



Notes for Sustainable Leather Products from Analysis of Product Complaints Database

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Abstract

To sustainably expand sales of leather products, recycling-oriented sustainable manufacturing and appealing superiority over competing materials are essential. In other words, we need to make more use of upcycling and reuse, so it is especially important to learn what kind of quality problems there are in aging products.

While we are establishing quality standards at Japanese department stores, we are constantly in contact with product complaints. Product complaints are difficult to resolve individually and are often handled confidentially, but when aggregated into statistical data, they clearly reflect customer wishes and disappointments. Furthermore, by comparing competing materials in the same way, we would like to draw out the problems faced by leather products and their superiority over competing materials.

In this survey, products that have been sold for more than 3 years are defined as aged products and compared with products that have been sold for less than 3 years (mostly less than 1 year). As a result, the composition ratio of synthetic, etc., has increased in aging products, while the composition ratio of leather has decreased. This reflects the fact that in hot and humid climates such as Asia, polyurethane is hydrolyzed, and its strength is likely to drop significantly. In addition, there were cases where stains occurred on the leather near the areas where the adhesive was used.

From the above results, we have reached the following conclusions. synthetic products are not durable, so it is recommended to wear them as soon as possible rather than storing them for a long time. Since leather products are durable, they can be used for a long time by replacing consumables such as metal fittings and fasteners. This report discusses these issues while presenting the basis for product complaints, such as the composition ratio and typical examples.

Keywords: Leather Product; Consumer Complaint; Quality Management

1. Introduction

Based on past complaints, we will introduce quality problems that tend to occur during long-term use. Avoiding these will promote the long-term use of your leather products. As a result of the investigation, the biggest problem was polyurethane hydrolysis, which is unique to the Asian region.

2. Material and Methods

We have been operating the database that records complaints and requests regarding product quality received by the customer service departments of a one of major Japanese department store chains since 1996. The chain has 10 stores in major cities in Japan, including Tokyo, Nagoya, Osaka, Hakata, and Sapporo. Currently, the database contains more than 100,000 customer correspondence records for sold products in the field of clothing, food, and housing. In this report, we will introduce





the analysis results of clothing and miscellaneous goods such as shoes and bags that include leather products. Its target period is from 1996 to 2020.

3. Results and Discussion

3.1 Composition of items

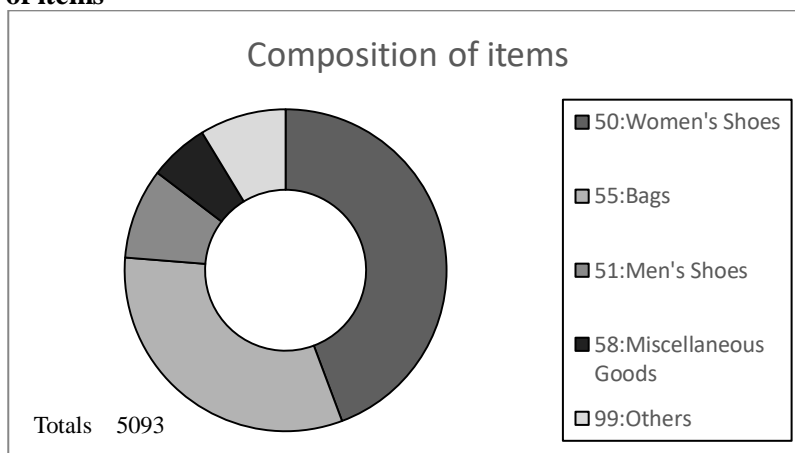


Figure 1 Complaints which complaints occurred by items

Figure 1 shows the item composition of the target data. The number of product complaints for women's shoes and bags is exceptionally large, and case studies are analyzed in this report.

Product complaints include the following cases.

- (1) Cases in which the type and cause of the material were determined through scientific testing
- (2) Cases in which the type of material is determined by quality labeling or supplier information
- (3) Cases in which the cause was estimated from past similar complaints

Product testing was conducted in half of the complaints.

