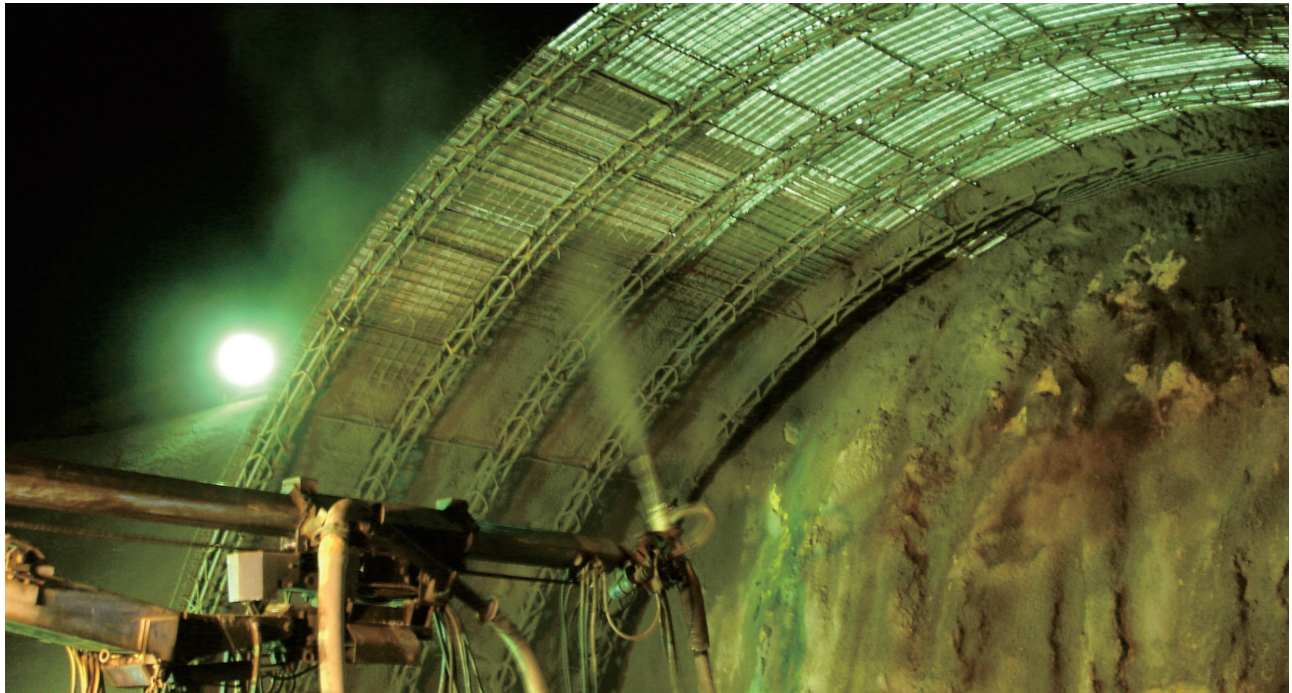


# DYWIDAG Steel Support Solutions



## KEY FEATURES

- Active and passive support systems for the excavated cross section
- Profile template for the excavation geometry
- Bearing for pre-support elements

## MAIN BENEFITS

- Immediate support in the excavation area
- Utilization as a true-to-form template for shotcrete application
- Easy and quick assembling, simple handling
- Optimum bond and interconnection with the shotcrete lining
- Simple adjustment and shaping to the excavation geometry
- Ideal bearing for spiles and lagging boards
- Spiles may be installed both above or through the lattice girders

**DYWIDAG Steel Support Solutions portfolio is designed to stabilize excavation works by providing with systematic roof support made of stiff and flexible steel arch profiles from different geometries.**

Used as immediate support systems in tunneling construction, DYWIDAG Steel Support Solutions provide the same mechanical characteristics as the traditional H-beam profiles, while mitigating their defects. They indeed allow combination of the shotcrete lining with steel profiles into an uniform RC structure, generating fastest bearing capacity gains and improvement of water-tightness for the whole structure.

## Applications:

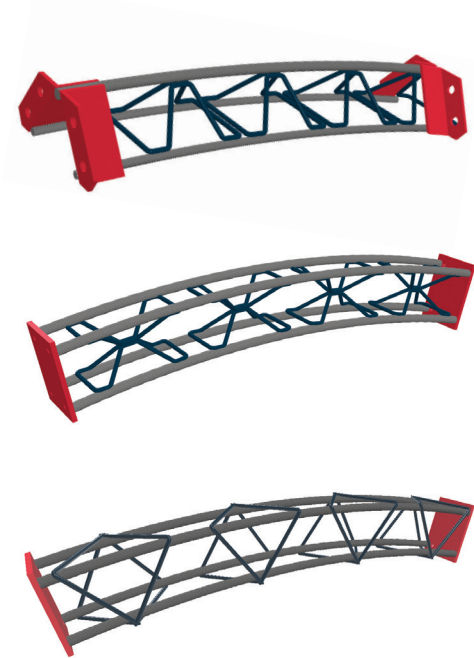
- Tunnel ribs
- Shaft rings and breakout structures
- Mine sets and overcasts
- Steel lagging
- SEM/NATM works
- Bearing for pre-support elements

DYWIDAG Lattice Girders

System Description

Used as passive support systems in tunneling construction, DYWIDAG Lattice Girders provide the same mechanical characteristics as the traditional H-beam profiles, while mitigating their defects. DYWIDAG Lattice girders indeed allow combination of the shotcrete lining with steel profiles into an uniform RC structure, generating fastest bearing capacity gains and improvement of water-tightness for the whole structure.

