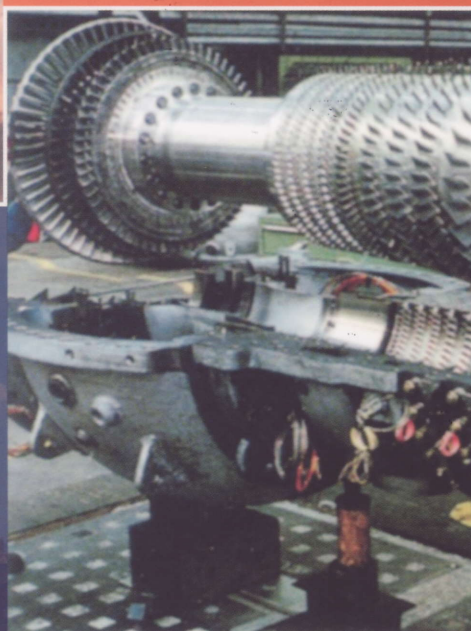
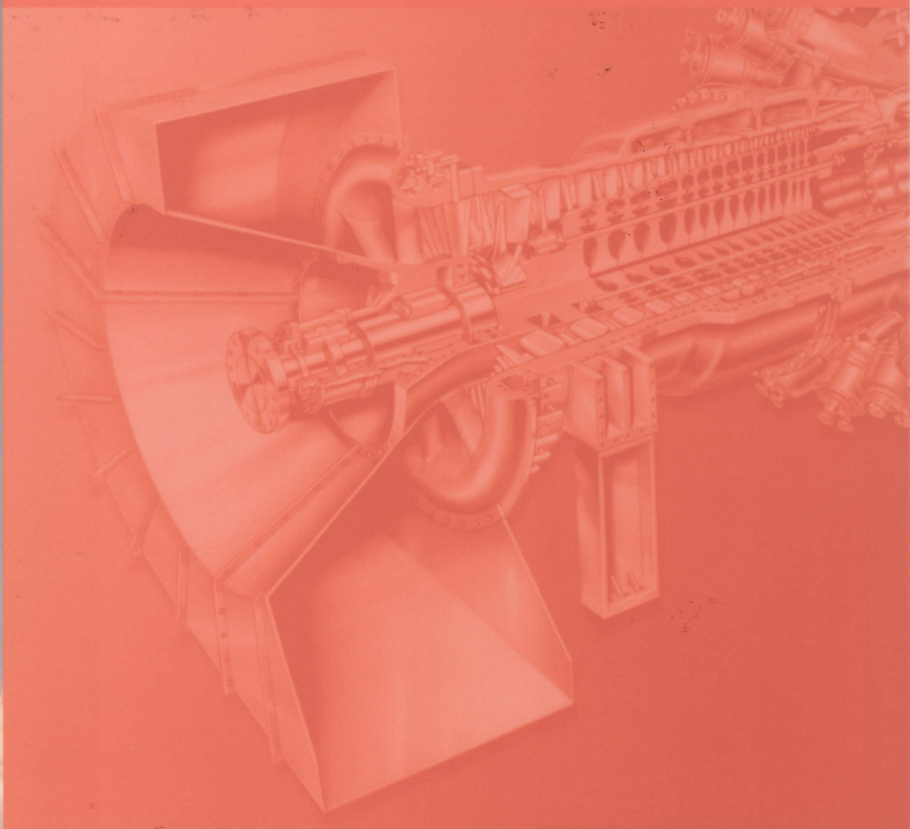
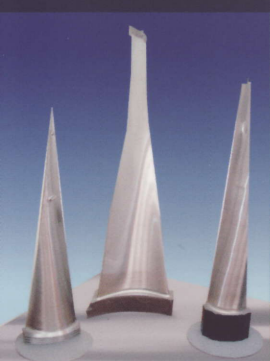
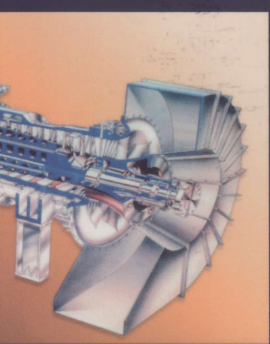


High quality is our standard

# Stainless and Specialty Steels for **POWER GENERATION**

LONG PRODUCTS



**ACCIAIERIE VALBRUNA**

# POWER GENERATION

High quality is our standard

Stainless and Specialty Steels for

# POWER GENERATION

LONG PRODUCTS



Valbruna, founded in 1925 and leader in the production of long products in stainless steels, nickel alloys and titanium, presents a selected range of billets, flats and rounds for Power Generation, supported by long experience and highly qualified customer service.