3.2 Relation “when a complaint occurred” and “the product life”

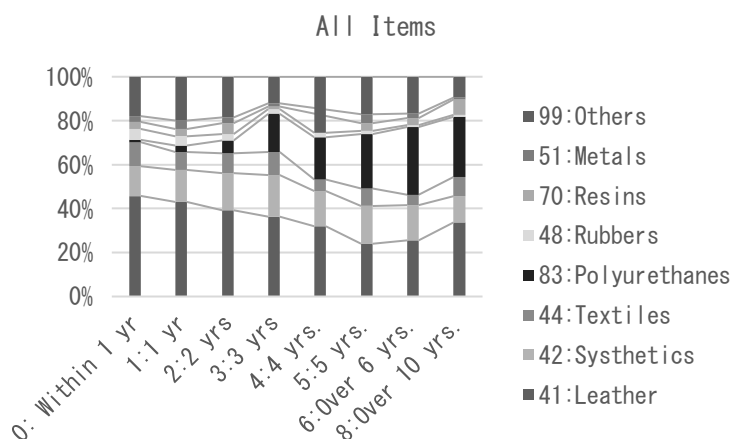
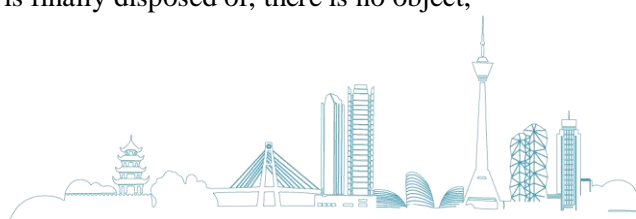


Figure 2 Materials where complaints occurred by Term of use

Figure 2 shows the relation between “the term of use” and “the number of complaints” by materials. The composition of “leather” decreases over time, while a remarkable point is the huge increase of polyurethane over the third year and after.

The “the duration of use when a complaint occurred” is not the same as the “the end of product life.” In my past work experience, most of the complaints are that “the product should still be usable, but it can't be used due to quality problems.” When the product is finally disposed of, there is no object,





so no claims can be made. Therefore, it can be estimated that the “the time when complaints about a product stop coming” is the “the end of product life.”

To extend the life of the product, it is extremely important to resolve problems that occur due to aging, in other words, "the product should still be usable, but it can't be used due to quality problems."

In this report, we define "the time when complaints stop coming" as "the end of product life."

3.3 Definition of “the long-term use”

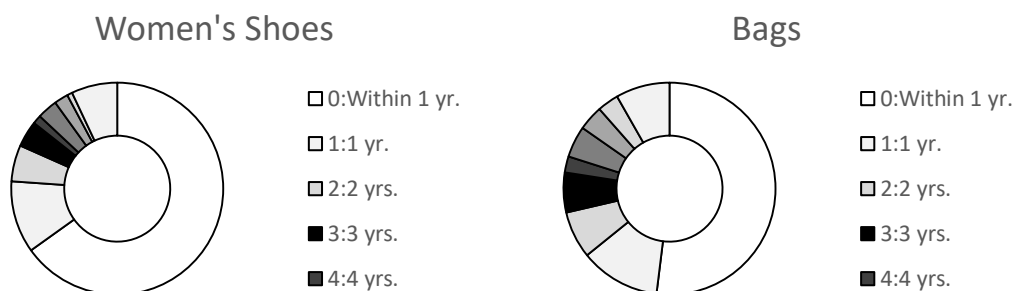


Figure 3 Term of use when complaints occurred

Figure 3 shows the composition of "Term of use when a complaint occurred" by items. Over half of complaints occur within a year. In this report, it is interested in the complaints about aged items.

By item, complaints about most women's shoes and leather accessories occurred within 1 to 2 years after purchase. Also, complaints about Bags and men's shoes tend to occur more than three years after purchase.

In this report, we define "the long-term use" as "more than 3 years after purchase" regardless of the item and aim to clarify the problem of "a product that is still usable but has a quality problem."

