilt indicator on one side of the palletized materials.

3.7 External Bulk Packaging for Water Freight

3.7.1 EchoStar requires the supplier to externally package bulk water shipments in the following manner:

- 3.7.1.1 To ensure support, inset material one inch on pallet.
- 3.7.1.2 To support during shipping, use cardboard as well as corner supports on each of the four sides of the palletized materials.
 - Minimum of two layers cardboard covering sides and top.
 - Stronger materials (plywood, particleboard, etc.) may be used to replace cardboard.
 - Cardboard should be 275 pound c or s flute or higher.
- 3.7.1.3 For boxed or bulk packed materials, label with information described in section 3.2.2
- 3.7.1.4 Stretch-wrap the boxes to the pallet with at least 6 layers of stretch wrap.
- 3.7.1.5 To ensure boxes are handled properly, place “*This end up*” and “*Fragile*” stickers on each of the four sides of the palletized materials.
- 3.7.1.6 To monitor handling of boxes, place tilt indicator on one side of the palletized materials.

- 3.7.1.7 Ensure shipping container has new/ proper silica/capacity.
 3.7.1.8 All HDD product must have vacuumed sealed bags, and are not compromised, per BOM.

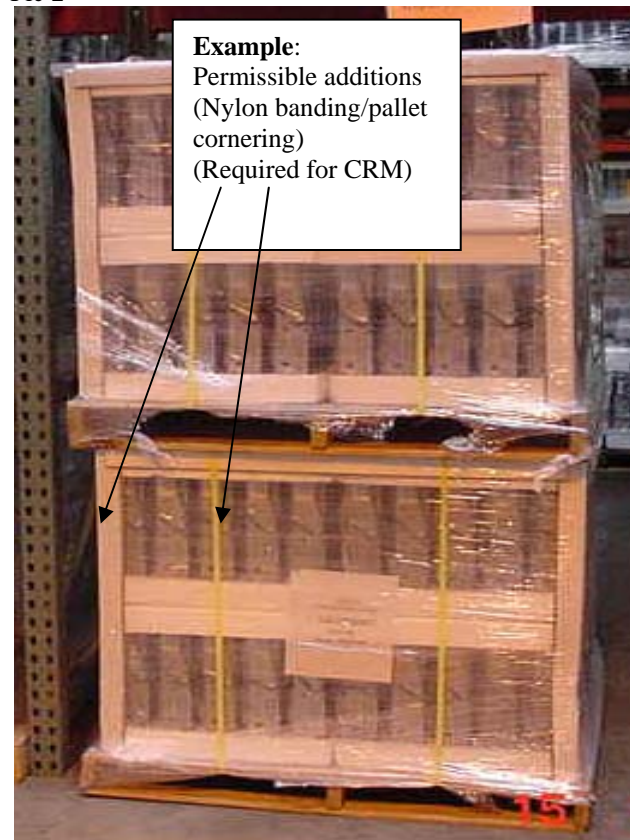
3.8 Shipping/Packing suggestions/requirements for avoiding potential product defects.

- 3.8.1 Additional shipping/packaging support (materials) are recommended in addition to the documented requirements stated within this document, per Echostar QA/Engineering management approval only. Permissible items that are approved to be used (see Pic 2) include corner guards and banding. All banding used must be nylon, and must be 2 per pallet banded in the “long” direction of the pallet.
- Pallet foam corner protection (Required for EchoStar Service/CRM shipments)
 - Pallet nylon banding (Required for EchoStar Service/CRM shipments)(metal banding is not acceptable)
 - Cardboard or wood pallet/foam squares (corner stabilizer)
- 3.8.2 Double stacked bulk foam receiver pallets must be stretch wrapped together, using 4-7 layers from the middle of the top pallet, to the middle of the bottom pallet, on the last row of truck loaded pallets only.
- 3.8.3 Single pallets must have stretch wrap connected to the pallet and foam, to secure the product to the pallet. (see picture 6 for example)
- 3.8.4 Shipping trucks/containers must be inspected for wetness/leaks prior to loading, then again prior to shipping. Cargo hold must be dry.
- 3.8.5 Pallets must be loaded into shipping trucks/containers in the direction that allows the least amount of movement between them and the truck walls. To achieve this when loading pallets side-by-side, the 48" width of the pallets must be parallel to the front and back while the 40" side of the pallets are end-to-end.
- 3.8.6 Vented trailers are recommended for condensation issues commonly found that may lead to product damage/rejection.

