

DUGARD

Machine Tools That Create Solutions Since 1939

Dugard V20/5 - 5 Axis, 5 Face High Speed
Vertical Machining Centre



www.dugard.com

Dugard V20/5

Model V20/5 is a high speed machining centre with 5 axis or 5 face milling capability. The machine is perfect for a wide range of applications: medical engineering, aerospace engineering, high speed die and mold etc. Equipped with the trunnion table, either torque motor for both A-C axes or C axes with torque motor and A axes with worm gear driven unit, the machine can turn perfectly in the combination movements of the A axis and C axis to perform the full 5 axis milling simultaneously. The V20/5 only needs one set up/workpiece.

The V20/5 has the ability to machine complicated, multi-sided parts while reducing the cycle time, handling time and machine cost.

In addition, the superior design gives optimal vertical traverse with shorter tool length, creating the best tool life and surface finishing with the highest accuracy.



Machine Features

- 5 axis simultaneous milling/facing/drilling/tapping or 5 face machining
- Highly reliable, high loading capacity built-in tilt-trunnion rotary table
- Various spindle speeds
In-line spindle 12000/15000rpm direct drive and motorised spindle 18000rpm/24000/30000rpm available
- Roller type linear guideways to ensure rigidity and reliability
- High precision encoders on A axis and C axis, ensuring tolerance
- Auto lubrication timing control to ensure machine life time
- Fully enclosed guarding gives a well-protected working station

5 Axis Machining Centre

Maximum value for small parts up to 320mm diameter, 100kg

The model V20/5 is capable of full 5 axis simultaneous machining and/or 5 face machining, allowing workpieces to be machined from all angles and positions. The tilt trunnion table is available in smaller sizes in place of the standard table increasing working capacity and reducing interference. The tilt trunnion table has a rotating dia 320mm and capacity to load 100kg

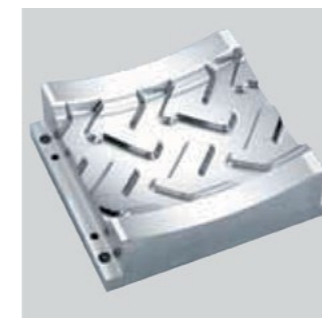


Application

The V20/5 has the capability to meet all requirements for different spindle torque and power, high speed axes acc/dec variations, high axis torque, and fast tool changing time. It's the perfect machine for a range of applications:

- Die and mold industry
- Aerospace industry
- Mechanical engineering
- Medical engineering
- Motor sport
- Subcontract industry

Precise cutting and performance





Side-mounted 24 or 32 tool ATC

for quick tool change.
24 tool ATC comes as standard

Various spindle speed selection

12,000rpm or 15,000rpm in-line spindle speed or 18,000rpm or 24,000rpm motorised spindle speed



Trunnion table instead of plain table

Trunnion table offers rapid traverse speed of 25rpm in A axis and C axis. 320mm dia/100kg

High precision hollow-cooled ballscrews

Precision C3 class precision ball screw with preloaded double-nut device which allows a high tolerance and low backlash capability.

Hollow shaft ball screw with internal cooling system which allows the mechanism to run at a constant temperature, a small amount of thermal growth of driven system is provided for



Roller type linear guide ways

Roller type linear guide ways provide high rigidity and accuracy, the device is capable of providing a rapid traverse up to 48m/min and fast acceleration/deceleration speed



Spindle

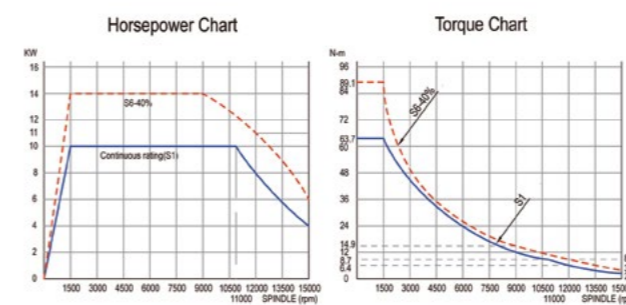
A wide selection of spindle speeds are available including 18,000rpm or 24,000rpm. High power and high torque output spindle with built-in cooling motorised spindle or in-line mechanical spindle with 12,000rpm and 15,000rpm options.

