

中华人民共和国第六机械工业部
指导性技术文件

带翼板的单头
球扁钢剖面要素曲线

CB/Z 149—80

带翼板的单头球扁钢剖面要素曲线

本图谱汇集了带不同厚度和不同宽度的翼板的五号至二十七号球扁钢惯性矩 I 曲线, 最小剖面模数 W 曲线, 翼板相当面积 ω 曲线, 这些曲线可供设计人员在计算带翼板的球扁钢剖面要素时使用。

1. 计算公式

$$\text{惯性矩 } I = I_0 + \frac{F_1 t^3}{12} + \frac{F_0 F_1}{F_0 + F_1} \left(y_0 + \frac{t}{2} \right)^2$$

$$\text{最小剖面模数 } W = \frac{I}{h + \frac{t}{2} - \frac{F_0}{F_0 + F_1} \left(y_0 + \frac{t}{2} \right)}$$

$$\text{翼板相当面积 } \omega = \frac{I b}{F_1 y_1 + \frac{1}{2} \left(y_1 - \frac{t}{2} \right)^2 b}$$

式中, I ——单头球扁钢自身惯性矩;

F_0 ——单头球扁钢断面积;

y_0 ——单头球扁钢断面重心至翼板内缘的距离;

$F_1 = bt$ ——翼板断面积;

b ——翼板宽度;

t ——翼板厚度;

h ——单头球扁钢高度;

δ ——单头球扁钢腹板厚度;

