



RIZA GROUP

Heat treatment and forging

Ezkió – Itsaso (Gipuzkoa, Spain)

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01

RIZA Group overview

General information

Heat treatment

Forging



RIZA Group overview

General information

- Family owned Industrial Group with more than 75 years of experience in the market of mechanical components of great responsibility.
- Founded in 1947 as a Heat Treatment company.
- Nowadays formed by aprox. 250 people, divided into 8 different companies.
- 2 business units: Heat Treatment and Forging.
- Headquarters are located in B° Santa Lucía s/n. 20.709 Ezkio-Itsaso (Gipuzkoa, Spain).





RIZA Group overview

Heat treatment

- More than fifty years of experience
- Wide variety of hardening processes available
- State of the art equipment
- Main OEM companies among customers
- Main markets:
 - Windpower industry
 - Railway industry
 - Defense industry



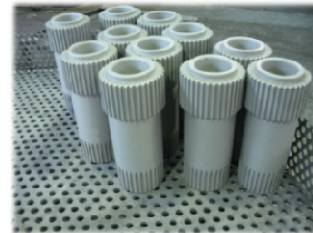


RIZA Group overview

Heat treatment

Thermal and thermochemical treatments

- Carburizing
- Nitriding
- Induction hardening
- Normalizing
- Quenching & Tempering
- Stress relieving
- ADI





RIZA Group overview

Heat treatment

Quenching and tempering

- Designed to meet the requirements of the products we typically forge → significantly big capacity:
 - 2 furnaces up to 70 ton
 - 5 furnaces up to 15 ton
- Short delivery times
- Competitive prices
- Very suitable for long series of heavy components

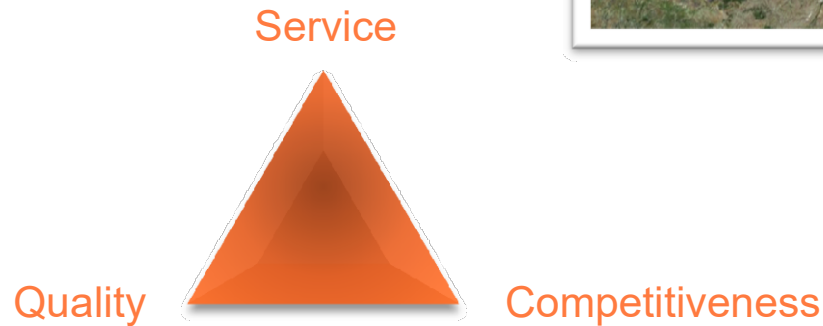


RIZA Group overview

Heat treatment

Three different locations:

- Ezkio Itsaso
- Vitoria
- Pamplona



Find the **proper facility** for each situation customer / product / batch size / delivery time



RIZA Group overview

Forging

- Capacity to produce forged components ranging from 15kg to 20000kgs.
- More than 25 years forging transmission components.
- Traditional markets:
 - Industrial vehicle
 - Forklift
 - Agricultural vehicle
 - Hydraulic motors
- In 2009, it was decided to invest in a new production line for serial production of heavy components for windpower gearboxes. The goal was to follow the process principles of automotive industry: competitiveness, quality, delivery reliability, traceability...



RIZA Group overview

Forging

Main weight ranges

These are the main unitary weight ranges (Kg/unit per part) where we are specially competitive:

1. 15-30 Kg/unit. External D (Dext) \leq 250 mm; lot size: 1000-100.000 units/year
2. 80-500 Kg/unit. Dext \leq 700 mm; lot size: 100-10.000 units/year
3. 500-2000 Kg/unit. Dext \leq 1500 mm; lot size: 50-5.000 units/year
4. $>$ 6.000 Kg/unit. Dext \leq 2500 mm; lot size: 20-200 units/year

***FOR SEGMENT 4, WE RELY ON THE MOST POWERFUL
HYDRAULIC PRESS IN EUROPE!!***



RIZA Group overview

Forging



Available processes: open die forging, ring rolling and closed die forging

Very significant competitive advantages for serial production





02

Closed-die forging

Advantages Vs Disadvantages

Typical products for gearbox/braking system



Closed-die forging

Advantages Vs Disadvantages

Advantages:

