PX4

Highly Weldable General-Purpose Plastic Mold Steel

Features

1. As it is pre-hardened to 30 ~ 33 HRC, it is ready to be machined into mold.
2. With a uniform microstructure and hardness, PX4 shows the best surface finish characteristics: mirror surface polishability and photo etchability.
3. As Hardness of surface-hardened layer is low in electrical discharge machining, finishing operations becomes easy.
4. As it is alloy designed to decrease weld crack susceptibility, weldability is greatly improved.

Applications

1. **Electrical and audio visual related**
   VTR body, TV body, cassette cases, fans, connectors, buttons, others.
2. **Automobile related**
   Tail lamps, mirror cases, meter cases, wheel caps, air-con/heater cases, others.
3. **Communication, OA related**
   Telephones, fax body, copier body, fans, gears, others.
4. **Others**
   Toys, musical instruments, housing equipment, garment cases, miscellaneous goods, etc.

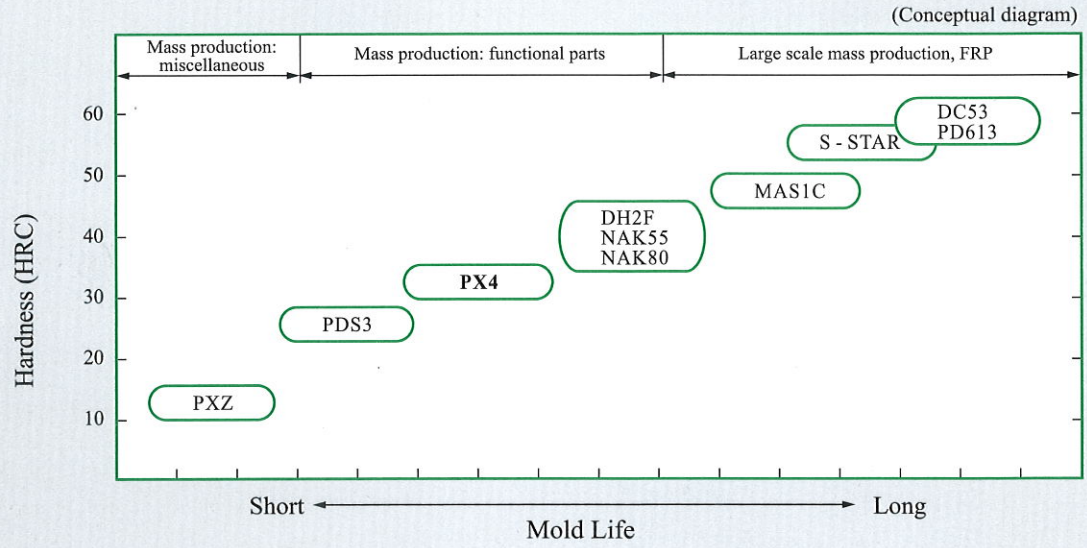
DAIDO STEEL

Chemical Composition

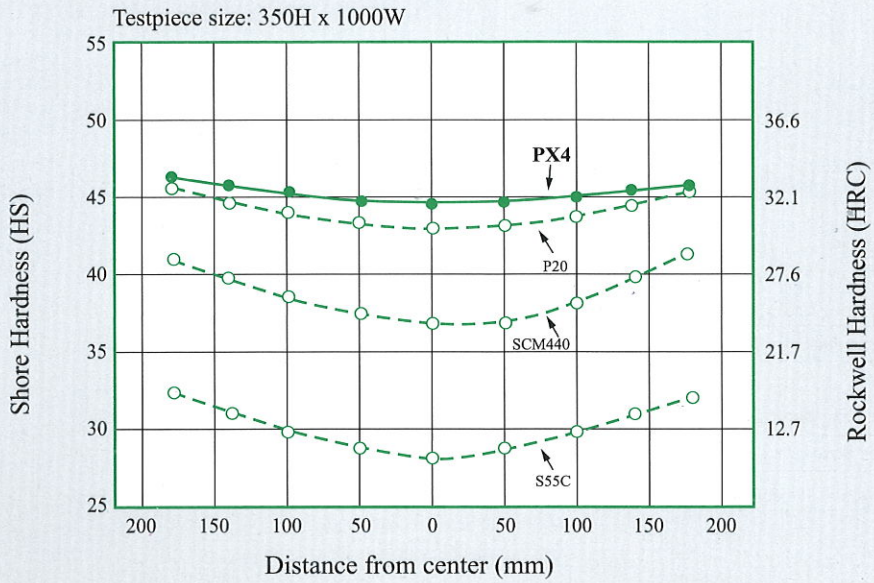
Daido Brand	Hardness	Chemical Composition (%)						Remarks
		C	Si	Mn	Cr	Mo	V	
PX4	30-33HRC	Patent pending						Improved AISI P20

