Fondeyur

# Cold Formed Dished Heads.
# Stainless Steel Experts.

# Index

**03** Presentation

**04** Trust Us

**06** Advantages

**08** Polishing

**10** Quality

**12** Products


# “We are Stainless Steel experts.”

**We manufacture top quality dished ends for tanks, boilers, industrial equipment, etc.**

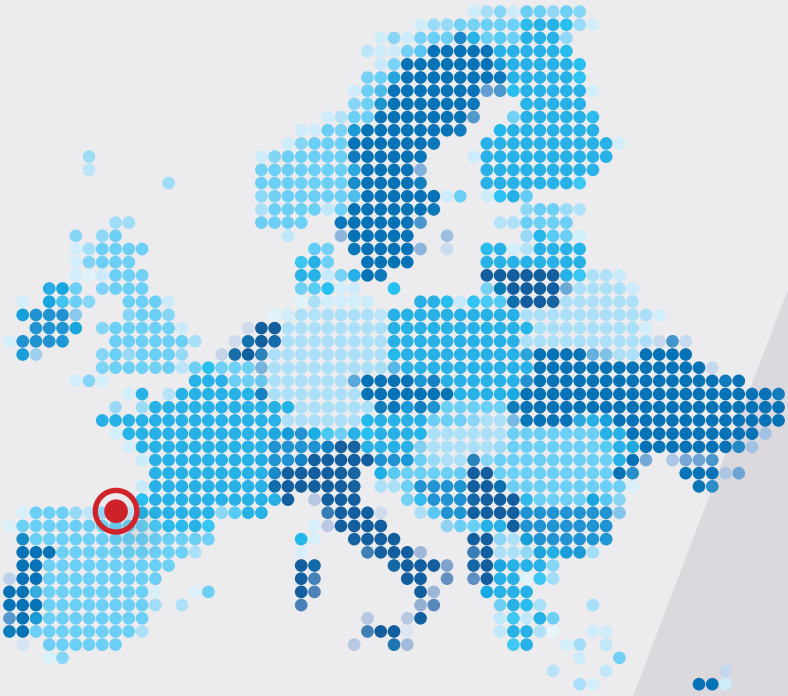
**We specialize in polishing dished ends.**

# Presentation

**Fondeyur, S.L. was founded in 2008 combining extensive experience in the sector of its staff with a significant investment in latest generation machinery.**

We manufacture cold forming dished heads for tanks, boilers, industrial equipment, etc. and we are experts in Stainless Steel. We offer the highest quality products to the national and international market.

## Location – Contact




### FONDEYUR, S.L.

POL. IND. BILDOSOLA, PARCELA A3
48142 ARTEA (BIZKAIA) – SPAIN

**Ph.:** + 34 94 631 79 82
**Fax:** + 34 94 631 79 79
**Email:** fondeyur@fondeyur.com

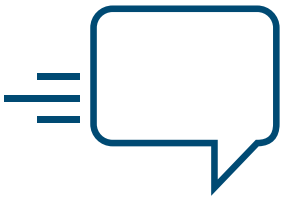
# Trust Us

## Why should you work with Fondeyur?

We have an experienced team, adapted technology, and a methodology that guarantees the product's quality and the fulfillment of the delivery deadlines nationally and internationally.

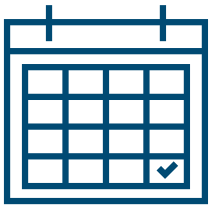
### Experience and technology

Experienced staff and latest-generation machinery.



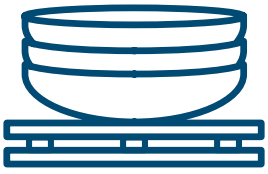
### Quick response

We reply the same day as we receive the enquiry. Maximum 24 hours.



### On-time deliveries

Seriousness and commitment. We provide stress free service to our customers.



### Warranty packaging

Our products are quality palletized, strapped, and packed for maximum protection.

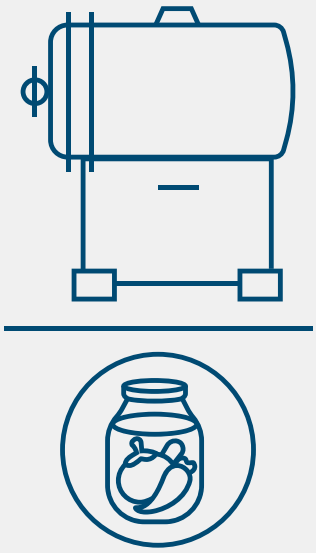
### Distribution and delivery

We deliver our dished heads nationally and internationally using the best logistics providers.

### Intelligent Document Management

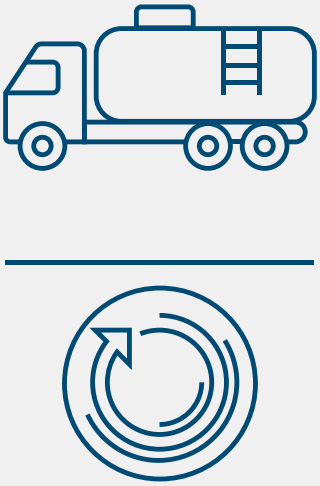
Our professional archiving system allows us to automatically search for all the documentation for each dished head.

