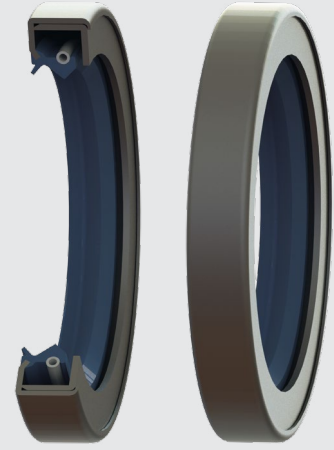


## STANDARD SHAFT SEALS

# TA2



### DESCRIPTION

The TA2 profile is a shaft seal composed of a single external metal cage with a metal reinforcement, a primary sealing lip with integrated spring and an additional anti-pollution lip.

### ADVANTAGES

Excellent radial rigidity, particularly for large diameters

Very good stability when assembled, preventing the bounce-back effect

Sealing for low and high viscosity fluids

Modern primary sealing lip with low radial forces

Protection against undesirable air contaminants

### APPLICATIONS

Shaft sealing

Engines

Pumps

Transmissions

### MATERIALS

#### Rubber

ACM 70 - 75 Shore A

EPDM 70 - 75 Shore A

FKM 70 - 75 Shore A

HNBR 70 - 75 Shore A

NBR 70 - 75 Shore A

#### Metal cage

Steel - AISI 1010

Stainless steel - AISI 304

Stainless steel - AISI 316

#### Spring

Steel - AISI 1070 - 1090

Stainless steel - AISI 316

### SEAL DESIGN

#### Tolerance for the outside diameter of the seal (ØD)

Bore diameter ØD1 (mm)	Apparent metal cage	Rubber coating	Coating with grooves
ØD1 ≤ 50.0	+0.10 / +0.20	+0.15 / +0.30	+0.20 / +0.40
50.0 < ØD1 ≤ 80.0	+0.13 / +0.23	+0.20 / +0.35	+0.25 / +0.45
80.0 < ØD1 ≤ 120.0	+0.15 / +0.25	+0.20 / +0.35	+0.25 / +0.45
120.0 < ØD1 ≤ 180.0	+0.18 / +0.28	+0.25 / +0.45	+0.30 / +0.55
180.0 < ØD1 ≤ 300.0	+0.20 / +0.30	+0.25 / +0.45	+0.30 / +0.55
300.0 < ØD1 ≤ 500.0	+0.23 / +0.35	+0.30 / +0.55	+0.35 / +0.65
500.0 < ØD1 ≤ 630.0	+0.23 / +0.35	+0.35 / +0.65	+0.40 / +0.75

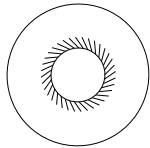
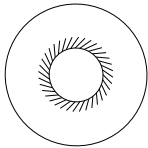
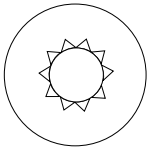
#### Roundness tolerance

Bore diameter ØD1 (mm)	Apparent metal cage	Rubber coating
ØD1 ≤ 50.0	0.18	0.25
50.0 < ØD1 ≤ 80.0	0.25	0.35
80.0 < ØD1 ≤ 120.0	0.30	0.50
120.0 < ØD1 ≤ 180.0	0.40	0.65
180.0 < ØD1 ≤ 300.0	0.25% of the outside diameter	0.80
300.0 < ØD1 ≤ 500.0	0.25% of the outside diameter	1.00
500.0 < ØD1 ≤ 630.0	-	-

#### Tolerance for the inside diameter of the seal (Ød)

Free and without constraint, the inside diameter of the sealing lip is always smaller than the diameter of the shaft. The pre-tightening or interference denotes the difference between these two values. Depending on the shaft diameter, the diameter of the sealing lip is generally considered to be less, between 0.8 and 3.5 mm.