Quality Characteristics I

Materials and Life General-purpose plastic, molding material for mass-production



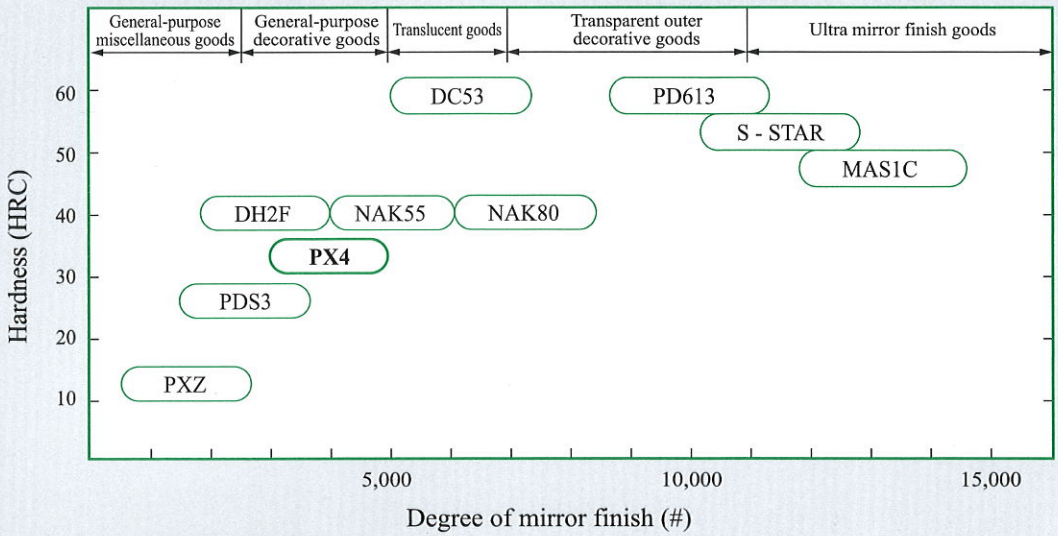
Hardness distribution PX4 shows uniform hardness distribution through to the center.



Quality Characteristics II

Mirror surface polishability

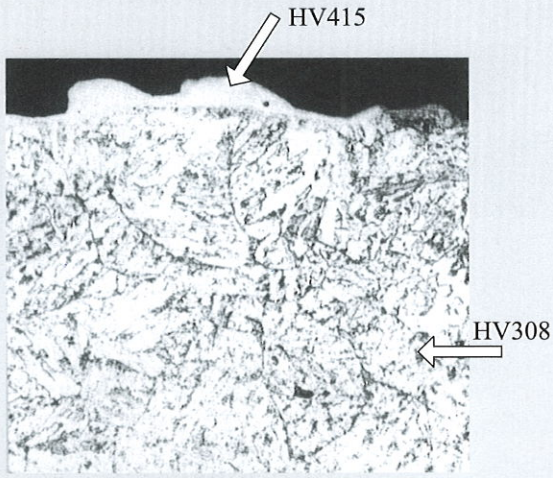
PX4 is uniformed in its microstructure and hardness and its mirror surface polishability is in the highest level among 30HRC type of materials.



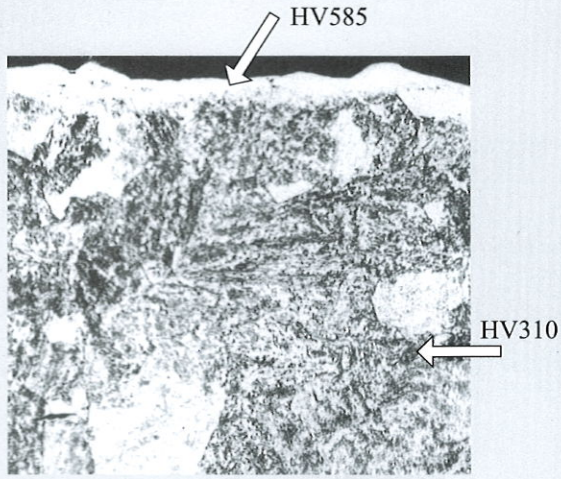
Electrical discharge machinability

As PX4's hardness of the hardened layer in electrical discharge machining is 70% of general Cr-Mo materials, finish grinding of the layer can be carried out more easily.