Pic 1



Pic 2





**EchoStar Technologies L.L.C.
Pallet Construction Specifications**

**120313
Revision AE**

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I. PREPARED BY

George M. Hansen

II. APPROVALS

Refer to the Engineering Change Order for approvals.

III. REVISION HISTORY

Date	Rev.	ECO#	Action
12/16/02	AA	C10342	Initial Release
09/8/03	AB	C11644	Addition of Optional, HDTV and NagraStar pallets, other edits
01/25/06	AC	C17751	Addition of Reference document, Specification and Material edits, Grade replaced with Knots, added Optional Plastic Pallet, deleted HDTV pallets.
3/5/07	AD	C20516	Addition of Phytosanitation standard, 30 x 40 and block pallet specifications, other minor edits.
11/19/08	AE	C25361	Delete Optional Plastic Pallet

This document SUPERSEDES the following:

- * **All previous samples and all verbal instructions.**

1. Introduction

The purpose of this document is to establish minimum quality requirements for EchoStar Pallet Construction Specifications.

2. Scope

This specification applies to all suppliers that ship raw materials to EchoStar. It is intended to document the minimum specifications of an acceptable wood pallet. More detailed pallet construction requirements can be found in the Uniform Standard for Wood Pallets written by the National Wood Pallet and Container (Website: www.palletcentral.com).

Prior to implementation, the QA Manager must review any alterations or deviations to the criteria in this document.

Products received by EchoStar which do not meet the criteria of this document are subject to MRB disposition.

3. References

3.1 Related documentation

Part Number	Description
100664	SOP for Labeling of Raw Materials, Shipping Containers, Packaging Lists, and Bills of lading
	Uniform Standard for Wood Pallets – National Wood Pallet and Container Association (Website: www.palletcentral.com)

4. Objective

The objective of this document is to establish standards and inspection criteria for the acceptability of wooden pallets.

5. Application range

These standards apply to all wooden pallets used to ship raw materials to ET facilities.

Exceptions: Any exceptions to these specifications must be approved by EchoStar Technologies Corporation Engineering and Quality Assurance Departments prior to acceptance.

6. Standard Pallet Construction Specifications

1. New and Used Pallet Specification:

- 48 inch x 40 inch; stringer class, four-way modified, limited use pallet.
- ISPM 15 compliant.
- The pallet size shall be limited to plus +1/4 in. and minus -1/2 in. of the target dimension, as measured at specific points along the pallet length and width.
- The pallets must be flat on their top and bottom surfaces to within 1/4 in. maximum deviation from corner to corner straight line.
- Top Deckboards must be evenly spaced with maximum 3-9/16" spacing between boards.
- No missing boards on top or bottom.
- Top and Bottom Deck boards: Open splits (cracks) with visible fastener shanks or legs shall be limited. No more than one open split with a visible fastener shank or leg per connection shall be permitted and not more than one-third of the components per pallet shall contain open splits with visible fastener shanks or legs at the completion of manufacture.
- All stringers to be solid and not broken or cracked.
- No double stringers or patched boards.
- Beveled edges or chamfers on inside and outside of lead bottom boards are preferred.
- Painted pallets are not acceptable. (Blue CHEP style pallets are acceptable)
- Pallets are required to be clean and free of odors or stains.

2. Material

- The species of woods used in pallets is numerous. Accepted species can be found in Annex A of the Nation Wood Pallet and Container Manufactures Uniform Standard for Wood Pallets.

