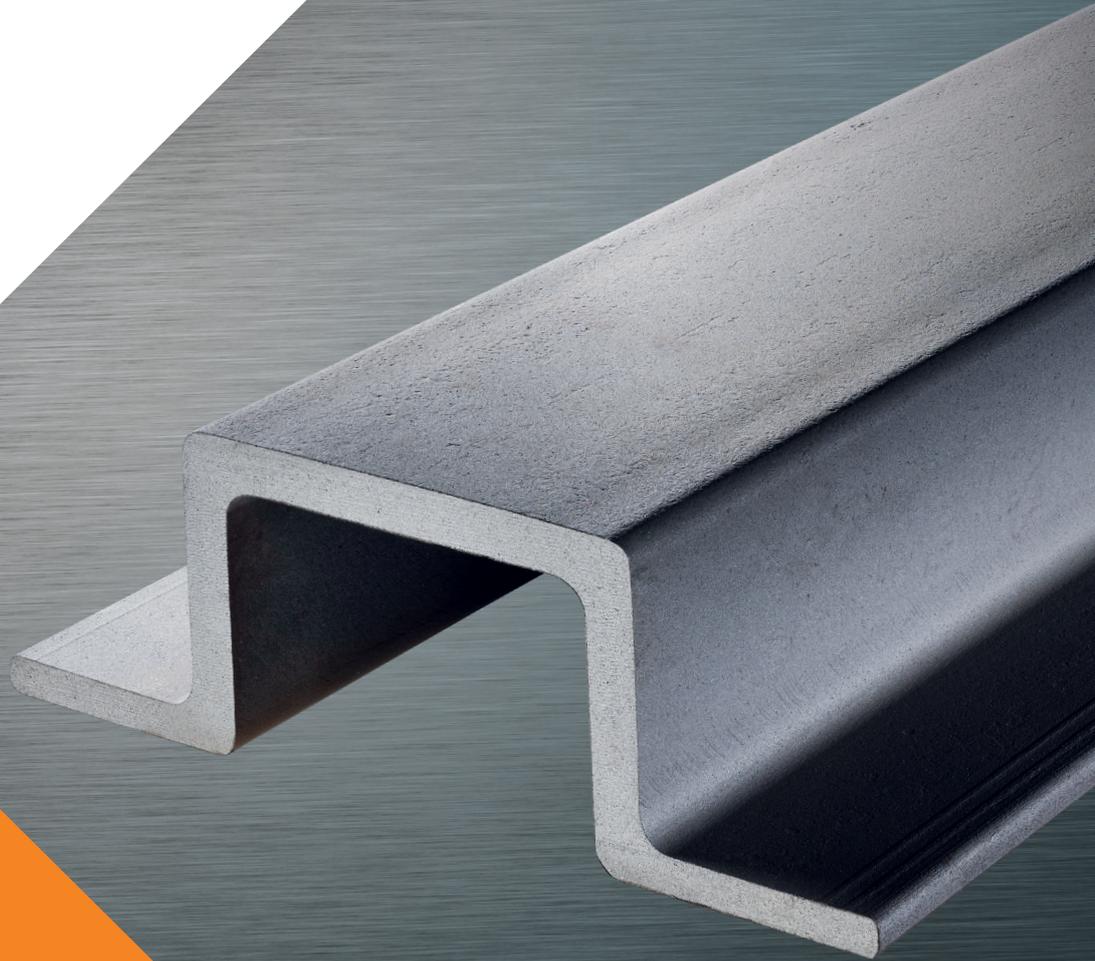




**BRITISH
STEEL**



Tophat

Shaft guides for mining
applications

BUILDING STRONGER FUTURES

British Steel's tophat shaft guides offer a high-quality, cost-effective hoisting system for use in vertical mineshafts. They're designed to give maximum productivity and service life in modern deep mine operations.



Hoisting benefits

Superior dimensional control and straightness make for a smoother, faster lift with better stability allowing greater hoisted mass.



Reduced maintenance

An open structure permits easy access for simpler and safer inspection. Greater wall thickness delivers both stability and anti-corrosion benefits.