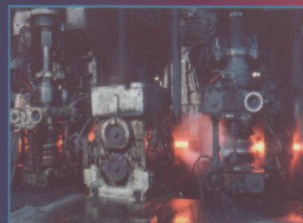
Vicenza plant



Bolzano plant



Fort Wayne, (IN) plant



**ITALY:** Vicenza  
Bolzano  
**Mills**  
**USA:** Fort Wayne

## VALBRUNA...SUCH A GREAT REALITY!

Our vast and strategic distribution network is our corner stone in a global market, granting not only a worldwide commercial presence but also a steadfast feedback with customers.

**ITALY**  
Ancona  
Torino  
Milano  
Brescia  
Parma  
Bologna

**EUROPE**  
Germany  
France  
England  
Spain  
Ireland  
Denmark  
Switzerland  
Netherlands  
Poland  
Finland  
Sweden

**AMERICA**  
Canada  
United States  
Mexico

**ASIA - OCEANIA**  
Hong Kong  
Australia  
Malaysia  
UAE



**ACCIAIERIE VALBRUNA**

High quality is our standard

## CHEMICAL COMPOSITION

### STAINLESS STEELS

| Valbruna | C max       | Mn max    | Si max    | P max | S max | Cr max      | Ni max    | Mo max     |
|----------|-------------|-----------|-----------|-------|-------|-------------|-----------|------------|
| V145     | 0,05        | 1         | 1         | 0,03  | 0,03  | 14 - 16     | 5 - 7     | 0,5 - 1    |
| X154MU/2 | 0,07        | 1         | 0,7       | 0,04  | 0,015 | 13 - 15     | 5 - 6     | 1,2 - 2    |
| VAL1B/1  | 0,08 - 0,15 | 1         | 0,5       | 0,025 | 0,015 | 11,5 - 13,5 | 0,6       | 0,5        |
| VAL1C    | 0,18        | 1         | 1         | 0,04  | 0,03  | 11,5 - 13,5 | -         | -          |
| VAL1MP   | 0,15        | 1         | 0,5       | 0,04  | 0,03  | 11,5 - 13   | 0,6       | -          |
| VAL2A/1  | 0,17 - 0,22 | 1         | 1         | 0,035 | 0,03  | 12,5 - 14   | 1         | -          |
| VAL2MCV  | 0,16 - 0,22 | 0,3 - 0,8 | 0,1 - 0,5 | 0,035 | 0,035 | 10 - 11,5   | 0,3 - 0,8 | 0,5 - 1    |
| VAL2MV   | 0,18 - 0,23 | 0,3 - 0,8 | 0,1 - 0,5 | 0,03  | 0,03  | 11 - 12,5   | 0,3 - 0,8 | 0,8 - 1,2  |
| VAL2W    | 0,20 - 0,25 | 0,5 - 1   | 0,5       | 0,025 | 0,025 | 11 - 12,5   | 0,5 - 1   | 0,9 - 1,25 |
| X134M    | 0,05        | 1,5       | 0,7       | 0,04  | 0,015 | 12 - 14     | 3,5 - 4,5 | 0,3 - 0,7  |
| X164M    | 0,06        | 1,5       | 0,7       | 0,04  | 0,03  | 15 - 17     | 4 - 6     | 0,8 - 1,5  |
| X122MV   | 0,08 - 0,13 | 0,5 - 0,9 | 0,35      | 0,025 | 0,015 | 11 - 12,5   | 2 - 3     | 1,5 - 2    |

