Cots Quality Handbook

A guide to a safe sleep

Date Reviewed: 2018-02-13	Approved date: 2018-02-13
Supplier name and number:	POA: SEE & CE
Name and Signature:	Name and Signature:

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1. Background

Global expansion of Cots production creates the need to unify quality requirements and acceptance criteria and assure that all IKEA Suppliers and IKEA units and have the same understanding of quality. Different people have different sensitivity towards each particular case or article, moreover suppliers have different acceptance criteria for product quality. Production Engineers responsible for each cots Supplier need to have one quality standard to work with all of them. **ONE QUALITY STANDARD – ONE IKEA**.

2. Purpose & scope

The Cots Quality Handbook describe the minimum demands of material and workmanship on IKEA cots. Each IKEA Supplier is responsible to implement the judgment criteria from this document at their production. This document supports the "GO/NO GO" Standard (IKEA Quality Compliance Standard, chapter 4. for Final Inspection. This document does not override other official IKEA documentation, such as Technical Description, Specifications and Drawings, connected to the product via PDOC system.

IKEA's expectation towards Suppliers is to deliver articles with no defects. In case of any deviation from required quality will occur, this handbook/guide will be a base for judgement when performing Final Inspection to clarify specific requirement and visually present and categorize any discrepancies.

This document is meant to be:

- A tool to ensure the same quality judgment between IOS, Purchasing & Suppliers worldwide.
- A living document to be updated on a regular basis according to customers' needs / expectations and industry constraints.
- Valid for all cots suppliers.
- Used for Requests of Quotations, evaluations of different suppliers on same product, or for start-up of new Suppliers.
- A good training tool for newcomers, both at IKEA and at Suppliers.
- Part of Final Inspection at Suppliers.

NOTICE! Points/discrepancies not covered in this document should initiate a change request and a separate agreement between the Supplier and IKEA until described and included in the Cots Quality Handbook.

3. Quality judgement

3.1 Classification

In this document we use the following terms with the described meaning:

Defect	Disqualifying the product. The element shall not move to the next operation.
Remark	Conditionally allowed occurring. Elements can move to next operation. If reoccurring, related to systematic process fault it shall be treated as defect. Example of a reoccurring systematic process fault is a remark that always show up on the same place on different elements with a predictable frequency e.g. on elements produced during the first 5 minutes when starting up the production each day.
OK	It is ok to have particular feature, can move further in the process.

Defect and remarks due to reoccurring systematic faults must be recorded and traceable in the production process when and where they are discovered. They must be subject for root cause analysis, corrective actions and preventive actions.

There must be proper light during the assessment and detection of defects and remarks. The minimum light demand is 1200 ±400 Lux and shall be measured in case of doubt.

When acceptance level for defect is defined “not visible from…” that shall be done from several angles and specified distance.

The distances in this document are set taking customer´s point of view into consideration. Distance: 0.5 m (arms length) to be used if no other distance is stated.