The cutting tools are securely drawn into the spindle by a high torque power draw bar and the pre-loaded well balanced disk spring package ensures a precise tool release.

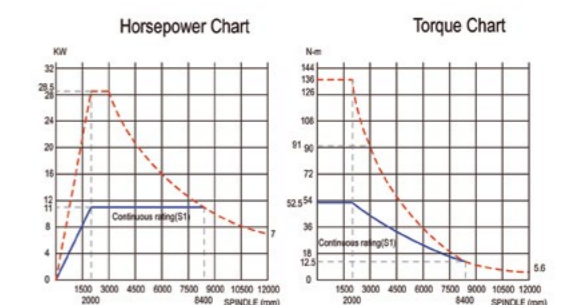
High pressure 20 bar coolant through spindle device is provided as standard on the V20/5, which will ensure longer tool life, allowing higher efficiency of drilling and milling, and exceptional chip removal for deep hole drilling and blind pocket milling.

Spindle Power and Torque Charts

In-line 12000/15000 rpm (Heidenhain)

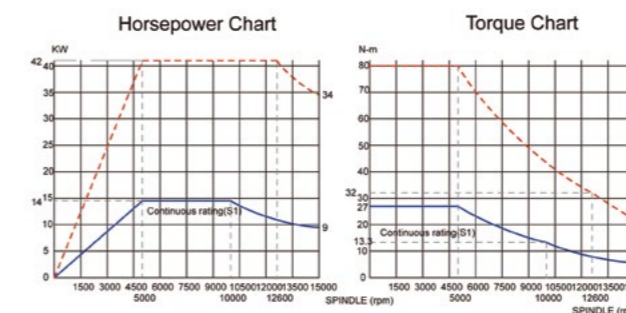


In-line 12000rpm (Siemens)



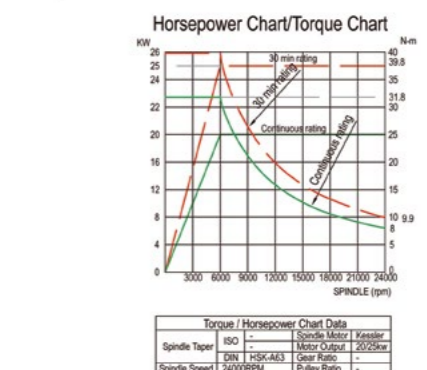
Y connection

In-line 15000rpm (Siemens)