## We have extensive experience in manufacturing dished ends for all types of professional sectors

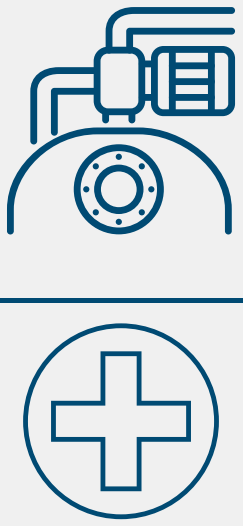


**Food**

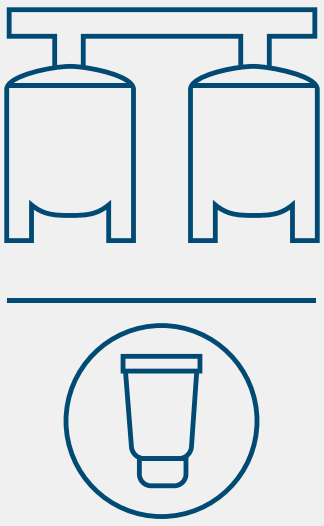
**Drinks**



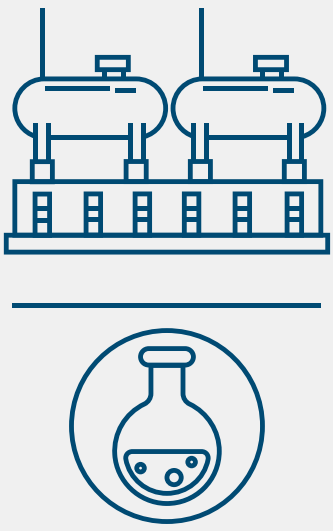
**Logistics / Transports**



**Pharmaceutical**



**Cosmetic**

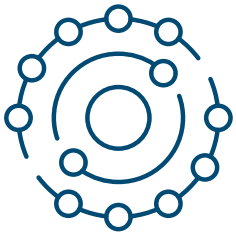


**Chemical**

# Advantages

## We exclusively manufacture stainless steel dished heads.

**This allows us to offer the following advantages to our clients**

1 

**We avoid risks of contamination** of materials in our production plant.

2

We offer **the best quality in polishing.** We always bet on the highest quality abrasives and the most innovative composition to achieve the highest quality of our products.

3

**We minimize marks in the forming** employing a special protection of our manufacturing dies.

4

We apply **a complete degreasing and passivation procedure** to all manufactured dished ends.

5

**Our entire staff** is specialized **only** in the manufacture of **stainless steel** dished heads. We know the best way to care for the product.

# Polishing

## We are specialists in Mirror polishing of dished heads

We offer inside and outside polishing service to the roughness Ra (µm) and / or finish requested by the client. The process is carried out automatically always using latest technology abrasives.

After polishing, dished heads are securely protected with adhesive plastic film and packaging.

# Quality

Our Quality Management System based on the highest quality standards of the sector is recognized by the best certifying entities.

We comply with the requirements of ISO 9001:2015 norm and also AD 2000-Merkblatt norm, modules W0, HP 0, HP 8/1 y EN ISO 3834-3.

ZERTIFIKAT ◆ CERTIFICATE ◆ 證書 證書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

TÜV SÜD Industrie Service

CERTIFICATE

The company

Fondeyur, S.L.
Polígono Industrial Bildosola, A-3
E – 48142 Artea (Vizcaya)

has been audited according to

AD 2000-Merkblatt W0, HP 0, HP 8/1 and EN ISO 3834-3.

The company
- has facilities permitting manufacturing and inspection in compliance with the current technical standards,
- operates a quality system which guarantees that manufacturing and inspection of the products stated in our report are in conformity with the technical rules and standards,
- employs qualified supervisory and inspection personnel.

The company has the welding suitability for manufacturing pressure equipment according above mentioned standards.

The scope of the approval is described in the annex to this certificate. Further details are mentioned in report no. 20229734-19.

Independently of this certificate the requirements of the respectively selected module have to be considered within the framework of manufacturing pressure equipment according to Pressure Equipment Directive 2014/68/EU.

Certificate No.: DGR-0036-QS-W 605/2013/MUC
Munich, May 27th, 2019

Certification Body
Material and Welding Technology
(H. Müller)

EQ2592625

TÜV SÜD Industrie Service GmbH, Westendstr. 199, 80686 Munich, Germany

Applus+

CERTIFICADO

Núm. EC-9528/18

LGAI Technological Center, S.A. (Applus+)
certifica que el sistema de Gestión de la Calidad de la organización:

FONDEYUR, S.L.

FONDEYUR,S.L.
Pol. Ind. Bildosola, Parcela A-3
48142 , Artea (Vizcaya)

para las actividades de:

Conformado en frío y lijado de fondos de acero inoxidable para depósitos a presión.

es conforme con los requisitos de la norma UNE-EN ISO 9001:2015

ENAC CERTIFICACIÓN Nº 02/C-SC832

Director General
Applus+ Certification, B.U.
Juan Sendín Caballero

Directora Técnica
Applus+ Certification, B.U.
Cristina Bachiller Martínez

El presente certificado se considerará válido siempre que se cumplan todas las condiciones del contrato del cual este certificado forma parte. LGAI Technological Center, S.A. (Applus+) Campus U.A.B., Ronda de la Font del Carme s/n, 08193 Bellaterra, Barcelona

## Certification along with the final product:

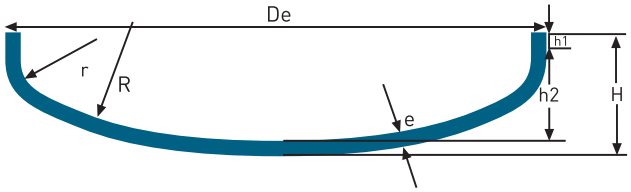
- Inspection Certificate (3.1, 3.2, ...) of material
- Inspection Certificate (3.1, 3.2, ...) of manufactured dished ends
- Dimensional control report

## At the customer's express request, the following certifications will be issued:

- Thickness report
- Rugosity reports
- Radiographic reports
- Ultrasound reports
- Liquid penetrant inspection (LPI) of welding seams
- Visual inspection reports
- Magnetic particles reports
- Cold forming attestation
- Reports issued by third parties (Certification companies etc.)