In the following discussions, based on the precondition that the number of complaints within one year after purchase is most large, we discuss the comparison ratio between "within three years after purchase" and "more than three years after purchase."

3.4 Women's shoes

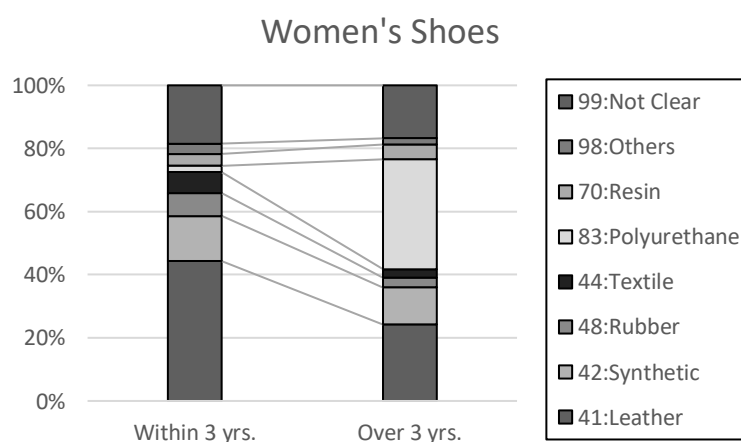
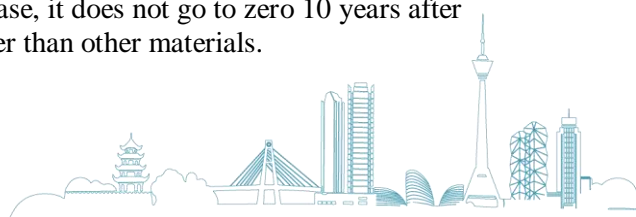


Figure 4 Materials where complaints occurred

Figure 4 shows the composition of materials used in points where complaints were received about women's shoes. In particular, the significant strength loss due to hydrolysis of polyurethane increases significantly after three years or more have passed since purchase. On the other hand, the number of complaints about “leather” tend to decrease over the years, and although there are still a small number of complaints received 5 years or more after purchase, it does not go to zero 10 years after purchase. In other words, it shows that leather is used longer than other materials.



