

# OPEN-DIE MACHINED FORGINGS

## SPECIFICATION SHEET



### 📌 Description

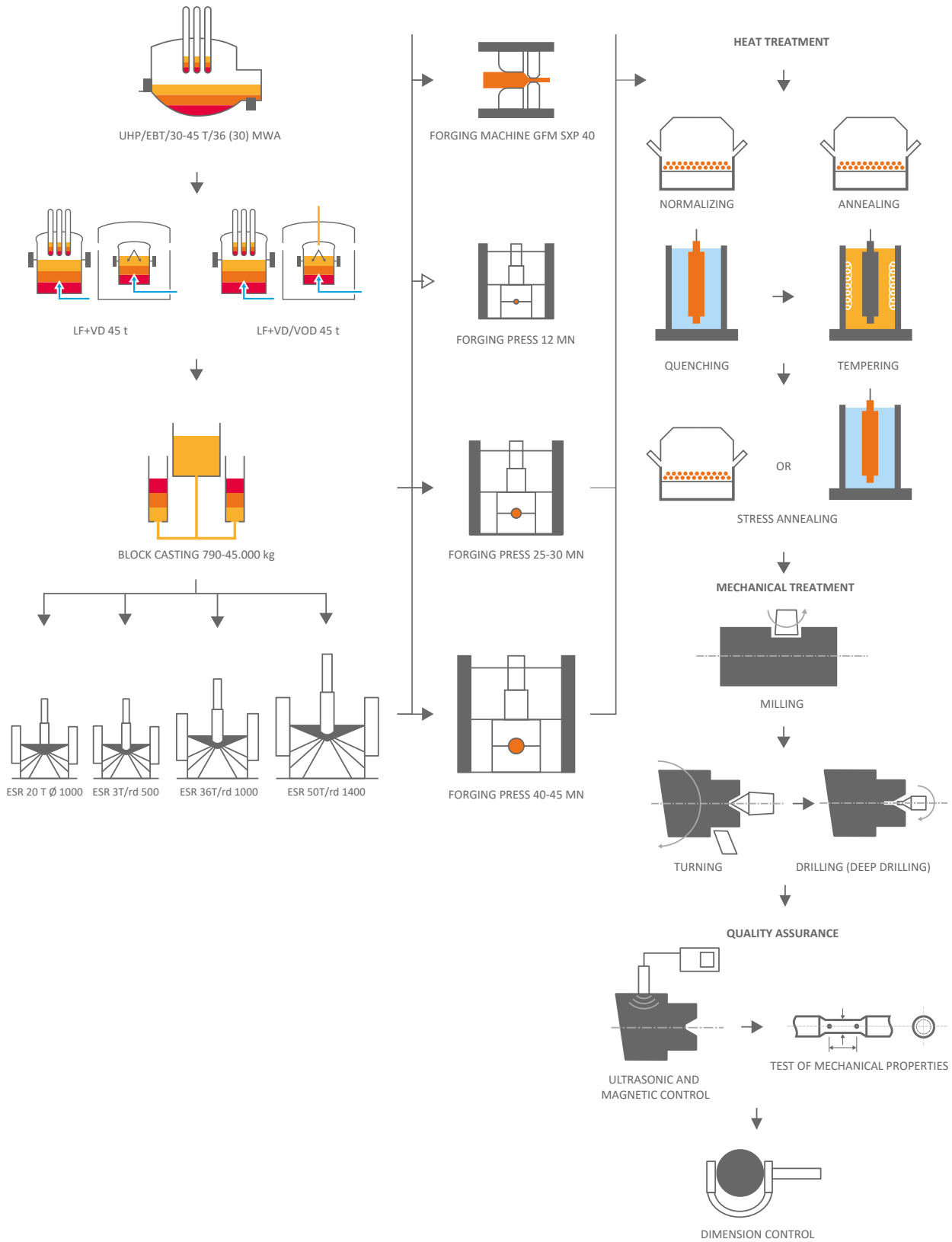
Open-die machined forgings are a special part of SIJ Metal Ravne production program. Their aim is to improve the quality of products. Better quality means a more homogeneous microstructure and better mechanical properties. All open-die forgings can be subjected to heat treatment (normalizing, soft annealing, hardening & tempering, quenching, etc.) and machining by turning, milling, drilling, etc. Our staff is highly skilled working on advanced quality testing equipment (US, hardness, MT, test of mechanical properties, microstructure, etc.). Machined forgings produced by SIJ Metal Ravne include rolls, shafts, mandrels and sleeves. The advantages of machined forgings are shared by both customer as well as producer:

- more accurate US analysis,
- surface free of any defects,
- elimination of dimensional deviations,
- no problems with storage of cut material on the side of customer.

