# Power Engineering 101: Your Guide to Success

Power Engineering 101 is dedicated to helping power engineers succeed at every stage of their careers. Our proven system of structured tutorial courses and realistic practice exams ensures that students not only learn the required material but also gain the confidence and skills needed to pass their certification exams with ease.

## What We Offer

**Comprehensive Tutorial Courses:** Our structured courses break down complex topics into easy-to-understand lessons, following the SOPEEC syllabus to ensure you're studying exactly what's required.

**Realistic Practice Exams:** Designed to mirror actual exam conditions, our practice exams help you assess your knowledge, identify weak areas, and improve retention.

**Flexible Learning:** Study at your own pace, with access to expert tutors and detailed explanations to guide you through challenging concepts.

**Proven Success:** Thousands of students have used our system to pass their exams—many on their first attempt. With our support, you can do the same.

## How We Help You Succeed

**Targeted Study Plans:** Focus on the most important formulas, principles, and problem-solving techniques needed for second-class certification.

**Unlimited Support:** Have questions? Get expert answers through our tutoring and community support systems.

**Exam Readiness Guarantee:** We provide structured learning paths and extensive practice resources to ensure you are fully prepared or get your money back!

## ASME Section I: Power Boilers Formulas

This ASME Section I: Power Boiler Formulas contains essential formulas, concepts and terms you'll need for success. Use it as a quick reference while studying and practicing problem-solving. If you're looking for a guided study approach to ensure exam success, explore our tutorial courses and practice exams at PowerEngineering101.com

**Your success is our mission—let's get started!**

### ASME Section I Formulas

## 1. Cylindrical components

Tubing, PG-27.2.1

$$t = \frac{PD}{2Sw + P} + 0.005D + e$$

$$P = Sw\left[\frac{2t - 0.01D - 2e}{D - (t - 0.005D - e)}\right]$$

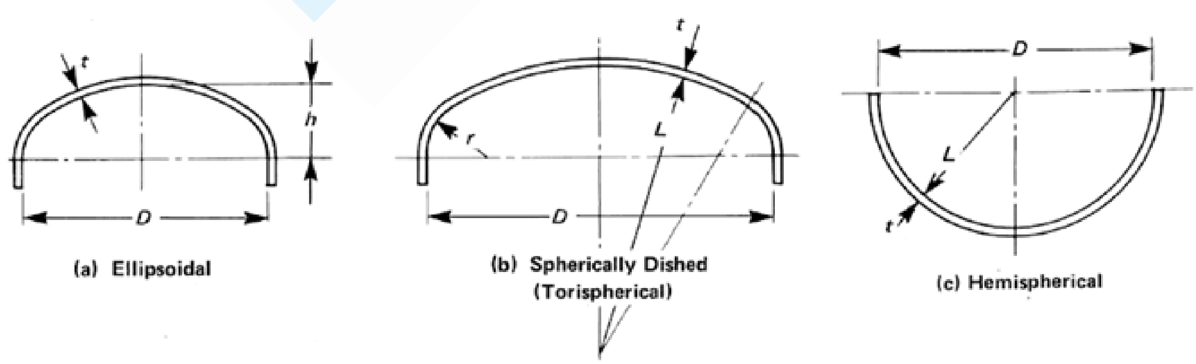
Piping, drums, shells, and headers, PG-27.2.2

$$t = \frac{PD}{2SE + 2yP} + C \quad \text{or} \quad \frac{PR}{SE - (1 - y)P} + C$$

$$P = \frac{2SE\,(t - C)}{D - 2y\,(t - C)} \; or \; \frac{SE(t - C)}{R + (1 - y)(t - C)}$$

## 2. Dished heads, PG-29

Figure 1-4
Principal Dimensions of Typical Heads



A. Segment of a Sphere (Flanged and Dished) PG-29.1 to PG-29.6

Formula from PG-29.1

$$t = \frac{5\ PL}{4.8\ Sw}$$

B. Semi-ellipsoidal PG-29.7 to PG-29.8

The ellipsoidal head (PG-29.7 to PG-29.8) has a 2:1 ratio between the major and minor axis of the ellipse and is designed using the cylinder formulas from PG-27. If a flanged-in manhole is used, the thickness is the same as for a head dished to a segment of sphere (PG-29.1 and PG-29.5).

Blank (no manhole)

$$t = \frac{PD}{2SE + 2yP} + C$$

Flanged-in Manhole

$$t = \frac{5\ PL}{4.8\ Sw}$$

C. Full hemispherical PG-29.11 to PG-29.13

Blank (no manhole)

$$t = \frac{PL}{2Sw - 0.2P}$$

Flanged-in Manhole

$$t = \frac{5\ PL}{4.8\ Sw}$$

ASME Section I, PG-29.11 states that when the required thickness of the head exceeds 35.6% of the inside radius, the following formula is used:

$$t = L\left(Y^{1/3} - 1\right) \text{ where } Y = \frac{2(Sw + P)}{2Sw - P}$$

**3. Unstayed flat heads, PG-31**

$$t = d\sqrt{CP/S}$$

Openings and compensation, PG-33.