3. Knots

- The number of maximum size knots not to exceed 1 in every 1/2 length of each component.
- Maximum affected portion of the material cross section:
 - Unsound knots (decay within knot) and holes to be no larger than 2/3 the width of the board. None allowed larger than 1/2" diameter immediately over the stringer notch areas.
 - Tight, solid knots (without voids) to be no larger than 7/8 the width of the board, or 1/2 of the cross section above the stringer notch areas.

4. Nailing

- 2 in. minimum length, .105" minimum diameter helical nails.
- The nail length shall be sufficient to provide a minimum penetration of 1-1/4 in. into the stringer for all deckboard thickness over 1/2 in. and a minimum penetration of 1 in. for deckboard thickness of 1/2 in. or less.
- All nailed joints are to be tight with no protruding nail heads.
- All Lead boards to have 3 nails per junction minimum
- All Interior boards to have 2 nails per junction minimum

5. Notching

- All three stringers need to be notched in two places 1-1/2 in. deep x 9 in. long with a 3/4 in. radius.

6. Phytosanitation Standard of Wood Pallets

Treatment and marking of wood pallets must conform to the Internal Standards for Phytosanitary Measures Publication No. 15 (ISPM 15) Guidelines for regulating wood packaging material in international trade. ISPM 15 has been adopted by trading partners of the United States as their import requirements for wood pallets.

Treatment or quality mark should include the following:

- IPPC logo
- Two-letter Country of Origin abbreviation
- Unique number assigned by an inspection agency to the facility
- HT or MB abbreviation
- Inspection agency logo

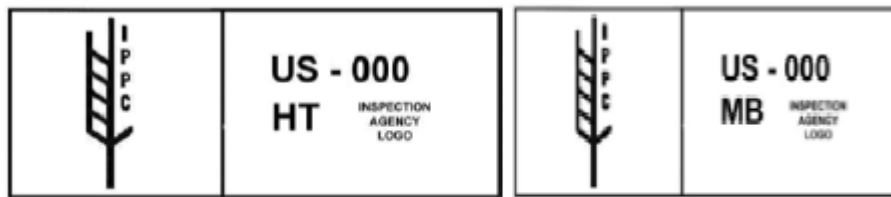


Figure 21. HT and MB treatment marks.

Wood pallets can be ISPM 15-compliant by adhering to any of the following:

Heat Treated (HT) wood pallets

Heat treatment and marking of wood pallets shall conform to the enforcement regulations and policy of the American Lumber Standards Committee (ALSC) Wood Packaging Material (WPM) Program.

Methyl bromide (MB) fumigated pallets

MB fumigation and marking of wood pallets shall conform to the enforcement regulations and policy of the Export WPM Fumigation Program.