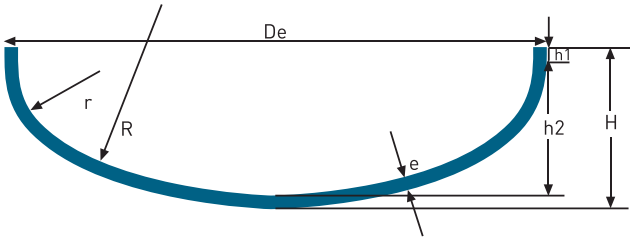
5.50
SCAN
PRB
CAL
IN MM
ALRM

# Products



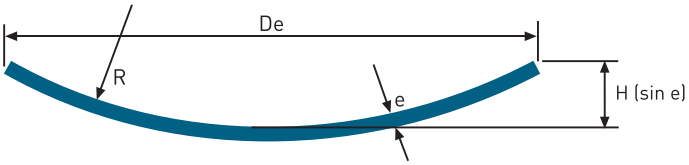

Ref. F1

## Klopper (DIN 28011)



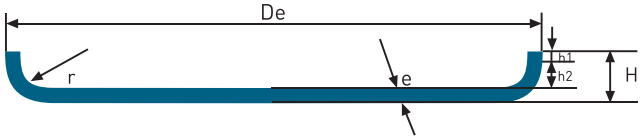

Ref. F2

## Korbbogen (DIN 28013)



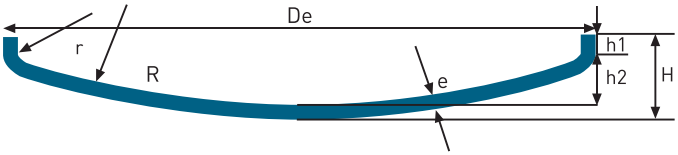

Ref. F3

## Spherical Cap



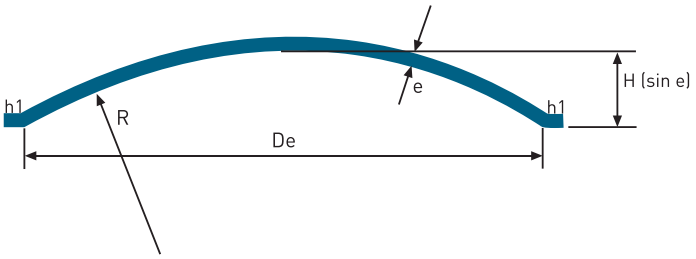

Ref. F4

## Flat Head



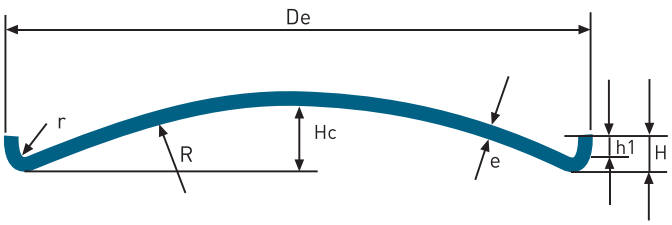

Ref. F5

## Dished Head for Low Pressure



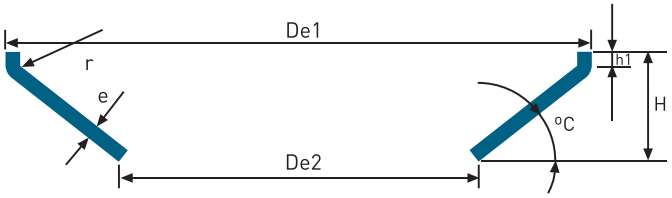

Ref. F6

## Spherical Cover



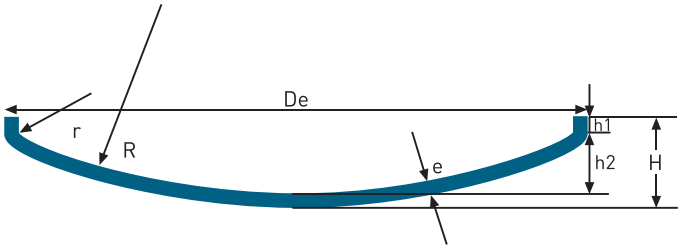

Ref. F7

## Diffusion Head



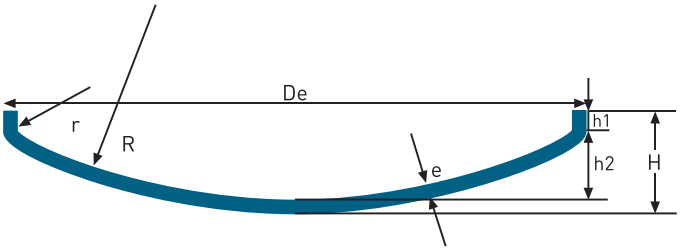

Ref. F8

## Cone Head



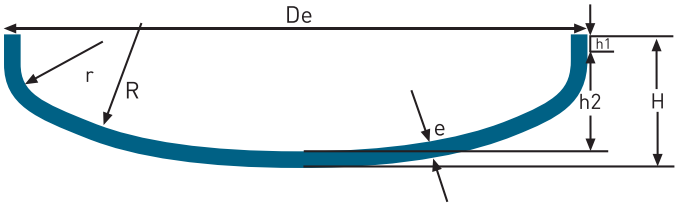

Ref. F9

## P.R.C. (NF E 81-101)



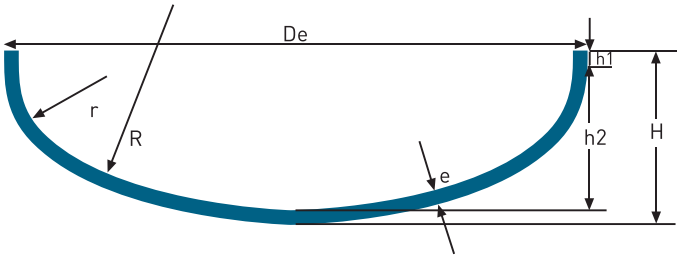

Ref. F10

## M.R.C. (NF E 81-104)



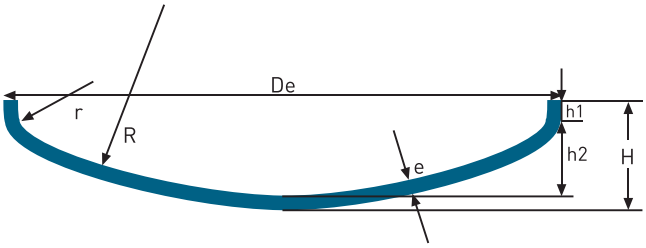

Ref. F11

## G.R.C. (NF E 81-102)



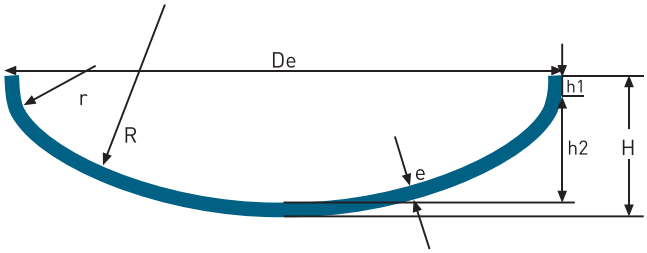

Ref. F12

## Elliptique (NF E 81-103)



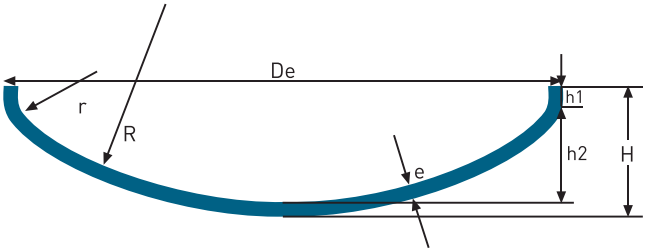

Ref. F13

## Flanged & Dished (ASME)



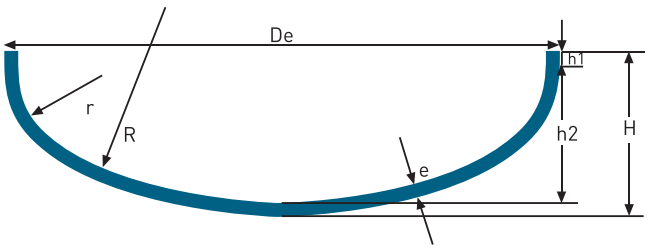

Ref. F14

## 80-10 Flanged & Dished (ASME)



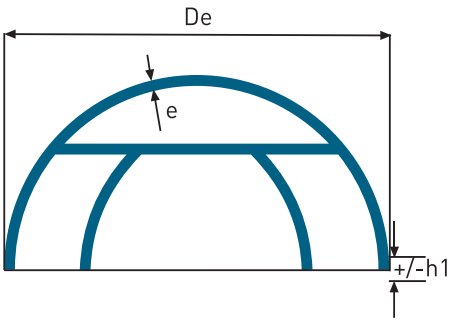

Ref. F15

## High Crown Flanged & Dished (ASME)




Ref. F16

## Elliptical Head 2:1 (ASME)




Ref. F17

## Hemispherical Head

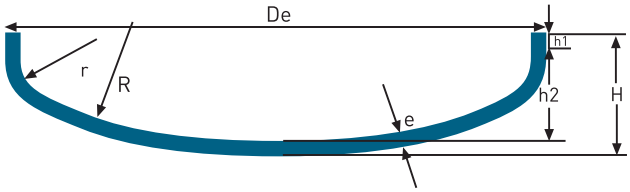
