Calculation of Consumption Guide

Calculations for Mastic / Sealant

- **a** = Hole Diameter in mm
- **b** = Depth of Sealant in mm / wet film thickness for spray material (See recommendations)
- **c** = Pipe or Bunched Cables diameter in mm
- **d** = Annular space in mm (See recommendations)
- **l** = Length of square opening / joint
- **w** = Width of square opening / joint
- **h** = Cartridge or spray bucket size in ml
- **n** = Number of holes
- **e** = Area of hole in mm² = \( \pi (a ÷ 2)^2 \)
- **f** = Area of pipe in mm² = \( \pi (c ÷ 2)^2 \)
- **g** = Amount of mastic needed per hole in ml = \((e-f) \times b ÷ 1000\)

**Example:**

- **a** = 90mm
- **b** = 40mm
- **c** = 50mm
- **h** = 310ml
- **n** = 20

\[
e = 3.14 \times 45^2 = 6361.73 \text{ mm}^2
\]
\[
f = 3.14 \times 25^2 = 1963.50 \text{ mm}^2
\]
\[
g = (6361.73 - 1963.50) \times 40 ÷ 1000 = 175.92 \text{ ml}
\]

No. of cartridges = 20 \times \left( \frac{175.92}{310} \right) = 11.35 cartridges

Calculations for FireStop Block FBB

- **a** = block length = 230mm = 0.23m
- **b** = block width = 130mm = 0.13m
- **l** = length of opening
- **w** = width of opening
- **t** = block thickness = 60mm = 0.06m
- **c** = %penetrant Area

\[
\text{Area to be covered/filled by blocks} = l \times w \times (1-c/100) = A
\]

Fire rating up to 60 minutes

\[
\text{No. of blocks required} = \frac{A}{a \times t}
\]

Fire rating up to 120 minutes

\[
\text{No. of blocks / buckets} = \left( \frac{A}{b \times t} \right)
\]

**Example:**

- **l** = 500mm = 0.5m
- **w** = 500mm = 0.5m
- **c** = 30%

\[
\text{Area to be covered/filled by blocks} = 0.5 \times 0.5 \times (1 - 0.3) = 0.175m^2
\]

Fire rating up to 60 minutes

\[
\text{No. of blocks required} = \frac{0.175}{0.23 \times 0.06} = 12.68
\]

Fire rating up to 120 minutes

\[
\text{No. of blocks / buckets} = \frac{0.175}{0.13 \times 0.06} = 22.4
\]
Calculations for Compound

- **l** = length of the opening
- **b** = width of the opening
- **d** = depth as per required fire rating
- **C** = Penetrant Area or cross sectional area of services
- **Y** = coverage / yield of 1 bag in Liters

Volume of Compound Required = \[ (l \times b \times d) - (C \times d) \] m³

\[ (l \times b \times d) - (C \times d) \times 1000 \text{ liters} \]

Example:
- **l** = 1000mm = 1m
- **b** = 500mm = 0.5m
- **d** = 100mm = 0.1m
- **C** = 20% of opening = \( l \times b \times 0.2 \) = 1000 x 500 x 0.2 = 0.1
- **Y** = 24 liters per 22 KG bag

Volume of Compound Required = \[ (1 \times 0.5 \times 0.1) - (0.1 \times 0.1) \] x 1000 liters

\[ V = 40 \text{ liters} \]

Numbers of bags required = \[ \frac{40}{24} \]

= 1.67 bags

Calculations for Pillows FiP

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<th>Width mm</th>
<th>Wall</th>
<th>Floor</th>
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Calculations for Fire Barrier Foam - FBS

Material use as reference value for 40% degree of seal use - number of cartridges for seal thickness 200mm and 100mm for 90 minutes and 30 minutes fire rating respectively

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<th>Volume @ 200mm depth</th>
<th>Cartridge</th>
<th>Volume @ 100mm depth</th>
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<th>Core boring</th>
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* The above calculations do not consider wastage of material. Please consider an appropriate factor.