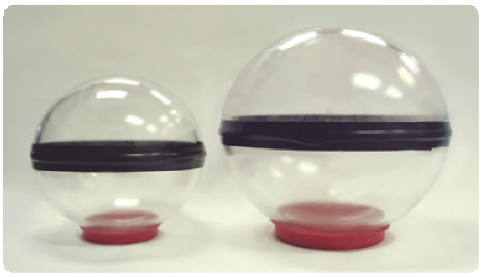
SWALE OCEANOGRAPHIC

Teledyne Benthos

Flotation

Glass Instrument Housings

Deep Sea Glass Spheres



GLASS SPHERES are a unique, reliable, cost effective method for flotation and the housing of electronic instruments in the marine environment. Teledyne Benthos is the world's leading manufacturer of deep sea glass spheres and instrument housings. Ongoing improvements continue to ensure their high reliability in extreme environments. Advanced assembly techniques and the patented *VacuSealed* closure method consistently result in high quality, long-life spheres. Teledyne Benthos continues to pressure test every sphere prior to shipment, assuring their integrity in the field.

Deep-sea glass spheres are superior to other types of flotation and instrument housing for several reasons: they are transparent, lightweight, inexpensive, corrosion resistant, easily handled, extremely strong, and non-polluting. As a result, they are preferred by oceanographers worldwide and are backed by over 50 years of experience in deep sea technology.

Teledyne Benthos patented VacuSealed glass floats and instrument housings are manufactured from precision-moulded spheres to exact specifications. The edge of each hemisphere is ground flat to extreme tolerances. When used for flotation the hemispheres are mated, and then evacuated to an absolute internal air pressure of less than 0.3 atmospheres. After evacuation, a sealant and protective tape are applied around the equator. Spheres sealed in this method are nearly impossible to open due to the force exerted upon them by the atmospheric pressure. For the 17" (43.2cm) diameter float, the force is > 880 kg.

VACUUM PORTS

A titanium vacuum port (Model 204-VPT) can be installed in a glass instrument housing to facilitate opening and closing the sphere. The vacuum port option is recommended for any housing that will be opened frequently

TELEDYNE BENTHOS
Everywhereyoulook™

Flotation

Glass Instrument Housings

TECHNICAL SPECIFICATIONS

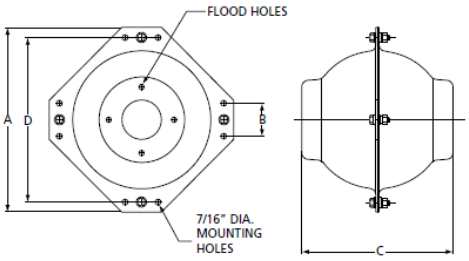
Type	Low expansion borosilicate
Thermal Coefficient of Expansion	38 x 10^{-7}/°C
Specific Gravity	2.22
Young's Modulus	62 GPa (9 x 10^6 psi.)
Poisson's Ratio	0.20
Refractive Index	1.48
Thermal Conductivity	0.0023 calorie cm/cm^2 sec°C
Specific Heat	0.18 calorie/gm°C

DIMENSIONS, WEIGHT, AND DEPTH DATA

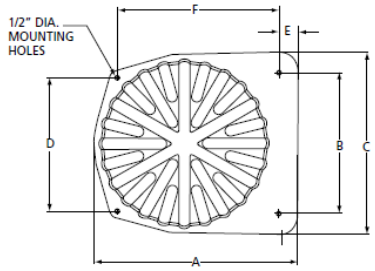
	2040-13V 13"	2040-17V 17"
Outside Diameter:	33 cm	43.2 cm
Inside Diameter:	30.5 cm	40.4 cm
Weight in Air:	9.07 kg	17.7 kg
Net Buoyancy:	10.4 kg	25.4 kg

Standard 204H *Ribbed 204HR* *Super Ribbed 204-SRO/204-SRM*

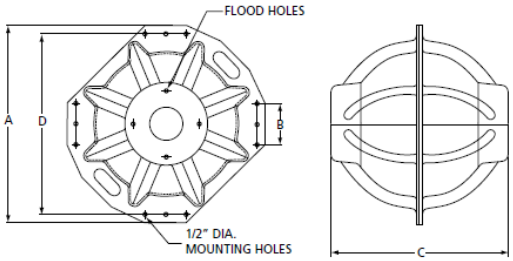
Bright yellow, neutrally buoyant, polyethylene hard hats are available for glass protection, storage, and ease of handling. Hard Hats consist of two flanged units bolted together with stainless steel hardware. Flanges can be bolted to a mounting framework, wire clamp, or chain section on a mooring line.



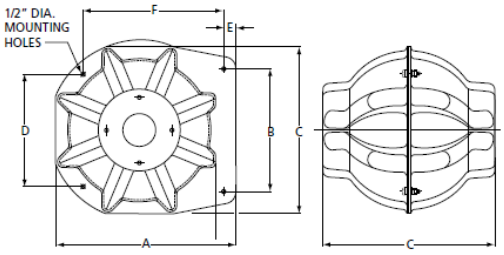
204H-17 Standard Hard Hat



204HR-17 Ribbed Hard Hat



204-SRO-13 and 17 Super Ribbed Octagonal Hard Hat



204-SRM-17 Super Ribbed Mooring Hard Hat

Dimensions and Weight in Air (Dimensions in drawings, right)

	A	B	C	D	E	F	Weight in Air
Model	cm	cm	cm	cm	cm	cm	kg
204H-17	55.9	12.7	48.3	49.5	-	-	2.95
204HR-17	54.6	38.1	49.5	35.8	5.1	43.2	3.29
204-SRO-13	48.3	12.7	40.6	43.2	-	-	2.50
204-SRO-17	61.0	12.7	53.3	55.9	-	-	3.63
204-SRM-17	55.9	38.1	51.8	35.0	3.8	43.7	3.74

SWALE TECHNOLOGIES Ltd

Unit 51G, Rm48 Whitehill & Bordon Enterprise Park, Budds Lane, Bordon, GU35 0FJ, UK

Tel: +44 (0)1420 473334 Email: Sales@swaletechnologies.com www.swaleocean.co.uk