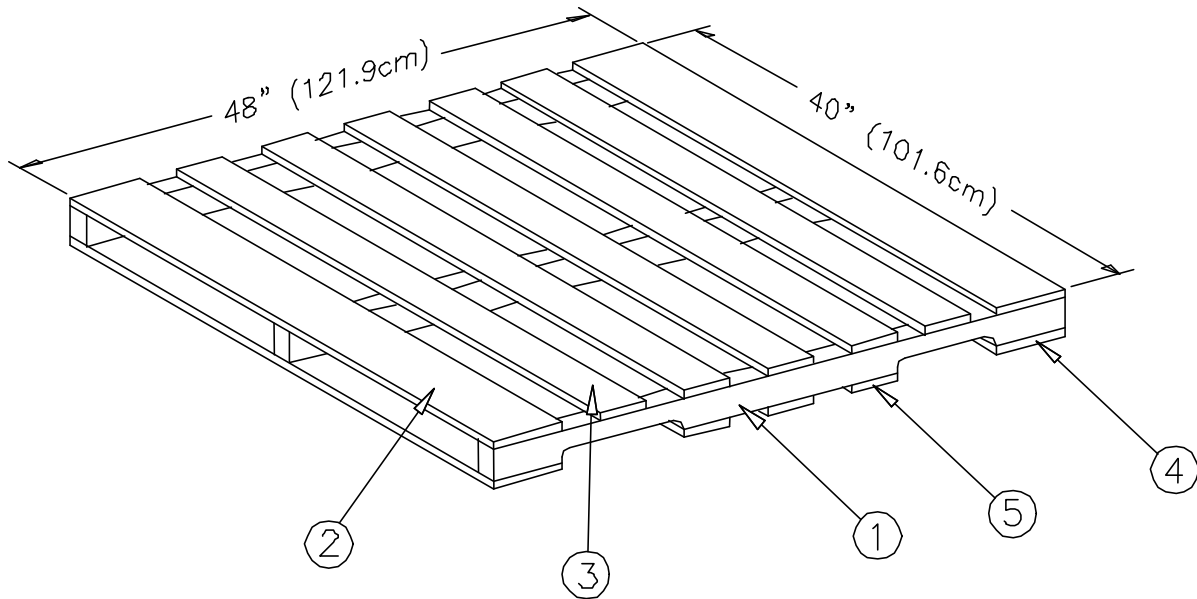
New Pallets

New pallets that will be used for export shipment must be ISPM 15-compliant.

Recycled pallets

Reusing ISPM 15-compliant wood pallets do not require retreating and remarking. However, repaired, remanufactured and compo pallets must be treated and remarked.

7. Preferred 48" x 40" Pallet Construction Specification



Preferred 48" x 40" Pallet Specification

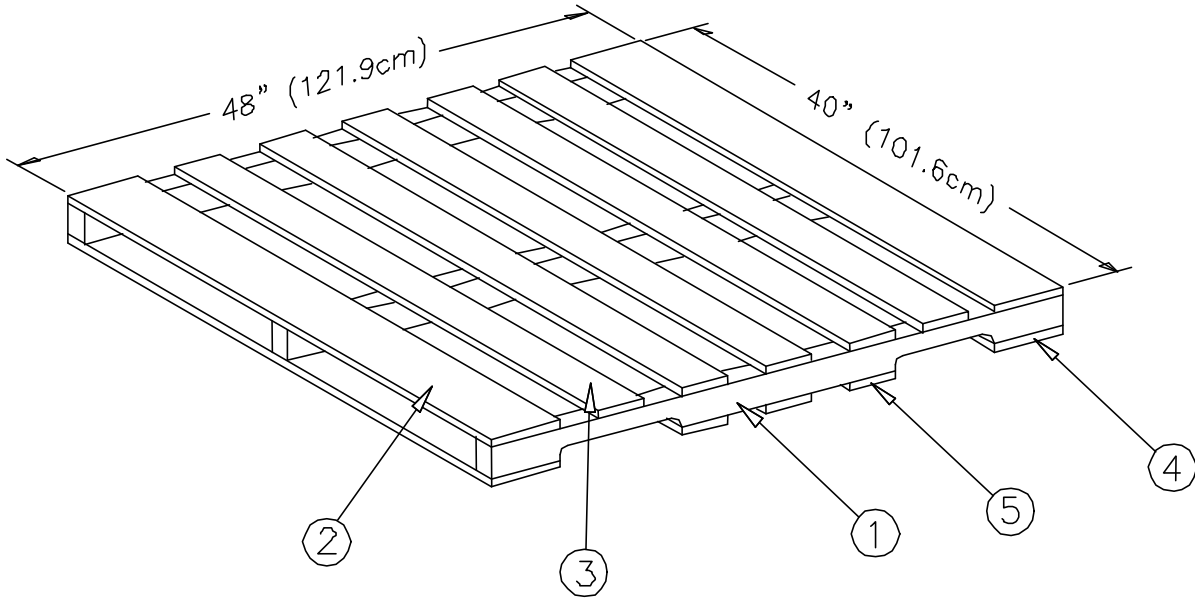
All component sizes and quantities are minimums, not maximums

Sizes are given for dry material unless otherwise noted (max. of 20% moisture)

Item No.	Quantity	Description
1 (Stringer)	3	Board, 1-1/2" X 3-3/4" X 48"
2 (Top Lead)	2	Board, 1/2" X 5-3/4" X 40"
3 (Top Inner)	5	Board, 1/2" X 3-3/4" X 40"
4 (Bottom Lead)	2	Board, 1/2" X 5-3/4" X 40"
5 (Bottom Inner)	3	Board, 1/2" X 3-3/4" X 40"

8. Optional 48" x 40" Pallet Construction Specification

Use of optional construction pallets must be approved by EchoStar Technologies Corporation Engineering and Quality Assurance Departments.