### NICKEL ALLOYS

| Valbruna | C max       | Mn max | Si max | P max | S max | Cr max      | Ni max  | Mo max    | N max | Cu max  |
|----------|-------------|--------|--------|-------|-------|-------------|---------|-----------|-------|---------|
| GL1      | 0,05 - 0,1  | 1      | 0,5    | 0,02  | 0,015 | 14 - 17     | 72 min  | -         | -     | 0,5     |
| GL2      | 0,04 - 0,1  | 1      | 1      | 0,02  | 0,015 | 18 - 21     | 65      | -         | -     | 0,2     |
| GL3      | 0,1         | 0,5    | 0,5    | 0,015 | 0,015 | 20 - 23     | 58 min  | 8 - 10    | -     | 0,5     |
| AV718    | 0,08        | 0,35   | 0,35   | 0,015 | 0,015 | 17 - 21     | 50 - 55 | 2,8 - 3,3 | -     | 0,3     |
| AN1      | 0,06 - 0,1  | 1,5    | 1      | 0,03  | 0,015 | 19 - 23     | 30 - 34 | -         | -     | 0,75    |
| AN2      | 0,05        | 1      | 0,5    | 0,03  | 0,03  | 19,5 - 23,5 | 38 - 46 | 2,5 - 3,5 | -     | 1,5 - 3 |
| AN5      | 0,03 - 0,08 | 1 - 2  | 1      | 0,025 | 0,015 | 13,5 - 16   | 24 - 27 | 1 - 1,5   | -     | -       |

### TITANIUM ALLOY

| Valbruna | N max | C max | H max  | Fe max | O max | Al max      | V max     |
|----------|-------|-------|--------|--------|-------|-------------|-----------|
| Ti Gr.5. | 0,05  | 0,08  | 0,0125 | 0,30   | 0,2   | 5,50 - 6,75 | 3,5 - 4,5 |

## MECHANICAL PROPERTIES

### STAINLESS STEELS\*

| Valbruna | Steel Name/Number | T.S. min [ N/mm <sup>2</sup> ] | Y.S. [ 0,2% ] min [ N/mm <sup>2</sup> ] | E in 4 D min [ % ] | RA min [ % ] |
|----------|-------------------|--------------------------------|-----------------------------------------|--------------------|--------------|
| V145     | XM-25             | 860 - 1140                     | ≥ 655                                   | ≥ 10               | ≥ 40         |
| X154MU/2 | 1.4594            | 1000 - 1200                    | > 860                                   | > 10               | -            |
| VAL1B/1  | 410 / 1.4006      | 650 - 850                      | ≥ 450                                   | > 15               | -            |
| VAL1C    | 403CB             | > 790                          | > 660                                   | > 15               | > 50         |
| VAL1MP   | -                 | 700 - 900                      | ≥ 550                                   | > 18               | -            |
| VAL2A/1  | 1.4021            | 800 - 950                      | > 600                                   | > 12               | -            |
| VAL2MCV  | 1.4913            | 900 - 1050                     | > 750                                   | > 12               | > 40         |
| VAL2MV   | 1.4923            | 800 - 950                      | > 600                                   | > 14               | > 40         |
| VAL2W    | -                 | > 1000                         | > 720                                   | > 13               | > 30         |
| X134M    | 1.4313            | 900 - 1100                     | ≥ 800                                   | ≥ 10               | -            |
| X164M    | 1.4418            | 900 - 1100                     | ≥ 700                                   | ≥ 16               | -            |
| X122MV   | 1.4938            | 930 - 1130                     | > 760                                   | > 14               | > 40         |

\* Mechanical properties on hardened and tempered bars to be taken as reference values.

### TITANIUM ALLOY

| Valbruna | Name/Number   | T.S. min [ N/mm <sup>2</sup> ] | Y.S. [ 0,2% ] min [ N/mm <sup>2</sup> ] | E in 4 D min [ % ] | RA min [ % ] |
|----------|---------------|--------------------------------|-----------------------------------------|--------------------|--------------|
| Ti Gr.5. | 3.7164/R56400 | 930                            | 860                                     | 10                 | 25           |

### NICKEL ALLOYS

| Valbruna | Name/Number |
|----------|-------------|
| GL1      | N06600      |
| GL2      | 2.4816      |
| GL3      | 2.4952      |
| GL3      | 2.4856      |
| AV718    | 2.4668      |
| AN1      | 2.4876      |
| AN2      | 2.4858      |
| AN5      | 1.4980      |