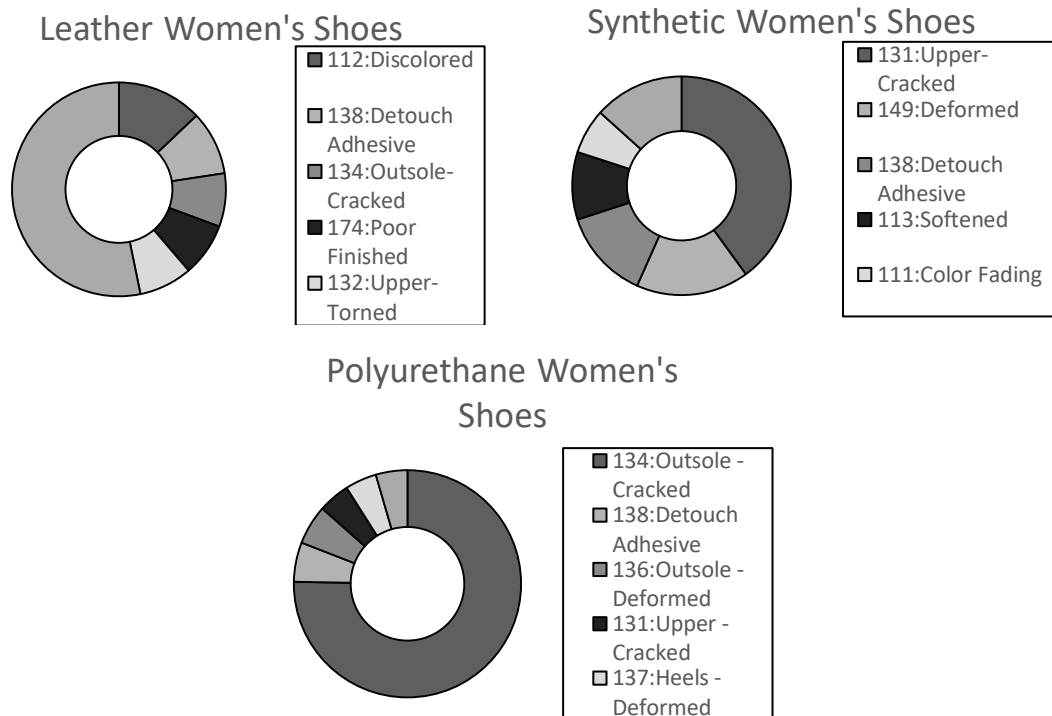


Figure 5 Component of Complaints by Materials

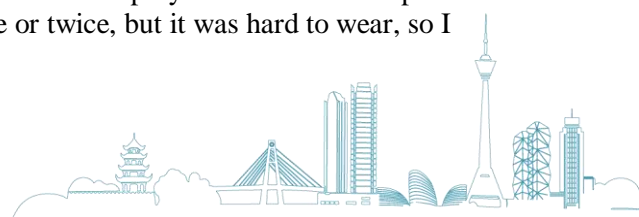
Figure 5 shows the details of complaints by material. "Leather" shoes have discoloration, peeling of adhesion of upper and outsole, and cracks. "Synthetic" shoes tend to crack and peel in the upper and outsole.

The biggest problem is cracks and cracks in the "polyurethane" outsole. Since this report discusses leather, we will not go into details, but polyurethane tends to be hydrolyzed and softened by the influence of moisture in the air in the hot and humid climate typical of Asian regions such as Japan. As for the unavoidable characteristics of the material, complaints about hydrolyzed polyurethane are often dismissed as deterioration over time rather than as a defective product. Because this problem occurs after 3 to 5 years have passed since manufacture regardless of whether it is used or not, there are many cases where products are stored at home unused for some reason, or products that have been in stock for a long time in stores.



Figure 6 Case Study of Polyurethane Outsole Broken

Finally, Figure 6 shows an example of cracks in the outsole made of polyurethane. The complaint was: "I bought the shoes over four years ago. I wore it once or twice, but it was hard to wear, so I





kept them in the box. When my grandson tried it on recently, the outsole of it came off." This is thought to be due to the polyurethane deteriorating over time while it was stored in a box at home.