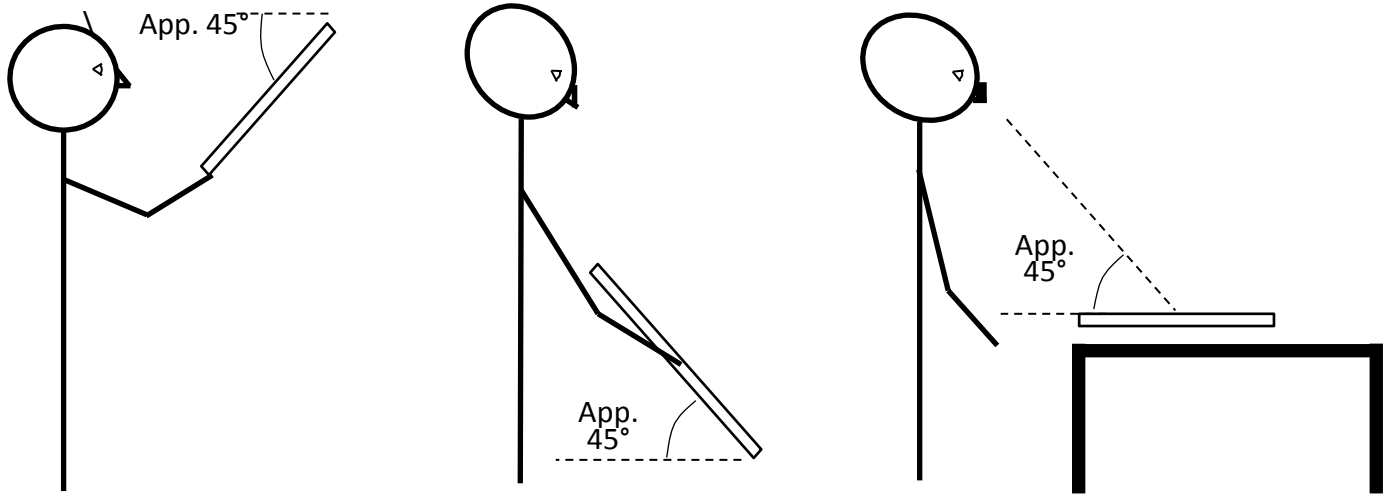
3.2 Color

General

Both color samples and objects must be clean and without any fingerprints. Both color sample and objects shall always have the same angle so the light reflection does not influence the judgment.

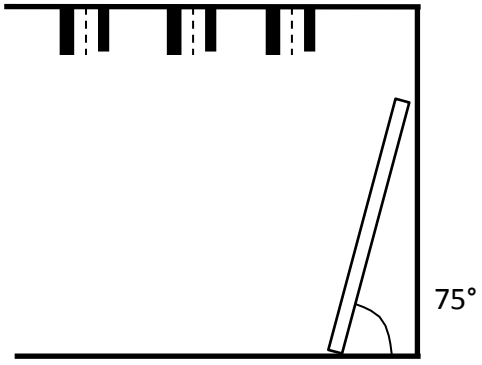
Without light box/room

The color sample and the object to be evaluated shall be held at a distance of approximately 0.5 m. Examples of relevant viewing angles are depicted below.



With light box/room

The color sample is to be placed next to the object as depicted below. Inside the light box and area around the light box/room shall not be influenced by any other light sources.



Color shall be judged in all following lights:

D65 10°	Artificial day light, correlated color temperature is 6500K
F11 10°	Fluorescent Lamps, correlated color temperature between 4000-4100K (Philips TL84, Ultralume)
A 10°	Illuminated ´A‘, correlated color temperature between 2700-2856K

If **no noticeable** color difference is detected on the object, then the color match is approved.
If a **hardly noticeable** color difference between individual components of the same product is detected, the product shall be assembled in its entirety and another visual evaluation shall be made based on if the customer would detect any color difference on the finished product.

Metamerism: comparison between master sample and production material should be considered. Evaluation is to be done case by case.

With spectrophotometer

The solid colors can be evaluated with a spectrophotometer and compared with IKEA master sample value. This verification should always be done in case of dispute between two parties. All suppliers producing solid color articles must have easy access to a spectrophotometer.
Note: Final products are always the base for judgment as the further processes can influence the color.

3.3 Gloss

A gloss meter must be used to verify the gloss on the final product. Surface gloss tolerances are according to valid edition of IOS-MAT-0043. The gloss is measured at the supplier according to *Gardner 60º* on flat surfaces with a minimum width of 50 mm.

The gloss value is given as the average value of at least three measurements on the same surface. When measuring gloss it is always done in the fibre or production direction of the sample where the structure is visible if applicable

3.4 Repair/reworks

Repairs and rework are acceptable if they are invisible and the properties are not changed on the product.
Repairs and rework need to be discussed and agreed in written between supplier and IKEA Category case by case. Repair is allowed under certain conditions, where Customer Experienced Product Quality is main criteria. The final result shall be invisible from 0.5 m.

4. Attribute Agreement Analysis, AAA

Each supplier must calibrate their inspection or workmanship standards against the customer´s requirements stated in this document.

The tool is used in order to:

- Make sure that inspectors/operators across all shifts, all machines, etc. use the same criteria to determine "good" from "bad".
- Quantify the ability of inspectors to accurately repeat their inspection decisions.

Areas are discovered where:

- Training is needed.
- Procedures are missing.
- Standards are not defined.