**10% Torispherical, 6% Torispherical, specific sizes... our manufacturing range can be adapted to your needs millimeter by millimeter**

# Products

## Types of dished heads

Ref. F1

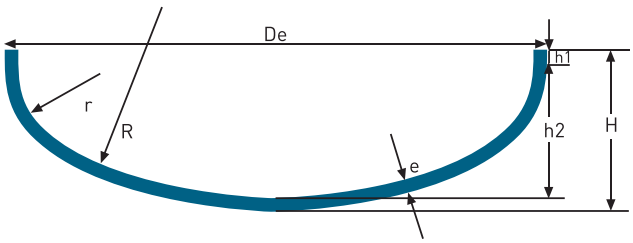
### Klopper (DIN 28011)




| Technical information | Example |
|---|---|
| R= De | De: 2000 |
| r= 0.1De | e: 10 |
| h1≥ 3,5e | R: 2000 |
| h2= 0.1935De-0.455e | r: 200 |
| H= h2+h1+e | h1: 50 |
| Dd= 1.11De+1.85h1 | H: 442 |
| V(h2)= 0.1(Di)³ | V(h2): 776 |

Ref. F2

### Korbbogen (DIN 28013)

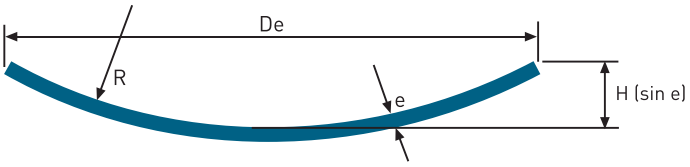



| Technical information | Example |
|---|---|
| R= 0.8De | De: 2000 |
| r= 0.154De | e: 10 |
| h1≥ 3e | R: 1600 |
| h2= 0.255De-0.635e | r: 308 |
| H= h2+h1+e | h1: 50 |
| Dd= 1.16De+ 2h1 | H: 564 |
| V(h2)= 0.1298(Di)³ | V(h2): 1008 |

**Key to symbols**

**De:** Outside diameter
**e:** Initial thickness
**R:** Inside Dish radius
**r:** Knuckle radius
**h1:** Straight flange
**H:** Total height
**V:** Volume
**Dd:** Diameter of the disc
**Di:** Inside diameter
**h2:** Height of dished part
**Hc:** Center height

## Ref. F3
# Spherical Cap




«R» to be defined by the client

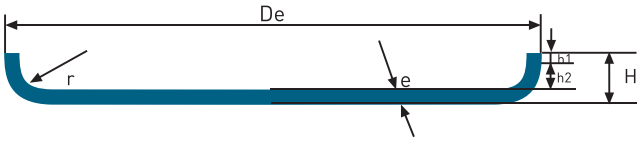
### Technical information

| | R=De | R=0.8De | R=1.5De |
|---|---|---|---|
| H(sin e) | 0.134De | 0.175De | 0.085De |
| Dd | 1.04De | 1.08De | 1.02De |
| V≈ | 0.054De³ | 0.072De³ | 0.034De³ |