# POWER GENERATION

High Corrosion and Heat Resistance Steels

| Nb + Ta<br>max | Cu<br>max   | N<br>max    | V<br>max    | B<br>max | W<br>max | Sn<br>max |
|----------------|-------------|-------------|-------------|----------|----------|-----------|
| 8 x C min      | 1,25 - 1,75 | -           | -           | -        | -        | -         |
| 0,15 - 0,6     | 1,2 - 2     | -           | -           | -        | -        | -         |
| -              | 0,05        | -           | -           | -        | -        | 0,05      |
| 0,05 - 0,3     | -           | -           | -           | -        | -        | -         |
| -              | -           | -           | -           | -        | -        | -         |
| -              | -           | -           | -           | -        | -        | -         |
| 0,15 - 0,5     | -           | 0,05 - 0,1  | 0,1 - 0,3   | 0,01     | -        | -         |
| -              | -           | -           | 0,25 - 0,35 | -        | -        | -         |
| -              | -           | -           | 0,2 - 0,3   | -        | -        | -         |
| -              | -           | 0,02 min    | -           | -        | -        | -         |
| -              | -           | 0,02 min    | -           | -        | -        | -         |
| -              | -           | 0,02 - 0,04 | 0,25 - 0,4  | -        | -        | -         |

| Fe<br>max | Al<br>max  | Ti<br>max   | B<br>max     | Co<br>max | Nb<br>max   | Nb + Ta<br>max | Al + Ti<br>max | V<br>max  |
|-----------|------------|-------------|--------------|-----------|-------------|----------------|----------------|-----------|
| - 10      | 0,3        | 0,3         | 0,006        | 1         | -           | -              | -              | -         |
| 1,5       | 1 - 1,8    | 1,8 - 2,7   | 0,008        | 1         | -           | -              | -              | -         |
| 5         | 0,4        | 0,4         | -            | 1         | 3,15 - 4,15 | 3,15 - 4,15    | -              | -         |
| 22        | 0,2 - 0,8  | 0,65 - 1,15 | 0,006        | 1         | 4,8 - 5,5   | -              | -              | -         |
| 5 min     | 0,15 - 0,6 | 0,15 - 0,6  | -            | -         | -           | -              | 0,15 - 0,6     | -         |
| 2 min     | 0,2        | 0,6 - 1,2   | -            | 2         | -           | -              | -              | -         |
| -         | 0,35       | 1,9 - 2,3   | 0,003 - 0,01 | -         | -           | -              | -              | 0,1 - 0,5 |

| T.S. min<br>[ N/mm <sup>2</sup> ] | Y.S. [ 0,2% ] min<br>[ N/mm <sup>2</sup> ] | E in 4 D min<br>[ % ] | RA min<br>[ % ] |
|-----------------------------------|--------------------------------------------|-----------------------|-----------------|
| >550-850                          | >240                                       | 30                    | -               |
| 1000 - 1300                       | >600                                       | ≥12                   | ≥12             |
| >690                              | >280                                       | >30                   | -               |
| >1275                             | >1034                                      | >6                    | >8              |
| >515                              | >205                                       | >30                   | -               |
| >590                              | >240                                       | >30                   | -               |
| 900 - 1150                        | >600                                       | >15                   | -               |

**POWER  
GENERATION**  
LONG PRODUCTS



**ACCIAIERIE VALBRUNA**

## STEEL DESIGNATION

Stainless steels and other corrosion resistant alloys are extensively used in the power generation industry to prevent corrosion, particularly at elevated temperatures.

### STAINLESS STEELS

| Valbruna | Name             | USA           |            |               | EUROPE        |                      |                                                               | JAPAN       | BS          |
|----------|------------------|---------------|------------|---------------|---------------|----------------------|---------------------------------------------------------------|-------------|-------------|
|          |                  | Standard Norm | Grade AISI | Symbol        | Standard Norm | EN Number            | Designation                                                   | Designation | Designation |
| V145     | XM-25            | A564          | XM-25      | S45000        | -             | -                    | -                                                             | -           | -           |
| X154MU/2 | X5CrNiMoCuNb14-5 | -             | -          | -             | EN 10088-3    | 1.4594               | X5CrNiMoCuNb14-5                                              | -           | -           |
| VAL1B/1  | 403/410          | ASTM A182     | 403/410    | S40300/S41000 | EN 10088-3    | 1.4006/1.4011        | X12Cr13/X12Cr12                                               | SUS 410     | -           |
| VAL1C    | 403CB            | -             | 403CB      | -             | -             | -                    | -                                                             | -           | -           |
| VAL1MP   | 403/410          | -             | 403/410    | S41025        | EN 10088-3    | 1.4006               | -                                                             | -           | -           |
| VAL2A/1  | 420              | -             | 420        | -             | EN 10088-3    | 1.4021/1.4014/1.4027 | X20Cr13/X20Cr14                                               | SUS 420J1   | -           |
| VAL2MVC  | 422CB            | -             | 422CB      | -             | EN 10269      | 1.4913               | X19CrMoNbVN11-1                                               | -           | -           |
| VAL2MV   | X22CrMoV12-1     | -             | -          | -             | EN 10269      | 1.4923/1.4921/1.4922 | X20CrMoV11-1<br>X19CrMo12-1<br>X22CrMoV12-1<br>X21CrMoNiV12-1 | -           | -           |
| VAL2W    | 422              | A565          | 616/422    | S42200/B4B    | -             | -                    | -                                                             | -           | -           |
| X134M    | F6NM             | ASTM A276     | F6NM       | S41500        | EN 10088-3    | 1.4313               | X3CrNiMo13-4                                                  | -           | -           |
| X164M    | X4CrNiMo16-5-1   | -             | -          | -             | EN 10088-3    | 1.4418               | X4CrNiMo16-5-1                                                | -           | -           |
| X122MV   | XM-32            | ASTM A565     | XM-32      | -             | EN 10269      | 1.4938/1.4939/1.4933 | X12CrNiMoV12-3<br>X12CrNiMoN12                                | -           | -           |