### 📌 SIJ Metal Ravne is recognized for:

- modern facilities: steel plant, forging shop, heat treatment shop, machining shop,
- high level of flexibility,
- skilled employees,
- technological excellence,
- an excellent and strong technical support for each customer,
- dedication to best grades of quality,
- 400 years of experience and knowledge in steel production.

## Production process



## ▾ DIMENSIONAL RANGE

## Rolls, axles, shafts

max. dia.	1000 mm (39.37")
max. length	10000 mm (32.8 ft)
max. weight	20000 kg (44.93 lbs)



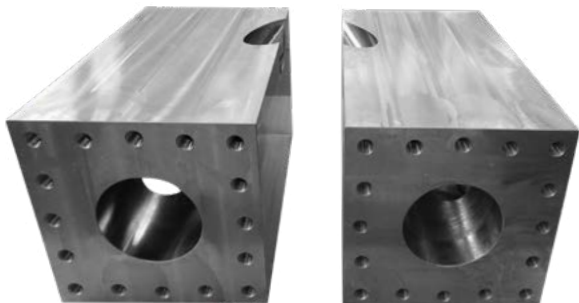
## ▾ GRADE RANGE

SINOXX<sup>™</sup>SIQUAL<sup>™</sup>SIMOLD<sup>™</sup>SITHERM<sup>™</sup>SIHARD<sup>™</sup>

## ▾ APPLICATION AREAS

- Mechanical engineering (rolls)
- Hot-forming rolls ( for steel, aluminium, aluminium foil)
- Automotive ( dies, frames)
- Shipbuilding industry ( shafts, stabilizers)
- Metallurgical industry ( tools, mandrels, extrusion sleeves)
- Metalworking industry (sleeves, rings for cutting dies)
- Energy industry ( turbine shaft housing, sealing rings, shafts)
- Oil&gas industry ( tubes, connectors)
- Graphic industry (rolls for newspaper printing)

➤ APPLICATION AREAS



**SIQUAL** 6566

**MECHANICAL ENGINEERING:**  
Bearing element of a roof construction

Dim.: 400 × 400 × 616 mm (15.75" × 15.75" × 2.02 ft)



**SITHERM** 2362

**HOT-FORMING ROLLS:**  
Rolls for aluminium foil

Dim.: D340 × 2450 mm (13.58" × 8.04 ft)



**SIQUAL** 6580

**MINING INDUSTRY:**  
Gear

Dim.: D352 × 1885 mm (13.85" × 6.18 ft)



**SIHARD** 2379

**METALLURGICAL INDUSTRY:**  
Sleeves for sandblasting machines

Dim.: D232/175 × 2030 mm (9.13/6.88" × 6.66 ft)



**SITHERM** 2714

**METALWORKING INDUSTRY:** Support dies  
of a machine for welded tube production)

Dim.: 600 × 480 × 1320 mm (23.62" × 18.90" × 4.32 ft)



**SINOXX** 4923

**METALWORKING INDUSTRY:**  
Elements of a winding machine for sheet metal

Dim.: 530 × 265 × 2525 mm (20.86" × 10.43" × 8.28 ft)



**SIHARD** 2379

METALWORKING INDUSTRY:  
Sleeve for metal knives

Dim.: D865/470 × 850 mm (34.05"/18.5" × 2.788 ft)

**SITHERM** 2343

METALWORKING INDUSTRY:  
Sleeve for metal knives

Dim.: D950/450 × 1300 mm (37.4"/17.7" × 4.26 ft)



**SINOXX** 4021

ENERGY INDUSTRY:  
Sleeves for sealing rings

Dim.: D450/370 × 350 mm (17.71"/14.56" × 1.14 ft)



**SINOXX** 4923

ENERGY INDUSTRY:  
Valve spindle

Dim.: D700 × 1620 mm (27.56" × 5.31 ft)



