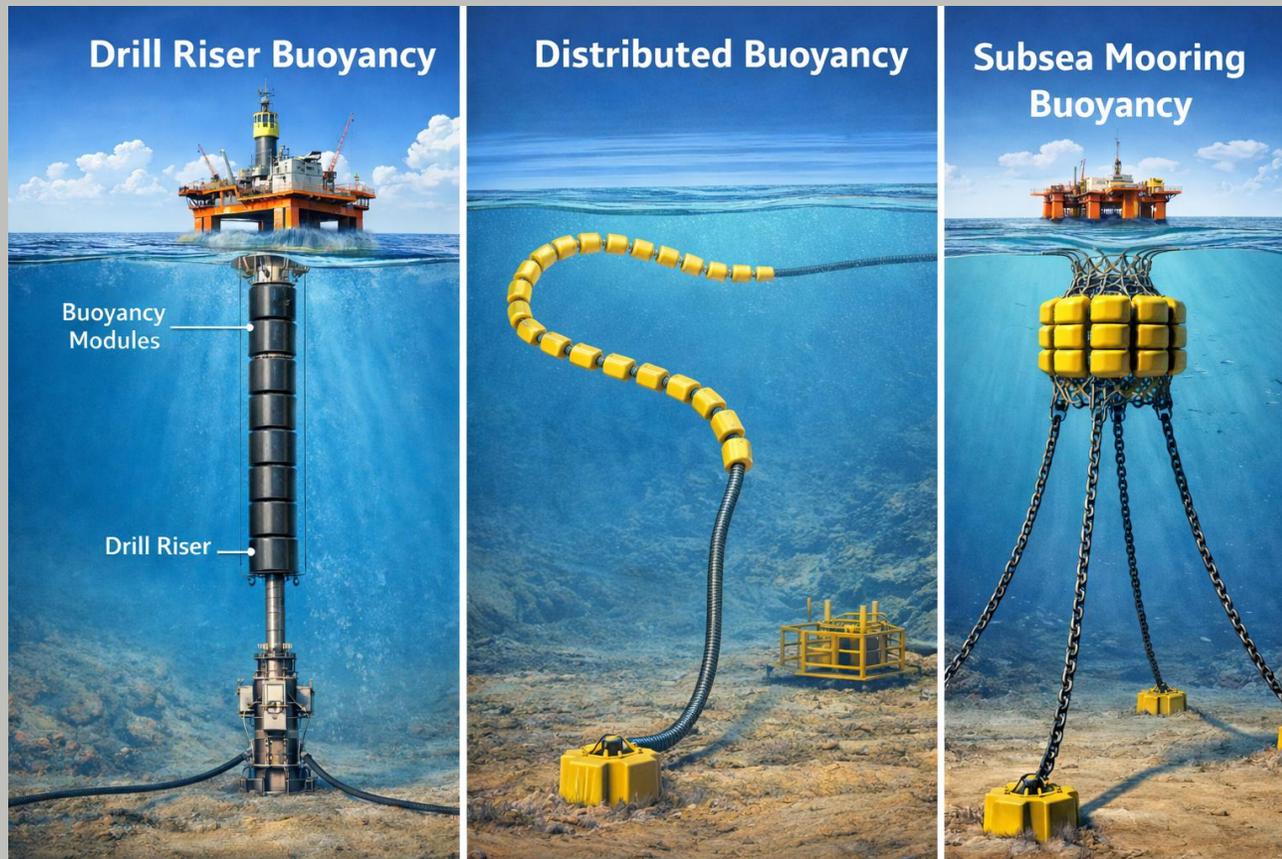


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Areas of use



Moulded buoyancy

- Production method moulding to shape
- Coarse tolerances

Example of use

- Drill riser buoyancy
- Distributed buoyancy
- Mooring buoyancy

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Areas of use



Custom-Fit Buoyancy

Precision-Fit Buoyancy Modules

- Used in ROV and subsea operations
- High precision and accurate fit

Module design with tight fit

Precise modules designed for tight tolerances

Examples of Use

- ROV Gripper
- Hydraulic Cutter
- ROV Tool Holder

Custom-Fit Buoyancy

- Procured to sheet format
- For products with fine tolerances

Example of use

- ROV buoyancy
- ROV tooling
- Seabed structures

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Focus in this presentation