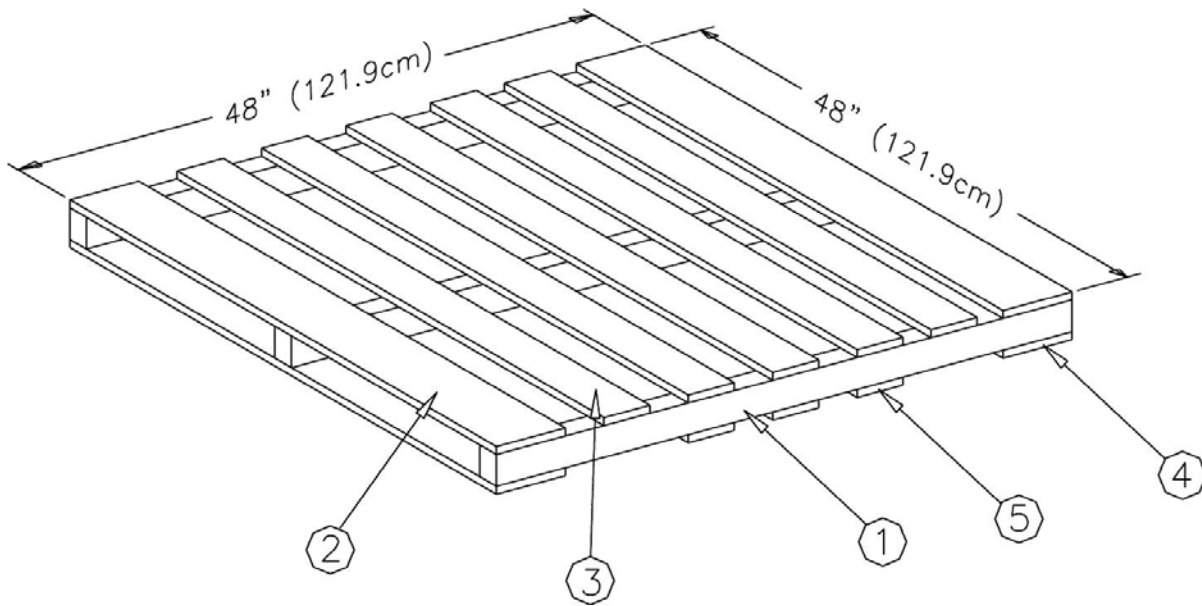
Optional 48" x 40" Pallet Specification

All component sizes and quantities are minimums, not maximums

Sizes are given for dry material unless otherwise noted (max. of 20% moisture)

Item No.	Quantity	Description
1 (Stringer)	3	Board, 1-1/2" X 3-3/4" X 48"
2 (Top Lead)	2 or 4	Board, 9/16" X 5-1/4" X 40" 2 Butted boards each end, 9/16" X 3-1/4" X 40"
3 (Top Inner)	5	Board, 9/16" X 3-1/2" X 40"
4 (Bottom Lead)	2 or 4	Board, 9/16" X 5-1/2" X 40" 2 Butted boards each end not to exceed 6" in width
5 (Bottom Inner)	3 or 2	Board, 9/16" X 3-1/4" X 40" Board, 9/16" X 5-1/2" X 40"

9. 48" x 48" Bulk Reflector Pallet Construction Specification



Bulk Reflector 48" x 48" Pallet Specification

48" x 48", Stringer Class, Double-Face Non-Reversible, 2 way, limited Use

All component sizes and quantities are minimums, not maximums

Sizes are given for dry material unless otherwise noted (max. of 20% moisture)

