

ASTM A 829 - GRADE 4140 / GRADE 4142

Cr Mo-alloyed vacuum degassed steels

Material data sheet, edition February 2024¹

ASTM A 829 - Grade 4140 and ASTM A 829 - Grade 4142 are vacuum degassed fine-grained steels which are particularly used by the customers for heavy machinery applications.

Product description

Designation and range of application

ASTM A 829 - Grade 4140 and ASTM A 829 - Grade 4142 are available as plate in form I-Rectangular and with the edge categories 3 (sheared edge), 4 (gas cut edge) and 5 (special cut edge) in the following dimensions:

Thickness [mm]	Width ^a [mm]	Length [mm]	Thickness [in]	Width ^a [in]	Length [in]
≥ 12 ≤ 130	≥ 1000 ≤ 3000	≥ 4500 ≤ 6000	≥ ½ ≤ 5	≥ 40 ≤ 118	≥ 177 ≤ 236
> 130 ≤ 300	≥ 1000 ≤ 2050	≥ 4000 ≤ 6000	> 5 ≤ 12	≥ 40 ≤ 80½	≥ 157½ ≤ 236

^a Widths < 1250 mm (49 in) have to be ordered with an even number of plates. Other dimensions available upon request.

Chemical composition

For the ladle analysis the following limiting values in % are applicable (a product analysis can be agreed upon request):

	C	Si	Mn	P	S	Cr	Mo	V
ASTM A 829 - Grade 4140	0.36 - 0.44	0.15 - 0.35	0.75 - 1.00	≤ 0.020	≤ 0.005	0.80 - 1.10	0.15 - 0.25	—
ASTM A 829 - Grade 4142	0.38 - 0.46	0.15 - 0.35	0.75 - 1.00	≤ 0.020	≤ 0.005	0.80 - 1.10	0.15 - 0.25	^a

^a alloyed depending on dimensions

Delivery condition

The following delivery conditions according to ASTM A 829 can be offered:

- ASTM A 829 – Grade 4140 subcritical annealed
- ASTM A 829 – Grade 4140 normalized
- ASTM A 829 – Grade 4140 quenched + tempered
- ASTM A 829 – Grade 4142 subcritical annealed
- ASTM A 829 – Grade 4142 normalized + tempered
- ASTM A 829 – Grade 4142 quenched + tempered

The as rolled (AR) delivery condition is not offered. The delivery condition is to be agreed before placing the order.

¹ The latest edition of this material data sheet is available at www.dillinger.de

Mechanical properties

Delivery condition	Thickness		Hardness HBW			
			ASTM A 829 – Grade 4140	ASTM A 829 – Grade 4142		
annealed (subcritical annealing)	all		≤ 240	≤ 250		
normalized ^a	≤ 38	mm	≤ 1½	in	≤ 320	-
	> 38 ≤ 76	mm	> 1½ ≤ 3	in	≤ 300	
	> 76	mm	> 3	in	≤ 270	
normalized ^a + tempered	all				260 – 310	

^a control rolling (normalizing rolling) may replace furnace normalizing

If deviating tensile or hardness requirements are specified, they must be compatible with the chemical analysis, the delivery condition and the thickness.

Indicative value for the yield point $R_{eH} \geq 380$ MPa

Testing

- Heat analysis
- Dimension control
- Surface inspection
- HBW - Hardness (tested on surface of one plate for each thickness and heat)
- Tensile testing (of one plate for each thickness and heat) can be specified

Unless otherwise agreed, the results are documented in an inspection certificate 3.1 in accordance with EN 10204.

Identification

Unless otherwise agreed, the marking is carried out via steel stamps with at least the following information:

- steel grade
- heat number
- number of mother plate and individual plate
- the manufacturer's symbol
- inspection representative's sign

Processing

Flame cutting

Due to their chemical composition common die and mold steels will be cut by plasma, waterjet or saw. In case of other thermal cutting, we recommend contacting Dillinger prior to processing.

General technical delivery requirements

Unless otherwise agreed, the general technical delivery requirements in accordance with ISO 404 apply.

Tolerances

Unless otherwise agreed, tolerances are in accordance with ASTM A 6 with the following restrictions:

Plate width [mm]	Tolerance [mm]	Plate width [in]	Tolerance [in]
$\geq 1000 \leq 1500$	± 25	$\geq 40 \leq 59$	± 1
$> 1500 \leq 2050$	± 40	$> 59 \leq 80\frac{1}{2}$	$\pm 1\frac{1}{2}$
> 2050	± 50	$> 80\frac{1}{2}$	± 2

Plate length	Tolerance	
	[mm]	[in]
all	± 1000	± 40

Plate thickness and flatness in accordance with ASTM A6.

Unless otherwise agreed, short length ≥ 2000 mm (79 in) are part of the delivery.

Surface Quality

Unless otherwise agreed, the specifications will be in accordance with EN 10163-2 class A, subclass 3. Shot blasting of upper and lower surface of the plate and shop priming are possible on request.

Ultrasonic testing

Ultrasonic testing in accordance with ASTM A578, Level B.

Options

Tolerances: Flatness 3 mm/m (1/8 in / 40 in), evaluation according to EN 10029.

General note

If special requirements, which are not covered in this material data sheet, are to be met by the steel due to its intended use or processing, these requirements are to be agreed before placing the order.

The information in this data sheet is a product description. This data sheet is updated at irregular intervals. The current version is relevant. The latest version is available from the mill or as download at www.dillinger.de.

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