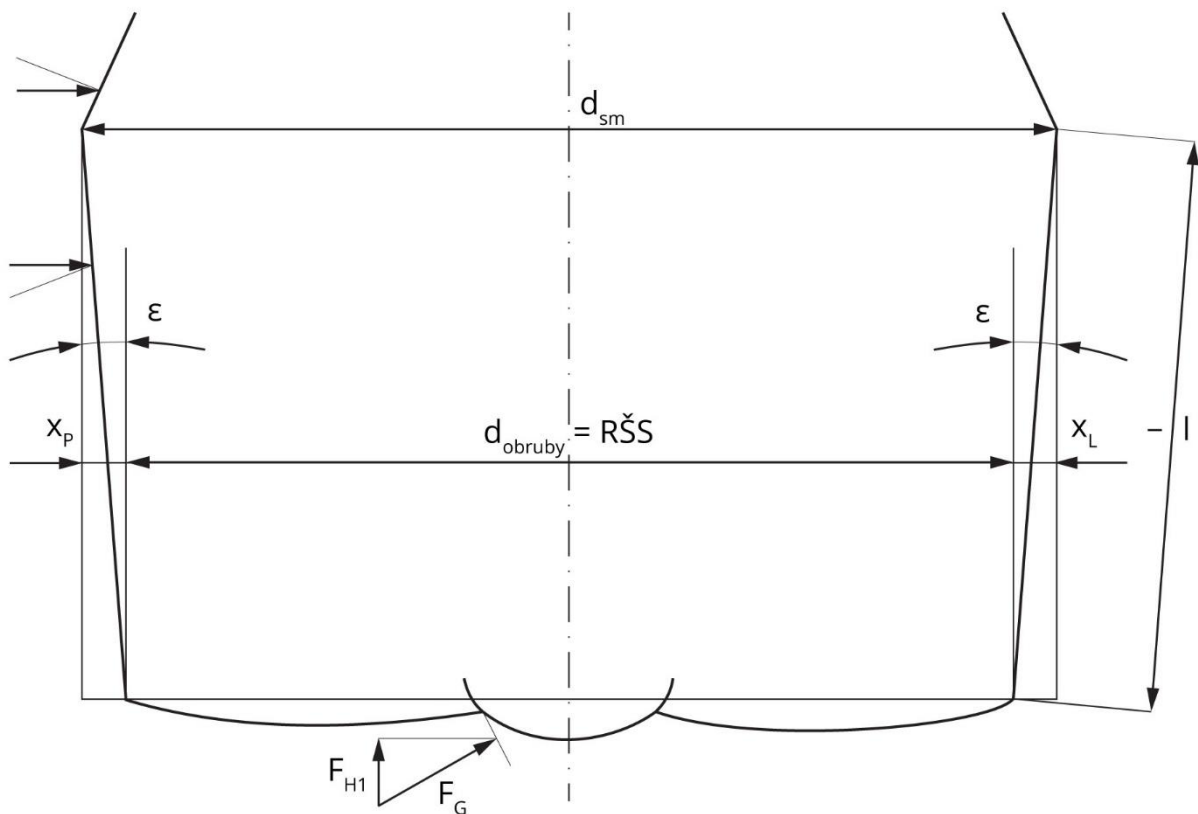


# 9 Measurement of spectacle side opening angle

## 9.1 Introduction

Spectacle frame stability is provided not only with side endings behind the ears, but also with the power which push the skin around the temporal area (above the ear). Optimal frame side opening should be from 5 to 10 degrees. Recommended size of the spectacle frame is derived from so called temporal size (dsm, Rutrlé 2001). Temporal size is influenced by the head size.



Picture 9.1: Angle of the frame opening ( $d_{sm}$  – temporal size,  $d$  – size of the spectacle frame,  $\epsilon$  – angle of frame opening,  $F_H$  – horizontal power,  $F_G$  – gravity power,  $x$  – side opening,  $l$  – length of the side, Rutrlé 2001).

## 9.2 Goals

- Measure size of the spectacle frame  $d_s$
- Measure angle of frame side opening  $\epsilon$
- Calculate size of  $d_{sm}$
- Measure size of your head periphery  $d_H$
- Check suitability of the selected spectacle frame

### 9.3 Equipment

Spectacle frame, ruler or millimeter ruler, writing equipment, calculator.

### 9.4 Methods

#### Measure size of the spectacle frame $d_S$

Put the frame with front side on the paper and draw the frame shape. Measure size of the center of the spectacle frame. This distance is from peripheral part of one eye frame to another in horizontal direction.

#### Measure angle of frame side opening $\epsilon$

Draw the shape of the frame like from upper view in the protocol. Measure angle of the frame side opening ( $\epsilon$ ). This angle should be very similar on both sides (See the picture 9.1)

#### Calculate size of $d_{SM}$

The value of the temporal size you can calculate if you add value  $x_P$  and  $x_L$  to value  $d$ . Value  $x_P$  and  $x_L$  you can calculate with trigonometric function. You should know the angle of the side opening and length of the side ( $l$ ).

$$\sin \epsilon = \frac{x_{PL}}{l}$$

$$x_{PL} = \sin \epsilon \cdot l$$

$$d_{SM} = 2 \cdot x_{PL} + d_S$$

(11)

#### Measure size of your head periphery $d_H$

With help of elastic ruler measure periphery size of your head ( $O$ ). From the object periphery formula calculate diameter of the virtual circle.

$$O_H = \pi \cdot d_H$$

(12)

#### Check suitability of the selected spectacle frame

Compare temporal size of the frame  $d_{SM}$  with the  $d_H$  which shows the head diameter.

## 9.5 Results

Measure size of the spectacle frame  $d_s$

$d_s =$

Measure angle of frame side opening  $\epsilon$

$\epsilon =$

Calculate size of  $d_{SM}$

$d_{SM} =$

Measure size of your head periphery  $d_H$

$d_H =$

Check suitability of the selected spectacle frame

$d_H < d_{SM}$

$d_H > d_{SM}$

$d_H = d_{SM}$

## 9.6 Discussion

In optimal situation is the size of the  $d_H$  equal or higher than  $d_{SM}$  of the frame. In case of  $d_{SM}$  is higher than  $d_H$  we have to push the side to the head. Other way is to replace the frame with the frame with smaller  $d_s$  value. In every case the opening angle of side should be not higher than 5 to 10 degrees.

## 9.7 Conclusion, notes, comments

How is the way to adapt the frame sides in plastic and metal frames?