The tool will provide the following information:

- Repeatability of each inspector.
- Each inspector´s judgment towards standard.
- Reproducibility within the group.
- Group´s agreement towards standard.

Based on the findings a plan must be created in order to improve the Measurement System performance
Minimum demand from IKEA is 70% agreement towards standard for each quality inspector.

Attribute Agreement Analysis Step by Step

Step 1: Identify the inspectors who should be calibrated. IKEA demands that all quality inspectors shall be calibrated.

Step 2: Select a minimum of 30 elements from the process. Select equal share of good, bad and border line (or marginal) samples and number the elements (1-30). Predefine according to standard which elements are pass (P) and which ones are fail (F) and record this. Make sure that the elements will not get damaged during the exercise. This would jeopardize the accuracy. Identified inspectors shall not see the elements prior to the exercise.

Step 3: Each inspector shall judge all panels two times. The order of the panels shall be changed between first and second round of assessment. Inspector judges if each element pass (P) or fail (F).

Step 4: Enter the data (P or F) into statistical software.

Step 5: Use statistical software to interpret the data.

Step 6: Present to the group each judged element and explain if element is P or F and why. Interpret and document the results (statistical software). Present the result to group. Agree on actions to improve results when necessary.

Step 7: Agree the date of re-run activity.

Note: A sample of 30 or more pieces decreases the possibility of agreement by chance.

5. Document change request

Following change is necessary in the COTS QUALITY HANDBOOK:

Paragraph: What column?

◯ Change
◯ Add paragraph

Suggested text:

Picture on page number _____ is not good (please write page number): Please send picture with this change request for picture exchange

Date:

Change requested by (name and company):
Email address:
Phone number:

Please send this document to:

michal.dabrowski@ikea.com
ivan.zlatkovic@ikea.com

6. Cots Quality Requirements (applicable also for Changing Tables)

NOTICE! Photos used in this document are only examples of discrepancies. The same remark/defect may occur on another type of element
The requirements are in force otherwise stated in product requirements (Technical Description, Specifications, etc.)

6.1 MATERIAL/MACHINING

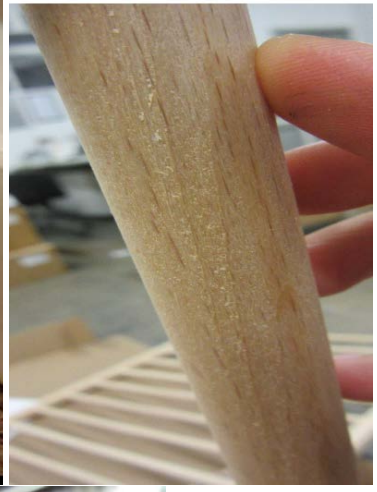
Illustration	Description	OK	DEFECT	Comments
  	**Surface/Edges Roughness**		If it is visible or person can feel it	

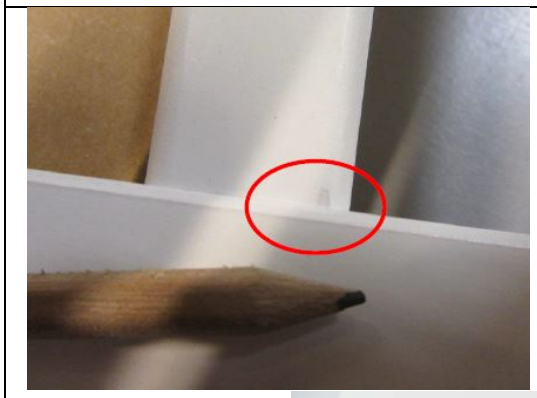
Illustration	Description	OK	DEFECT	Comments
	Dimensions outside the tolerances		X	All elements must have the right dimension (length, width, height)
  	**Missing material/chipouts**	Up to 2mm – **Remark**	Larger than 2mm in any dimension	