### NICKEL ALLOYS

| Valbruna | Name           | USA           |                          | EUROPE        |               |                     | JAPAN       | BS          |
|----------|----------------|---------------|--------------------------|---------------|---------------|---------------------|-------------|-------------|
|          |                | Standard Norm | Symbol                   | Standard Norm | EN Number     | Designation         | Designation | Designation |
| GL1      | Alloy 600      | ASTM B166     | N06600                   | -             | 2.4816        | -                   | -           | NA 14       |
| GL2      | Alloy 80A      | ASTM B637     | N07080                   | -             | 2.4952        | -                   | -           | NA 20       |
| GL3      | Alloy 625      | ASTM B446     | N06625                   | -             | 2.4856        | -                   | NCF 625     | NA 21       |
| AV718    | Alloy 718      | ASTM B637     | -                        | -             | 2.4668        | -                   | -           | -           |
| AN1      | 800/800H/800HT | ASTM B408     | N08800/N08810/<br>N08811 | -             | 1.4876/1.4958 | -                   | NCF 800     | NA15/NA15H  |
| AN2      | Alloy 825      | ASTM B564     | N08825                   | -             | 2.4858        | -                   | NCF 825     | NA41/NA16   |
| AN5      | Alloy A286/660 | ASTM A453     | 660/S66286               | EN 10269      | 1.4980        | X6NiCrTiMoVB25-15-2 | -           | -           |

### TITANIUM ALLOY

| Valbruna | Name    | USA           |        | EUROPE        |           |
|----------|---------|---------------|--------|---------------|-----------|
|          |         | Standard Norm | Symbol | Standard Norm | EN Number |
| Ti Gr.5. | Ti6Al4V | AMS 4928      | R56400 | WL 3.7164.1   | 3.7164    |



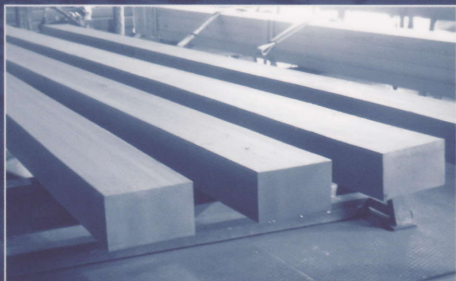
**ACCIAIERIE VALBRUNA**

Stainless and Specialty Steels for

## POWER GENERATION

LONG PRODUCTS

### Flats



Hot rolled:

up to 170 x 60 mm

Rotatory forged:

up to 200 x 125 mm

Press Forged:

up to 600 x 500 mm

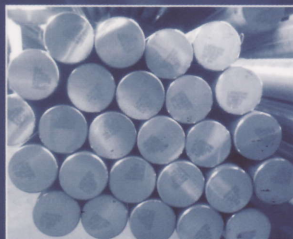
### Billets



Hot Rolled: 40 ÷ 230 mm

Forged: 230 ÷ 600 mm

### Rounds



Hot Rolled and Peeled:

18 ÷ 170 mm

Forged and Peeled:

180 ÷ 300 mm

Forged and Turned:

310 ÷ 600 mm



## ACCIAIERIE VALBRUNA

### ACCIAIERIE VALBRUNA

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