# Steam Traps and Monitoring Equipment

The right choice in every case


Engineering steam performance

# Best equipped
# with GESTRA steam traps

## Steam traps have to work perfectly

In industry, one of steam's most important tasks is to provide thermal energy through condensation, and to heat a variety of media in heat exchangers. During this process, the steam flows through pipes and cools down more and more en route, so that condensate forms here, too.

Condensate prevents the optimum transfer of heat, but also, in particular, leads to erosion and water hammer. To enable steam systems to work reliably and efficiently, steam traps discharge any condensate that builds up, while retaining the valuable steam to the greatest possible extent. How well steam traps perform has a considerable influence on:

- **the system's reliability**
- **availability and**
- **cost efficiency.**

To achieve the very best results here, it needs valves that satisfy all the different requirements in every respect.

## Flexible for different requirements

To heat water using steam, at times large quantities of condensate must be discharged as quickly as possible, so that drainage without banking-up can be guaranteed even if load and pressure are fluctuating.

If turbines or pipes with superheated steam are drained, only low condensate flowrates occur during operation. More condensate only forms on start-up. Here, the demand is for robustness, maintenance friendliness, durability and a regulator that closes reliably even at pressures above 200 barg.

## This is what sets GESTRA steam traps apart

For steam system operators, the cost of energy production is a key driver. Durable steam traps that work without loss of steam help to keep these costs as low as possible. What's more, they ensure reliable and safe operation.

For decades now, GESTRA steam traps have epitomised optimum energy efficiency and absolute reliability. They satisfy the most demanding quality requirements, and their compact and modular design makes them impressive in the field. In addition, they are very maintenance-friendly and extremely easy and convenient to use.

## Best quality for every need

At GESTRA you will find an extensive selection of functional types and versions to suit every requirement. In addition, we offer systems that enable you to reliably test and monitor your steam and condensate systems.

# How do I get my optimum steam trap?

We find the optimum steam trap for you, with the best efficiency. To achieve this, what matters most is keeping an eye on the decisive factors:

1. Requirements specific to your application
   - Saturated steam pipe
   - Superheated steam pipe
   - Steam-regulated heat exchanger
   - Unregulated heat exchanger or heating coil
   - Steam tracing where undercooling is required
   - Turbine drainage

2. System and equipment requirements
   - Pressure rating
   - Type of end connection, e.g. EN flange or socket weld end
   - Material of construction

3. Operating parameters
   - Pressure upstream from steam trap
   - Temperature upstream from steam trap
   - Pressure downstream from steam trap
   - Condensate flowrate
   - Start-up and shut-down cycles
   - Load changes

4. Additional options required
   - Monitoring
   - Dirt strainer
   - Drain valve and manual air vent
   - Manual vent valve
   - Bypass

## Online design software

We are happy to advise you on selecting, sizing and configuring the right steam trap for you. But first you can also use our CAESar design software. This shows you the best way to your perfect steam trap.

You can find the easy-to-use CAESar steam trap selection range on our homepage, www.gestra.com, under “Service & Support”.

# Steam traps with membrane regulator
# SMK series

## Thermostatic steam traps with minimum stagnant area for sterile and aseptic applications

For CIP (clean-in-place) and SIP (steam-in-place) processes, recognition of the phase, i. e. steam or water, and an adequate steam trap reaction time are crucial factors. The STERI*line* membrane regulators used in the SMK series react especially quickly to a change in temperature or a change in phase, due to their design, smaller surface area and low weight.