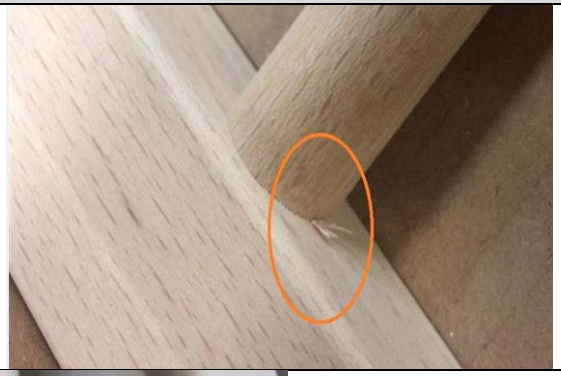
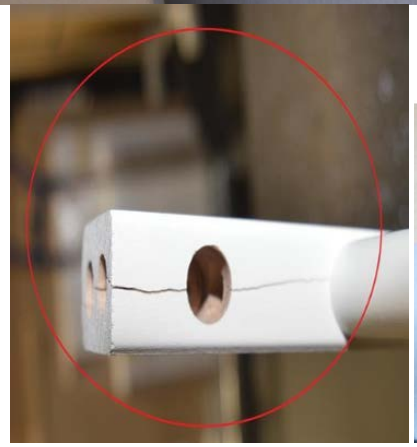
Illustration	Description	OK	DEFECT	Comments
	**Splinters**		X	
   	**Cracks**		X	

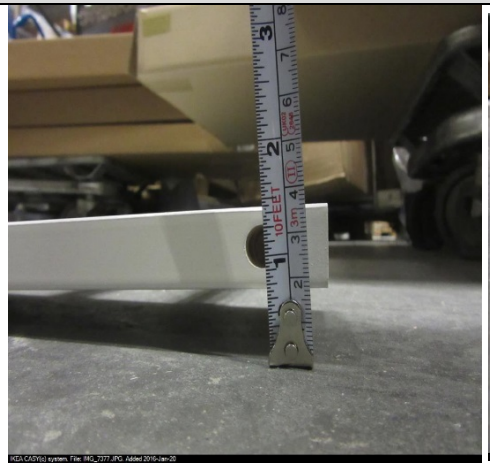
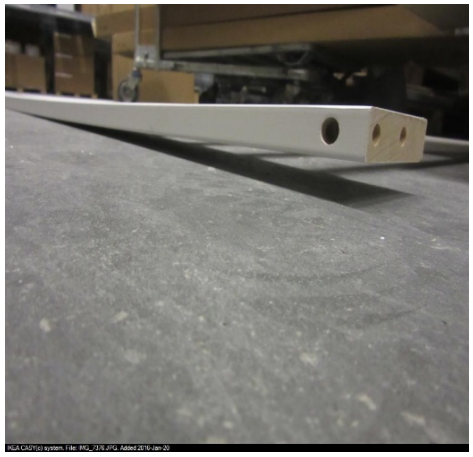
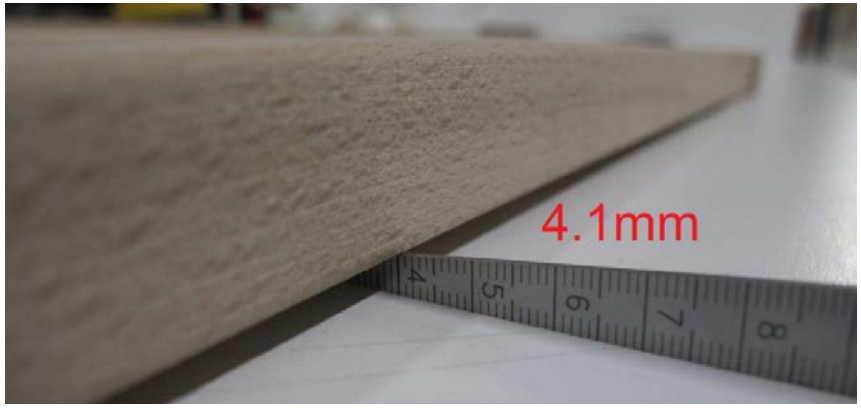
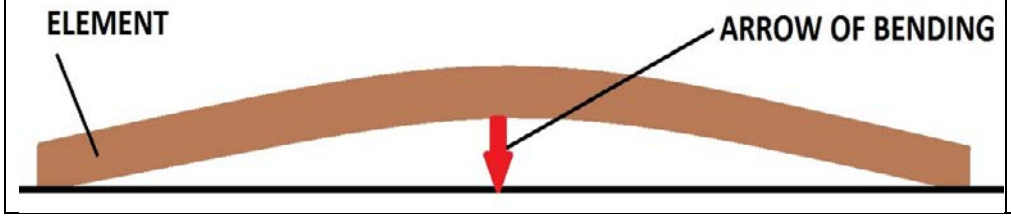
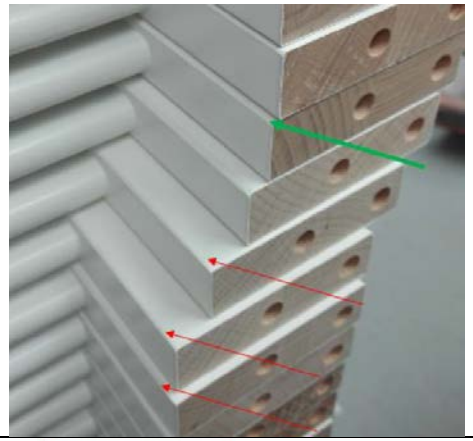
Illustration	Description	OK	DEFECT	Comments
   	**Bending of element/part**	Arrow of bending up to 1,5mm/m, but max 4mm gap between elements on assembled article *bending deviation will be measured at half-length both sides	Arrow of bending more than 1,5mm	**ATTENTION!** **Arrow of bending needs to be measured in the middle of the bending in the extremum point! Please see drawing in the left column**