Hardness of electrical discharge machined surface



PX4



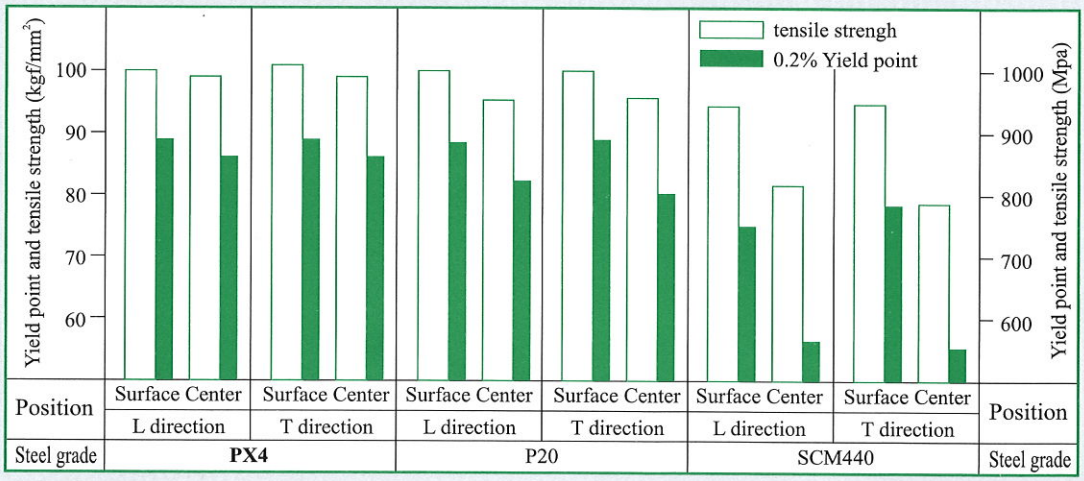
P20

Quality Characteristics III

FEATURES

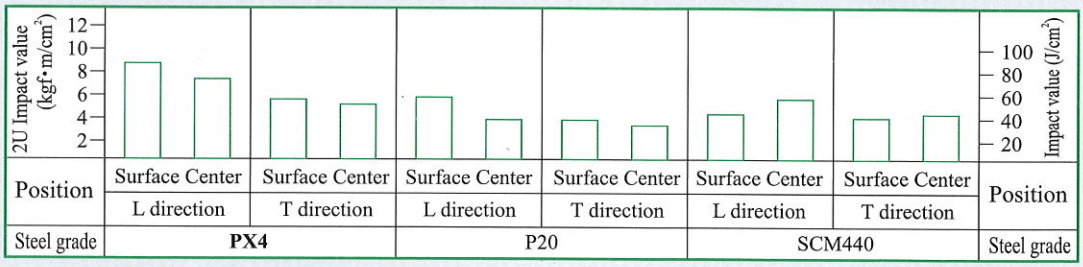
Isotropy and uniform strength:
PX4's strength is of the same level at the center and surface of the material and that isotropy (T/L) is at least 0.95. PX4 ranks in the highest toughness class among Cr-Mo materials.

· Tensile properties



(350H x 1000W)

· Toughness



(350H x 1000W)

Physical Properties

Thermal conductivity (W/m · °C)

(( ) cal/cm·sec·°C)

	20°C	100°C	200°C	300°C	400°C
PX4	42.45 (0.1014)	42.36 (0.1012)	42.07 (0.1005)	39.22 (0.0937)	38.80 (0.0927)
SCM440	42.28 (0.1010)	41.61 (0.0994)	42.70 (0.1020)	39.39 (0.0941)	38.00 (0.0908)

Coefficient of thermal expansion

(x 10⁻⁶/°C)

	30 ~ 100°C	30 ~ 200°C	30 ~ 300°C	30 ~ 400°C	30 ~ 600°C
PX4	11.9	12.7	13.1	13.5	14.1
SCM440	11.9	12.7	13.2	13.7	14.2

Specific heat (J/kg · °C)

(( ) cal/g·°C)

	20°C	100°C	200°C	300°C	400°C
PX4	481.4 (0.115)	489.8 (0.117)	540.0 (0.129)	552.6 (0.132)	627.9 (0.150)
SCM440	481.4 (0.115)	514.9 (0.123)	581.9 (0.139)	590.2 (0.141)	607.0 (0.145)

Young's modulus (Mpa)

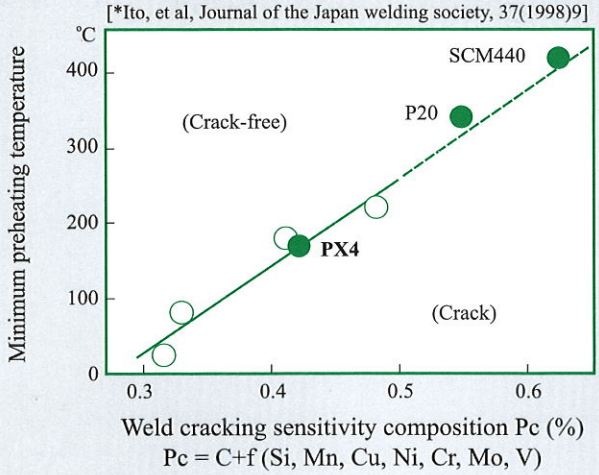
(( ) kgf/mm²)