$y_1 = \frac{F_0}{F_0 + F_1} \left(y_0 + \frac{t}{2} \right)$ ——翼板中心

轴至组合剖面中和轴距离。

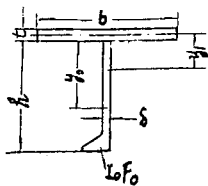


图 1

2. 图谱形式

I曲线、W曲线（图2~15）以翼板的宽度 b 为横坐标。

ω 曲线（图16~23）以翼板的面积 F_1 为横坐标。

3. 应用举例

求带厚度 $t = 6\text{mm}$ ，宽度 $b = 40\text{cm}$ 的翼板的五号球扁钢的剖面要素。

由图2的I、W曲线查得 $I = 37.84\text{cm}^4$ ， $W = 7.67\text{cm}^3$ ；

由图16五号球扁钢的 ω 曲线查得 $\omega = 1.72\text{cm}^3$ 。

注：图谱中翼板的厚度 t 的单位为 mm 。

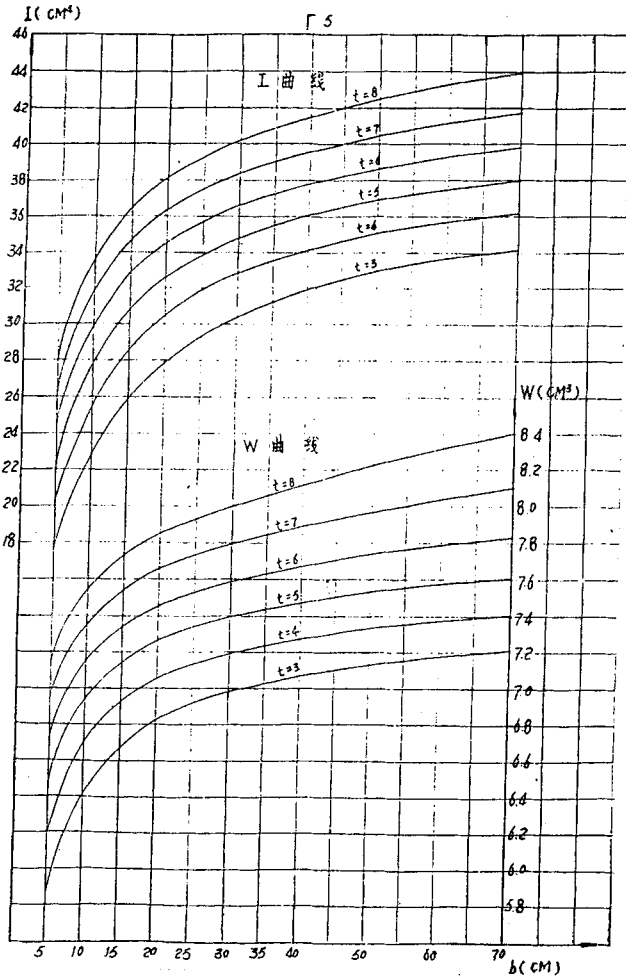


图 2

Γ 6

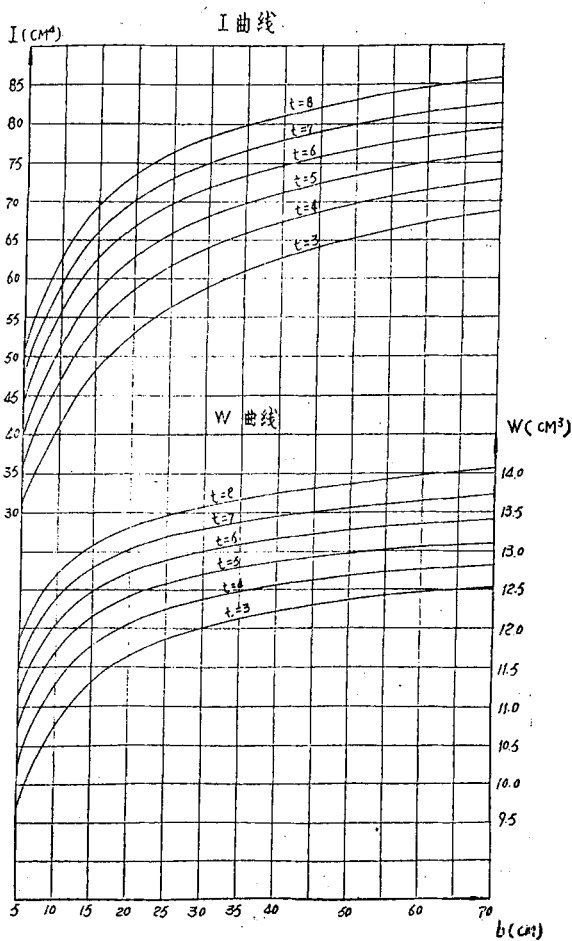


图 3

Γ 7

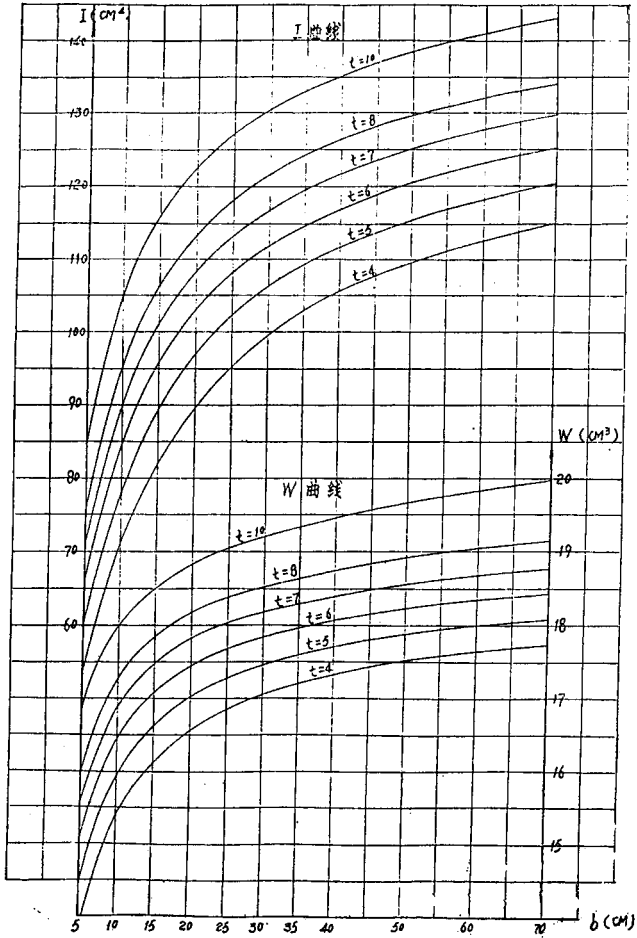


图 4

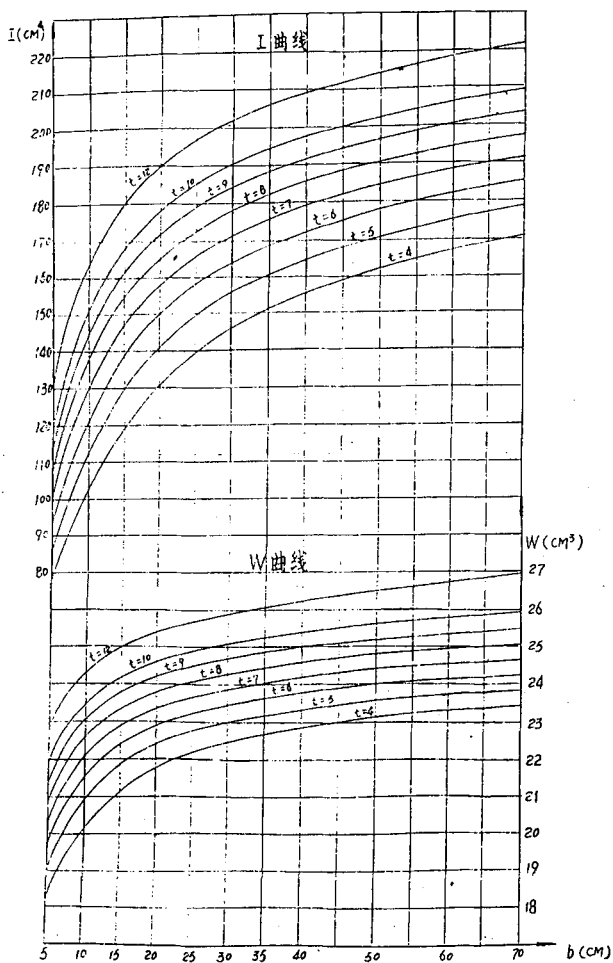


图 5

f?