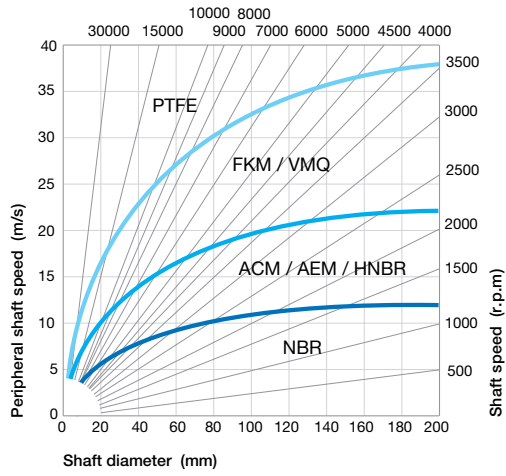
#### Pumping leads

Clockwise	Anti-clockwise	Bi-directional
		
R	L	H0

Other types of pumping leads can be created according to your specifications. Please contact our experts.

**TECHNICAL DATA**

**Speed**



The shaft seals with an additional protective lip are limited to a speed of 8 m/sec.

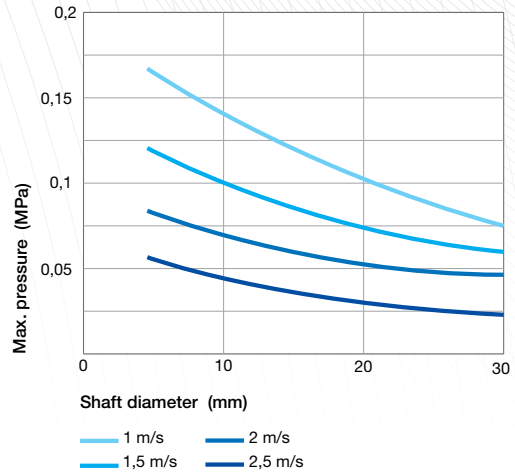
Linear speed calculation:

$$s \text{ (m/s)} = \frac{[\text{shaft } \varnothing \text{ (mm)} \times \text{speed (rpm)} \times \pi]}{60,000}$$

**Pressure**

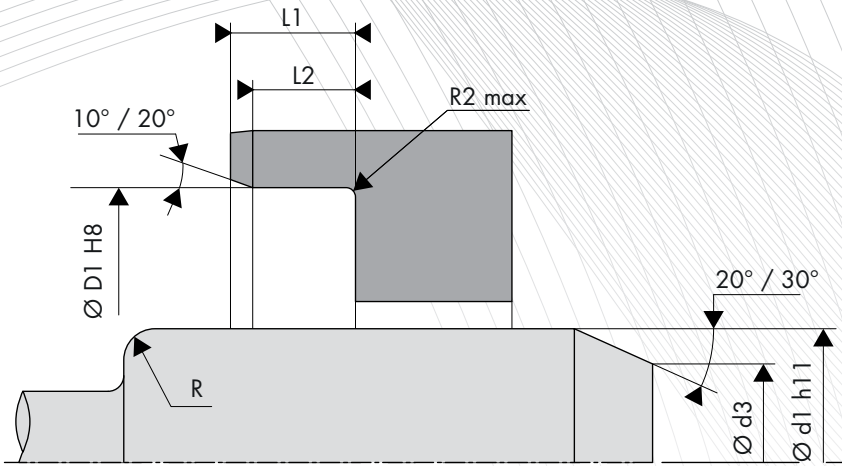
The standard shaft seals are generally used in unpressurised environments, or for pressures between 0.02 and 0.05 MPa maximum.

Higher pressures are acceptable, following testing, for standard NBR or FKM shaft seals used on a shaft of less than 30 mm.



**Temperature / Media**

Media		Maximum temperature depending on the materials						
		ACM	AEM	EPDM	FKM	HNBR	NBR	VMQ
Mineral oils	Oils for motors	+130°C	+130°C	-	+170°C	+130°C	+100°C	+150°C
	Oils for gearboxes	+120°C	+130°C	-	+150°C	+110°C	+80°C	+130°C
	Oils for hypoid gears	+120°C	+130°C	-	+150°C	+110°C	+80°C	-
	ATF oils	+120°C	+130°C	-	+170°C	+130°C	+100°C	-
	Hydraulic oils	+120°C	+130°C	-	+150°C	+130°C	+90°C	-
	Greases	-	+130°C	-	-	+100°C	+90°C	-
Fire-resistant fluids	HFA group - Emulsion with more than 80% water	-	-	-	-	+70°C	+70°C	+60°C
	HFB group - Opposite solution (water in oil)	-	-	-	-	+70°C	+70°C	+60°C
	HFC group - Polymer aqueous solution	-	-	+60°C	-	+70°C	+70°C	-
	HFD group - Water-free synthetic fluids	-	-	-	+150°C	-	-	-
Other fluids	EL + L heating oil	-	-	-	-	+100°C	+90°C	-
	Air	+150°C	+150°C	+150°C	+200°C	+130°C	+100°C	+200°C
	Water	-	-	+150°C	+100°C	+100°C	+90°C	-
	Water for washing	-	-	+130°C	+100°C	+100°C	+90°C	-
Temperature range	Min.	-25°C	-40°C	-45°C	-20°C	-30°C	-30°C	-60°C
	Max.	+150°C	+150°C	+150°C	+200°C	+150°C	+100°C	+200°C



