



Flat Product of Stainless Steel Plate/Sheet, Coil, and Strip

Standard: ASTM A240/A480

Standard specification for the flat product of stainless steel, i.e. plate/sheet, coil and strip form.

Using this standard will give the assurance that flat product you used is applicable in general requirement and even in heat treatment.

AISI 300/400 Series & 253 MA

For wide range of your requirement, we supply from AISI 300 series and 400 series. Type from AISI 300 series (austenitic): 304/304L, 310S, 316/316L; from AISI 400 series (ferritic): 409 and 430. For heat treatment, we also provide 253 MA.

Standar: ASTM A240/A480

Spesifikasi standar untuk stainless steel jenis flat: baik dalam bentuk plat/sheet, coil maupun strip.

Standar ini menjamin produk flat yang Anda gunakan mampu menerima perlakuan panas, disamping penggunaan serba guna (umum) lainnya.

AISI 300/400 Series & 253 MA

Untuk berbagai situasi dan keperluan, kami menyediakan plat baik dari seri AISI 300 maupun AISI 400. Tipe-tipe dari seri AISI 300 (austenitic): 304/304L, 310S, 316/316L; sedang dari seri AISI 400 (ferritic): 409 dan 430. Untuk pengerjaan pada suhu tinggi kami sediakan pula 253 MA.

STOCK

For each type of the both series (AISI 300 and 400), we offer the sizes (width x length) as shown the right list. Thickness is available in very large range, starting 0.5 mm through 25 mm. Coils with 4' and 5' width for any grades and thicknesses are available based on request.

Untuk setiap tipe dari kedua seri (AISI 300 dan 400), tersedia dengan ukuran (lebar x panjang) seperti pada list di samping. Ketebalannya mulai dari 0.5-25mm. Coil tersedia dengan lebar 4' dan 5'. Hubungi kami untuk mendapatkan coil dgn grade & ketebalan sesuai kebutuhan Anda.

| Stainless Type | Size (w x l) | Thickness range (mm) | |
|----------------|-------------------------------------------|----------------------|---------------|
| 304/304L | 1000 x 2000 mm | 0.50 - 16.00 | Plate / Sheet |
| | 4' x 8' | 0.50 - 25.00 | |
| | 5' x 10' | 0.80 - 2.00 | |
| | 5' x 20' | 3.00 - 12.00 | |
| 316/316L | 1000 x 2000 mm | 1.00 - 5.00 | |
| | 4' x 8' | 0.50 - 16.00 | |
| | 5' x 10' | 1.00 - 9.00 | |
| | 5' x 20' | 4.00 - 8.00 | |
| 310 S | 1000 x 2000 mm | ≥ 1.00 | |
| | 4' x 8' , 5' x 10' | ≥ 8.00 | |
| 409 | 914 x 2000 mm | 0.80 - 1.20 | |
| | 1245 x 2000 mm | 0.80 - 1.20 | |
| 430 | 1000 x 2000 mm | 0.50 - 3.00 | |
| | 4' x 8' | 0.50 - 3.00 | |
| 253 MA | 5' x 10' | ≥ 3.00 | |
| 304 | width : 25 - 100 mm length : ± 6000 mm | 3.00 - 25.00 | strip |

SURFACE FINISHED

Berbagai finishing permukaan plat

| Finish No. | Description and Application | Penjelasan dan Penggunaan |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | <i>Hot rolled, annealed, and descaled. Generally used when smoothness and uniformity of finish are not important.</i> | Hasil dari proses <i>hot rolled, annealed, and descaled</i> . Penggunaannya tidak mempertimbangkan keindahan permukaan. |
| 2B | <i>Cold rolled, annealed, and descaled. A smooth finish for general applications.</i> | Hasil dari proses <i>cold rolled, annealed, and descaled</i> . Permukaan halus untuk aneka keperluan. |
| BA | <i>Bright cold-rolled finish retained by final annealing in a controlled atmosphere furnace.</i> | Permukaan halus dan lebih berkilap daripada 2B, dihasilkan dari proses <i>bright annealing</i> . |
| 4 | <i>Cold rolled, annealed, descaled, polished to 100 grid. Polished satin finish. Widely used for restaurant equipment, food processing equipment, etc.</i> | Hasil dari proses <i>cold rolled, annealed, descaled</i> , dan pemolesan 100 grid. Polesan satin. Banyak digunakan untuk peralatan restoran, pemrosesan makanan, dll. |
| Hair Line (HL) | <i>Cold worked. Polished finish, used for exterior / interior / decoration.</i> | Hasil dari proses <i>cold worked</i> . Permukaan dengan polesan, tampak ada garis-garis. Digunakan untuk eksterior, interior, dekorasi. |