3.5 Bags

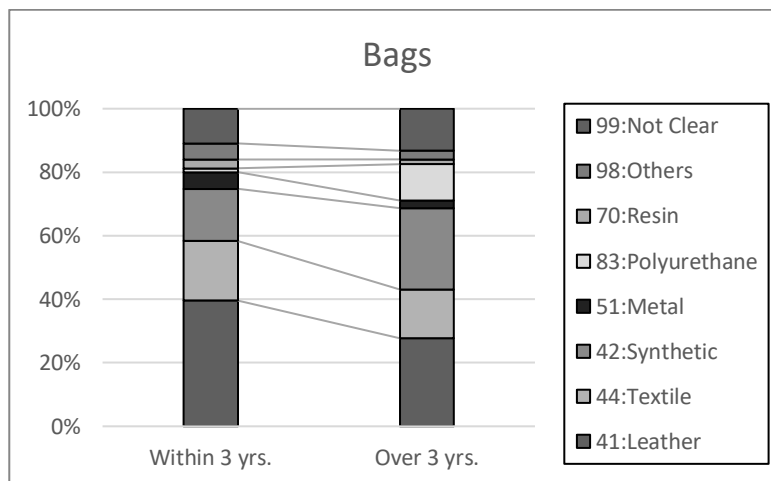
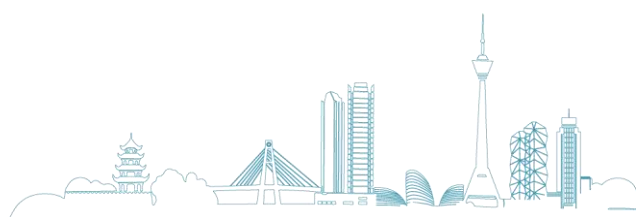
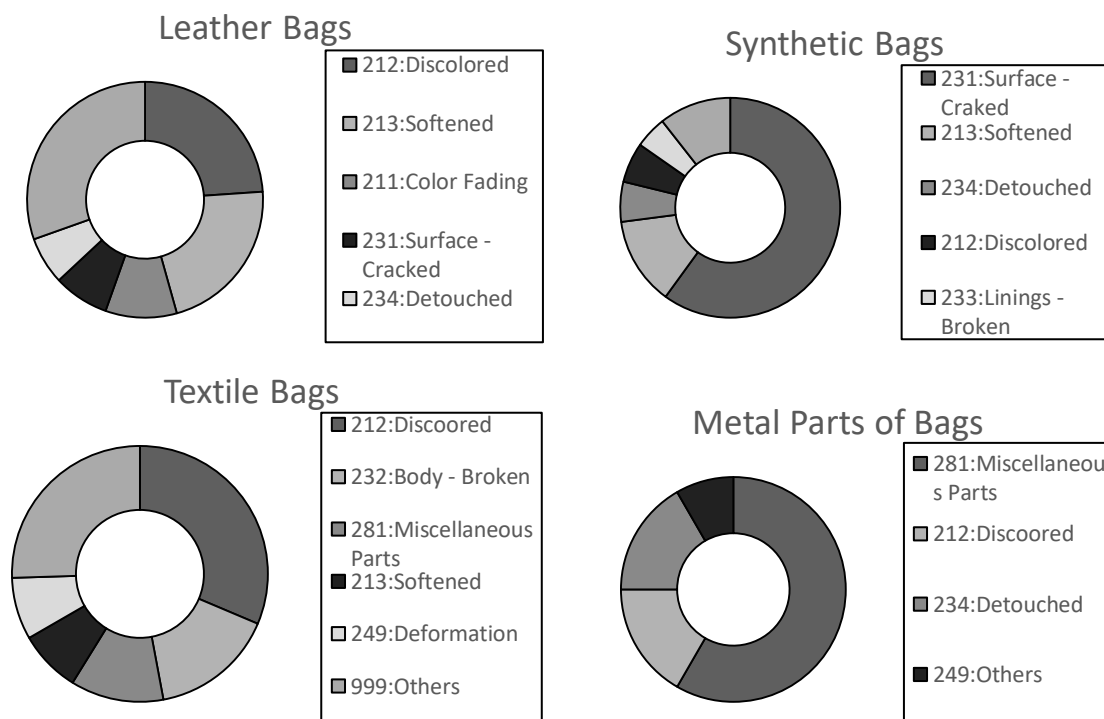


Figure 7 Materials where complaints occurred

Figure 7 shows the composition of materials used in points where complaints were received about bags. As well as in women's shoes, the large ratio of complaints in "synthetic" and "polyurethane" is noticeable. In addition, although the complaints for "leather" tend to decrease over the years, its complaints have continued in a few ratios for a long time. It shows that leather is used longer than other materials. The unique is including the complaints of "metals".





Bags where Ployurethane used

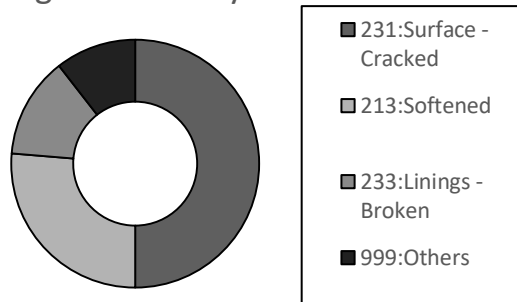


Figure 8 Component of Complains by Materials

Figure 8 shows the details of complaints by material. "Leather" bags have discoloration, stains, peeling of paint, becoming sticky, hardens, and softens. "Synthetic" and "polyurethane" bags have surface cracks, cracks, peeling, stickiness, hardening, and softening. "Metal" parts of bags have discoloration, staining, peeling of paint, and damage to joints of accessories. Although there is no record of the color of the product in records, judging from my past practical experience, I have the impression that "leather" has many discolorations of light-colored and many deteriorations of the polyurethane surface coating over time. "Synthetic" and polyurethane bags hydrolyze over time. "Metal" parts have rust and peeling of paints such as fasteners and locks.