Custom-Fit Buoyancy

Precision-Fit Buoyancy Modules

- Used in ROV and subsea operations
- High precision and accurate fit

Examples of Use

ROV Gripper

Hydraulic Cutter

ROV Tool Holder

Module design with tight fit

Precise modules designed for tight tolerances

Custom-Fit Buoyancy is focus in this presentation

1. Design
2. Reuse

Design of buoyancy modules

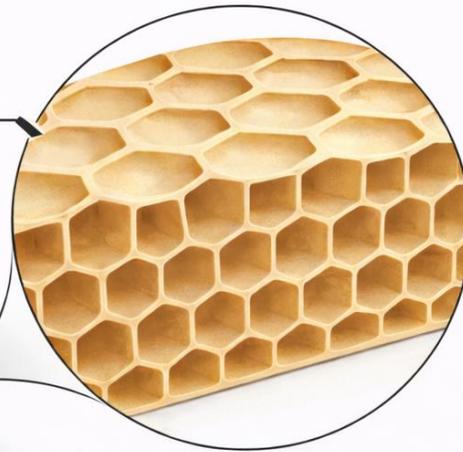
PVC Foam Board



Functional properties

- Low weight
- High stiffness
- Minimal water absorption
- Insulating properties

Closed-cell
structure



Schematic illustration

Two main categories

PVC Foams

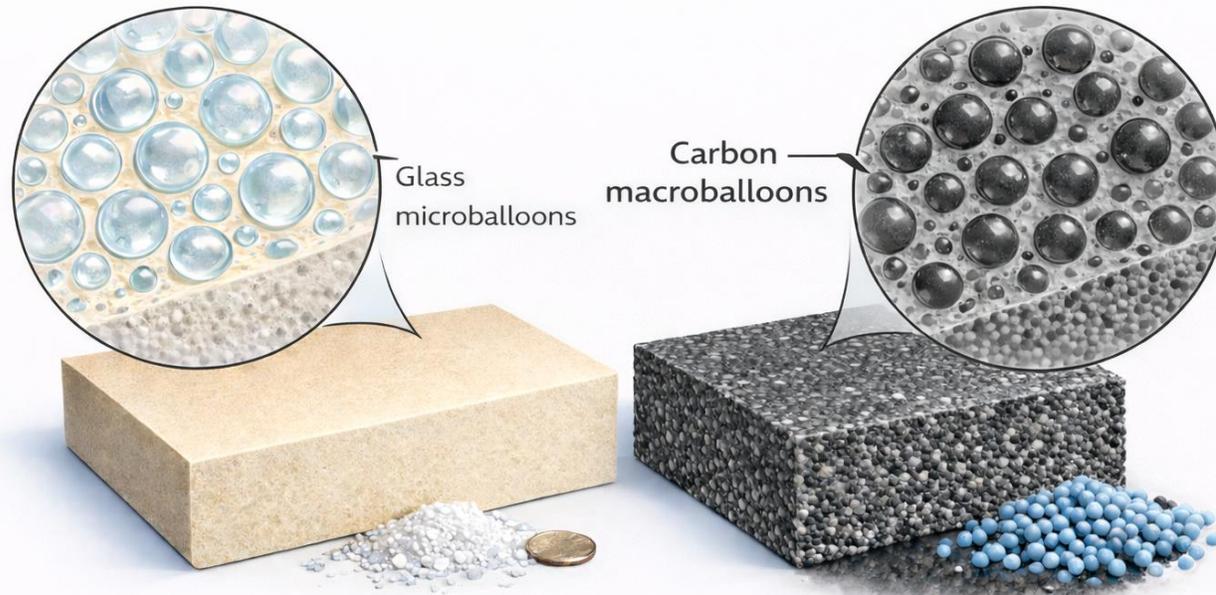
Syntactic Foams

- Bot must contain hollow areas.
- **PVC foams**
- Max depth rating 650 meter
- Modules are made from predefined material in plate forms