### Use

Extremely responsive steam trap – especially suitable for draining in:

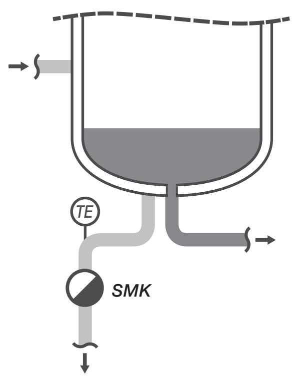
- The pharmaceutical industry
- Pure steam and ultrapure steam applications
- Clean-in-process (CIP)
- Steam-in-place (SIP) processes

### Advantages

- Fast and precise STERI*line* thermostatic capsule
- Achieves an almost constant system temperature
- Minimum stagnant area
- All parts in contact with medium are of high-quality stainless steel
- Design principle allows installation with few
  welded joints
- Functional unit can be replaced quickly and safely
- Optional short design with clamp connection

### Installation example

Sterile tank





*SMK 22*


*SMK 22-51*


*SMK 22-81, SMK 22-82*

# SMK 22 in detail:

## Fast acting regulator with minimum crevice body design for minimum stagnant area.

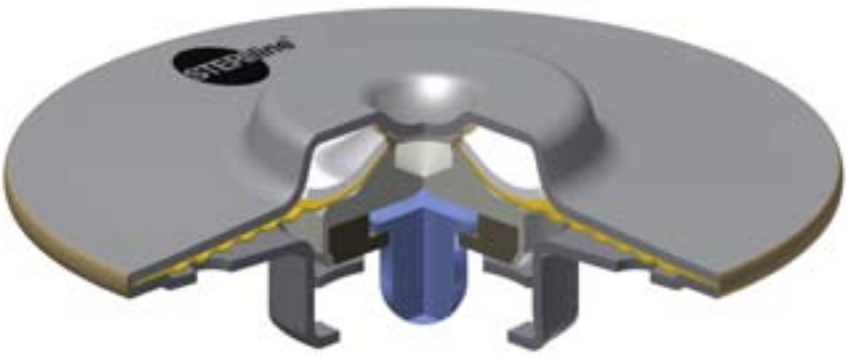
These traps work with the extremely responsive GESTRA STERI*line* thermostatic capsule. This ensures the steam traps can also perform drainage tasks with stringent requirements for high-quality control and a clean process. Condensate is discharged reliably and almost immediately.

### Key data

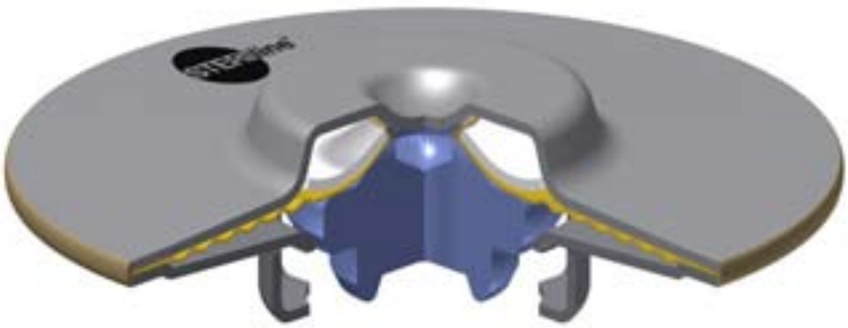
- DN 10–25 (NPS 3⁄8˝–1˝)
- PN 10
- Max. differential pressure: 6 bar
- Surface roughness: ≤ 0.8 µm
- GESTRA STERI*line* thermostatic capsule

### Options

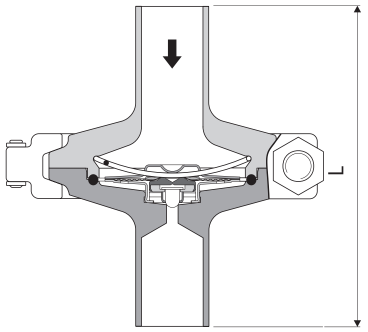
- Surface roughness ≤ 0.4 µm
- Various STERI*line* thermostatic capsules for small and large condensate flowrates
- Different end connections available, including clamp version for weld-free assembly