Δ connection

Motorized Kessler 18000/24000rpm 20/25kw

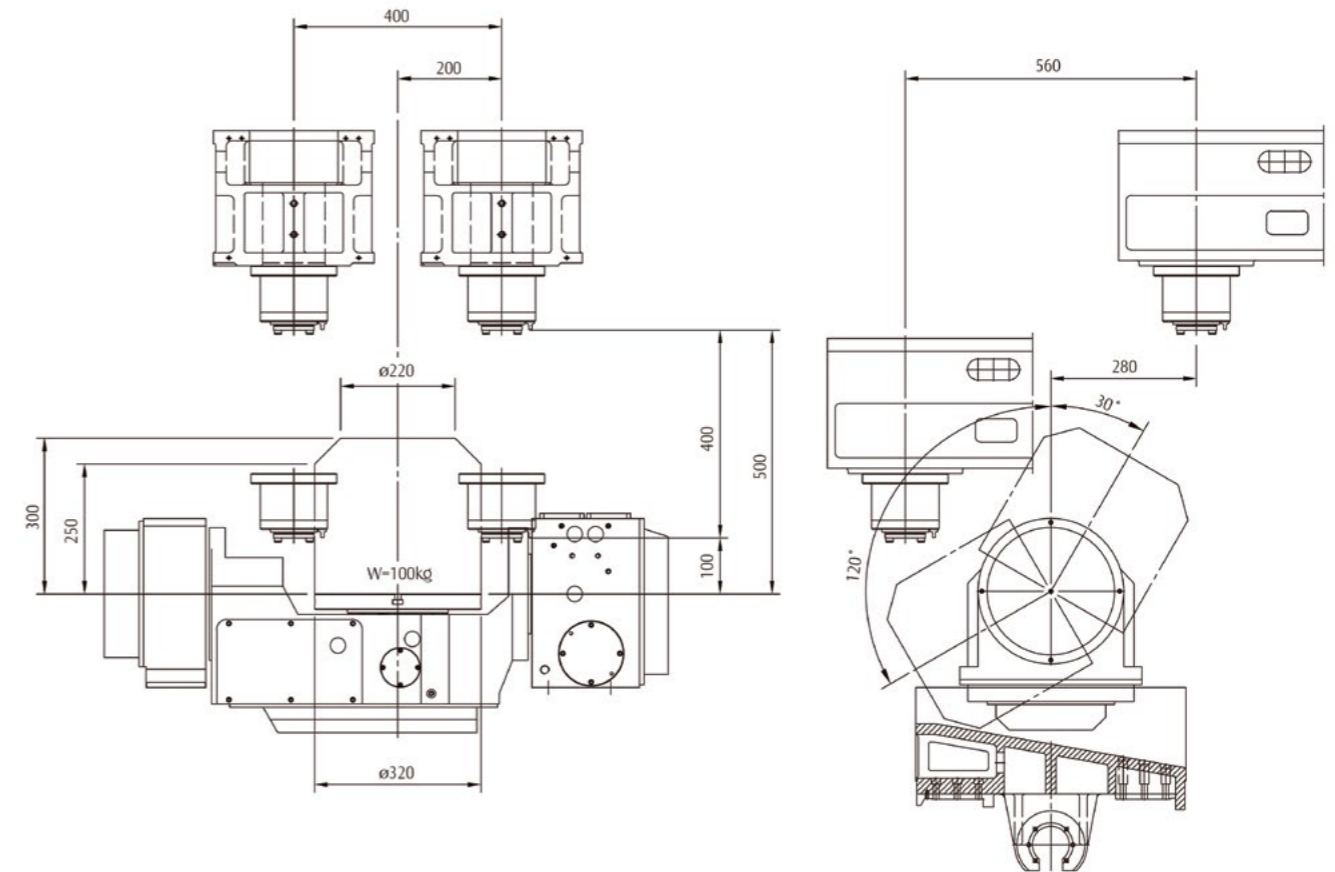


Ergonomic Operation

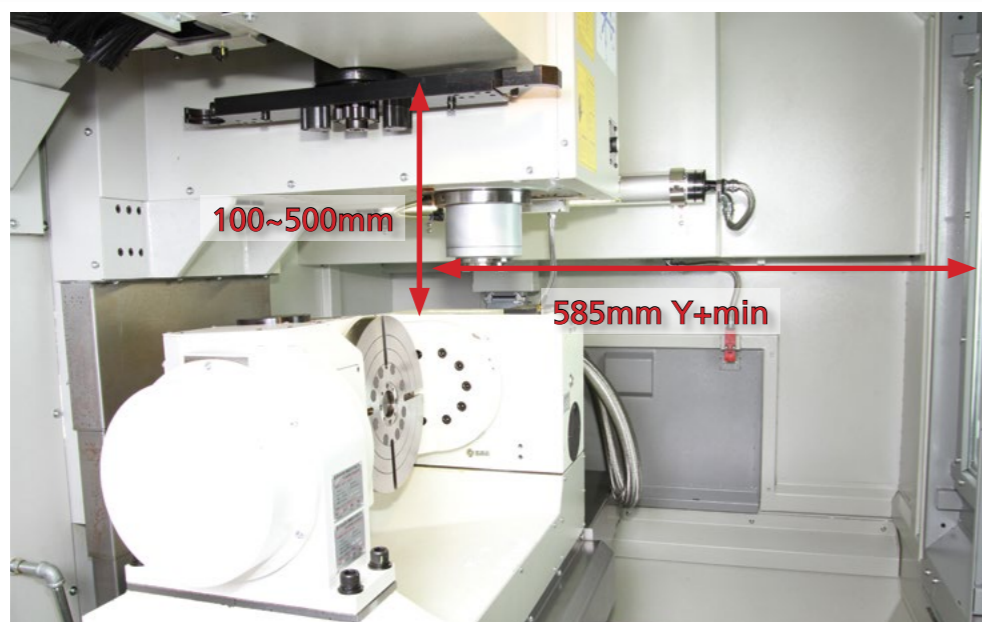
During operation, the operator can stand very close to the position of the A axis, giving the operator easy access to the machining chamber