## SHAFT DESIGN

### Shaft hardness

Rotation speed	Hardness in HRC
$s \leq 4.0$ m/sec	45 HRC
$4.0 < s \leq 10.0$ m/s	55 HRC
$s > 10.0$ m/sec	60 HRC

### Surface roughness

Ra *	0.2 to 0.8 $\mu\text{m}$
Rz	1.0 to 4.0 $\mu\text{m}$
Rmax	$\leq 6.3$ $\mu\text{m}$

\*Ra = 0.1  $\mu\text{m}$  for demanding applications

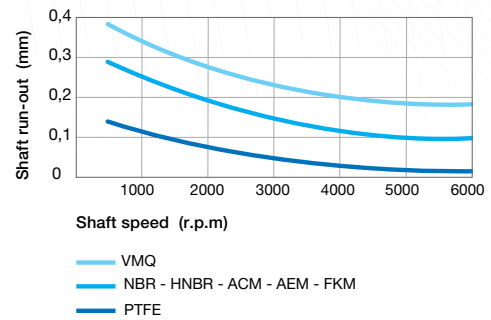
### Shaft tolerance

Shaft diameter $\varnothing d1$ (mm)	Tolerance h11 (mm)
$\varnothing d1 \leq 3.0$	-0.060 / 0
$3.0 < \varnothing d1 \leq 6.0$	-0.075 / 0
$6.0 < \varnothing d1 \leq 10.0$	-0.090 / 0
$10.0 < \varnothing d1 \leq 18.0$	-0.110 / 0
$18.0 < \varnothing d1 \leq 30.0$	-0.130 / 0
$30.0 < \varnothing d1 \leq 50.0$	-0.160 / 0
$50.0 < \varnothing d1 \leq 80.0$	-0.190 / 0
$80.0 < \varnothing d1 \leq 120.0$	-0.220 / 0
$120.0 < \varnothing d1 \leq 180.0$	-0.250 / 0
$180.0 < \varnothing d1 \leq 250.0$	-0.290 / 0
$250.0 < \varnothing d1 \leq 315.0$	-0.320 / 0
$315.0 < \varnothing d1 \leq 400.0$	-0.360 / 0
$400.0 < \varnothing d1 \leq 500.0$	-0.400 / 0