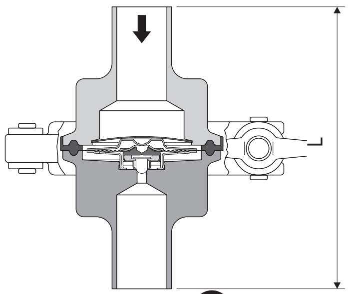
STERI*line 1 thermostatic capsule for small condensate flowrates*



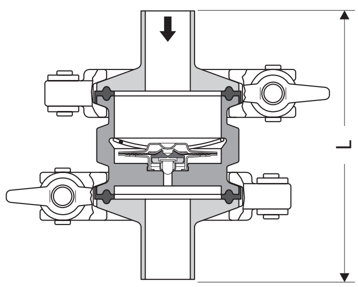
STERI*line 2 thermostatic capsule for large condensate flowrates*



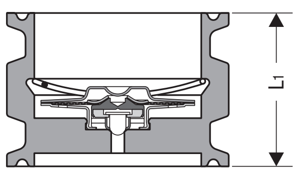

SMK 22, DN 15 STERIline®



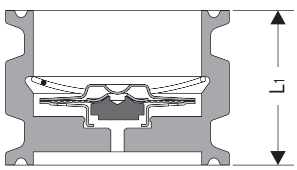

SMK 22-51 STERIline®




SMK 22-81, SMK 22-82 STERIline®




Functional unit SMK 22-81 STERIline®




Functional unit SMK 22-82 STERIline®

## Application

| Type | |
|---|---|
| **SMK 22**<br>STERIline® | **Virtually pocket-free**<br>For small and medium condensate flowrates. Internal surface roughness Ra ≤ 0.8 µm machine faced, optionally up to Ra ≤ 0.4 µm electropolished. |
| **SMK 22-51**<br>STERIline® | **Virtually pocket-free**<br>For small and medium condensate flowrates. Internal surface roughness Ra ≤ 0.8 µm machine faced, optionally Ra ≤ 0.6 µm plasma polished. |
| **SMK 22-81**<br>STERIline® | **Virtually pocket-free**<br>For small and medium condensate flowrates. Functional unit easy to exchange. Internal surface roughness Ra ≤ 0.8 µm machine faced, optionally Ra ≤ 0.6 µm plasma polished. |
| **SMK 22-82**<br>STERIline® | **Virtually pocket-free**<br>For medium and large condensate flowrates. Functional unit easy to exchange. Internal surface roughness Ra ≤ 0.8 µm machine faced, optionally Ra ≤ 0.6 µm plasma polished. |
| **Functional unit SMK 22-81**<br>STERIline® | **Virtually pocket-free**<br>For small and medium condensate flowrates. Internal surface roughness Ra ≤ 0.8 µm machine faced, optionally Ra ≤ 0.6 µm plasma polished.<br>Connection via socket for mounting between clamps DIN 32676-DN 40. |
| **Functional unit SMK 22-82**<br>STERIline® | **Virtually pocket-free**<br>For medium and large condensate flowrates. Internal surface roughness Ra ≤ 0.8 µm machine faced, optionally Ra ≤ 0.6 µm plasma polished.<br>Connection via socket for mounting between clamps DIN 32676-DN 40. |
| **SRK 22A** | **Virtually pocket-free**<br>Non-return valve for liquids, gases and steam.<br>Connection via socket for mounting between clamps DIN 32676. |