Illustration	Description	OK	DEFECT	Comments
	**Sharp Edges**		X	**Accessible edges need to be rounded or chamfered. Size according to PDOC. Not accessible edges need to be broken.**
	**Wood grade different comparing to TED**		X	
	Other non-conformities to TED e.g. NA market warning label positioning		X	

6.2 DRILLING

Illustration	Description	OK	DEFECT	Comments
	**Missing holes**		X	
	**Drillings out of tolerances**		X	**Any deviation from PDOC**
 	**Holes not aligned**		X	

Illustration	Description	OK	DEFECT	Comments
 	**Countersink/step drilling too deep**		X	
	**Falling out dowels – tolerance too loose**	Only one dowel per article – **Remark**	X	
	**Holes for spindles too loose creating gap after assembly**	Only one gap per sideframe/ headboard and gap not bigger than 0,5mm – **Remark**	X	

6.3 GLUING

Illustration	Description	OK	DEFECT	Comments
 	**Open, uneven, not repaired FJ**		X	
 	**Visible connection**		X	

Illustration	Description	OK	DEFECT	Comments
  	**Gaps**	Gap after assembly gluing only when even on whole connection lenght and up to 0,5mm– **Remark**	X	

Illustration	Description	OK	DEFECT	Comments
	**Glue marks**		X	**If can be easily cleaned and not re-occuring in the same article/part - Remark**
	**Glue leaks/leftovers**		X	
	Rotating spindles after gluing		X	**Spindles shall not be possible to turn around after gluing with a force less than 8Nm**
				

6.4 LACQUERING

Illustration	Description	OK	DEFECT	Comments
      ;	**Missing lacquer/stain**	Not visible after assembly - **Remark**	X	