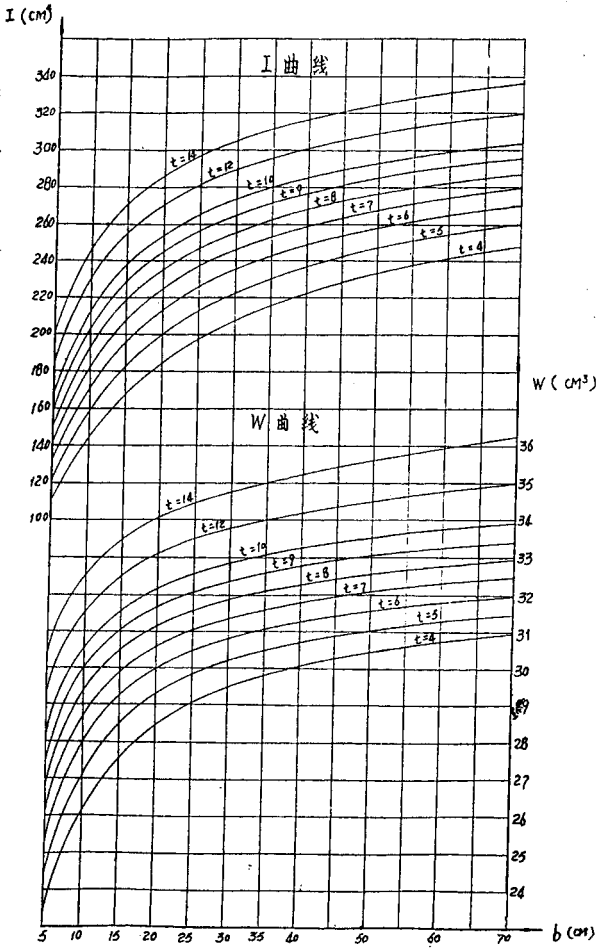


图 6

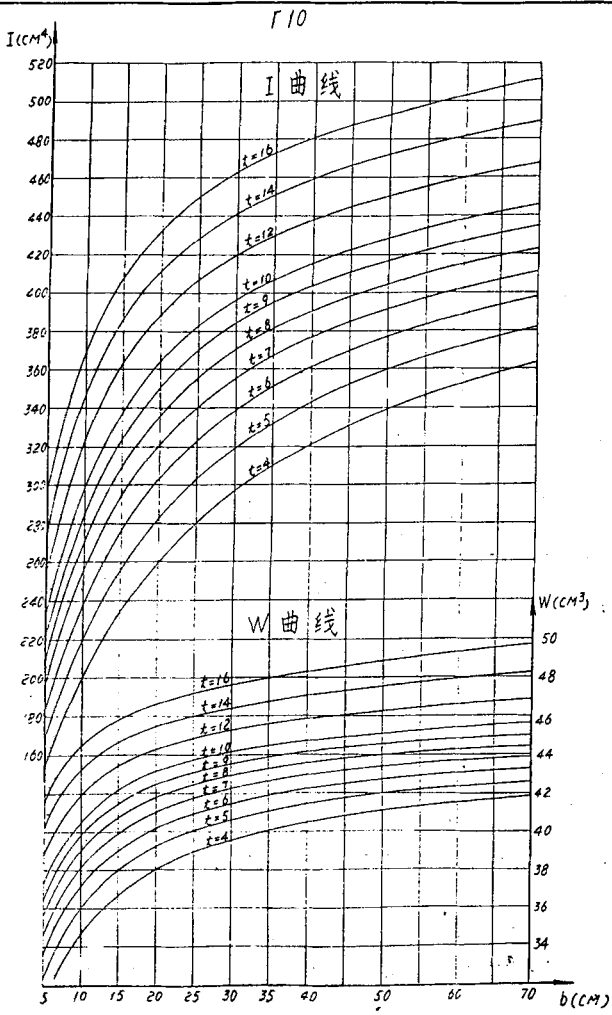


图 7

r12

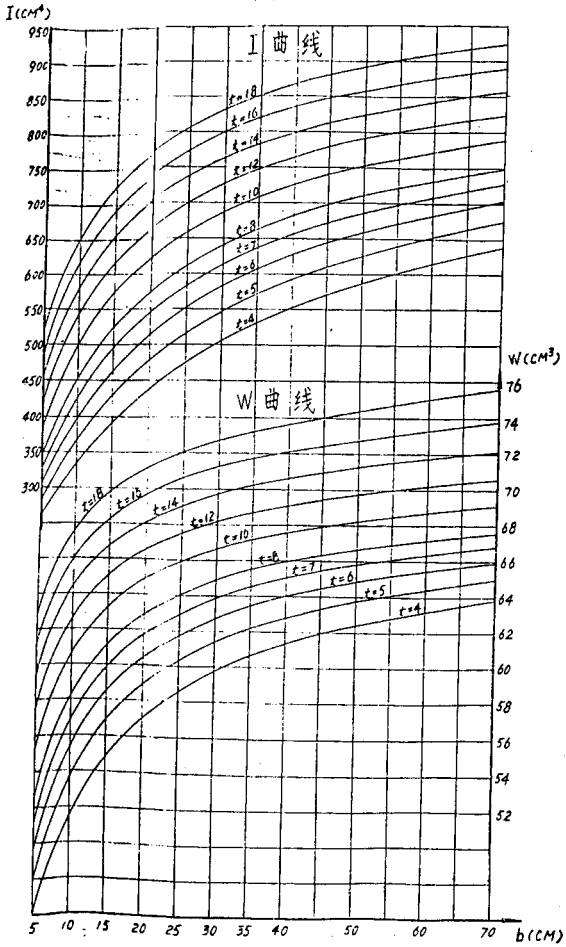


图 8

$r14^a$

I 曲线

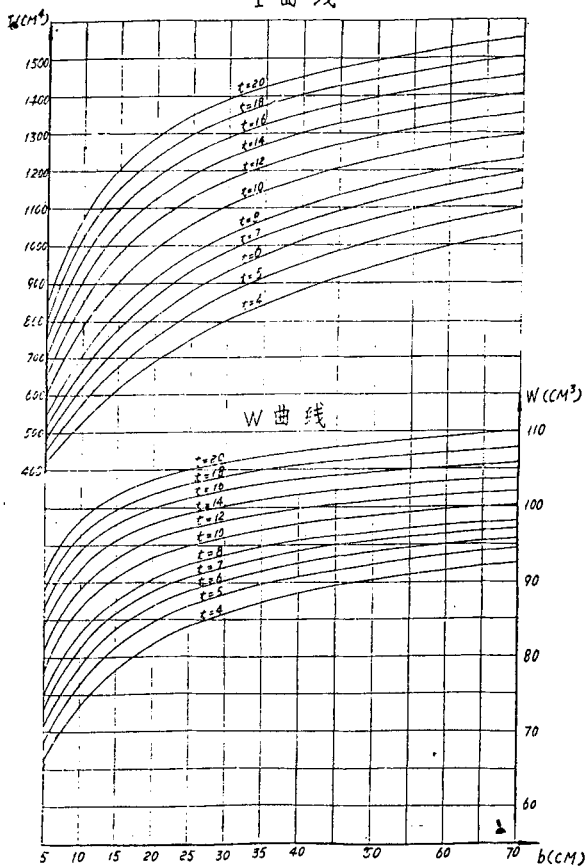