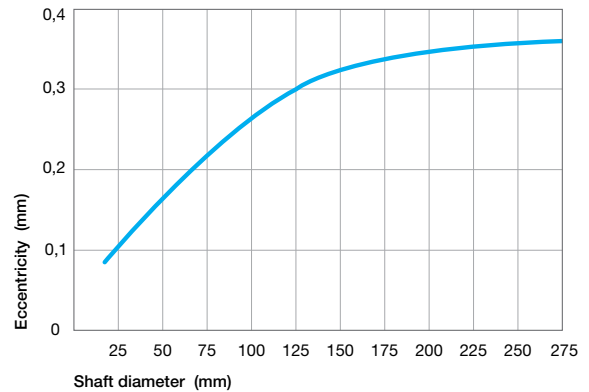
### Chamfer and radius

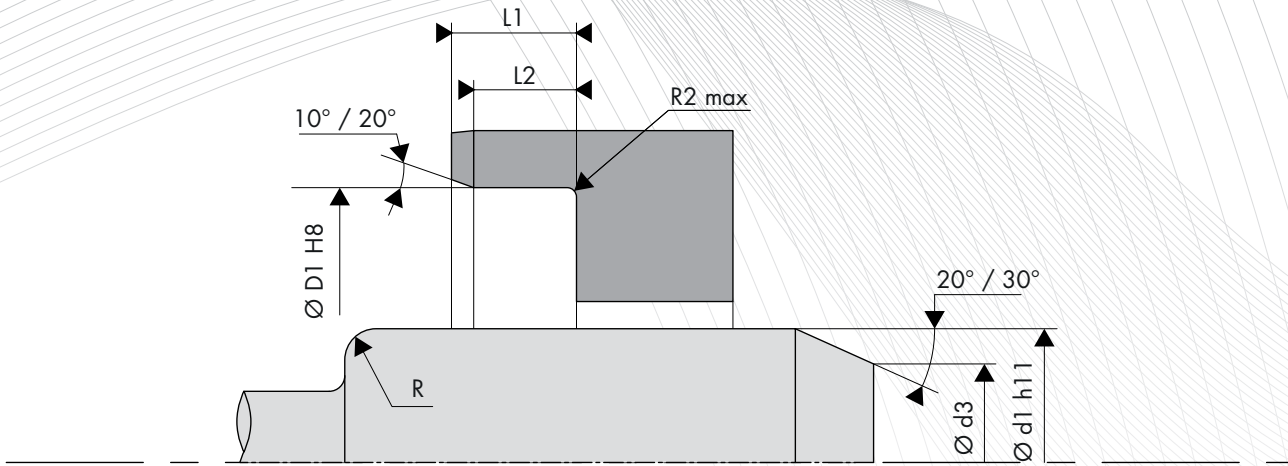
Shaft diameter $\varnothing d1$ (mm)	Chamfer diameter $\varnothing d3$ (mm)	Radius R (mm)
$\varnothing d1 \leq 10.0$	$\varnothing d1 - 1.50$	2.00
$10.0 < \varnothing d1 \leq 20.0$	$\varnothing d1 - 2.00$	2.00
$20.0 < \varnothing d1 \leq 30.0$	$\varnothing d1 - 2.50$	3.00
$30.0 < \varnothing d1 \leq 40.0$	$\varnothing d1 - 3.00$	3.00
$40.0 < \varnothing d1 \leq 50.0$	$\varnothing d1 - 3.50$	4.00
$50.0 < \varnothing d1 \leq 70.0$	$\varnothing d1 - 4.00$	4.00
$70.0 < \varnothing d1 \leq 95.0$	$\varnothing d1 - 4.50$	5.00
$95.0 < \varnothing d1 \leq 130.0$	$\varnothing d1 - 5.50$	6.00
$130.0 < \varnothing d1 \leq 240.0$	$\varnothing d1 - 7.00$	8.00
$240.0 < \varnothing d1 \leq 500.0$	$\varnothing d1 - 11.00$	12.00

### Shaft run out



### Eccentricity





## HOUSING DESIGN

### Surface roughness

Ra	0.8 to 3.2 $\mu\text{m}$
Rz	6.3 to 16.0 $\mu\text{m}$
Rmax	$\leq 16.0 \mu\text{m}$

### Housing tolerance

Bore diameter $\varnothing D1$ (mm)	Tolerance H8 (mm)
$3.0 < \varnothing D1 \leq 6.0$	0 / +0.018
$6.0 < \varnothing D1 \leq 10.0$	0 / +0.022
$10.0 < \varnothing D1 \leq 18.0$	0 / +0.027
$18.0 < \varnothing D1 \leq 30.0$	0 / +0.033
$30.0 < \varnothing D1 \leq 50.0$	0 / +0.039
$50.0 < \varnothing D1 \leq 80.0$	0 / +0.046
$80.0 < \varnothing D1 \leq 120.0$	0 / +0.054
$120.0 < \varnothing D1 \leq 180.0$	0 / +0.063
$180.0 < \varnothing D1 \leq 250.0$	0 / +0.072
$250.0 < \varnothing D1 \leq 315.0$	0 / +0.081
$315.0 < \varnothing D1 \leq 400.0$	0 / +0.089
$400.0 < \varnothing D1 \leq 500.0$	0 / +0.097
$500.0 < \varnothing D1 \leq 630.0$	0 / +0.110

### Housing radius and width

Height H1 (mm)	Width		Radius R2 max (mm)
	L2min (H1 x 0.85)	L1min (H1 x +0.3)	
7.00	5.95	7.30	0.50
8.00	6.80	8.30	
10.00	8.50	10.30	
12.00	10.30	12.30	0.70
15.00	12.75	15.30	
20.00	17.00	20.30	