## Pressure/Temperature Ratings

| Type | PN / Class | ∆PMX | Material | | Pressure/Temp. Rating[1]) | | | |
|---|---|---|---|---|---|---|---|---|
| | | | EN | ASTM | PMA | TMA | p/T | |
| | | [bar] | | | [bar] | [°C] | [bar/°C] | |
| **SMK 22** | PN 10 | 6 | 1.4435 | A276 316L[2]) | 10.0 | 185[3]) | 10.0 / 20 | 6.0 / 185[3]) |
| **SMK 22-51** | PN 10 | 6 | 1.4404 | A182 316L[2]) | 10.0 | 185[3]) | 10.0 / 20 | 6.0 / 185[3]) |
| **SMK 22-81**<br>**SMK 22-82** | PN 10 | 6 | 1.4404 | A182-316L[2]) | 10.0 | 185[3]) | 10.0 / 20 | 6.0 / 185[3]) |
| **Functional unit SMK 22-81**<br>**SMK 22-82** | PN 10 | 6 | 1.4404 | A182-316L[2]) | 10.0 | 185[3]) | 10.0 / 20 | 6.0 / 185[3]) |
| **SRK 22A** | PN 10 | – | 1.4408 / 1.4571 | A351 CF8M / AISI316Ti | 10.0 | 185[3]) | 10.0 / 20 | 6.0 / 185[3]) |

**1) Limits for body/cover. Functional requirements may restrict the use to below the limits quoted.**
**For full details on limiting conditions depending on end connection and type of regulator see data sheet.**

**2) ASTM nearest equivalent is stated for guidance. Physical and chemical properties comply with EN.**

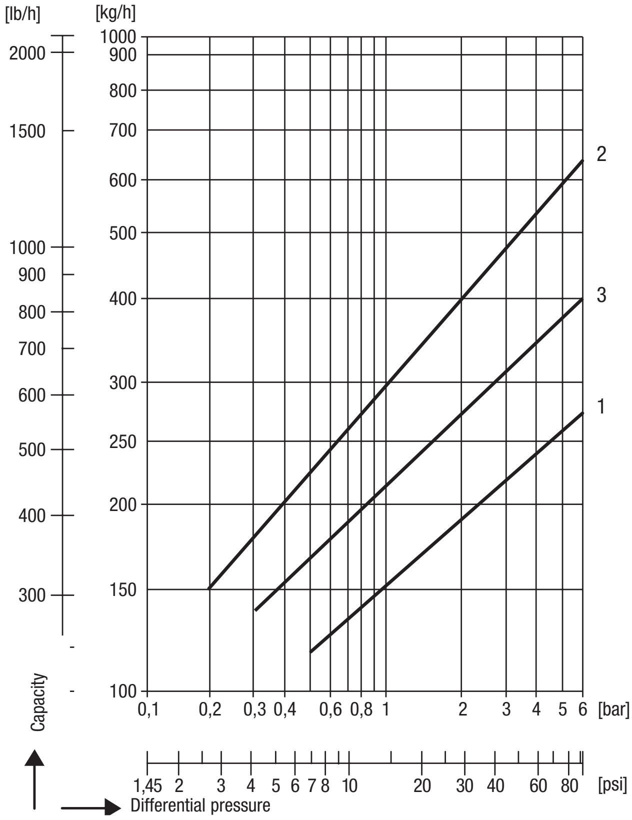
**3) 185 °C with PTFE gasket, 150 °C with EPDM gasket.**

## Available End Connections and Overall Length

| Type | Connections | Overall length (L) in mm | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | DN 10 3/8" | DN 15 1/2" | DN 20 3/4" | DN 25 1" | DN 32 1 1/4" | DN 40 1 1/2" | DN 50 2" |
| **SMK 22** | Butt-weld ends<br>Clamp | 83<br>65 | 83<br>65 | 83<br>65 | 83<br>65 | – | – | – |
| **SMK 22-51** | Butt-weld ends<br>Clamp | 90<br>65 | 90<br>65 | 90<br>65 | 90<br>65 | – | – | – |
| **SMK 22-81** | Butt-weld ends | 96 | 96 | 96 | 96 | – | – | – |
| **Functional unit SMK 22-81**<br>**SMK 22-82** | Socket for mounting between clamps DIN 32676-DN 40 L1 standard | – | – | – | 35 | – | – | – |
| **SRK 22A** | Socket for mounting between clamps DIN 32676 | – | 23 | 29.5 | 33.5 | 38 | 43 | 54 |

