

EVALUATION OF TACTILE PLEASURE OF ANTISKID DECK SURFACE OF A SAILING YACHT

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This paper shows the results of a study conducted within a degree thesis discussed at the Faculty of Architecture in Pescara which was dealing with a project on a 10 metres sailing yacht. The study was on the development and evaluation test on tactile pleasantness of antiskid deck surfaces. It has given the students some project guidelines which are useful in order to avoid a simple “decorating” approach to “macro-grip” design.

Tactile pleasure, Antiskid deck surface, Sailing yacht, pleasure evaluation.

1 Introduction

The pleasantness of a product can be related to several factors, ranging from physiological and sensorial feelings to factors referred to social or “ideological” fields (Jordan 2000). But within these fields, consciousness and control capability of designers have not been developed in the same way. Regarding the simple sensorial pleasure, for example, the historical supremacy of sight on the other senses has not allowed an harmonic and conscious development of aesthetic languages. As a matter of fact the sensations such as odours, noises, tactile qualities and aesthetic feeling can hardly be controlled and measured by the project tools. Western culture has developed a mature critical conscience related to the “visual” design of artefacts, but, at the same time, the result is not the same regarding those aspects connected to the experience of products perception. Consequently, designers usually are not able to rule objectively the aspects of the project referred to other sensations as much as they can rule the visual ones. This situation can be detected also in the field of some antiskid deck surfaces design. As the users on board of sailing yachts are constantly in contact with these surfaces with their naked bodies, the sensations and feelings aroused by the material are particularly important.

The evaluation test here reported¹, that was conducted referring to the Sequam method (Sensorial Quality Assessment method) (Bandini Buti, Bonapace and Tarzia 1997; Bonapace 2002), aims to provide some guidelines of antiskid deck surfaces design, in order to avoiding a simple “decorating” approach.

2 Objectives

The general complexity of nautical design and the big number of variables related to it, makes difficult to verify objectively all the factors implied in the multi-sensorial perception of a sailing yacht. This is true also for the aspects determining the tactile

¹ The evaluation test was developed within a degree thesis of industrial design, carried out within the courses of Ergonomic Studies and Nautical Design at the faculty of Architecture in Pescara. The dissertation title was “Day Cruiser” ten meters sailing yacht; relator prof. A. Vallicelli, correlator prof. G. Di Bucchianico, graduand students F. Merla & G. Patruno. Graduant students designed and carried out the test with the supervision of prof. G. Di Bucchianico.

pleasure of some antiskid deck surfaces which the users on board are constantly in contact with. In order to objectively define these aspects, test designers started their study individualizing two main aspects regarding antiskid performances of surfaces:

- the so-called “micro- grips”, depending upon the chemical-physical features forming the material (toughness, friction-factor exc.);
- the so-called “macro-grips”, depending upon the morphological features of surface finishing (height, dimension, distribution and design of relief-elements exc.).

The evaluation test has been focused on the evaluation of macro-grips, because of their influence on designer’s choices.

The experimental results allowed to provide some design suggestions to guide design choices, in order to avoid a simple “decorating” approach in “macro-grip” design.

3 Method

The evaluation test was set up and conducted referring to the Sequam method (Sensorial Quality Assessment method) (Bandini Buti, Bonapace and Tarzia 1997; Bonapace 2002), though with some methodological adaptations, necessary to the feature of the object to be surveyed and to the limits imposed by the application context. The Sequam method starts by separating the morphological features of an antiskid surface: this compared to its main *product elements*² which can be objectively seized and quantified. Then the Sequam goes on by associating these latter together with the individual sensations perceived by the users, which can be seized as well by applying some techniques definitely acquainted, (like structured questionnaires with bipolar scales of assessment, exc.). The idea is that by associating the individual sensations with the physical features of the product, suggestions could be given to designers regarding the conscious development of the different design solutions.

That’s the reason why the whole test design was articulated in three phases, although the experiment was later restricted to the first two of them.

The first phase (paragraph 3.1), where pleasure parameters were explored, allowed to define sensorial (tactile) parameters which were required to be investigated. This was possible examining some products whose tactile characteristics are similar to the one meant to be assessed. It allowed also to classify the *product elements* of antiskid surfaces, which were decisive in the assessment of the tactile parameter investigated. The second phase (paragraph 3.2), where the evaluation test on tactile pleasure was carried out, was performed using maquettes made for that purpose, thus isolating and assessing the single tactile product features. In this phase 24 users were asked to answer to questionnaires with bipolar scales, while sitting or standing on the 18 maquettes. According to the Sequam method, in a third phase the pleasantness of products has to be verified by means of working prototypes in real use conditions. That’s why the the third stage was not performed in this evaluation test, due to evident difficulties in making it both regarding the product (prototyping of a deck surface of 10 metres sailing yachting) and the real use conditions (in navigation).