## DIMENSIONS

Part number	Shaft diameter Ød1 h11	Bore diameter ØD1 H8	Seal height H1
TA2 17 x 30 x 8	17.00	30.00	8.00
TA2 26 x 42 x 10	26.00	42.00	10.00
TA2 27 x 62 x 12	27.00	62.00	12.00
TA2 28 x 38 x 8	28.00	38.00	8.00
TA2 28 x 47 x 8	28.00	47.00	8.00
TA2 29 x 50 x 10	29.00	50.00	10.00
TA2 29 x 52 x 10	29.00	52.00	10.00
TA2 32 x 60 x 10	32.00	60.00	10.00
TA2 36 x 50 x 7	36.00	50.00	7.00
TA2 38 x 52 x 7	38.00	52.00	7.00
TA2 38 x 58 x 8	38.00	58.00	8.00
TA2 40 x 52 x 7	40.00	52.00	7.00
TA2 40 x 70 x 10	40.00	70.00	10.00
TA2 41 x 53 x 7	41.00	53.00	7.00
TA2 42 x 62 x 12	42.00	62.00	12.00
TA2 42 x 65 x 12	42.00	65.00	12.00
TA2 43 x 54 x 6	43.00	54.00	6.00
TA2 45 x 65 x 10	45.00	65.00	10.00
TA2 45 x 70 x 13	45.00	70.00	13.00
TA2 47 x 65 x 12	47.00	65.00	12.00
TA2 48 x 62 x 7	48.00	62.00	7.00
TA2 48 x 62 x 8	48.00	62.00	8.00
TA2 48 x 65 x 12	48.00	65.00	12.00
TA2 50 x 65 x 8	50.00	65.00	8.00
TA2 50 x 68 x 8	50.00	68.00	8.00
TA2 50 x 68 x 9	50.00	68.00	9.00
TA2 50 x 70 x 7	50.00	70.00	7.00
TA2 50 x 72 x 8	50.00	72.00	8.00
TA2 50 x 73 x 9	50.00	73.00	9.00
TA2 50 x 75 x 9	50.00	75.00	9.00
TA2 50 x 76 x 13	50.00	76.00	13.00
TA2 50 x 90 x 13	50.00	90.00	13.00
TA2 55 x 80 x 10	55.00	80.00	10.00
TA2 58 x 75 x 12	58.00	75.00	12.00
TA2 60 x 74 x 10	60.00	74.00	10.00
TA2 60 x 80 x 10	60.00	80.00	10.00
TA2 60 x 85 x 16	60.00	85.00	16.00
TA2 60 x 110 x 13	60.00	110.00	13.00
TA2 62 x 80 x 10	62.00	80.00	10.00
TA2 62 x 90 x 12	62.00	90.00	12.00
TA2 65 x 88 x 12	65.00	88.00	12.00
TA2 65 x 90 x 13	65.00	90.00	13.00
TA2 66 x 85 x 8	66.00	85.00	8.00
TA2 68 x 88 x 9.5	68.00	88.00	9.50
TA2 68 x 90 x 10	68.00	90.00	10.00
TA2 68 x 92 x 10	68.00	92.00	10.00
TA2 70 x 90 x 10	70.00	90.00	10.00
TA2 70 x 90 x 12	70.00	90.00	12.00
TA2 70 x 92 x 12	70.00	92.00	12.00
TA2 70 x 110 x 13	70.00	110.00	13.00
TA2 72 x 100 x 13	72.00	100.00	13.00
TA2 72 x 105 x 13	72.00	105.00	13.00
TA2 75 x 95 x 13	75.00	95.00	13.00
TA2 75 x 100 x 13	75.00	100.00	13.00
TA2 75 x 105 x 10	75.00	105.00	10.00
TA2 75 x 105 x 12	75.00	105.00	12.00
TA2 75 x 105 x 13	75.00	105.00	13.00
TA2 75 x 108 x 13	75.00	108.00	13.00
TA2 78 x 108 x 13	78.00	108.00	13.00
TA2 80 x 100 x 12	80.00	100.00	12.00
TA2 80 x 100 x 13	80.00	100.00	13.00
TA2 80 x 108 x 13	80.00	108.00	13.00
TA2 80 x 110 x 13	80.00	110.00	13.00
TA2 80 x 130 x 13	80.00	130.00	13.00