## Capacity Charts

### SMK 22, SMK 22-51, SMK 22-81, SMK 22-82



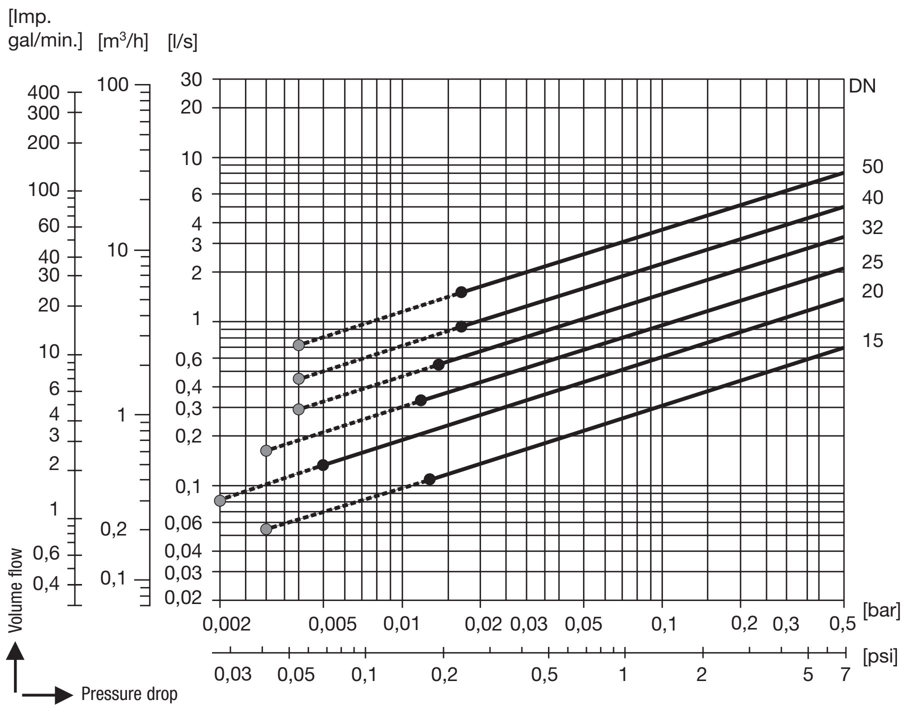

The chart shows the maximum capacities for hot and cold condensate.

**Curve 1 SMK 22, SMK 22-51, SMK 22-81**
This curve indicates the max. capacity of hot condensate that the steam trap with regulating membrane Steri*line* can discharge with virtually no banking-up.

**Curve 2 SMK 22, SMK 22-51, SMK 22-81, SMK 22-82**
This curve shows the max. capacity of cold condensate that the steam trap can discharge (20 °C at start-up).

**Curve 3 SMK 22-82**
This curve indicates the max. capacity of hot condensate that the steam trap with regulating membrane Steri*line* can discharge with virtually no banking-up.