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Design of buoyancy modules



Synthetic foam with glass microballoons

- Glass microballoons
- Epoxy resin as binder
- Low weight
- Low water absorption

Synthetic foam with carbon macroballoons

- Carbon macroballoons
- Epoxy resin as binder
- Low weight
- High compressive strength
- High thermal conductivity

Syntactic foams

- Depth rating up to 11000 meter
- Modules are made from predefined material in plate forms
- Syntactic foam with micro balloons is most common in ROV marked

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Design of buoyancy modules



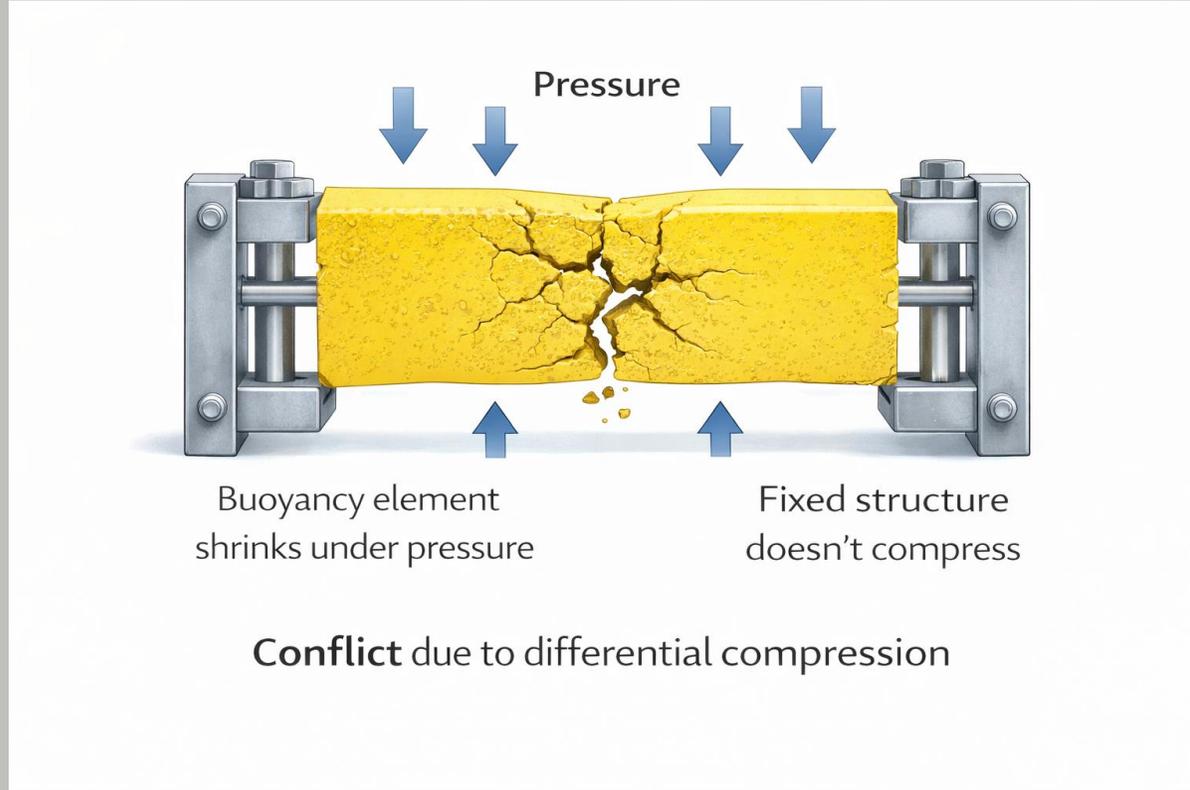
Selection of **PVC Foam** or **Syntactic Foam**

- Buoyancy, the most costly single component
- 90 % can be raw materials
- PVC Foam is lowest in price
- Crucial to decide operating depth.

