Hydraulic Pressure

Pouring liquid metal into an inclosed mold creates hydraulic pressure.
This pressure is pushing outward on your mold sides in an attempt
to open the two parts. To counteract this force, you must add weight,
apply banding or clamp your mold together. The following calculator will
give you the amount of pressure in pounds that you will need to counteract
the pressure.

1.) Calculate the surface area of your pattern (and sprues) that is being
presented against the cope

$$\text{lenght (L)} \times \text{width (W)} = \text{area (A)}$$

2.) Multiply the area by the height of your cope (note that the height includes the
height of the pour cup).

$$\text{area (A)} \times \text{height (H)} = \text{hydraulic volume (V)}$$

3.) Multiply the hydraulic volume by the density of the metal you are pouring
(per cubic inch). ⟶   Aluminum......0.085
                        Bronze..............0.25
                        Iron....................0.25

$$\text{hydraulic volume (H)} \times \text{density (D)} = (\#)\text{weight needed to keep the mold closed}$$

NOTE: Your cope weight can be subtracted from (#) as it is assisting in keeping
the mold closed