COATING

Coating for sheet :

- PE (blue) : for transport protection - cover is about 60-80 µm thick
- PVC (white) : for bending sheet - cover is about 100-140 µm thick
- PVC (blue) : for drawing sheet - cover is about 120 µm thick

LAPISAN PELINDUNG

Lapisan pelindung plat :

- PE (biru) : untuk pelindung permukaan waktu pengiriman - tebal pelindung sekitar 60-80 µm
- PVC (putih) : pelindung plat untuk keperluan *bending* - tebal pelindung sekitar 100-140 µm
- PVC (biru) : pelindung plat untuk keperluan *drawing* - tebal pelindung sekitar 120 µm

THICKNESS TOLERANCE

Based on ASTM A480

Toleransi Ketebalan berdasar ASTM A480

Thickness is measured along the longitudinal edges of the plate at least 9.52 mm, but not more than 76.20 mm from the edge.

Ketebalan diukur pada sisi panjang plat antara jarak 9.52 - 76.20 mm dari tepi.

| Specified Thickness Spesifikasi Ketebalan (mm) | Permissible Variations Toleransi yang Diizinkan | |
|---------------------------------------------------|----------------------------------------------------|-------------------|
| | Under / Kurang (mm) | Over / Lebih (mm) |
| 0.50 < 0.66 | 0.008 | 0.008 |
| 0.66 < 1.02 | 0.100 | 0.100 |
| 1.02 < 1.47 | 0.130 | 0.130 |
| 1.47 < 1.83 | 0.150 | 0.150 |
| 1.83 < 2.11 | 0.180 | 0.180 |
| 2.11 < 2.49 | 0.200 | 0.200 |
| 2.49 < 2.90 | 0.230 | 0.230 |
| 2.90 < 3.30 | 0.250 | 0.250 |
| 3.30 < 3.68 | 0.300 | 0.300 |
| 3.68 < 4.76 | 0.360 | 0.360 |
| 4.76 < 9.52 | 0.250 | 1.150 |
| 9.52 < 19.05 | 0.250 | 1.400 |
| 19.05 < 25.40 | 0.250 | 1.550 |

Maximum recommended service temperature (oxidising condition)

Batas maksimum temperatur yang direkomendasikan (kondisi oksidasi)

| Type of stainless steel Tipe Stainless Steel | Continuous heating (°C) Pemanasan terus-menerus | Intermittent heating (°C) Pemanasan berjeda |
|-------------------------------------------------|----------------------------------------------------|------------------------------------------------|
| 304/304L | 925 | 850 |
| 310 | 1150 | 1035 |
| 316/316L | 925 | 870 |
| 409 | 600 | 700 |
| 430 * | 750 | 850 |
| 253 MA | 1200 | 950 |

* do not use type 430 in temperature range of 450-500 °C

* jangan menggunakan tipe 430 di antara suhu 450-500 °C

CHEMICAL PROPERTIES

Based on ASTM A240

| AISI | % C _{max} | % Mn _{max} | % P _{max} | % S _{max} | % Si _{max} | % Cr | % Ni | % N _{max} | other % |
|---------|--------------------|---------------------|--------------------|--------------------|---------------------|--------------|----------|--------------------|---------------------------|
| 304 | 0.08 | 2.00 | 0.045 | 0.03 | 1.00 | 18 - 20 | 8 - 10.5 | 0.10 | |
| 304L | 0.03 | 2.00 | 0.045 | 0.03 | 0.75 | 18 - 20 | 8 - 12 | 0.10 | |
| 316 | 0.08 | 2.00 | 0.045 | 0.03 | 1.00 | 16 - 18 | 10 - 14 | 0.10 | Mo: 2 - 3 |
| 316L | 0.03 | 2.00 | 0.045 | 0.03 | 0.75 | 16 - 18 | 10 - 14 | 0.10 | Mo: 2 - 3 |
| 310S | 0.08 | 2.00 | 0.045 | 0.03 | 1.50 | 24 - 26 | 19 - 22 | | |
| 409 | 0.08 | 1.00 | 0.045 | 0.03 | 1.00 | 10.5 - 11.75 | 0.5 | | Ti: 0.75 |
| 430 | 0.12 | 1.00 | 0.040 | 0.03 | 1.00 | 16 - 18 | 0.75 | | |
| 253 MA* | 0.5 - 1.0 | 0.80 | 0.040 | 0.03 | 1.4 - 2.0 | 20 - 22 | 10 - 20 | 0.14 - 0.20 | Ce:0.03-0.08 Mo: 2 - 3 |