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Design of buoyancy modules



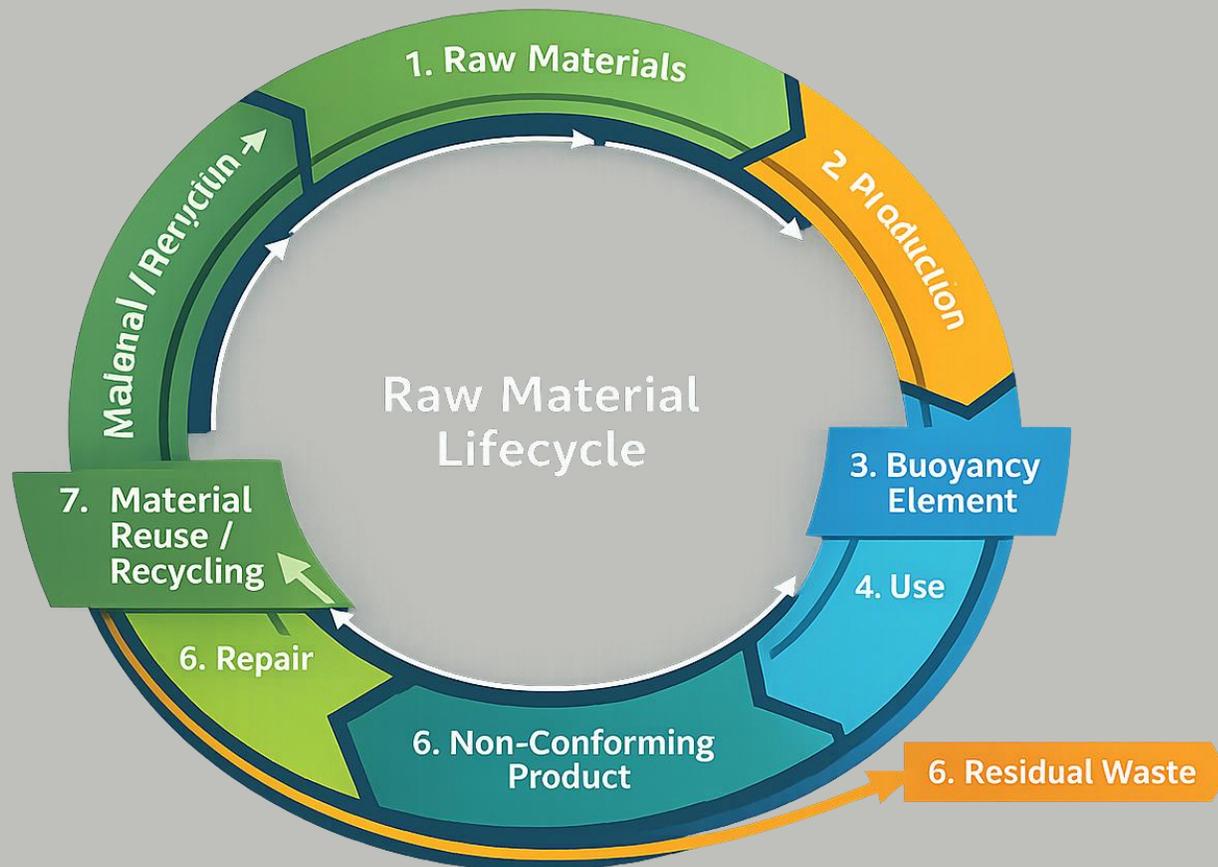
Buoyancy will shrink and attachments in metal will not shrink.