Part number	Shaft diameter Ød1 h11	Bore diameter ØD1 H8	Seal height H1
TA2 82 x 108 x 13	82.00	108.00	13.00
TA2 85 x 105 x 13	85.00	105.00	13.00
TA2 85 x 127 x 13	85.00	127.00	13.00
TA2 88 x 115 x 13	88.00	115.00	13.00
TA2 90 x 110 x 12	90.00	110.00	12.00
TA2 90 x 110 x 13	90.00	110.00	13.00
TA2 90 x 110 x 15	90.00	110.00	15.00
TA2 90 x 118 x 12	90.00	118.00	12.00
TA2 90 x 120 x 13	90.00	120.00	13.00
TA2 90 x 120 x 15	90.00	120.00	15.00
TA2 90 x 130 x 13	90.00	130.00	13.00
TA2 90 x 130 x 15	90.00	130.00	15.00
TA2 90 x 135 x 15	90.00	135.00	15.00
TA2 95 x 115 x 12	95.00	115.00	12.00
TA2 95 x 115 x 13	95.00	115.00	13.00
TA2 95 x 120 x 12	95.00	120.00	12.00
TA2 95 x 125 x 13	95.00	125.00	13.00
TA2 95 x 128 x 12.5	95.00	128.00	12.50
TA2 95 x 130 x 13	95.00	130.00	13.00
TA2 98 x 120 x 12	98.00	120.00	12.00
TA2 98 x 130 x 13	98.00	130.00	13.00
TA2 98 x 145 x 19	98.00	145.00	19.00
TA2 100 x 125 x 13	100.00	125.00	13.00
TA2 100 x 127 x 12	100.00	127.00	12.00
TA2 100 x 130 x 13	100.00	130.00	13.00
TA2 104 x 140 x 12	104.00	140.00	12.00
TA2 105 x 130 x 13	105.00	130.00	13.00
TA2 105 x 135 x 13	105.00	135.00	13.00
TA2 108 x 140 x 13	108.00	140.00	13.00
TA2 110 x 128 x 9	110.00	128.00	9.00
TA2 110 x 130 x 13	110.00	130.00	13.00
TA2 110 x 133 x 13	110.00	133.00	13.00
TA2 110 x 140 x 13	110.00	140.00	13.00
TA2 110 x 145 x 16	110.00	145.00	16.00
TA2 110 x 150 x 13	110.00	150.00	13.00
TA2 110 x 150 x 15	110.00	150.00	15.00
TA2 110 x 160 x 16	110.00	160.00	16.00
TA2 115 x 150 x 15	115.00	150.00	15.00
TA2 115 x 170 x 12	115.00	170.00	12.00
TA2 116 x 155 x 12	116.00	155.00	12.00
TA2 120 x 140 x 13	120.00	140.00	13.00
TA2 120 x 145 x 13	120.00	145.00	13.00
TA2 120 x 145 x 15	120.00	145.00	15.00
TA2 120 x 150 x 15	120.00	150.00	15.00
TA2 120 x 160 x 15	120.00	160.00	15.00
TA2 130 x 160 x 14	130.00	160.00	14.00
TA2 130 x 170 x 15	130.00	170.00	15.00
TA2 135 x 165 x 13	135.00	165.00	13.00
TA2 135 x 165 x 15	135.00	165.00	15.00
TA2 140 x 168 x 15	140.00	168.00	15.00
TA2 140 x 170 x 15	140.00	170.00	15.00
TA2 145 x 168 x 15	145.00	168.00	15.00
TA2 145 x 185 x 15	145.00	185.00	15.00
TA2 148 x 170 x 14.5	148.00	170.00	14.50
TA2 150 x 170 x 15	150.00	170.00	15.00
TA2 155 x 180 x 15	155.00	180.00	15.00
TA2 160 x 190 x 15	160.00	190.00	15.00
TA2 165 x 203 x 19	165.00	203.00	19.00
TA2 170 x 200 x 15	170.00	200.00	15.00
TA2 175 x 200 x 15	175.00	200.00	15.00
TA2 180 x 210 x 15	180.00	210.00	15.00
TA2 180 x 215 x 16	180.00	215.00	16.00
TA2 190 x 220 x 15	190.00	220.00	15.00
TA2 220 x 250 x 16	220.00	250.00	16.00