### Example

**De: 2000**
**e: 10**
**R: 2000**
**r:**
**h1:**
**H(sin e): 268**
**V: 432**

## Ref. F4
# Flat Head




«r» to be defined by the client

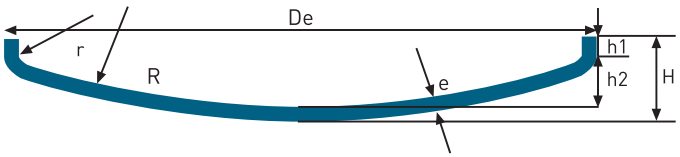
### Technical information

**h2= r**
**H= r+h1+e**
**Dd= De+ r + 2h1**
**V(h2)≈ 0,75.Di².h2**

### Example

**De: 2000**
**e: 10**
**R:**
**r: 50**
**h1: 50**
**H: 110**
**V(h2): 147**

## Ref. F5
# Dished Head for Low Pressure




«R» and «r» to be defined by the client

### Technical information

| | R=De | R=1.5De | R=2De |
|---|---|---|---|
| h2= | R-√((R-r)²-(Di/2-r)²) | | |
| Dd= | 1.03De+r+1.7h1 | 1.02De+r+1.7h1 | 1.01De+r+1.7h1 |
| H= h1+h2+e | | V(h2)≈ (De+r)².0,42h2 | |

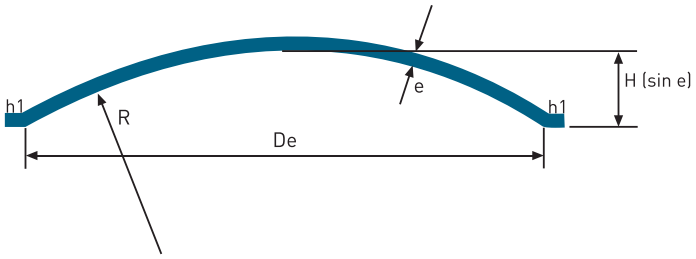
### Example

**De: 2000**
**e: 10**
**R: 3000**
**r: 50**
**h1: 50**
**H: 264**
**V(h2): 360**

### Key to symbols

**De:** Outside diameter
**e:** Initial thickness
**R:** Inside Dish radius
**r:** Knuckle radius
**h1:** Straight flange
**H:** Total height
**V:** Volume
**Dd:** Diameter of the disc
**Di:** Inside diameter
**h2:** Height of dished part
**Hc:** Center height

## Ref. F6
# Spherical cover




«R» to be defined by the client

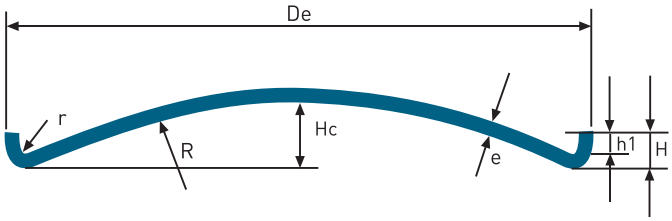
### Technical information

| | R=De | R=0.8De | R=1.5De |
|---|---|---|---|
| H(sin e) | 0.134De | 0.175De | 0.085De |
| Dd | 1.04De+2h1 | 1.08De+2h1 | 1.02De+2h1 |
| V≈ | 0.054De³ | 0.072De³ | 0.034De³ |

### Example

**De: 2000**
**e: 10**
**R: 2000**
**r:**
**h1: 100**
**H(sin e): 268**
**V: 432**

## Ref. F7
# Diffusion Head




«R» and «r» to be defined by the client

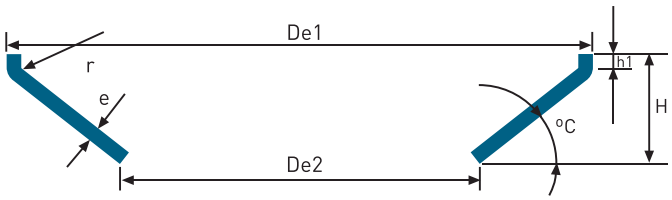
### Technical information

**H= r + h1 + e**
**Hc= R+r-√((R+r)² – (1/2Di – r)²)**
**Dd(R=D)= 1.02De + r + 1.7h1**

### Example

**De: 2000**
**e: 10**
**R: 2000**
**r: 50**
**h1: 50**
**H: 110**
**Hc: 228**

## Ref. F8
# Cone




«r» to be defined by the client

### Technical information

**Cotas a definir por el cliente**

### Example

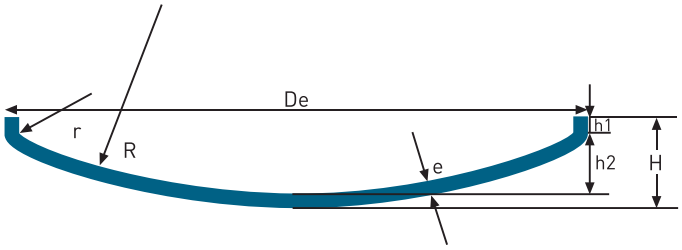
**De1: 2000**
**e: 10**
**R:**
**r: 50**
**h1: 50**
**H: 500**
**De2: 1250**

### Key to symbols

**De:** Outside diameter
**e:** Initial thickness
**R:** Inside Dish radius
**r:** Knuckle radius
**h1:** Straight flange
**H:** Total height
**V:** Volume
**Dd:** Diameter of the disc
**Di:** Inside diameter
**h2:** Height of dished part
**Hc:** Center height

Ref. F9

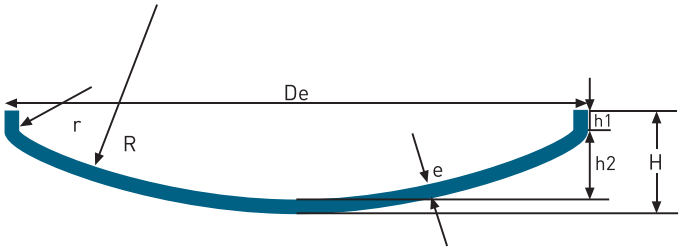
## P.R.C. (NF E 81-101)




| Technical information | Example |
|---|---|
| h2= R-√((R-r)²-(Di/2-r)²) | De: 2000 |
| H= h2+h1+e | e: 10 |
| V(h2)≈ (Di+0,2)².0,455h2 | R: 2300 |
| | r: 50 |
| | h1: 50 |
| | H: 316 |
| | V(h2): 457 |