Cutting Area and Interference



Trunnion Table



State of the Art Controls

Choice of various controls to meet your requirements. Each one features user-friendly operation, powerful functions and maximum dependability



Heidenhain iTNC 530i

- 18" TFT LCD colour monitor
- Super high speed
- Huge programme storage
- Conversational programming



Siemens 828D

- 10.4" TFT LCD colour monitor
- Shopmill conversational programming
- Super high speed
- USB/PC card storage

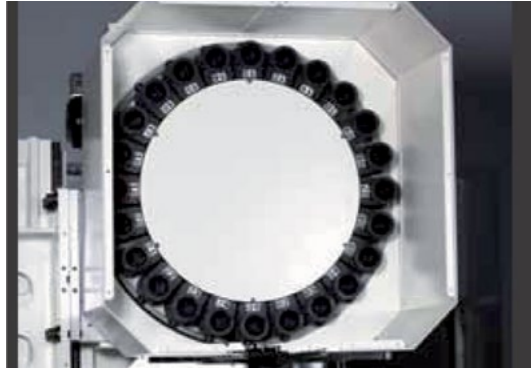


Various interfaces for programme saving, loading and software updating including:



- CF memory card
- RS-232C
- Ethernet

Automatic Tool Changer



24 station ATC (32 option)



High pressure 20 bar coolant through spindle (built-in type)