图 9

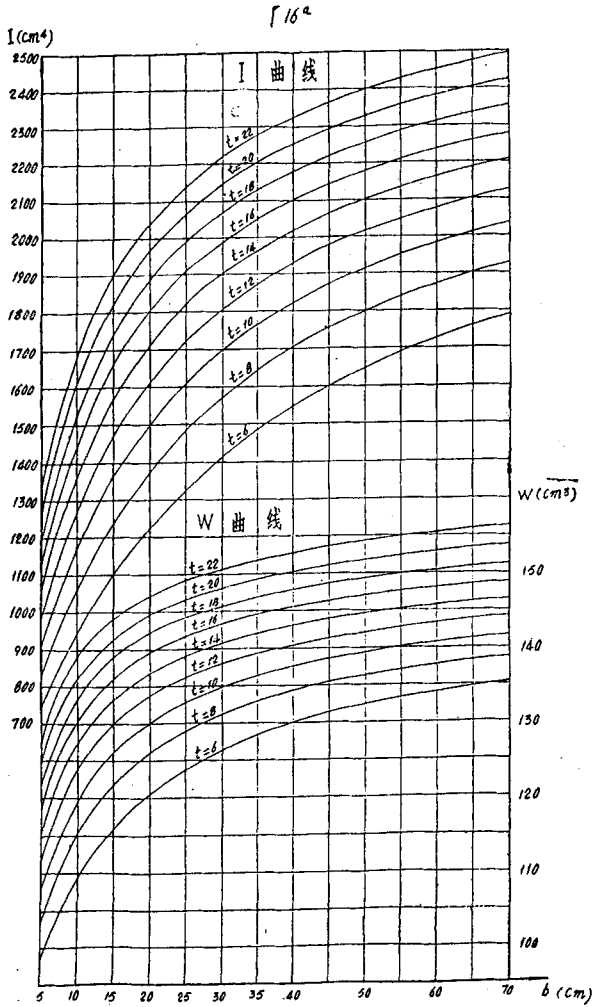


图 10

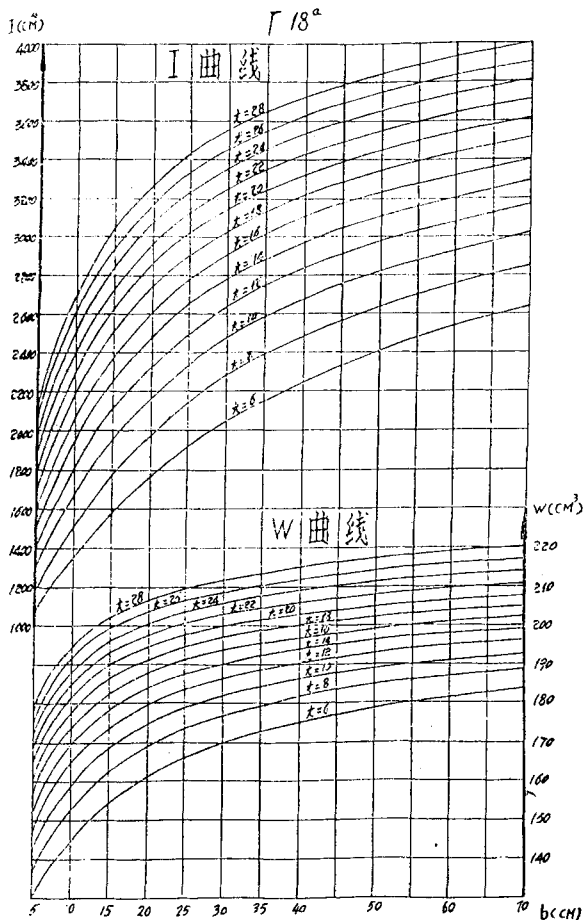


图 11

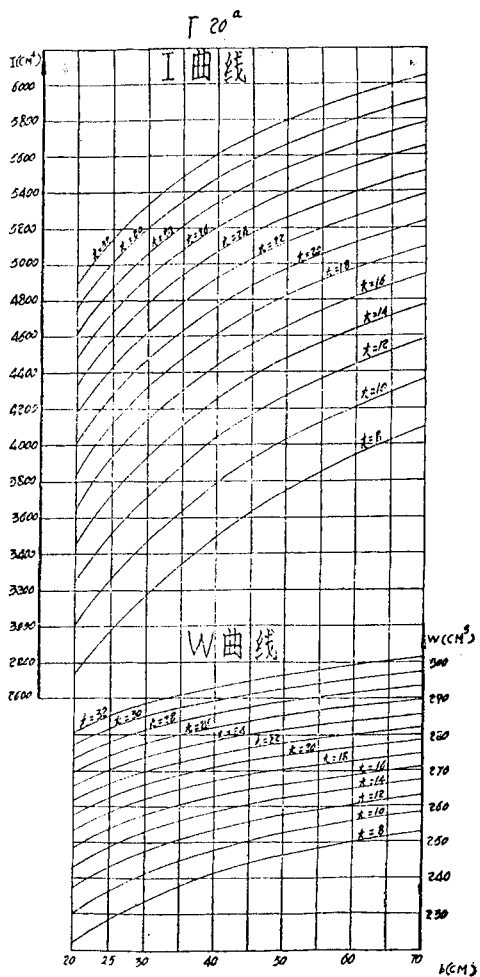


图12

$r=22^a$

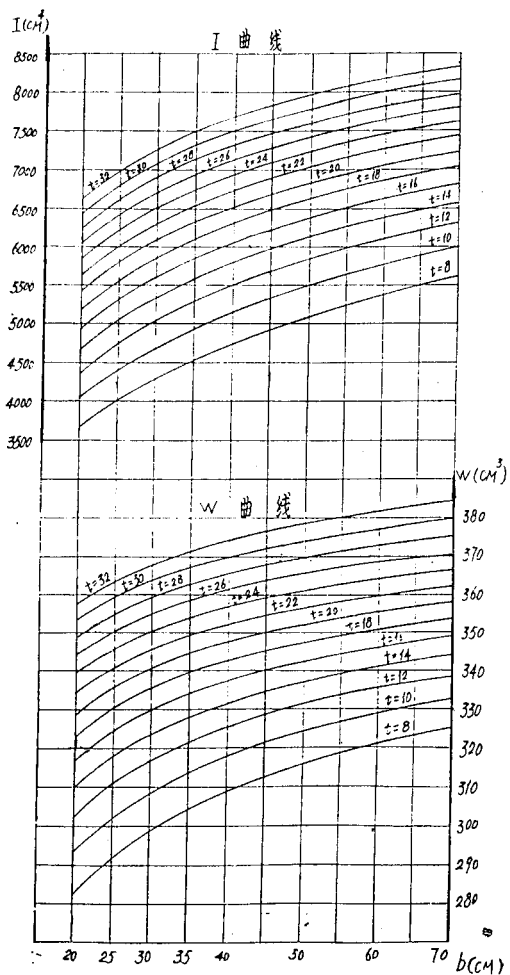