- Avoid breakage in operation by allowing buoyancy to freely move when in operation

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Reuse of buoyancy



Lifetime: 20 years

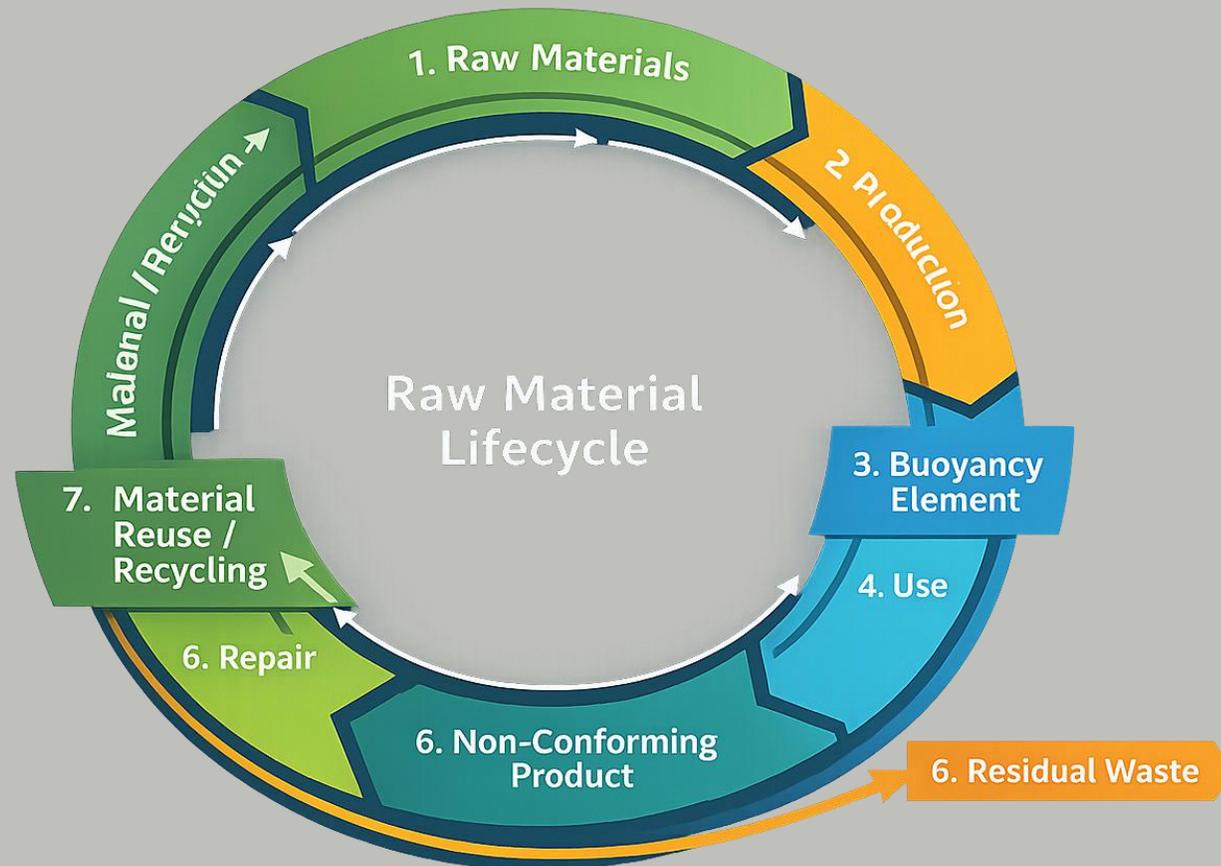
Potential sources of reduced lifetime.

- **Overload** → Waste
- **Wear** → Waste if not maintained
- **Damage** → Waste if not repaired
- **Outdated product** → Waste if not upgraded

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Reuse of buoyancy



Lifetime: 20 years

Factors to **maintain lifetime**

- **Overload**, check condition
- **Repair** worn elements
- **Reuse materials** by making new shapes
- **Surface protection** by adding stronger materials towards surface

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Thank you for your attention

Feel free to get in touch if any questions:

www.mechman.no

asmund@mechman.no

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