### SRK 22A



# GESTRA steam traps at a glance

| Type | Materials, body, cover | Operating principle | | | | |
|---|---|---|---|---|---|---|
| | | Bimetallic BK | Membrane MK | Ball float UNA | Thermodynamic DK | Inverted bucket IB |
| AK 45 | 1.0460 / SA105 | | | | | |
| BK 15 | 1.0460 / SA105 | x | | | | |
| BK 27N | 1.5415 | x | | | | |
| BK 28 | 1.5415 | x | | | | |
| BK 28-ASME | 1.7335 / SA182-F12-2 | x | | | | |
| BK 29 | 1.7335 / SA182-F12-2 | x | | | | |
| BK 29-ASME | 1.7335 / SA182-F12-2 | x | | | | |
| BK 36A-7 | 1.4408 / SA351-CF8M | x | | | | |
| BK 37 | 1.5415 | x | | | | |
| BK 37-ASME | A182-F12 | x | | | | |
| BK 45 | 1.0460 / SA105 | x | | | | |
| BK 45-LT | SA350-LF2 | x | | | | |
| BK 46 | 1.5415 | x | | | | |
| BK 212 | 1.7383 / A182-F22-3 | x | | | | |
| BK 212-F91 | 1.4903 / SA182-F91 | x | | | | |
| BK 212-1.4901 | 1.4901 (F92) | x | | | | |
| BK 212-ASME | 1.7383 / A182-F22-3 | x | | | | |
| DK 36A-7 | 1.4408 / SA351-CF8M | | | | x | |
| DK 45 | 1.0460 / SA105 | | | | x | |
| DK 47-L | A743 CA40 | | | | x | |
| DK 47-H | A743 CA40 | | | | x | |
| DK 57-L | AISI 420 | | | | x | |
| DK 57-H | AISI 420 | | | | x | |
| GK 11 | 5.1301 | | | | | |
| GK 21 | 5.1301 | | | | | |
| IB 16A-7 | SA240-304L | | | | | x |
| MK 20 | 5.4202 | | x | | | |
| MK 25/2 | 1.0460, 1.0619 / SA105, SA216-WCB | | x | | | |
| MK 25/2 S | 1.0460, 1.0619 / SA105, SA216-WCB | | x | | | |
| MK 35/31 | 1.0460 / SA105 | | x | | | |
| MK 35/32 | 1.0460 / SA105 | | x | | | |
| MK 35/2S | 1.0460 / SA105 | | x | | | |
| MK 35/2S3 | 1.0460 / SA105 | | x | | | |
| MK 36A-71 | 1.4408 / SA351-CF8M | | x | | | |
| MK 36A-72 | 1.4408 / SA351-CF8M | | x | | | |
| MK 36/51 | 1.4301 / SA479-F304 | | x | | | |
| MK 36/52 | 1.4301 / SA479-F304 | | x | | | |
| MK 45-1 | 1.0460 / SA105 | | x | | | |
| MK 45-2 | 1.0460 / SA105 | | x | | | |
| MK 45 A-1 | 1.4404 / A182-F316L | | x | | | |
| MK 45 A-2 | 1.4404 / A182-F316L | | x | | | |
| SMK 22 | 1.4435 | | x | | | |
| SMK 22-51 | 1.4404 | | x | | | |
| SMK 22-81 | 1.4404 | | x | | | |
| SMK 22-82 | 1.4404 | | x | | | |
| TK 23 | 5.1301 | | | | | |
| TK 24 | 1.0619 / SA216-WCB | | | | | |
| TS 36 | 1.4408 / SA351-CF8M | | | | | |
| UBK 46 | 1.0460 / SA105 | x | | | | |
| UC 36, UCY 36 | 1.4408 / SA351-CF8M | | | | | |
| UNA 14 | 5.3103 | | | x | | |
| UNA 14P | 5.3103 | | | x | | |
| UNA 16 | 1.0460, 1.0619 / SA105, SA216-WCB | | | x | | |
| UNA 16A | 1.4404, 1.4408 / A182-316L, SA351-CF8M | | | x | | |
| UNA 25-PK | 5.3103 | | | x | | |
| UNA 25-PS | 5.3103 | | | x | | |
| UNA 27h | 1.5419 | | | x | | |
| UNA 43 | 5.1301 / A126-B | | | x | | |
| UNA 45 | 1.0460, 5.3103 / SA105, (A395) | | | x | | |
| UNA 45 MAX | 1.0460, 5.3103 / SA105, (A395) | | | x | | |
| UNA 46 | 1.0460, 1.0619 / SA105, SA216-WCB | | | x | | |
| UNA 46 MAX | 1.0460, 1.0619 / SA105, SA216-WCB | | | x | | |
| UNA 46A | 1.4404, 1.4408 / A182-316L, SA351-CF8M | | | x | | |
| UNA 46A MAX | 1.4404, 1.4408 / A182-316L, SA351-CF8M | | | x | | |
| UNA 38 | 1.5415, 1.7357 | | | x | | |
| UNA 39 | 1.7335 / SA182-F12 | | | x | | |
| UNA-Special Typ 62-B | 1.0425 | | | x | | |
| UNA PN 25 | 1.0619 / SA216-WCB | | | x | | |
| UNA-Special PN 63 | 1.5419 | | | x | | |