图13

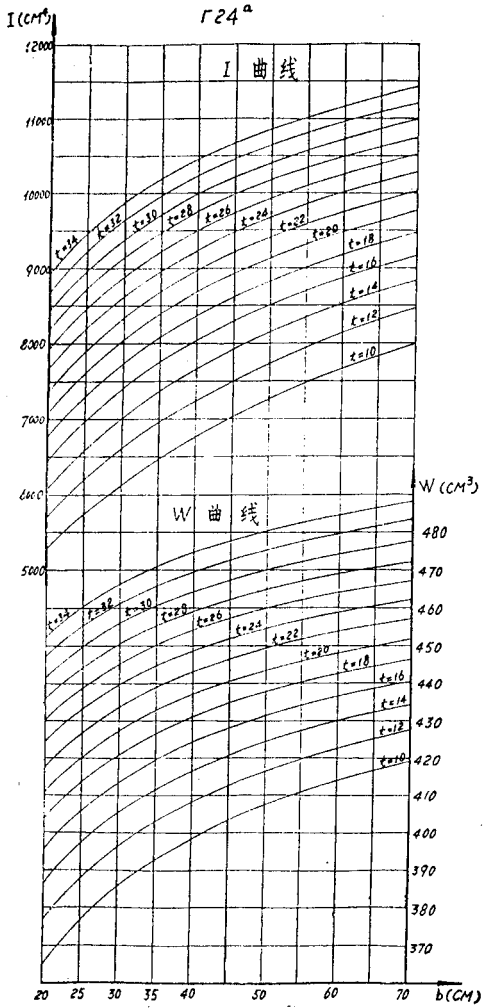


图14

f27^a

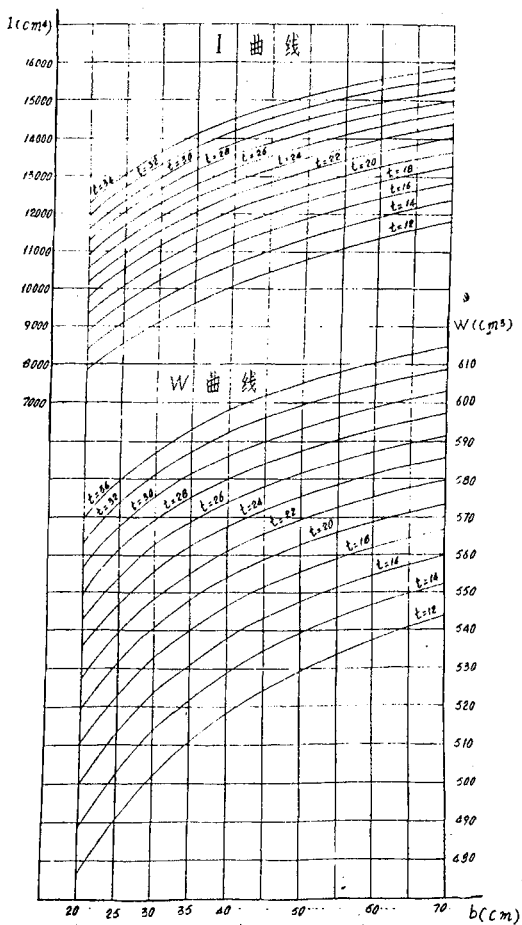


图15

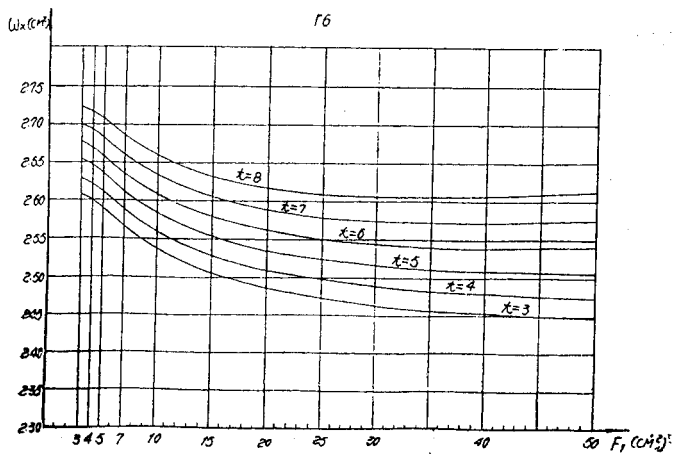
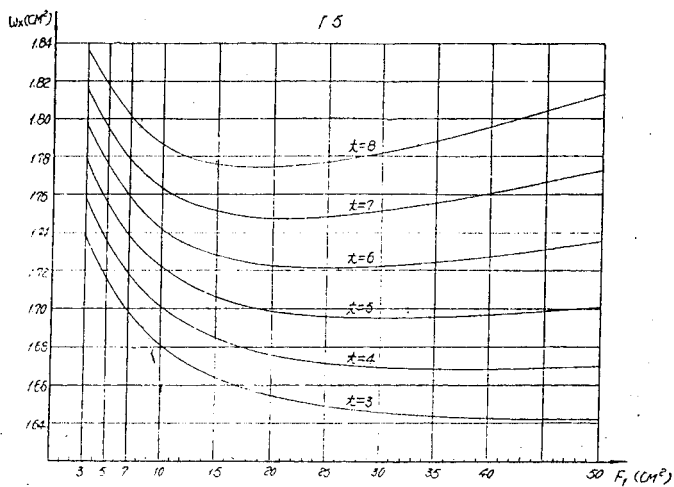