CTS individual tank (20 bar or 70 bar) on request

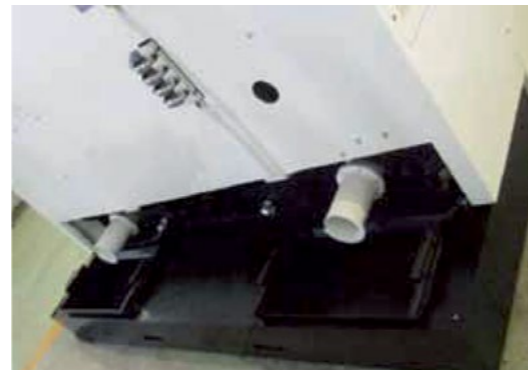


Coolant gun

Efficient Chip Removing



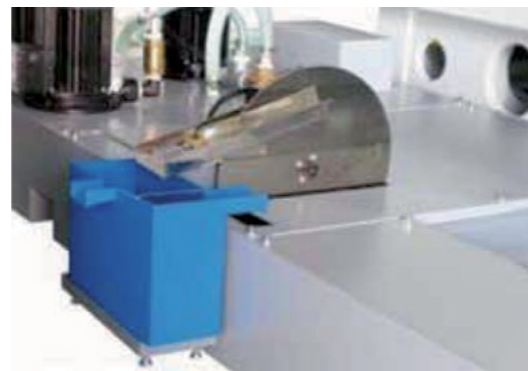
Side and rear washer on the guard



Two side chip auger convey chips to rear

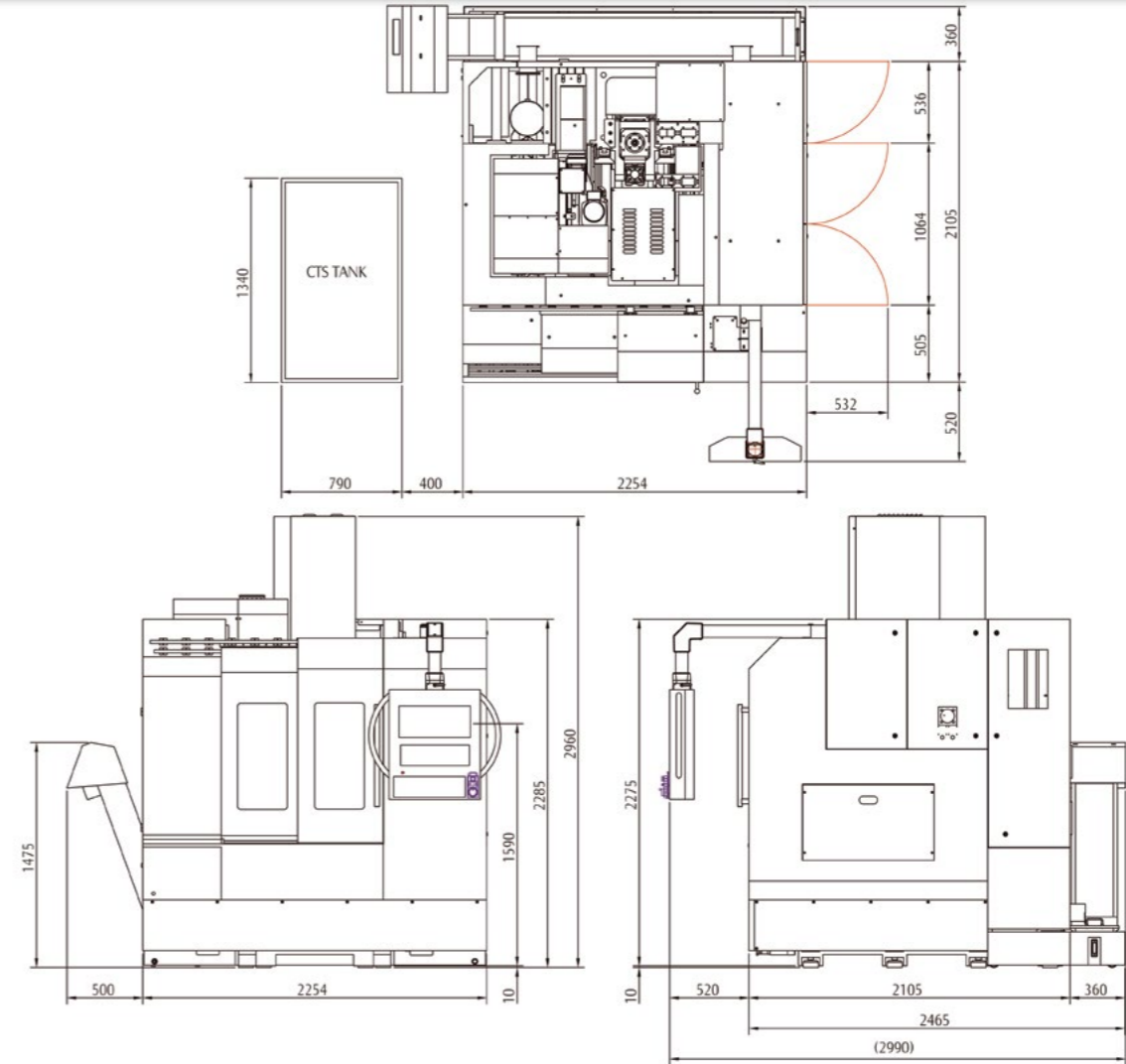


Scrapper or hinge type chip conveyor

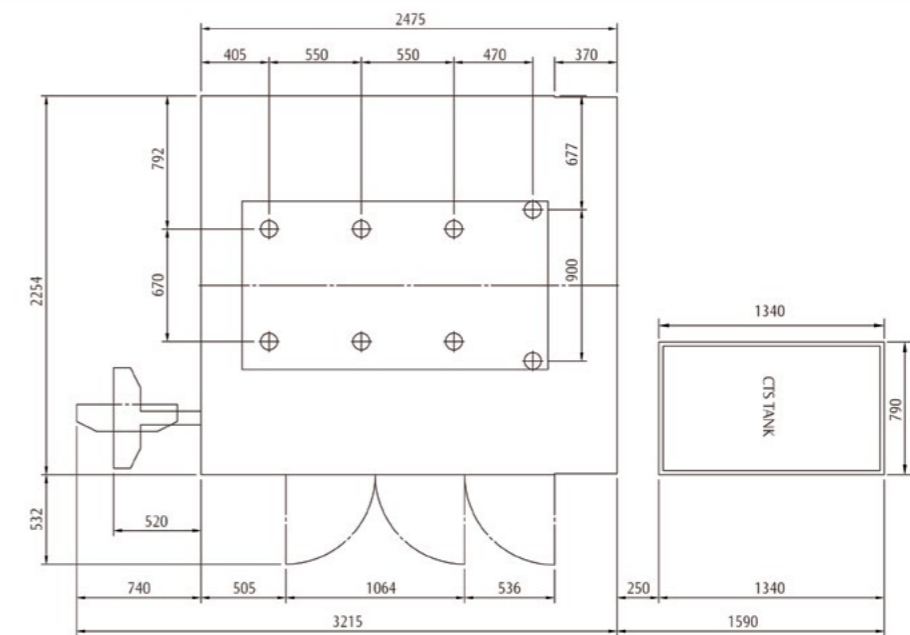


Oil Skimmer

Layout Drawing



Foundation Drawing



Description	Unit	Dugard V20/5
Advanced compact design		
High dynamic table		
Rotary table top diameter	mm	320
Table height	mm	1160
Tilting axis A	°	+120/-30
Rotary axis C	°	360
T-slots (number x width x pitch)	mm	12H7
Max weight on table	kg	100
Rotation on driving system		worm gear driven
Linear travels		
X axis	mm	400
Y axis	mm	560
Z axis	mm	400
Spindle		
Spindle taper		ISO40
Tooling available		BT40/DIN69871/CAT40
Spindle speed - direct drive	rpm	12,000 (std) / 15,000 (opt)
Spindle speed - built-in	rpm	18,000 (std) / 24,000 (opt)
Spindle motor output S1-S6 - in-line	kW	10/14 (Heidenhain)
Spindle motor output S1-S6 - motorised	kW	20/25
Spindle centre to Z axis way cover	mm	595
Distance from spindle nose to rotary table clamping surface	mm	100~500
Transmission		
X axis		
Ball screw		Ø40 x P16; C3
Transmission		direct
Y axis		
Ball screw		Ø40 x P16; C3
Transmission		direct
Z axis		
Ball screw		Ø40 x P16; C3
Transmission		direct
Guide way		
X guideway		
X axis linear guide type	(roller)	35
X guideway distance	mm	360
Y guideway		
Y axis linear guide type	(roller)	35
Y axis guideway distance	mm	700
Z guideway		
Z axis linear guide type	(roller)	35
Z guideway distance	mm	400
Tool magazine		
Tool change mode		arm
Magazine capacity		24 (std) / 32 (opt)
Tool shank		BT/DIN/CAT#40
Max tool length	mm	245
Max tool diameter	mm	80
Max tool diameter - adjacent stations empty		130