DYWIDAG Lattice Girders are made of high-strength round bars; thus, in comparison to conventional H-beam profiles, they weight much less for same loading capacity, making the installation and handling work faster and easier.



3-Bar Lattice girders

- Connectors: Spiders
- Height: H1 from 50mm - 130mm

4-Bar Lattice Girders

- Connectors: Butterfly - Connectors are assembled by 2 spiders
- Height: H1 from 100mm - 260mm

4-Bar Cage Design Lattice Girders

- Connectors design idea : reinforcing bars are spirally fixed as cages with rectangular section
- Height: H for 150mm & 200mm

Material standards for main components

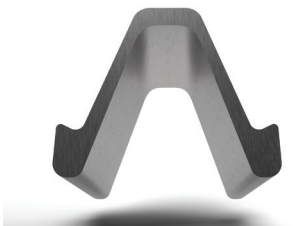
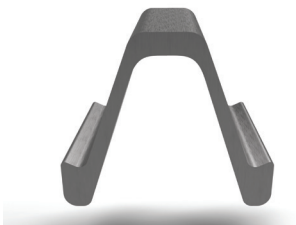
Components	Material	Standards
Main & Secondary Bars	Smooth reinforced steel	ASTM A615/A615M Gr.75
		BS B4449 B500B or equivalent
Connectors (spider)	Smooth reinforced steel	ASTM A615/A615M Gr.60
		BS B4449 B400B or equivalent
Link Bars	Round steel bar	EN 10025-2 S235 or JIS G3101 SS400
Connection and base plates	Standard or elephant foot	EN 10025-2 S235 or JIS G3101 SS400
Screw Bolt	Steel	Standard grade 8.8 (EN ISO 898-1) or ASTM A325
Screw Nut	Steel	ASTM A194
Welding: AWS A5.28 ER80S-G		

The main components include: main bars, secondary bars, connectors (spider), connection and base plates, bolts, and nuts.

DYWIDAG TH-Profile Systems

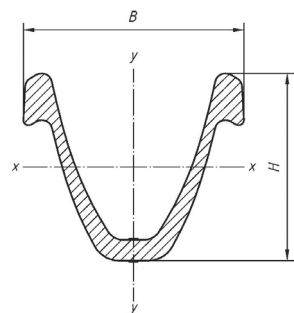
Because steel profiles are efficient and safe ground control elements in Tunneling, DYWIDAG TH-Profile Systems are an interesting active solution for excavations where squeezing ground conditions are in place. The connection method of the DYWIDAG TH-Profiles rests in the principle of sliding each component one to another. The profile joints design allows optimal fit and thus ensure an easy and quick erection of the arch - DYWIDAG TH-Profile are ideal when a 360° circular support is needed.

System Description



- Mine support steel 31Mn4 according to DIN 21544
- Cold-bent to the corresponding geometry design
- Single overlapping segments are usually connected by two locks
- Alternative DYWIDAG TH-Profile locks are available on request
- Additional parts such as straight beams, forepoling sheets, and steel lagging can also be fabricated on request
- DYWIDAG TH-Profile Systems are available in 2 types :  
AR (As Rolled) and QT (Quenched and Tempered)

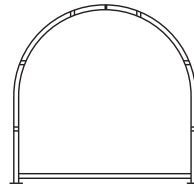
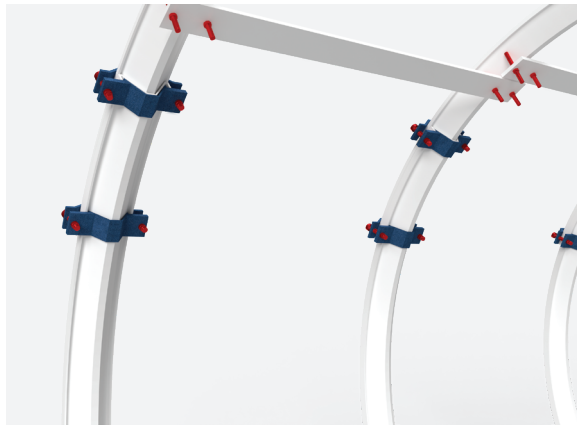
Technical standards



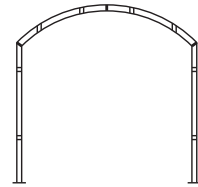
Technical standards as per DIN 21530

Characteristic Value/Type	Symbol	Unit	TH-21	TH-25	TH-29	TH-36	TH-44
Nominal Weight	m	Kg/m	20,9	25,0	29,0	35,9	43,7
Profile Height	H	mm	108	118	124	138	147,8
Profile Width	B	mm	127	136	150	171	172
Wy	y-y	cm³	64,0	82,0	106,0	146,0	181,0
Wx	x-x	cm³	60,0	74,0	93,7	128,0	165,0

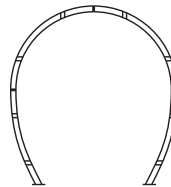
## Various application designs



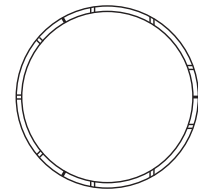
Horseshoe with optional  
invert strut design (2 pcs)



Modified horseshoe  
design (4 pcs)



Horseshoe design (4 pcs)



360° Circular design (3 pcs)



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