| Nominal size | | | | | | | | | | | Nominal pressure | | Max. permitted differential pressure | | Hot condensate | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8<br>¼″ | 10<br>⅜″ | 15<br>½″ | 20<br>¾″ | 25<br>1″ | 40<br>1½″ | 50<br>2″ | 65<br>2½″ | 80<br>3″ | 100<br>4″ | 150<br>6″ | PN | Cl | ∆PMX [bar] | ∆PMX [psi] | [kg/h] | [lb/h] |
| | | x | x | x | | | | | | | 40 | | | | | |
| | | | | | x | x | | | | | 40 | 300 | 22 | 320 | 2,550 | 5,620 |
| | | | | | x | x | | | | | 63 | | 45 | 650 | 1,500 | 3,310 |
| | | x | x | x | | | | | | | 100 | | 85 | 1,230 | 910 | 2,010 |
| | | x | x | x | | | | | | | | 600 | 85 | 1,230 | 910 | 2,010 |
| | | x | x | x | | | | | | | 160 | | 110 | 1,600 | 980 | 2,160 |
| | | x | x | x | | | | | | | | 900 | 110 | 1,600 | 980 | 2,160 |
| | | | | | | | | | | | | 300 | 32 | 465 | 300 | 660 |
| | | x | x | x | | | | | | | 100 | | 45 | 650 | 570 | 1,260 |
| | | x | x | x | | | | | | | | 600 | 45 | 650 | 570 | 1,260 |
| | | x | x | x | | | | | | | 40 | 300 | 22 | 320 | 510 | 1,120 |
| | | x | x | x | | | | | | | 40 | 300 | 22 | 320 | 510 | 1,120 |
| | | x | x | x | | | | | | | 40 | 300 | 32 | 465 | 550 | 1,210 |
| | | x | x | x | | | | | | | 630 | | 275 | 3,988 | 300 | 660 |
| | | x | x | x | | | | | | | 775 | 2500 | 275 | 3,988 | 300 | 660 |
| | | | | | | | | | | | 800 | | 275 | 3,988 | 300 | 660 |
| | | x | x | x | | | | | | | | 2500 | 275 | 3,988 | 300 | 660 |
| | | | | | | | | | | | | 300 | 32 | 465 | 400 | 880 |
| | | x | x | x | | | | | | | 40 | 300 | 32 | 465 | 510 | 1,120 |
| | | x | x | | | | | | | | 63 | 600 | 42 | 610 | 330 | 730 |
| | | | x | x | | | | | | | 63 | 600 | 42 | 610 | 2,000 | 4,410 |
| | | x | x | | | | | | | | 63 | 600 | 42 | 610 | 550 | 1,210 |
| | | | x | x | | | | | | | 63 | 600 | 42 | 610 | 2.100 | 4,630 |
| | | | | | | | x | x | x | x | 16 | | 6 | 87 | 380,000 | 837,740 |
| | | | | | | x | | | | | 16 | | 6 | 87 | 18,000 | 39,680 |
| | | | | | | | | | | | | 300 | 27.6 | 400 | 750 | 1,650 |
| | | x | x | | | | | | | | 6 | | 4.5 | 65 | 1,050 | 2,310 |
| | | | | | x | x | | | | | 40 | | 32 | 465 | 5,500 | 12,130 |
| | | | | | x | x | | | | | 40 | | 32 | 465 | 8,200 | 18,080 |
| | x | x | | | | | | | | | 25 | | 21 | 305 | 360 | 790 |
| | x | x | | | | | | | | | 25 | | 21 | 305 | 790 | 1,740 |
| | | | | x | | | | | | | 40 | | 32 | 465 | 1,800 | 3,970 |
| | | | | x | | | | | | | 40 | | 32 | 465 | 3,100 | 6,830 |