- Less raw material → cost saving (high impact on final price). Typically:
 - Parts with “big” inner diameter in comparison to the outer diameter
 - Parts with outer diameter not constant
- Shorter forging time → cost saving
- Shorter machining time → cost saving
- Optimized geometries → cost saving (carburizing less weight)
- Optimized geometries → lower final weight for gearbox
- Higher flexibility for design changes / optimizations
- Increased internal quality

Disadvantages:

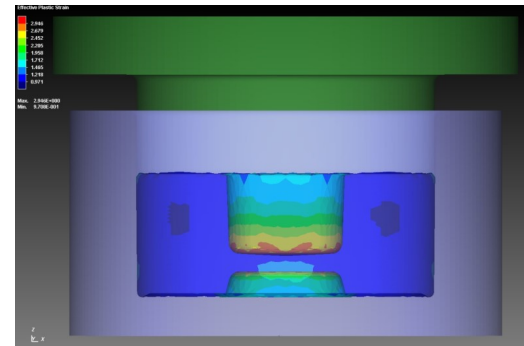
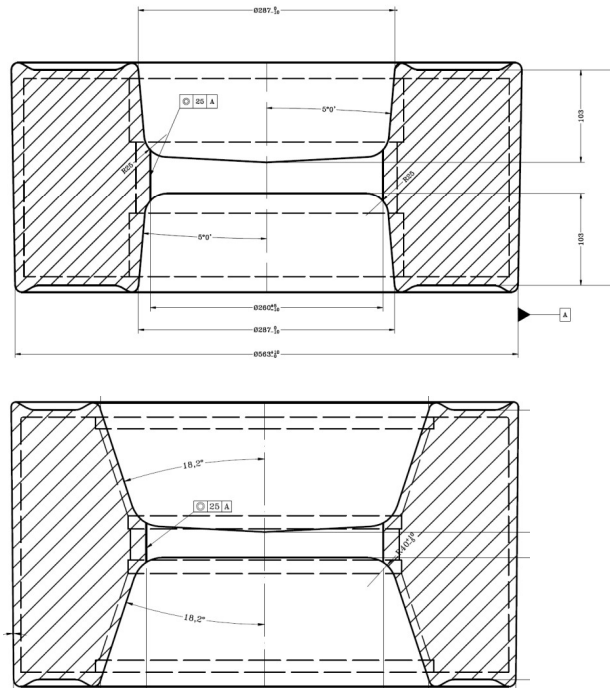
- Very high power press required (investment)
- Tooling manufacturing required (investment)
- Unitary production not possible due to set-up times