Ref. F10

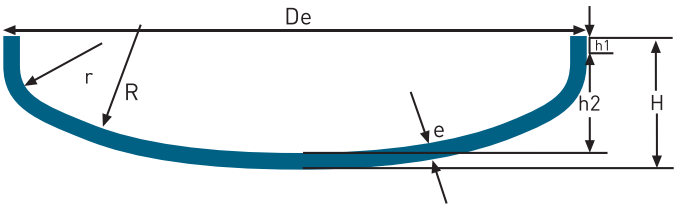
## M.R.C. (NF E 81-104)




| Technical information | Example |
|---|---|
| R= De | De: 2000 |
| h2= R-√((R-r)²-(Di/2-r)²) | e: 10 |
| H= h2+h1+e | R: 2000 |
| V(h2)≈ (De+r)².0,42h2 | r: 66 |
| | h1: 50 |
| | H: 361 |
| | V(h2): 540 |

Ref. F11

## G.R.C. (NF E 81-102)



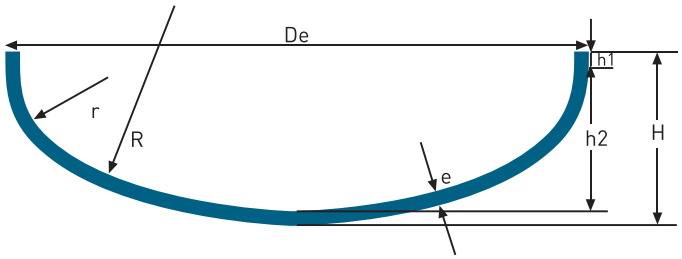

| Technical information | Example |
|---|---|
| R= De | De: 2000 |
| r= 0.1De | e: 10 |
| h1≥ 3.5e | R: 2000 |
| h2= 0.1935De-0.455e | r: 200 |
| H= h2+h1+e | h1: 50 |
| Dd= 1.11De+1.85h1 | H: 442 |
| V(h2)≈ 0.1(Di)³ | V(h2): 776 |

### Key to symbols

**De:** Outside diameter
**e:** Initial thickness
**R:** Inside Dish radius
**r:** Knuckle radius
**h1:** Straight flange
**H:** Total height
**V:** Volume
**Dd:** Diameter of the disc
**Di:** Inside diameter
**h2:** Height of dished part
**Hc:** Center height

Ref. F12

## Elliptique (NF E 81-103)




**Technical information**

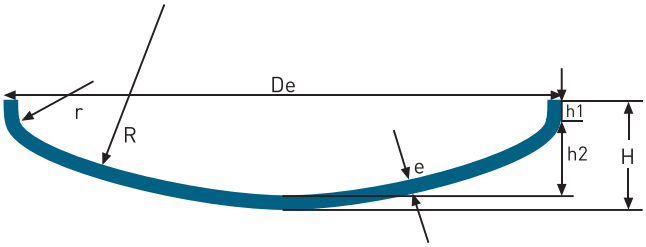
**R≈ 0.856De**
**r≈ 0.183De**
**h1≥ 3e**
**h2= Di/3.8**
**H= h2+h1+e**
**V(h2)≈ (Di.1,06)².0,466h2**

**Example**

**De: 2000**
**e: 10**
**R: 1716**
**r: 366**
**h1: 50**
**H: 581**
**V(h2): 1069**

Ref. F13

## Flanged & Dished (ASME)




**Technical information**

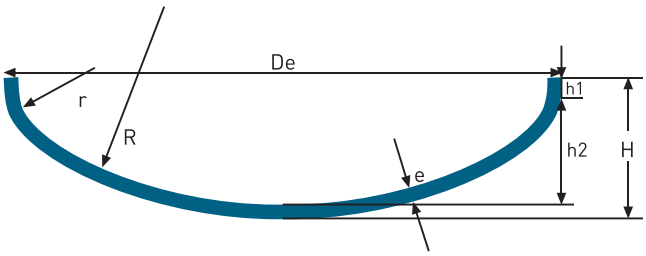
**R= De**
**r= 0.06De**
**h2= R-√((R-r)²-(Di/2-r)²)**
**H= h2+h1+e**
**V(h2)≈ (Di/25,4)³.0,0013**

**Example**

**De: 2000**
**e: 10**
**R: 2000**
**r: 120**
**h1: 50**
**H: 393**
**V(h2): 616**

Ref. F14

## 80-10 Flanged & Dished (ASME)




**Technical information**

**R= 0.8De**
**r=0.1De**
**h2= R-√((R-r)²-(Di/2-r)²)**
**H= h2+h1+e**
**V(h2)≈ (Di/25,4)³.0,0019**

**Example**

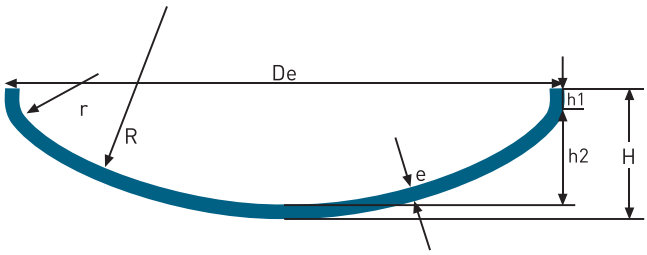
**De: 2000**
**e: 10**
**R: 1600**
**r: 200**
**h1: 50**
**H: 504**
**V(h2): 900**

### Key to symbols

**De:** Outside diameter
**e:** Initial thickness
**R:** Inside Dish radius
**r:** Knuckle radius
**h1:** Straight flange
**H:** Total height
**V:** Volume
**Dd:** Diameter of the disc
**Di:** Inside diameter
**h2:** Height of dished part
**Hc:** Center height