Quick and easy installation

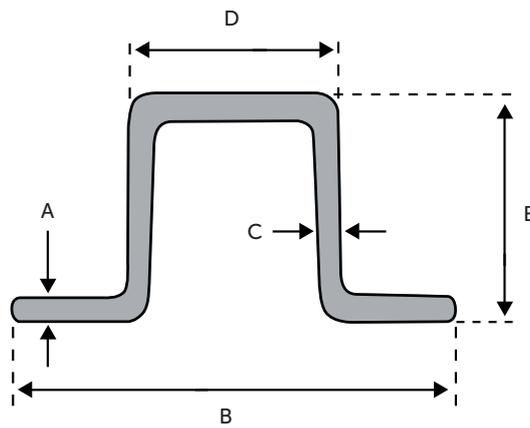
Double-sided access allows quicker, simpler and cheaper installation.



Longer lifespan

With the potential to last more than 3 times longer than alternative solutions, tophat shaft guides offer significantly extended service life, which can cover the entire lifespan of the mine without the need for major refurbishment or replacement.

Standard dimensions



| Size | Weight | Modulus I _{xx} (cm ⁴) | A (mm) | B (mm) | C (mm) | D (mm) | E (mm) |
|-------------|-----------|---|--------|--------|--------|--------|--------|
| 232 x 98mm* | 45.27kg/m | 671 | 16 | 232 | 13.4 | 152 | 98 |
| 305 x 102mm | 55.07kg/m | 997 | 12.7 | 305 | 15.9 | 152 | 102 |
| 320 x 150mm | 71.39kg/m | 2815 | 13.5 | 320 | 18 | 150 | 150 |
| 340 x 175mm | 85.94kg/m | 4392 | 15 | 340 | 20 | 175 | 175 |

*Available under licence from Robor, contact us for more information

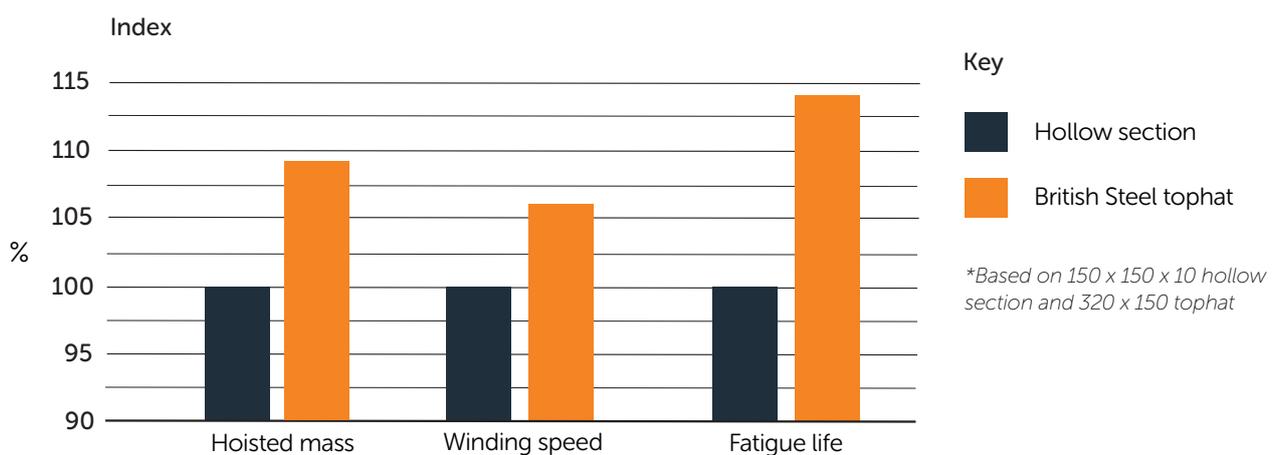
All 4 sizes offered with dimensions as follows:

- Straightness 5mm max over 12m length
- Twist 3mm max (typical < 1mm)
- Shaft guides are available in lengths from 6-17m, with a cutting tolerance of +100/-0mm
- Cold sawn lengths are also available to suit individual requirements, with a +0/-2mm cutting tolerance

Standard steel grades:

- EN 10025-2: 2004, S355JR+AR, S355J2+AR
- SANS 50025-2: 2009, S355JR+AR, S355J2+AR
- CSA G40.21-04: 2004, 300W, 350W, 350WT
- AS/NZS 3679.1: Grade 350

Relative performance



- The chart shows the superior performance of tophat shaft guides relative to other guide rail sections on 3 different factors
- The analysis is based on the dynamic forces applied to the shaft steelwork in the plane of the guides only
- Graph assumes all guide sections are used with the same bunton spacing (i.e. shaft pocket spacing is already fixed)