Max tool weight	kg	8
Change time (T-T)	sec	2
Feed rate		
Rapid traverse X/Y/Z	m/min	48
Max speed - A axis	rpm	25

Description	Unit	Dugard V20/5
Advanced compact design		
Max speed - C axis	rpm	25
Acceleration X/Y/Z	m.s ⁻²	6
Accuracy - VDI/DGQ 3441 standard		
Measuring system		direct
Repeatability	mm	+/- 0.005 / 300
Positioning accuracy	mm	0.005
A axis indexing and repeatability accuracy	sec	60
C axis indexing and repeatability accuracy	sec	20
Pneumatic system		
Air operating pressure	bar	6
Tool cooling system		
Max tank capacity	L	260
General		
Machine dimension (with chip conveyor) LxWxH	mm	3110 x 2990 x 2960
Machine dimension (without chip conveyor) LxWxH	mm	2254 x 2990 x 2690
Weight	kg	5000
Floor space (L x W x H)	mm	3110 x 4000 x 3000

Standard Accessories

- Choice of CNC controls - Siemens 828D / 840DSL, Heidenhain iTNC- 620 / iTNC 530 HSCI
- Side mounted 24 tool ATC (quick change arm-type)
- Central lubrication
- Working space light
- High pressure chip flush system
- Chip conveyor
- High efficiency oil cooler for spindle cooling system and ballscrew
- High pressure 20 bar coolant through spindle device (built-in)
- CE declaration conformity for EU countries
- Lamp of cycle finish and alarm
- Coolant gun or air gun
- Ethernet
- EMC and safety module for Siemens and Heidenhain
- Tool kit, leveling bolts, pads and nuts
- RS232 port
- Portable MPG

Optional Accessories

- Linear scales for 3 axes (Heidenhain or Fagor)
- Laser tool setter (BLUM or Renishaw)
- Heidenhain TS-740 + SE640 work piece probe
- Heat exchanger (Habor)
- ATC 32 tools
- Motorex / cooling lubricant for motorised spindle
- Motorised high speed spindle

*Specifications are subject to change without prior notice

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Tools

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