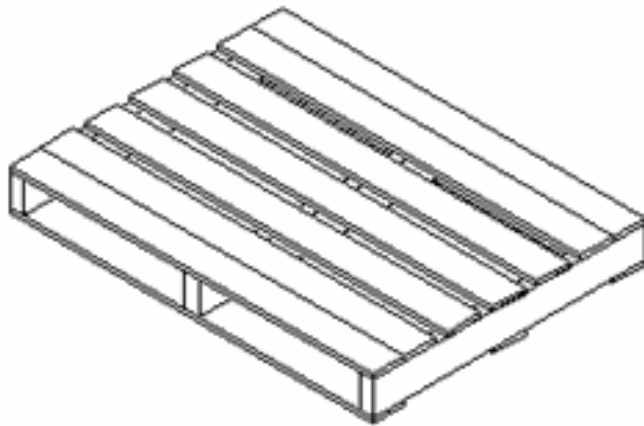
Item No.	Quantity	Description
1 (Stringer)	3	Board, 1-1/2" X 3-3/4" X 48"
2 (Top Lead)	2 or 4	Board, 9/16" X 5-1/4" X 48" 2 Butted boards each end, 9/16" X 3-1/4" X 48"
3 (Top Inner)	5	Board, 9/16" X 3-1/2" X 48"
4 (Bottom Lead)	2 or 4	Board, 9/16" X 5-1/2" X 48" 2 Butted boards each end, 9/16" X 3-1/4" X 48"
5 (Bottom Inner)	3 or 2	Board, 9/16" X 3-1/4" X 48" Board, 9/16" X 5-1/2" X 48"

10. Nagrastar Smart Card Pallet Construction Specification

120 cm x 80 cm x 14 cm

Nagrastar utilizes European designed pallets. Smart cards are received on these pallets and then transferred onto standard 40' x 48' pallets. Nagrastar pallets may be reused by EchoStar for small smart card shipments to EchoStar OEM's.

11. Optional 30" x 40" Pallet Construction Specification



Optional 30" x 40" Pallet Specification

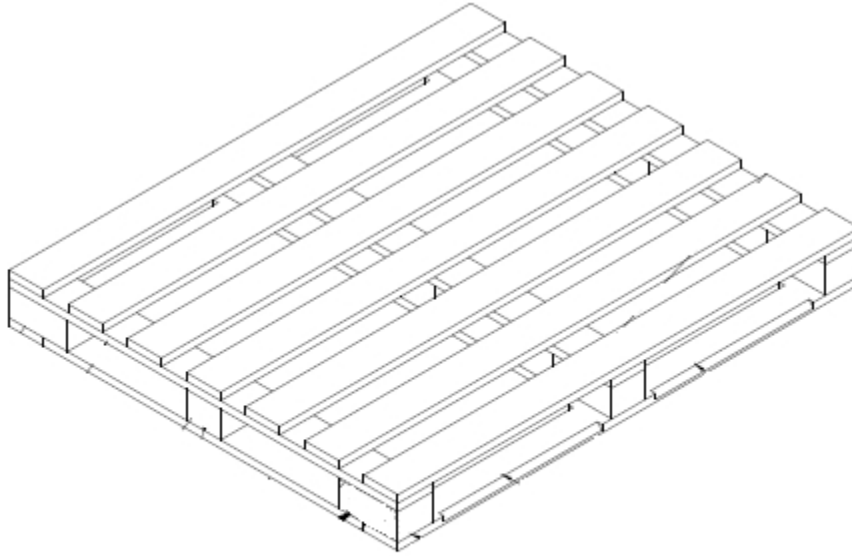
30" x 40", Stringer Class, 2 way, limited Use

All component sizes and quantities are minimums, not maximums

Sizes are given for dry material unless otherwise noted (max. of 20% moisture)

