**Chemical:** Hydrogen Fluoride (#76)

**TLV - TWA:** 

**TVL - STEL:** 

Ceiling limit: 3 ppm (2.5 mg/m³) as Fluoride

<table>
<thead>
<tr>
<th>Symptoms/Conditions</th>
<th>Level</th>
<th>Acute/Chronic</th>
<th>Reference</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild irritation of respiratory tract</td>
<td>7 ppm</td>
<td>Acute</td>
<td>D:R4P315</td>
<td>Animal studies, repeated daily exposures</td>
</tr>
<tr>
<td>Damage to lungs, liver, and kidneys</td>
<td>17 ppm</td>
<td>Chronic</td>
<td>D:R5P315</td>
<td>Repeated exposures to animals</td>
</tr>
<tr>
<td>Irritation of skin, nose, and eyes</td>
<td>&gt;3 ppm</td>
<td>Chronic</td>
<td>D:R5P315</td>
<td>Human subjects</td>
</tr>
<tr>
<td>Minimal increase in bone density due to</td>
<td>&gt;4.3 ppm</td>
<td>Chronic</td>
<td>D:R1P315</td>
<td>4.3 ppm is interpreted as the threshold for this effect</td>
</tr>
<tr>
<td>fluoride and fluoro</td>
<td>(fluorosis)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Conclusions**

Acute irritant and chronic toxicant  
Starting point 3 ppm  
Adjustment factor  
Acute: 10  
Chronic: 10 x 2 (chronic) x 4 (continuous exposure) = 80  
Recommended AAL  
0.3 ppm (15 min)  
0.037 ppm (24 hr)

**Comments**

The ACGIA ceiling value is based on acute irritation effects only.

AAL:  
0.3 ppm (0.25 mg/m³), 15-minute averaging time, 1987  
0.037 ppm (0.03 mg/m³), 24-hr averaging time, 1987

The Environmental Management Commission (EMC) changed the 15-min averaging time to 1-hr averaging time in 1997.

D: Documentation of Threshold Limit Values, 1986 (R: reference, P: page)  
R: Registry of Toxic Effects of Chemical Substances