| | | | | | | | | | | | | 300 | 32 | 465 | 300 | 660 |
| | | | | | | | | | | | | 300 | 32 | 465 | 450 | 990 |
| x | x | x | x | | | | | | | | | 300 | 32 | 465 | 500 | 1,100 |
| x | x | x | x | | | | | | | | | 300 | 32 | 465 | 830 | 1,830 |
| | | x | x | x | | | | | | | 40 | 300 | 32 | 465 | 610 | 1,340 |
| | | x | x | x | | | | | | | 40 | 300 | 32 | 465 | 1.100 | 2,430 |
| | | x | x | x | | | | | | | 40 | 300 | 32 | 465 | 610 | 1,340 |
| | | x | x | x | | | | | | | 40 | 300 | 32 | 465 | 1,100 | 2,430 |
| | x | x | x | x | | | | | | | 10 | | 6 | 87 | 270 | 600 |
| | x | x | x | x | | | | | | | 10 | | 6 | 87 | 270 | 600 |
| | x | x | x | x | | | | | | | 10 | | 6 | 87 | 270 | 600 |
| | | | | x | | | | | | | 10 | | 6 | 87 | 400 | 880 |
| | | | | | | x | x | x | x | | 16 | | 10 | 145 | 125,000 | 275,570 |
| | | | | | | x | x | x | x | | 25 | | 14 | 203 | 140,000 | 308,640 |
| | | x | x | x | | | | | | | | 300 | | | | |
| | | x | x | x | | | | | | | 40 | 300 | 32 | 465 | 170 | 370 |
| | | x | x | x | | | | | | | | 300 | | | | |
| | | x | x | x | | | | | | | 25 | | 13 | 188 | 650 | 1,430 |
| | | x | x | x | | | | | | | 25 | | 16 | 232 | 1,000 | 2,200 |
| | | x | x | x | | | | | | | 40 | 300 | 22 | 320 | 650 | 1,430 |
| | | x | x | x | | | | | | | 40 | 300 | 22 | 320 | 650 | 1,430 |
| | | | | | x | | | | | | 40 | | 13 | 188 | 3,200 | 7,050 |
| | | | | | x | | | | | | 40 | | 13 | 188 | 610 | 1,340 |
| | | | | x | x | x | | | | | 63 | | 45 | 650 | 4,800 | 10,580 |
| | | | | | | | | x | x | x | 16 | 125 | 13 | 188 | 26,000 | 57,320 |
| | | x | x | x | x | x | x | | | | 40 | 300 | 32 | 465 | 6,050 | 13,340 |
| | | | | | x | x | x | | | | 40 | 300 | 32 | 465 | 15,500 | 34,170 |
| | | x | x | x | x | x | x | x | x | x | 40 | 300 | 32 | 465 | 26,000 | 57,320 |
| | | | | | x | x | x | | | | 40 | 300 | 32 | 465 | 15,500 | 34,170 |
| | | x | x | x | x | x | x | | | | 40 | 300 | 32 | 465 | 6,050 | 13,340 |
| | | | | | x | x | x | | | | 40 | 300 | 32 | 465 | 15,500 | 34,170 |
| | | x | x | x | x | x | | | | | 100 | | 80 | 1,160 | 5,200 | 11,460 |
| | | x | | x | | x | | | | | 160 | 900 | 140 | 2,030 | 6,000 | 13,230 |
| | | | | | | | | | x | | 16 | | 16 | 232 | 90,000 | 198,410 |
| | | | | | | | | | x | | 25 | | 22 | 320 | 66,000 | 145,500 |
| | | | | | | | x | x | x | | 63 | | 45 | 650 | 32,000 | 70,550 |

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