Item	Quantity	Description
Stringer	3	Board, 1-1/2" X 3-1/2" X 30"
Top Lead Deck Boards	4	2 Butted boards each end, 5/8" X 3-1/2" X 40"
Top Inner Deck Boards	3	Board, 5/8" X 3-1/2" X 40"
Bottom Deck Boards	3	Board, 5/8" X 3-1/2" X 40"

12. Optional 48" x 40" Block Pallet Construction specification



Optional 48" x 48" Block Pallet Specification

48" x 48", Block Class, Non-Reversible, 4 way, nine block

Used for Hard Drive Factory Shipments

All component sizes and quantities are minimums, not maximums

Sizes are given for dry material unless otherwise noted (max. of 20% moisture)

Item	Quantity	Description
Outer Support Blocks	6	Block, 2-3/4" x 3-1/2" x 6"
Center Support Blocks	3	Block, 2-3/4" x 3-1/2" x 3-1/2"
Top Deck Boards	7	Board, 3/4" X 3-1/2" X 47.50"
Top Deck Support Boards	3	Board, 3/4" X 3-1/2" X 40"
Bottom Deck Boards	2	Board, 3/4" X 3-1/2" X 47.50"
Bottom Deck Support Boards	3	Board, 3/4" X 3-1/2" X 33"



**EchoStar Technologies L.L.C.
Standard Operating Procedure**

**Supplier AQL Requirements
for
Components, Fabrications and Assemblies**

**124214
Revision AA**
(QA tracking rev-A)

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I. APPROVALS

Refer to the Engineering Change Order for approvals.

II. PREPARED BY

Kolby V. Breitenstein

III. REVISION HISTORY

Part Number	Rev.	ECO	Date	Description
124214	AA	C11378	7/8/03	Formal Release to Document Control

IV. REFERENCE DOCUMENTS

Part Number	Description
ANSI/ASQC Z1.4-1993 (Or latest rev. to be used)	American National Standard- Sampling Procedures and Tables for Inspection by Attributes.
105450	Supplier Requirements Document
123473765-AA	Common Cosmetic Criteria Specification Procedure for new Products
110956	Outdoor Dish component surface criteria inspection template

1. Introduction

The purpose of this document is to establish the EchoStar AQL level for components, fabrications and assemblies.

2. Scope

This procedure applies to all suppliers of components, fabrications and assemblies.

3. Procedure

AQL (Average Quality Level) is defined by the American National Standard as “the maximum percent nonconforming (or the maximum number of nonconformities per hundred units) that, for purposes of sampling inspection, can be considered satisfactory as a process average”.

“AQL” includes, but is not limited to “Scope” as defined by the American National Standard ANSI/ASQC 21.9-1993 & 21.4-1993.

It is the responsibility of the supplier to verify all pertinent ECO changes & deviations that apply to the product or this documentation. Any factor that may require deviation to this document must be made through ETC QA/Engineering management.

The supplier is responsible to assure that their inspection or test plans take into account all operating requirements as set forth in the Echostar performance specification(s) that governs their product(s).

Any product/shipment, or fielded product that Echostar and/or its partners fail against this document will be rejected and returned to the supplier for credit, replacement, or check refund as decided by Echostar Supply Chain Management.

Upon cause of the rejection, Echostar reserves the right to refuse any further shipments until problem resolution is achieved.

If the non-conformance is systemic and could affect prior received shipments (this includes all fielded product), Echostar also reserves the right to return all product in accordance with Echostar business requirements. Determination of exceeding AQL levels may be accomplished from inspection of new product, or failure data for returned product from the field.

Note: Pending the type and extent of sample inspection or testing (such as life tests) required, lots could be subject to rejection at any time after their receipt.

3.1 AQL level

The following AQL is required for all product inspections.

.40 AQL S-2 ---Echostar reserves the right to change AQL sampling levels per supplier performance.

- This AQL level will be applied unless a different level is negotiated and documented by Echostar and the supplier.
- Suppliers must assure that their outgoing quality assurance is aligned with the level of sampling and/or test inspection stated.
- Product will be inspected to these requirements, unless supplier performance dictates otherwise.