Technical data

232x98mm (45.27kg/m) – SANS 50025:2 S355JR+AR

| | | Centroid | Centre of mass |
|--------------|---------|----------------|----------------|
| Perimeter | 771.917 | X:116.165 | X:116.165 |
| Surface area | 5773.66 | Y:54.6141 | Y:54.6141 |
| Mass | 45.2805 | Z:-1.0599e-019 | Z:-1.0599e-019 |

| | | Moments of inertia | Products of inertia |
|----------------|--|--------------------|---------------------|
| Centre of mass | | X:55768.9 | XY:-30.0664 |
| | | Y:212574 | XZ:1.40654e-020 |
| | | Z:4268343 | YZ:-5.64846e-018 |

| Principal moments | Principal directions | | |
|-------------------|----------------------|----------|-----------|
| X:55768.9 | 1.000000 | 0.000912 | 0.000000 |
| Y:212574 | 0.000912 | 1.000000 | -0.000000 |
| Z:268343 | -0.000000 | 0.000000 | 1.000000 |

| Radii of gyration | X | 35.0946 |
|-------------------|---|---------|
| | Y | 68.5172 |
| | Z | 76.892 |

305x102mm (55.1kg/m) – SANS 50025:2 S355JR+AR

| | | Centroid | Centre of mass |
|--------------|---------|-----------------|-----------------|
| Perimeter | 941.042 | X:152.36 | X:152.36 |
| Surface Area | 7016.53 | Y:50.7022 | Y:50.7022 |
| Mass | 55.0278 | Z:-1.62353e-014 | Z:-1.62353e-014 |

| | | Moments of inertia | Products of inertia |
|----------------|--|--------------------|---------------------|
| Centre of mass | | X:78195.5 | XY:82.3751 |
| | | Y:343178 | XZ:9.9699e-014 |
| | | Z:421374 | YZ:1.43119e-012 |

| Principal moments | Principal directions | | |
|-------------------|----------------------|-----------|----------|
| X:78195.5 | 1.000000 | 0.000311 | 0.000000 |
| Y:343178 | -0.000311 | 1.000000 | 0.000000 |
| Z:421374 | -0.000000 | -0.000000 | 1.000000 |

| Radii of gyration | X | 37.6964 |
|-------------------|---|---------|
| | Y | 78.9712 |
| | Z | 87.507 |

320x150mm (71.39kg/m) – SANS 50025:2 S355JR+AR

| | | Centroid | Centre of mass |
|--------------|---------|-----------------|-----------------|
| Perimeter | 1140.91 | X:159.968 | X:159.968 |
| Surface Area | 9046.97 | Y:74.9227 | Y:74.9227 |
| Mass | 70.9517 | Z:-4.78417e-014 | Z:-4.78417e-014 |

| | Moments of inertia | Products of inertia |
|----------------|--------------------|---------------------|
| Centre of mass | X:220763 | XY:136.929 |
| | Y:448707 | XZ:-4.44512e-013 |
| | Z:669470 | YZ:4.48865e-011 |

| Principal moments | Principal directions | | |
|-------------------|----------------------|-----------|-----------|
| X:220763 | 1.000000 | 0.000601 | -0.000000 |
| Y:448707 | -0.000601 | 1.000000 | 0.000000 |
| Z:669470 | 0.000000 | -0.000000 | 1.000000 |

| Radii of gyration | X | 55.7804 |
|-------------------|---|---------|
| | Y | 79.5243 |
| | Z | 97.1369 |

340x175mm (85.94kg/m) – SANS 50025:2 S355JR+AR

| | | Centroid | Centre of mass |
|--------------|---------|------------|----------------|
| Perimeter | 1273.97 | X:170.000 | X:170.000 |
| Surface Area | 1107.68 | Y:-89.1562 | Y:-89.1562 |
| Mass | 85.94 | - | - |

| | Moments of inertia | Products of inertia |
|----------------|--------------------|---------------------|
| Centre of mass | X:46099753.6 | XY:0.0000 |
| | Y:83962559.1 | - |
| | - | - |

| Principal moments | Principal directions | | |
|-------------------|----------------------|----------|---|
| X:46099753.6 | 1.000000 | 0.000000 | - |
| Y:83962559.1 | 0.000000 | 1.000000 | - |
| - | - | - | - |

| Radii of gyration | X | 64.4225 |
|-------------------|---|---------|
| | Y | 86.9423 |
| | - | - |



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SPTH:ENG:092018