图16

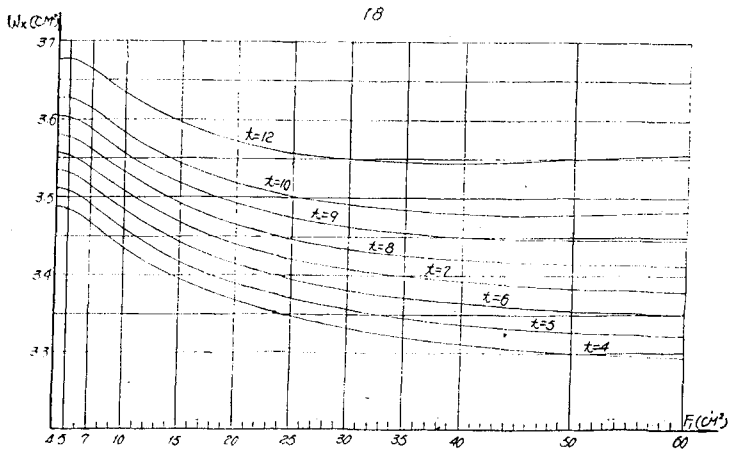
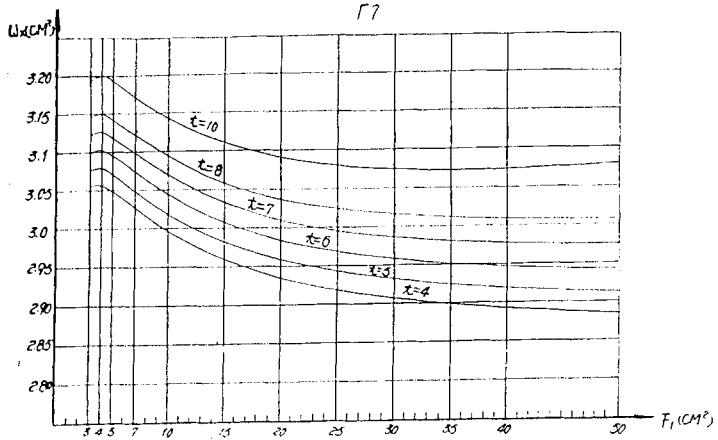


图17

Γ 9

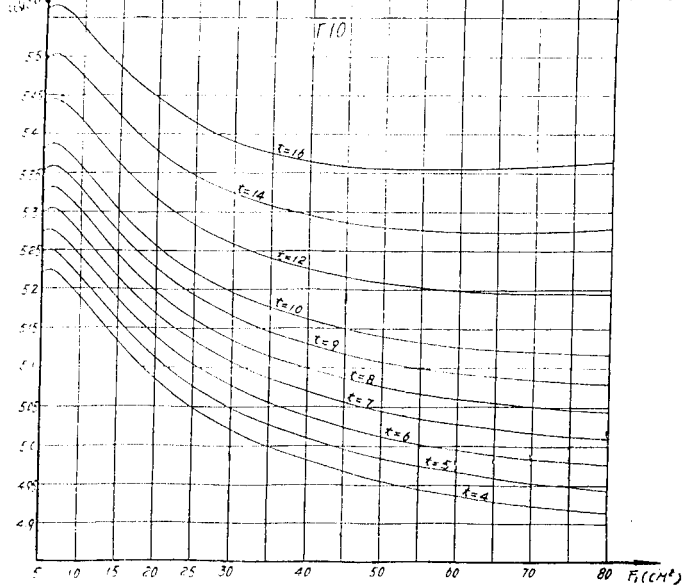
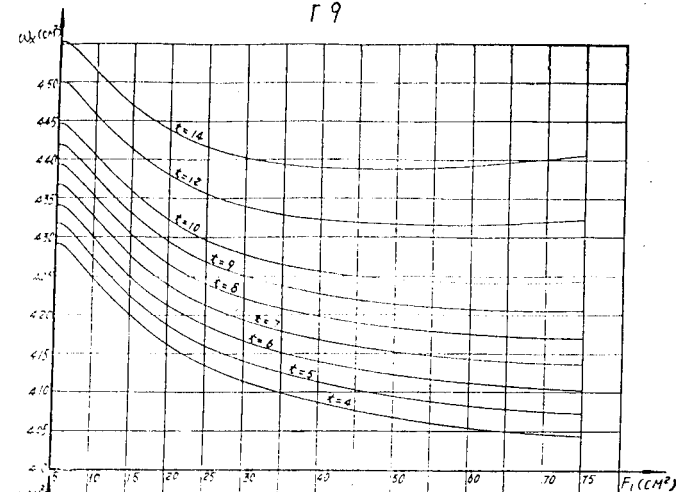