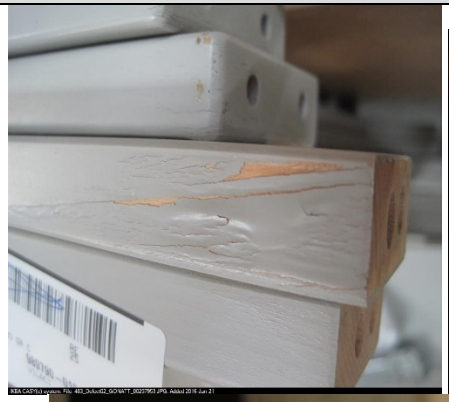
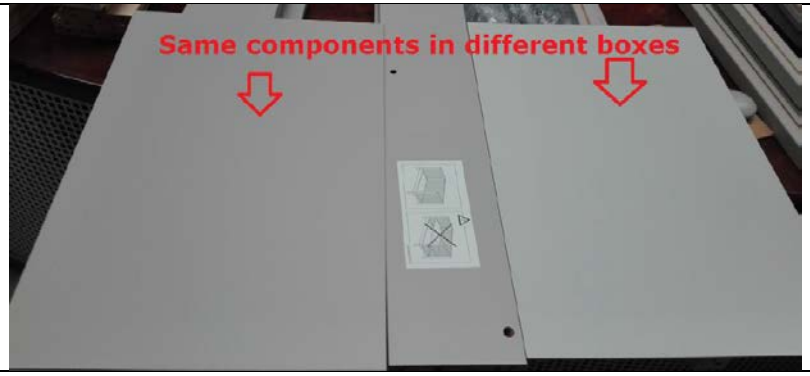
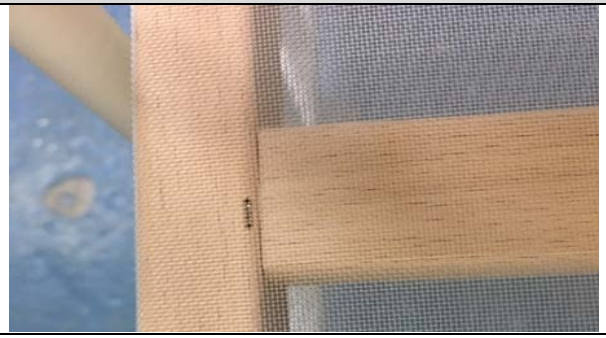
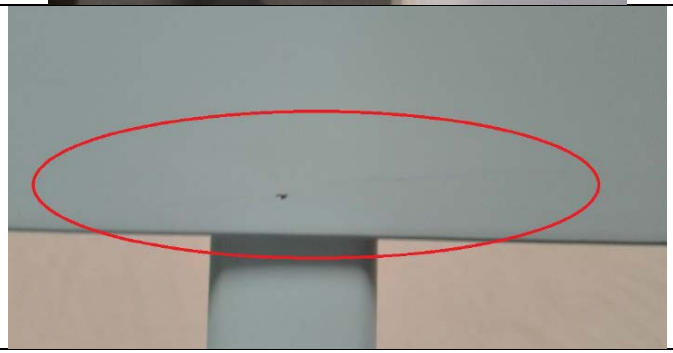
Illustration	Description	OK	DEFECT	Comments
  	**Paint peeling off**		X	
	**Lacquer leak/leftovers**		X	

Illustration	Description	OK	DEFECT	Comments
	**Orange skin effect**		X	
 	**Impurities in the lacquer/ dust under the paint**	Not visible after assembly - **Remark**	X	
	**Visible difference between lacquering technologies.**	Visible from less than 0,5 meter - **Remark**	X	***0.5 m considered vantage point- see chapter 3.**

Illustration	Description	OK	DEFECT	Comments
	**Chamfer/radius not fully covered**		x	
	**Visible/unprofessional repairs**		X	

Illustration	Description	OK	DEFECT	Comments
	Gloss difference between surface and chamfers		x	
	**Colour/gloss not acc to reference sample**		x	
	Dirty material under the clear lacquer		X	
	**Dirt on the lacquer**		X	
	Prints (e.g. fingerprints)		X	

6.5 STAPLING/NAILING

Illustration	Description	OK	DEFECT	Comments
	**Staple close to the edge**	If not making splinters - **Remark**	X	At least 3 mm from the edge
	Staples sticking out from the surface		X	
	**Nail marks on bed side rails**	Max 3 pcs. per each rail	If marks are bigger than 3mm	**Placement: on the edges and in the middle. (3 pcs)**
	**Crack around nail holes**		X	

6.6 TEXTILE COVER

Illustration	Description	OK	DEFECT	Comments
	Not proper size (too large/small)		X	
	Dirty fabric		X	
	**Corners not aligned/crooked fabric on the frame**		X	
	**Threads inside/sticking out of the cover**	One thread inside cover - **Remark**	X	
	Wet cover in the box		X	

6.7 HANDLING

Illustration	Description	OK	DEFECT	Comments
 	**Hits/dents/pressure marks**	If not bigger than 5mm and not visible after assembly - **Remark**	X	
 	**Scratches**	If not visible after assembly - **Remark**	X	