

Mouthguard Mastery



The Complete Guide to
Building Comfortable,
High Protection Mouthguards
for Any Sport

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Executive Summary

Make the Most Protective Mouthguards Ever Tested

The focus of this manual is to give you the knowledge to make better mouthguards. Mouthguards that have *more protection are more comfortable and give more choice*. That is, choice not only in terms of the most appropriate protection for the sport being played and other technical factors, but more choice in features that will make your mouthguards more exciting, more attractive and more desirable.

Many claims have been made and are still being made about the protection provided by specific mouthguards. However, it is a rarity for these claims to be supported by independent test results and therefore, in this manual we will work with designs that are supported by the results of independent University tests.

Are You Absolutely Sure The Mouthguards You Supply Are As Protective As They Need To Be?

- Custom Laminating provides *more protection and better retention* than any other method of making mouthguards. Consequently:
 - The use of a single foil mouthguard is *seriously questioned*
 - The use of air cushioned mouthguards is *seriously questioned*
 - The use of a standard vacuum-formed mouthguard *is seriously questioned*
- There are millions of orofacial sporting injuries each year. The annual cost is billions of dollars.
- Mouthguards massively reduce injury rates. For example, in American Football, where mouthguards are compulsory, only **0.07%** of all injuries involve teeth and the mouth. In Basketball, where they are not compulsory, and mouthguards are not worn, the injury rate is **34%!**
- With far greater emphasis being placed on sport, sporting injury, *duty of care and the negligence* arising from it, there is a rapid escalation in litigation relating to sporting injury. Negligence is being proven against an increasingly wider range of providers and organisations.

Mouthguard Protection – The Facts

- A single mouthguard design cannot provide sufficient protection for:
 - All sports
 - All competitive levels
 - All ages
 - All special needs – ortho bands, occlusal irregularities and so forth.
- The only way to economically build mouthguards with varying levels or forms of protection, is to custom laminate.
- Custom Laminated Mouthguards are recommended by most of the world's pre-
eminent mouthguard specialists.
- It is important for clinicians to realistically assess the degree of impact or collision that may occur in competition or training.
- As it is not possible, even when wearing the most protective mouthguards, to absorb all the force from a heavy blow at the point of impact, what design parameters should be incorporated into mouthguards to alleviate this?
- Test results submitted to the National Health and Medical Research Council of Australia in 1994 proved that protection varies with the knowledge and skill of the person making a mouthguard.
- Further work by a team in Germany led by Prof. Jurgen Hoffman tracked the path of impact through the maxilla. The comparative protective relationships between the different mouthguard designs of the 1994 study were confirmed.
 - Custom Laminated Mouthguards are more protective than single layer custom made mouthguards
 - The most protective mouthguards have a hard bonded layer
 - Foils that are laminated before being formed do not optimise protection
- The best way to consistently form and laminate mouthguards is with machines, that have full forming power available before the completion of the heating cycle. These can be vacuum or pressure but they are not standard (older style) vacuum machines, usually designed for square foils.
- German University Tests have proved that there is more retention with Custom Laminated Mouthguards than with any others (and subjectively, probably more comfort too!).
- University Tests have shown that the impact absorption of air cushioned mouthguards rapidly decreases at higher impacts. Ultimately the impact absorption may be little better than some poorer boil and bite mouthguards.

- 1997 tests showed that mouthguard polishing agents, Chloroform and Trichlorethylene, which are considered to be carcinogenic, leave a residual in the surface of the material that may be 10,000 times greater than the accepted safe limit for these substances.

Dentists' Attitudes Towards Mouthguard Protection

A survey conducted at the Medical College of Virginia Hospitals to analyse the attitudes of Virginia general dentists produced these results:

- 97% of orthodontists, 84% of pediatric dentists and 67% of general dentists recommended mouthguard protection
- The main reasons for not recommending mouthguard protection were:
 - The dentist had not received formal training on mouthguard fabrication or use
 - There were less expensive mouthguards available from sources other than a dental office
- Custom made mouthguards are recommended by 59% of general dentists and 56% of pediatric dentists
- 77% of orthodontists recommended prefabricated stock, boil and bite mouthguards

Frequency of Trauma in Children

- 30% of children suffer trauma to their primary dentition
- 22% of children suffer trauma to their permanent dentition
- The male:female ratio of the incidence of trauma is 2:1
- The major incidence of trauma occurs at
 - 2 – 4 years
 - 8 – 10 years
- With an overjet of 3 to 6 mm, the increase in the frequency of trauma doubles; with an overjet of more than 6 mm the frequency increases 3 fold