Closed-die forging

Typical products for gearbox/braking system

Planet gears

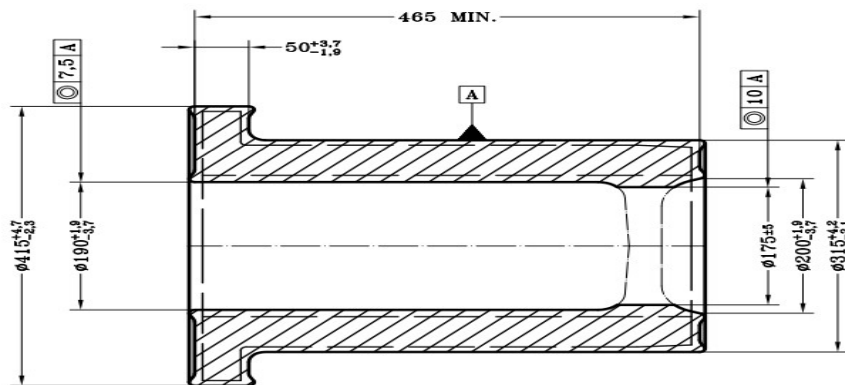




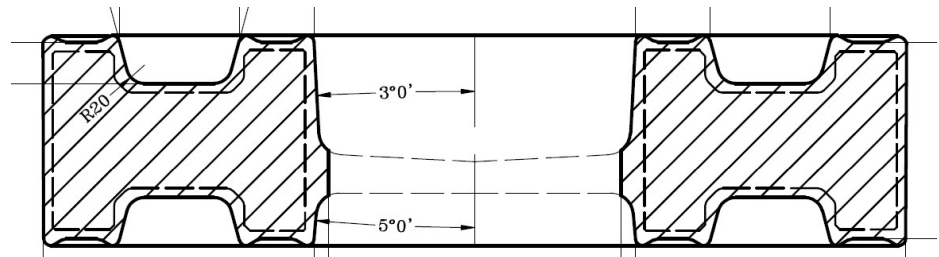
Closed-die forging

Typical products for gearbox/braking system

Hollow shafts / Sun shafts



Geared wheels

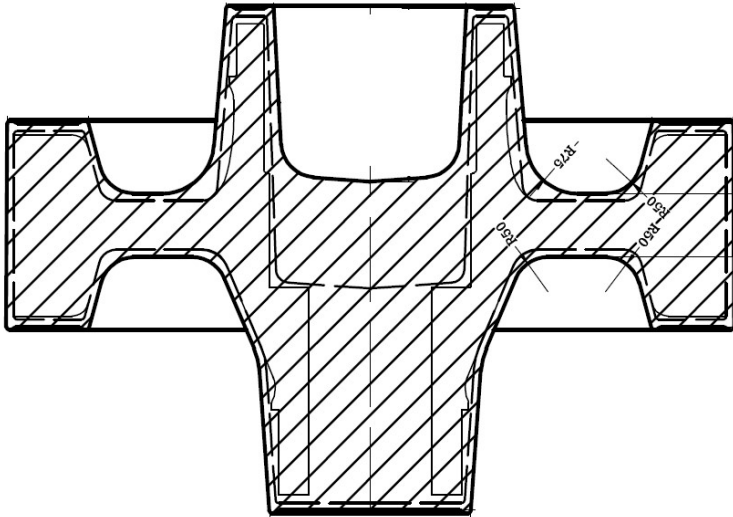




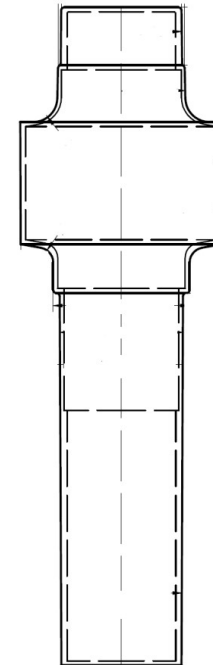
Closed-die forging

Typical products for gearbox/braking system

LSG + Hollow shaft monoblock



High Speed Shaft



Near-net-shape forging



03

Latest innovation

Background

RIZA's added value

Success cases



Latest innovation

Background

- In 2020, a new family of products was launched based on our knowledge of heat treatment and forging
- Focused on quenching process of highly demanded steels with %C>0,3 %
 - The more drastic the process is → the better mechanical properties
 - But there is a limitation in quenching drasticity → risk of cracks needs to be avoided!!
 - Available quenching fluids: oil and water. Water more drastic than oil
 - Acc. to standards, this steel family should be quenched in oil fluid
 - Water is not safe enough to avoid cracks

**GETTING TOGETHER THE KNOWLEDGE FROM FORGING
AND HEAT TREATMENT**



Latest innovation

RIZA's added value

- In 2020, RIZA was able to develop a software to predict the cooling speed of the part being quenched based on
 - Quenching fluid and its T°
 - Part geometry
- Combining this software with RIZA's metalurgical knowledge, we were able to predict the exact time the parts should be submerged in the quenching fluid:
 - Short enough to avoid any risk of cracks
 - Long enough to obtain the mechanical properties requested by our customers, increasing quenching drasticity compared to oil quenching

**GETTING TOGETHER THE KNOWLEDGE FROM FORGING
AND HEAT TREATMENT**



Latest innovation

Success cases

- We have significantly improved KV for 42CrMo4 at low (-40 °C) temperatures, making it more useful for very cold applications
- As a consequence, we have been able to obtain the properties requested for materials 34CrNiMo6 and 30CrNiMo8 by using 42CrMo4 both in Rm (MPa) and KV (J)
- By using 42CrMo4 instead of 34CrNiMo6 or 30CrNiMo8, we have been able to **save** respectively **400 and 600 €/Ton** in steel purchasing cost.

**GETTING TOGETHER THE KNOWLEDGE FROM FORGING
AND HEAT TREATMENT**



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