Ref. F15

## High Crown Flanged & Dished (ASME)




**Technical information**

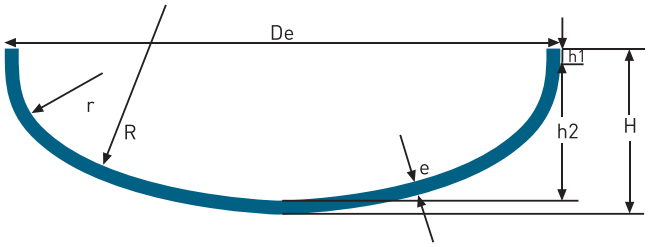
**R= 0.8De**
**r= 0.06De**
**h2= R-√((R-r)²-(Di/2-r)²)**
**H= h2+h1+e**
**V(h2)≈ (Di/25,4)³.0,0016**

**Example**

**De: 2000**
**e: 10**
**R: 1600**
**r: 120**
**h1: 50**
**H: 463**
**V(h2): 758**

Ref. F16

## Elliptical Head 2:1 (ASME)




**Technical information**

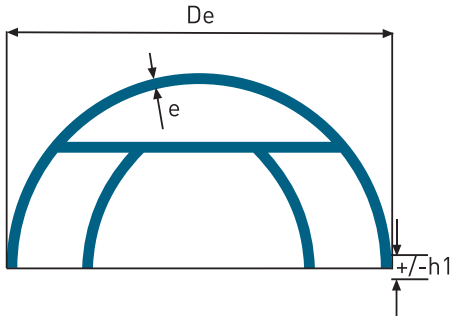
**R≈ 0.9De**
**r≈ 0.17De**
**h2= Di/4**
**H= h2+h1+e**
**V(h2)≈ 0,52Di².h2**

**Example**

**De: 2000**
**e: 10**
**R: 1800**
**r: 340**
**h1: 50**
**H: 555**
**V(h2): 1009**

Ref. F17

## Hemispherical Head




**Technical information**

**R=0.5Di**
**CALOTA + SECTORES**
**V≈0,2618Di³**

**Example**

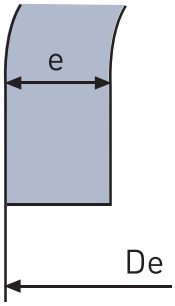
**De: 2000**
**e: 10**
**R: 990**
**r:**
**+/- h1: s/Demanda**
**H: 1000**
**V: 2032**

**Key to symbols**

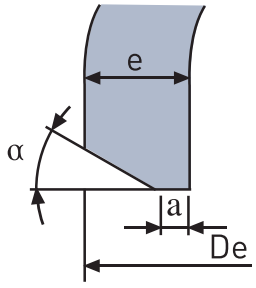
**De:** Outside diameter
**e:** Initial thickness
**R:** Inside Dish radius
**r:** Knuckle radius
**h1:** Straight flange
**H:** Total height
**V:** Volume
**Dd:** Diameter of the disc
**Di:** Inside diameter
**h2:** Height of dished part
**Hc:** Center height