**SINOXX** 4903

ENERGY INDUSTRY:  
Inlet stub

Dim.: D820/540 × 1205 mm (D32.28"/ 21.26" × 3.95 ft)



**SINOXX** 4006

GRAPHIC INDUSTRY:  
Rolls for printing machines

Dim.: D400 × 2550 mm (15.74" × 8.36 ft)

### ➤ Most frequently used grades

SIJ	W.Nr.	EN	AISI/ ASTM	DIN	Typical Chemical Composition (wt %)							
					C	Si	Mn	Cr	Ni	Mo	V	other
SIQUAL 3505	1.3505	100Cr6	52100	100Cr6	1.00	0.25	0.35	1.50		max. 1		
SIQUAL 6545	1.6545		8630H	30NiCrMo2-2	0.30	0.25	0.80	0.50	0.50	0.20		
SIQUAL 6566	1.6566	17NiCrMo6-4	SAE 4621H		0.17	max. 0.4	0.75	0.95	1.35	0.20		
SIQUAL 6580	1.6580	30CrNiMo8			0.30	max. 0.4	0.65	2.00	2.00	0.40		
SIQUAL 6582	1.6582	34CrNiMo6	4337/4340		0.34	max. 0.4	0.65	1.50	1.50	0.25		
SIQUAL 6981	1.6981			21CrMoNiV4-7	0.21	0.25	0.65	1.05	0.50	0.75	0.30	
SIQUAL 7218	1.7218	25CrMo4	4130		0.25	max. 0.4	0.75	1.10		0.20		
SIQUAL 7225	1.7225	42CrMo4	4142		0.42	max. 0.4	0.75	1.10		0.20		
SIQUAL 8159	1.8159	51CrV4	6145/6150		0.51	max. 0.4	0.90	1.05			0.20	
SIQUAL S130			~4340		0.40	0.20	0.70	0.80	1.90	0.25		
SIMOLD 2312	1.2312			40CrMnMoS8-6	0.40	0.40	1.50	1.90		0.20		
SIHARD 2327	1.2327			86CrMoV7	0.86	0.20	0.35	1.80		0.30	0.10	
SIHARD 2360	1.2360			X48CrMoV8-1-1	0.48	0.80	0.40	7.50		1.40	1.40	
SIHARD 2379	1.2379	X153CrMoV12	D2	X155CrVMo12-1 †	1.53	0.45	0.40	12.00		0.85	0.85	
SIHARD 2767	1.2767	45NiCrMoV16		X45NiCrMo4 †	0.45	0.25	0.35	1.35	4.00	0.25		
SIHARD 2375	1.2375			83CrMoV9	0.83	0.30	0.30	2.25		0.25	0.10	
SIHARD R243					0.75	0.30	0.65	3.00	max. 0.25	0.50	0.10	
SIHARD R350					0.80	0.80	0.30	5.00	max. 0.25	0.30	max. 0.05	
SITHERM 2343	1.2343	X37CrMoV5-1	H11	X38CrMoV5-1 †	0.37	1.00	0.35	5.20		1.30	0.40	
SITHERM 2344	1.2344	X40CrMoV5-1	H13		0.40	1.00	0.40	5.20		1.35	1.00	
SITHERM 2362	1.2362			X63CrMoV5-1	0.63	1.10	0.45	5.25		1.15	0.30	
SITHERM 2714	1.2714	55NiCrMoV7		56NiCrMoV7 †	0.55	0.25	0.75	1.00	1.65	0.45	0.10	
SINOXX 4006	1.4006	X12Cr13	410	X 10 Cr 13 †	0.12	max. 1	max. 1.5	12.50	max. 0.75			
SINOXX 4021	1.4021	X20Cr13	420		0.20	max. 1	max. 1.5	13.00				
SINOXX 4903	1.4903	X10CrMoVNb9-1	A213/P91		0.10	0.35	0.45	9.00	max. 0.4	0.95	0.20	Nb: 0.08; N: 0.05
SINOXX 4923	1.4923	X22CrMoV12-1		X21CrMoNiV12-1 †	0.22	max.0.5	0.65	12.00	0.55	1.00	0.30	

### ➤ Disclaimer

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