3.1 parameters exploration

A careful analysis of tactile parameters of antiskid surfaces, has shown to the test designers how the antiskid performance takes place mainly by means of “macro-grip” or relief-elements (which are characterized by their height, dimension, toughness,

² In the Sequam method, *products elements* are objective features of products, such as form, colour, graphic, material, sound, functionality, etc.

distribution, density, design, exc.) and by “micro-grip” connected to the physical features of material itself (friction, heat, exc.). In particular, test designers noticed that the design of relief-elements can be so determining in defining other overall performance aspects of surfaces (for example the draining features) that it takes a fundamental role in determining both capability and efficacy of antiskid effect, and those aspects connected to the pleasure of using deck surfaces. That’s why **test designers classified** the characteristics of relief-elements (figure 1): it allowed to organize the stages of the following test, and further to give useful suggestions in order to realize 18 maquettes (figure 2)



















Gradevolezza tattile	1 Caratteristiche generali (fisiche) degli elementi in rilievo	1.1 <u>distribuzione</u>		
			1.1.1 regolare	1.1.2 irregolare
		1.2 <u>densità</u>		
			1.2.1 bassa	1.2.2 alta
		1.3 <u>altezza</u>		
		1.3.1 bassa	1.3.2 alta	
	1.4 <u>dimensione</u>			
		1.4.1 piccola	1.4.2 grande	
		1.5 <u>durezza</u>		
			1.5.1 morbido	1.5.2 duro
2 Disegno degli elementi in rilievo	2.1 <u>continuo</u>	2.1.1 rettilineo		
			2.1.1.1 semplice	2.1.1.2 composta
		2.1.2 curvilineo		
			2.1.2.1 regolare	2.1.2.2 irregolare
	2.2 <u>puntiforme</u>	2.2.1 rettilineo		
			2.2.1.1 regolare	2.2.1.2 irregolare
		2.2.2 curvilineo		
			2.2.2.1 regolare	2.2.2.2 irregolare

figure 1. tactile parameters characterizing the relief-elements (macro-grip) of antiskid surfaces, producing objective and measurable qualities

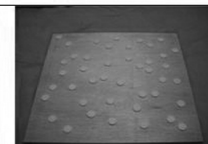
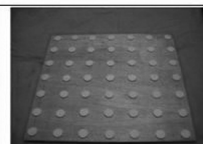
2.1.4 Realizzazione delle maquettes



1 Caratteristiche generali (fisiche) dell'elemento in rilievo

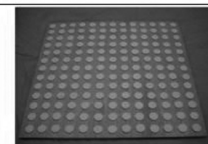
1.1

distribuzione dell'elemento in rilievo



1.2

densità dell'elemento in rilievo



1.3

altezza dell'elemento in rilievo



1.4

durezza dell'elemento in rilievo



figure 2. Making of maquettes and some of those showing the tactile parameters investigated.

3.2 Test performance

Maquettes were submitted to individual evaluation by means of 24 subjects (8 owners of a sailing boat, 8 people who had occasional navigation experience on a sailing boat, 8 people who have never had navigation experience on a sailing boat). It is useful to underline that, in order to limit the assessment on tactile aspects, during the test, the maquettes were covered with a black cloth so that users could not be influenced, as far as possible, by other important aspects of visual type. The questionnaire included questions on bipolar scale. The test, performed in the laboratory, was carried out with users wearing bathing costumes only, letting them standing and seating on the maquettes and contemporary see some pictures which made them conscious, at least of the context which the tested maquettes were coming from (figure 3).



L'utente si siede sulla maquettes (stimolo ricettivo passivo diretto) esprime una valutazione di gradimento e comfort

L'utente rimane seduto per 2 minuti. Esprime una nuova valutazione di comfort

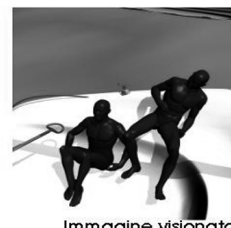


Figure 3. During each assessment, the user watches an evoking picture from the context where the tested surfaces are potentially used.

4 Results

The correlations between “product elements” and the “reactions” of single users have been collected during the test by means of a structured questionnaire showing different questions including the use of bipolar scales of assessment. This led to a first synthesis of data processing reporting on similar assessment scales the morphological features of the surfaces and the levels of tactile pleasantness felt by the subjects (Figure 4).