图18

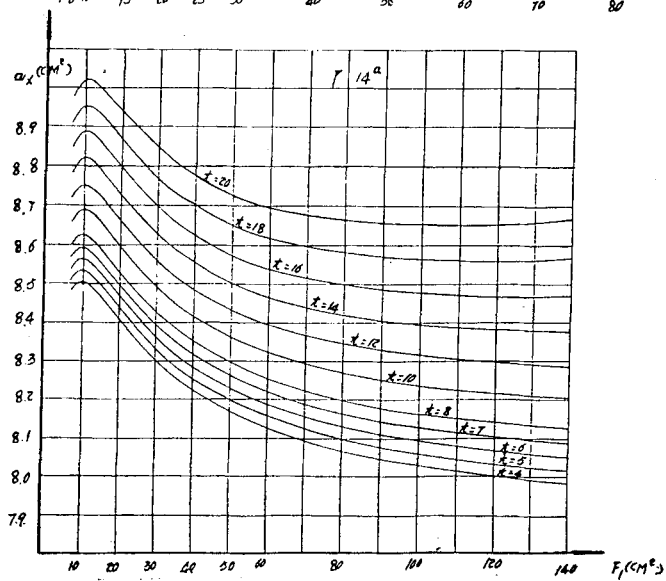
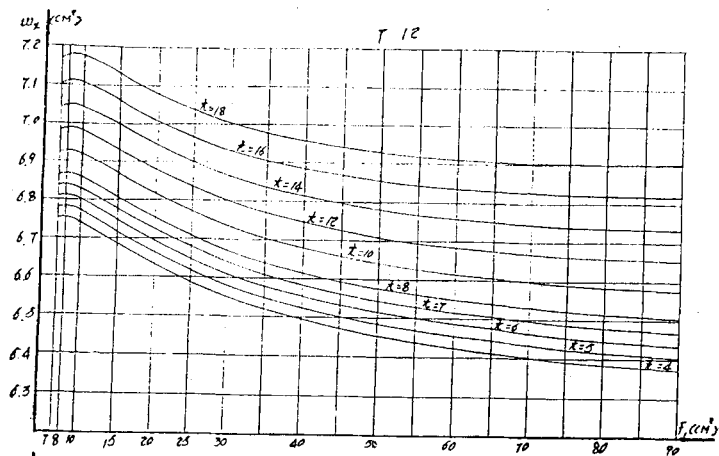