# Edge preparation

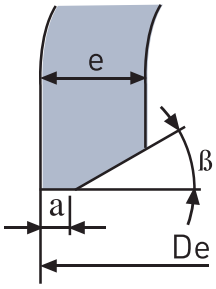
## Without taper



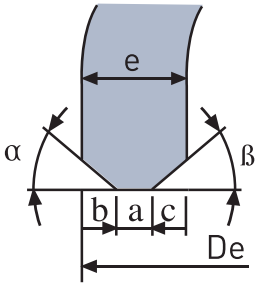

**Square Edge**




**Single Outside Bevel**

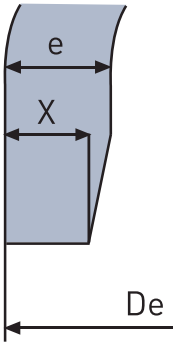



**Single Inside Bevel**

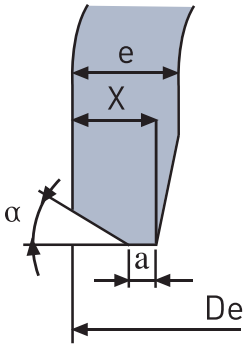



**Double "V" Bevel**

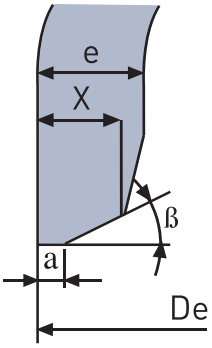
## With Inside Conical Taper



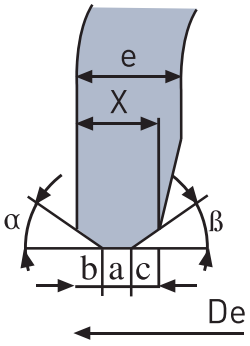

**Square Edge**




**Single Outside Bevel**

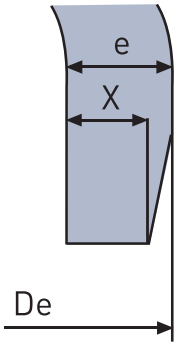



**Single Inside Bevel**

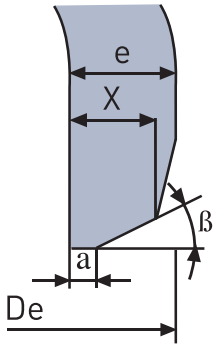



**Double "V" Bevel**

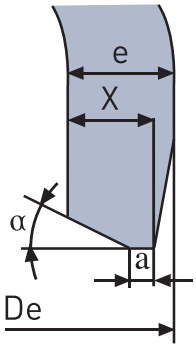
## With Outside Conical Taper



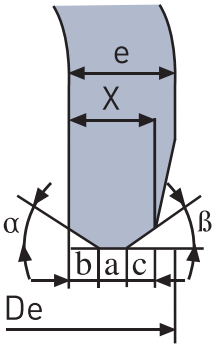

**Square Edge**




**Single Outside Bevel**




**Single Inside Bevel**



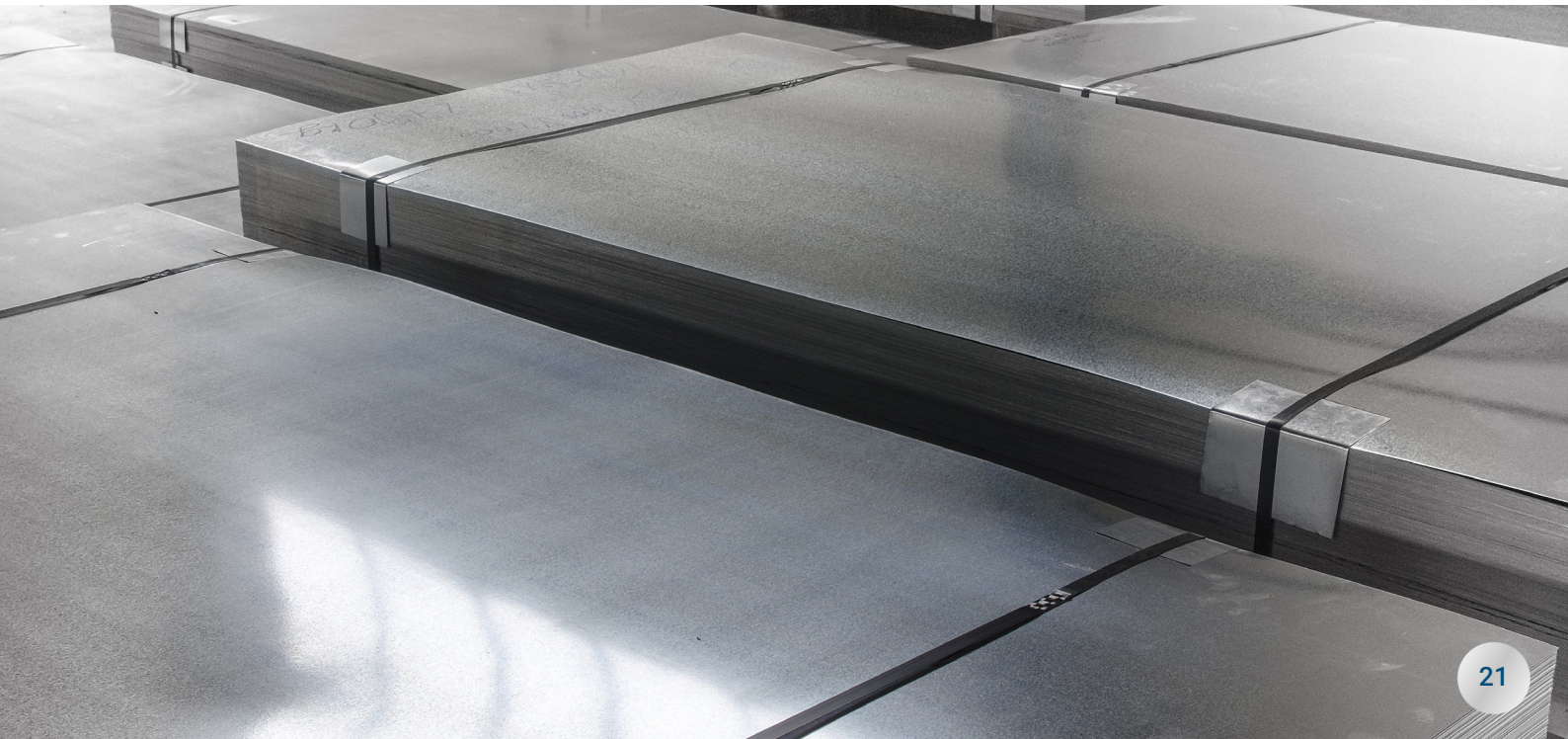

**Double "V" Bevel**

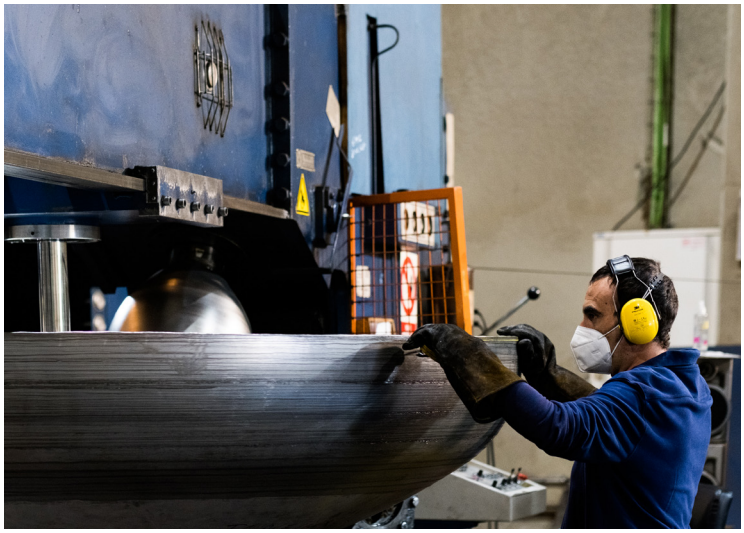
# Materials

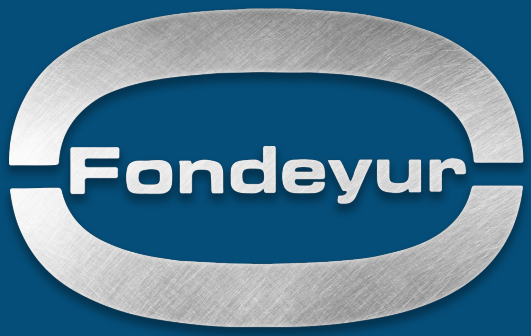
**We are experts in the manufacturing of stainless steel dished heads, always top-quality and with the corresponding certificates of origin**

## Stainless steels

| EN 10028-7 | ASTM A240/ASME SA240 |
|---|---|
| 1.4301 | AISI 304 |
| 1.4307 | AISI 304 L |
| 1.4541 | AISI 321 |
| 1.4401 | AISI 316 |
| 1.4404 | AISI 316 L |
| 1.4571 | AISI 316 Ti |
| 1.4845 | AISI 310S |
| 1.4410 | S32750 |
| 1.4462 | S31803 |
| ... | ... |





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Bizkaiko Foru Aldundiak finantzatu du proiektu hau, Suspertze Adimentsua 2020 Programaren barruan / Este proyecto ha sido financiado por la Diputación Foral de Bizkaia dentro del Programa Reactivación Inteligente 2020

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diputación foral