	20°C	100°C	200°C	300°C	400°C
PX4	207,482 (21,150)	204,048 (20,800)	198,162 (20,200)	192,276 (19,600)	184,919 (18,850)
SCM440	206,991 (21,100)	203,067 (20,700)	197,672 (20,150)	190,314 (19,400)	181,976 (18,550)

Welding Characteristics

PX4 and Conventional knowledge on weldcracking*

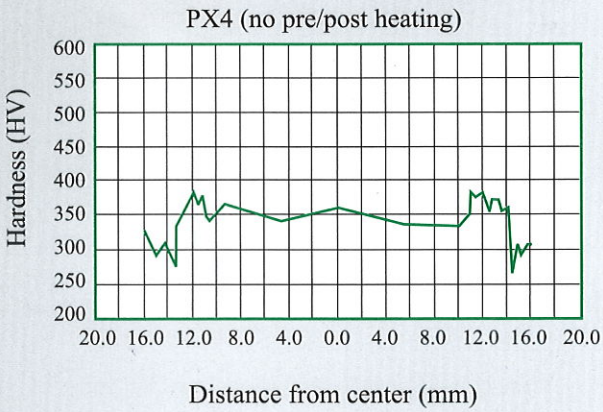
PX4 is alloy designed to decrease weld crack susceptibility.
Thus, it is possible to lower the pre- and after-heat temperature from the conventional range 300 to 500°C, to 200°C.

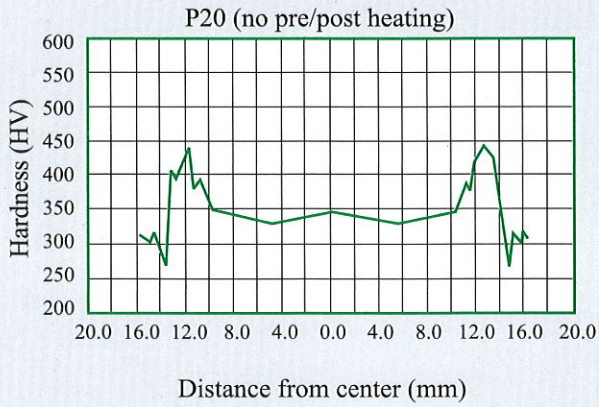


Hardness of welded area

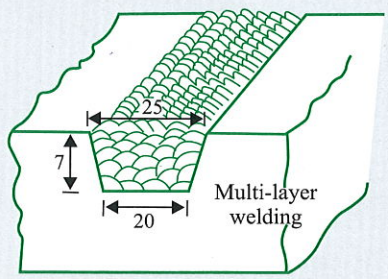
PX4's maximum hardness of heat affected area is the lowest among the 30HRC type of materials.
Thus, susceptibility for fracture is low and operation of cutting and grinding can be carried out more easily.

Hardness distribution around weld





Welding method	TIG
Filler rod	PX5-W
Filler rod dia.	2.4 ϕ
Welding current	130A
Gas flow rate	10ℓ/min.
Pre/post heating	no



DAIDO STEEL CO., LTD.

Tokyo Head Office (Export Sales Dept.)	Daido Shinagawa Building, 6-35, 1-Chome, Konan, Minato-ku, Tokyo, Japan Phone: +81-3-5495-1270 Fax: +81-3-5495-6738
Daido Steel (America) Inc.	1111 Plaza Drive, Suite 740, Schaumburg, IL 60173 U.S.A. Phone: +1-847-517-7950 Fax: +1-847-517-7951
Bangkok Office	120 Moo 5, Wellgrow Industrial Estate, Bangna-Trad Road, KM.36, Bangsamak, Bangpakong, Chachoengsao 24180, Thailand Phone: +66-38-571317 Fax: +66-38-571313
Daido Steel (Shanghai) Co., Ltd.	Room 1402, Ruijin Building, 205 Mao Ming Nan Road, Shanghai 200020, China Phone: +86-21-5466-2020 Fax: +86-21-5466-0279
Daido Steel (Shanghai) Co., Ltd. Guangzhou Subsidiary Company	Room 2601, No.8, Linhezhong Road, Tianhe District, Guangzhou 510610, China Phone: +86-20-3877-1632 Fax: +86-20-8550-1126

Document Disclaimer

The product characteristics included in this brochure are the representative values based on the result of our measurements, and do not guarantee the performance in use of the products. Please inquire the latest information to our department in charge as the information of this brochure is updated without previous notice as needed.

Copyright © 1994 Daido Steel Co., Ltd. All rights reserved.

http://www.daido.co.jp/

02/2016