图19

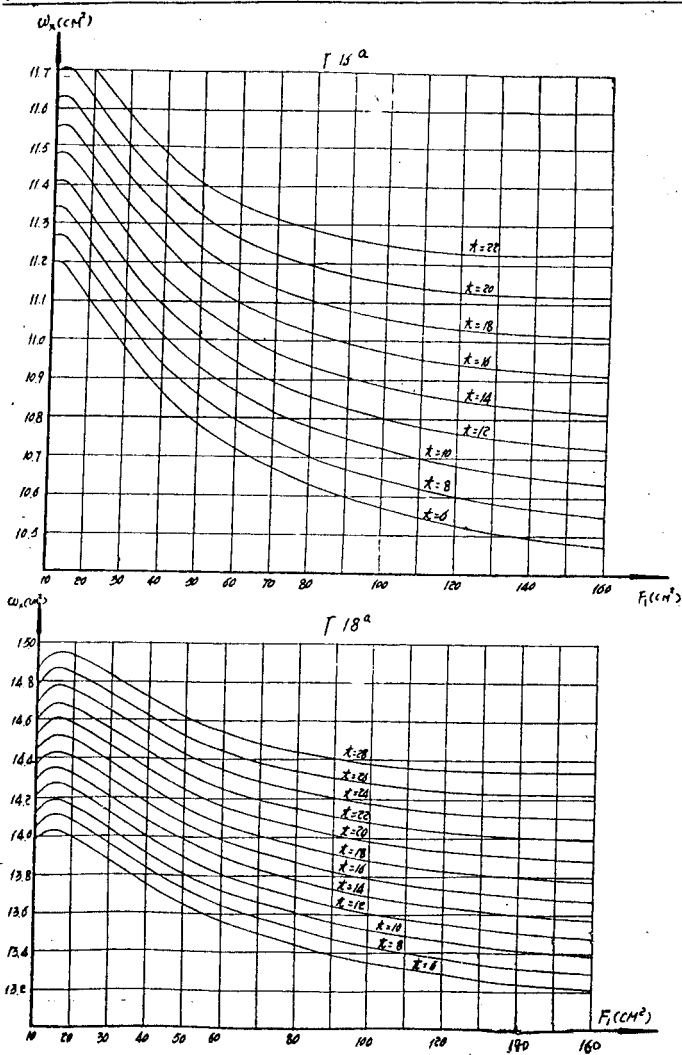


图20

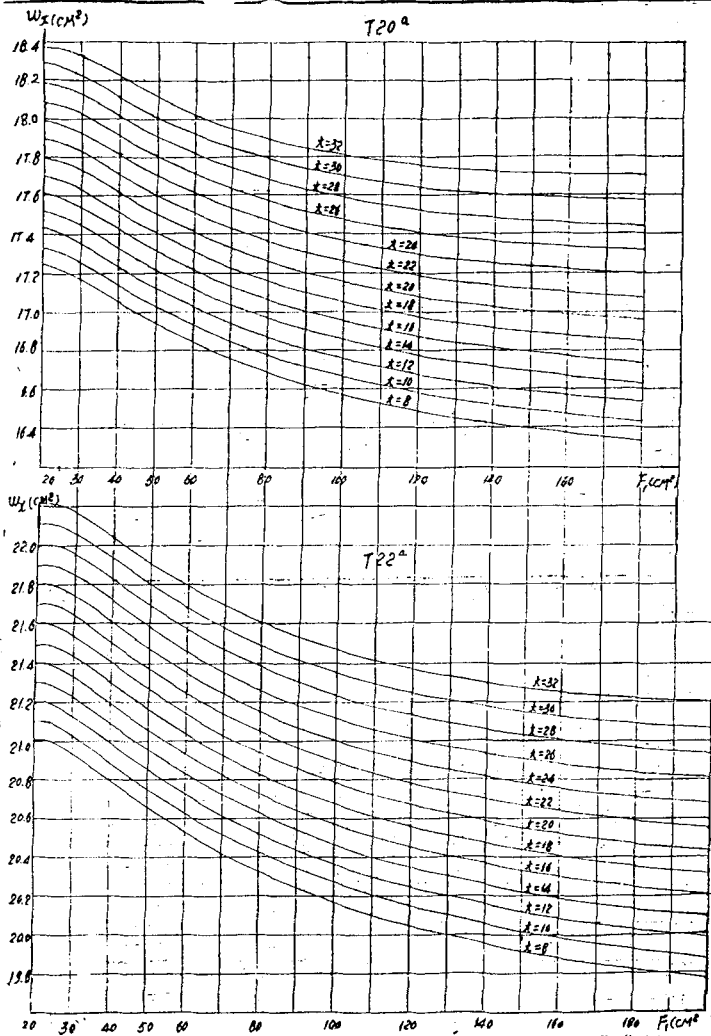


图21

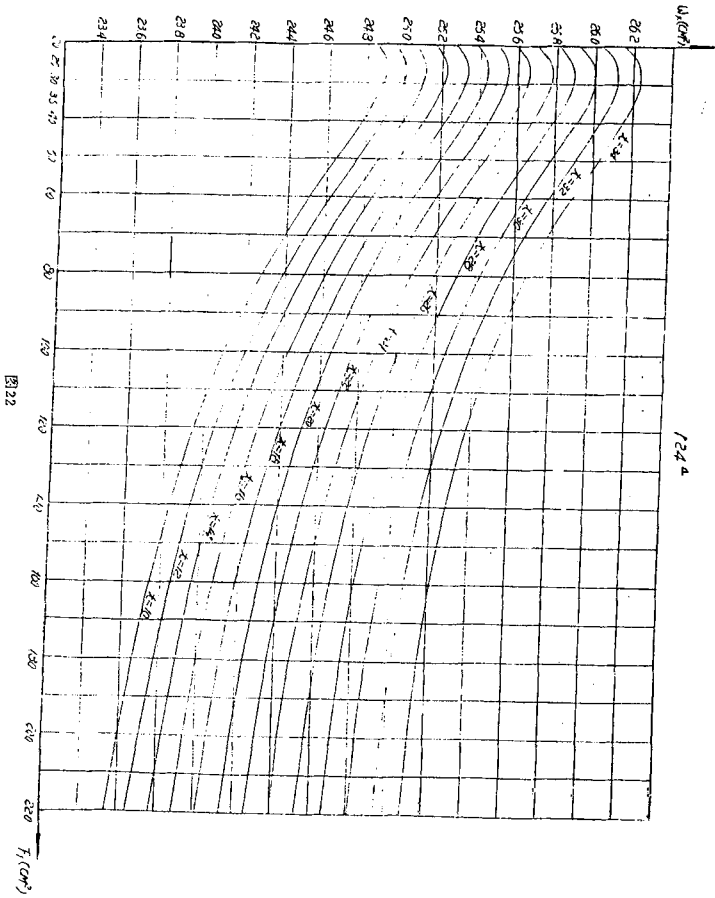


图 22

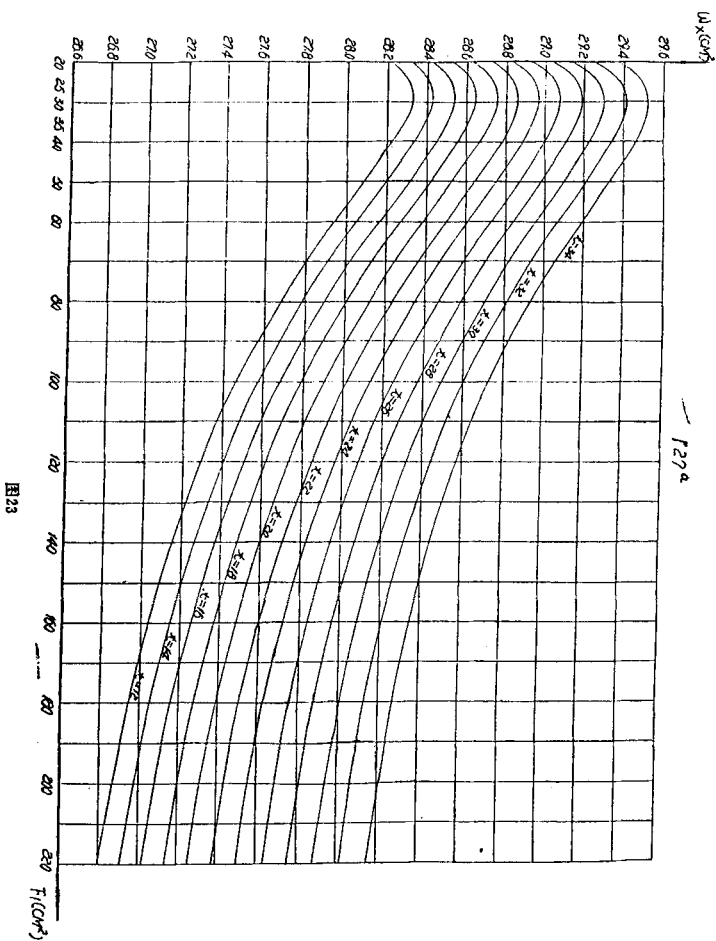


图23