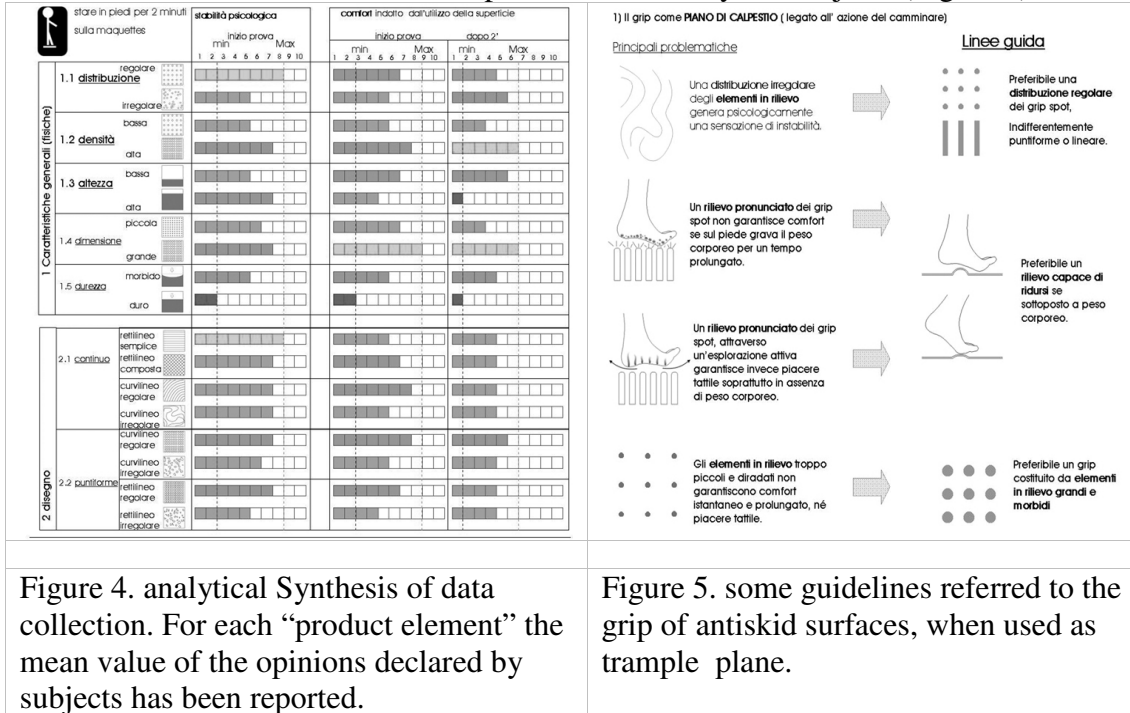


Figure 4. analytical Synthesis of data collection. For each “product element” the mean value of the opinions declared by subjects has been reported.

Figure 5. some guidelines referred to the grip of antiskid surfaces, when used as trample plane.

A later critical reading of these data allowed to focus some project advice useful to the project of antiskid deck surfaces for sailing boats. Two groups of guidelines were distinguished, particularly referring to morphological features of the grip in two different types of use:

- as trample plane (Figure 5), that is connected to the dynamic activity of walking;
- as supporting plane for the body, that is connected to the sitting, lying or simply standing positions.

Later, the guidelines obtained in the end of the test, were used to make hypotheses on some possible macro-grip design solutions of deck surfaces of a sailing boat (Figure 6).

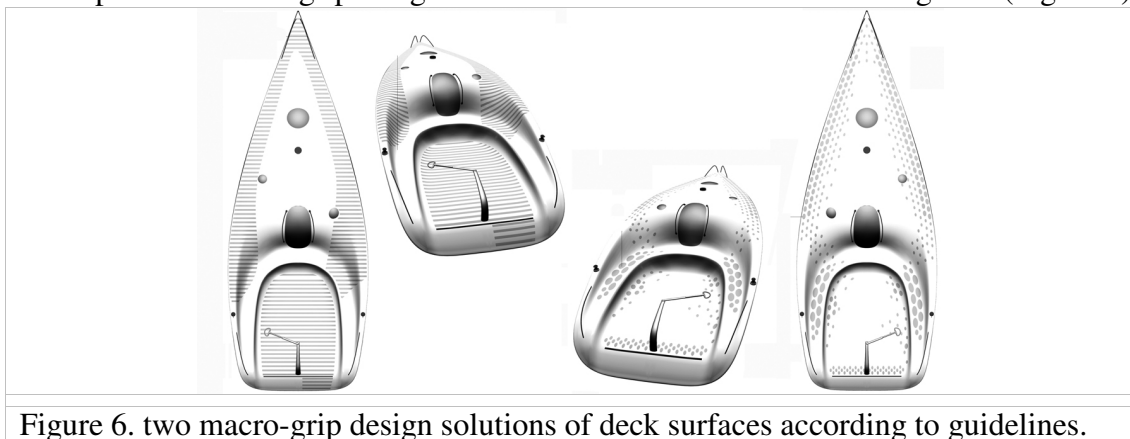


Figure 6. two macro-grip design solutions of deck surfaces according to guidelines.

5 References

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