*) Equivalent with UNS S30815 (ASTM) or DIN I, 4893

MECHANICAL PROPERTIES

| AISI / Grade | Tensile Strength min | | Yield Strength min | | Elongation in 2" (50mm) min | Hardness max | | Cold Bend °C |
|--------------|----------------------|-----|--------------------|-----|-----------------------------|--------------|----------|--------------|
| | ksi | MPa | ksi | MPa | | Brinell | Rockwell | |
| 304 | 75 | 515 | 30 | 205 | 40.0 | 202 | 92 | - |
| 304L | 70 | 485 | 25 | 170 | 40.0 | 183 | 88 | - |
| 316 | 75 | 515 | 30 | 205 | 40.0 | 217 | 95 | - |
| 316L | 70 | 485 | 25 | 170 | 40.0 | 217 | 95 | - |
| 310S | 75 | 515 | 30 | 205 | 40.0 | 217 | 95 | - |
| 409 | 55 | 380 | 30 | 205 | 20.0 | - | 80 | 180 |
| 430 | 65 | 450 | 30 | 205 | 22.0 | 183 | 88 | 180 |
| 253 MA* | 87 | 600 | 45 | 310 | 40.0 | 217 | 95 | |

*) Equivalent with UNS S30815 (ASTM) or DIN I, 4893

Data based on ASTM A240, at room temperature

| GRADE / TYPE | APPLICATIONS | APLIKASI |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 304/304L | <i>Cookware, sinks, cutlery, catering equipment, hospital equipment, food and beverage equipment, abattoir equipment, pharmaceutical equipment, cryogenic, tank, and process vessels for a large variety of corrosive liquids</i> | Aneka peralatan masak, pisau, sink, tempat makanan (catering), peralatan rumah sakit, peralatan food & beverage, peralatan rumah potong, peralatan farmasi, peralatan/instalasi pada suhu sangat rendah, tangki, dan aneka peralatan yang hubungannya dengan cairan penyebab korosi. |
| 310S | <i>High temperature oxidation (scaling) resistance, good high temperature strength, furnace parts, muffles, radiant transmission.</i> | Diaplikasikan pada proses okidasi bersuhu tinggi, bagian dari sistem pembakaran, pelindung panas, pen-transfer panas radiasi. |
| 316/316L | <i>Tank works, process vessels for more aggressive corrosive liquids and condition in chemical, petrochemical, pulp and paper, pollution control, hydro metallurgical, and petroleum industries</i> | Aneka pekerjaan tangki, dan peralatan lain yang berhubungan dengan bahan kimia, petrokimia, kertas, pengendalian polusi, hidro-metalurgi, dan industri petroleum. |
| 409 | <i>Part of automotive exhaust pipes, silencers, and catalytic converters.</i> | Bagian dari knalpot, peredam dan katalis. |
| 430 | <i>Sinks, washtroughs, trim for domestic equipment, kitchen & catering utensils, cutlery, material handling equipment in sugar and mining industri, heat resisting and abrasive elevated temperature application max 750°C</i> | Sink, aneka peralatan dapur dan catering, pisau, perlengkapan tangan untuk industri gula dan pertambangan, pengoperasian dengan suhu tinggi maksimum 750°C |
| 253 MA | <i>Burners, recuperator, petrochemical refinery, steam super heater, tube hanger, wire mesh, coveyor belt, radian tubes, refractory anchors, dampers, inner tubes, lifters, expansion bellow, furnace fan, muffle and bell furnaces.</i> | Tungku pembakaran, recuperator, petrokimia, penyulingan, pemanas dgn tungku uap, penggantung pipa, wire mesh, confeyor belt, radian tubes, refractory anchors, dampers, inner tubes, lifters, expansion bellow, furnace fan, muffle, bell furnaces. |

For your flat stainless steel purpose, please contact us.

Untuk kebutuhan plat stainless steel Anda, hubungi kami.