There is noticeable wear and tear on "metal" parts of handles and shoulder straps.



Figure 9 Case Study of Discolored

An example of a product complaint of "discoloration of light-colored leather" is shown (Fig. 9). The content of the offer was, "I bought it about five years ago. I put it in a cloth bag and kept it in a well-ventilated place on the third floor of my boyfriend's apartment. When I took it out recently, it had changed color from gray to green." The cause of complaint was the enameled leather changed color to yellow during home storage.

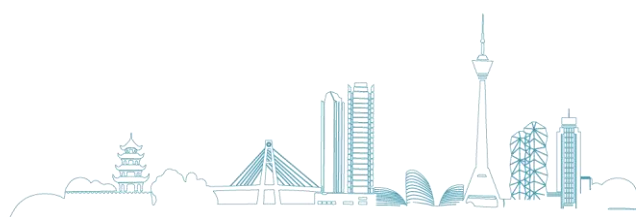




Figure 10 Case Study of Stained

Figure 10 shows that an example of a complaint about "stains on leather" is shown. The complaint was, "I bought it 2-3 years ago. It was stored in a dry place, but when I took it out, it was discolored around the slide fastener. Why is it like this?" The adhesive tape in the sewing area has seeped out.



Figure 11 Case Study of Surface Peeling of Synthetic

Figure 11 shows an example of a complaint about "surface peeling of synthetic". The complaint was "I purchased the ostrich bag one and a half years ago, but the outside is still okay, but the lining is peeling apart. I should have been storing it normally."

The bag was made of leather, but the lining seemed that the polyurethane coated synthetic used deteriorated over time and peeled off. Since the complaint was made early, one and a half years after purchase, there is a possibility that the shoes might have remained in store stock for a long time.

4. Conclusion

With a view to extending the life cycle and expanding the reuse, the following are the major quality issues that should be resolved in the future when using leather products for a long period of time.

- (1) Especially for Asian marketing, you should be careful of the hydrolysis in place where polyurethane is used such as synthetic upper and linings, outsole material that tend to occur after 3 or 5 years over from manufacturing. This is the biggest problem.
- (2) Especially for light-colored or enameled leather, you should be careful of the yellowing that occurs after 3 or 5 years over from manufacturing.
- (3) Where sewing and adhesive used together, you should be careful of staining by age for 3 or 5 years after purchase.
- (4) Where used metal parts, you should be careful of wear and rust by age for 3 or 5 years after purchase.





To create leather products that can be used for a long time, the following should be taken into consideration.

(5) Where synthetic, polyurethane, rubber, etc. are used, the structure should be replaceable as much as possible.

(6) When using light-colored leather, and when using synthetic material, when using vegan leather, you should carefully check its durability.

(7) Where using metal parts such as rings and slide fasteners, you should be replaceable.

Not only product manufacturers but also distributors such as department stores should pay attention to the following when handling leather products that can be used for a long time. Of course, it is most desirable to make leather products based on the following.

(9) In the Asian market, when selling products made of synthetic or polyurethane, you should provide information for your customers to the effect that "we recommend wearing them as soon as possible without stocking them for as long as possible" and to sell items in stock as quickly as possible. In addition, in difficult cases to identify its materials visually, you should clearly indicate where synthetic or polyurethane is used.

(10) Discoloration and fading over time are unavoidable in every material, so you should avoid too strict standard values when establishing quality standards.

(11) Such as worn parts and metals, you should design replaceable and should cooperate to repair to sell positively.

The above points show the requirements for using leather products for a long time. We hope to help extend the lifespan of leather products and promote reuse by this report.

5. Acknowledgements

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6. References

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