TESHIKLARNI DORNALASHDA ZAGATOVKALARNI BAZALASH JARAYONI

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***Annotatsiya**: Ushbu maqolada turli xil chuqur. Teshiklarni dornalashda zagatovkalarni bazalash jarayoni o`z ichiga oladi. Bujarayon yuza tozaligini oshiradi sifat darajasi yuqori bo`ladi. kichik diametrli chuqur teshiklarni xosil qilishda yuqori anilik va yuza tozaligini, detallarni ishlash qobiliyatini oshirish hamda ularni qattiqligini HRC≤445 dan kichik bo'lmagan xolatda bo'lishini ta'minlaydigan usullardan foydalanish maqsadga muvofiqdir. Bularga dornalash, proshivkalash usullari kiradi.*

Maqolada turli xil jarayonlarda dornlardan foydalanilgan.

Zagatovkaga ta'sir etuvchi kuchlarni tekislikdagi turg'unlik xolati

Asbobni tepadan pastga ishchi yurishida zagatovkani tik joylashtirib bazalashtirish va uning konusidagi kuchlar sxemasi.Bazalashtirish jarayonida zagatovkani o'z-o'zini o'rnatish xolatini aniqlaymiz.

***Kalit so'zlar:** Dornovka, Parmalash, metchiklar ,zenkerlar , sidirgichlar tokorlik stanoklari.*

***Abstract**: This article includes the process of basing blanks in the boring of various deep holes. This process increases the surface finish and the quality level is high. When forming deep holes of small diameter, it is advisable to use methods that provide high accuracy and surface finish, increase the workability of parts and ensure their hardness not lower than HRC≤445. These include boring, broaching methods.*

The article uses mandrels in various processes.

The state of stability of the forces acting on the blank in the plane

The scheme of forces on its cone during the working stroke of the tool from top to bottom with a vertical position of the blank is determined. We determine the state of self-positioning of the blank during the boring process.

***Keywords**: Dornovka, Parmalash, taps, countersinks, reamers, lathes.*

Kirish

Asosiy ta'sir etuvchi faktorlarni hisobga olgan xolda vtulka detali teshigini dornalash jarayonida bazalash jarayonini ko'rib chiqamiz.

Birinchidan zagatovka teshigi o'qini asbob o'qi bilan to'g'ri kelmasligi, zagatovkani geometrik parmalari va uni joylashishi, og'irligi ishchi asboni xarakat yo'nalishi, tutashuv natijasida hosil bo'ladigan ishqalanish koeffitsienti, teshiklarni dornalash sxemasi.

Asbobni dornalash jarayonida yuqoridan pastga xaraktida vertikal xolatdagi zagatovkani bazalashtirish sxemasini ko'rib chiqamiz.

Ta'sir etuvchi faktorlarni hisobga olgan xolda asbobni pastga xarakatida zagatovkani tayanchga nisbatan o'nga siljitishi va ishchi konus o'qi bilan ishlov berilayotgan detal teshigi o'qini bir-biriga nisbatan joylashishini ko'rib chiqamiz. Asbob tomonidan zagatovkaga ta'sir etuvchi kuchlarni aniqlaymiz (rasm 2.1.)

Zagatovkaga ta'sir etuvchi kuchlarni tekislikdagi turg'unlik xolati

$P_r=F_1$

$P_1=G+P_o$

bu yerda G-zagatovka og'iriligi: rasm 2.1.b dagi kuchlar sxemasiga oid, zagatovkaga asbobni ishchi konusi tomomnidani ta'sir etuvchi kuchlar

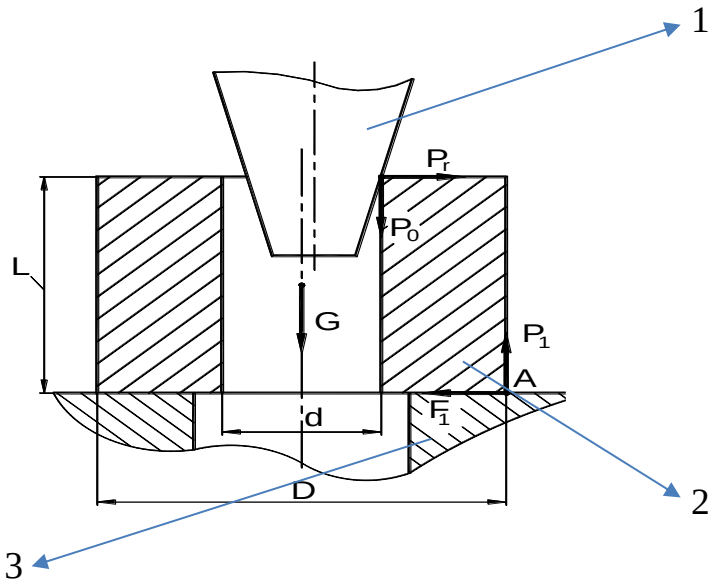
$$P_r = \frac{\cos\alpha - f\sin\alpha}{\sin\alpha + f\cos\alpha}\cdot P_o \quad (2.1)$$

bu yerda α-asbobni ishchi konusini yarim burchagi, f-zagatovka-asbob tutashuvilagi ishqalanish koeffitsienti.

Zagatovkani tayanchga nisbatan ishqalanish kuchi

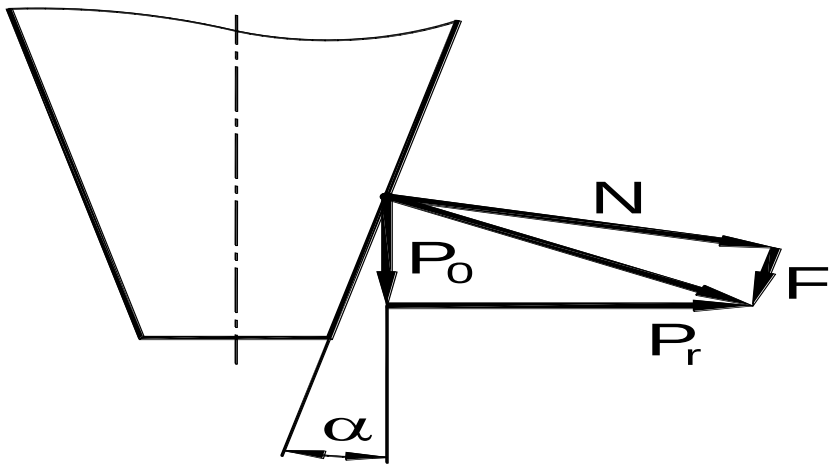
$$F_1 = P_1 \cdot f_1 = (G + P_o) f_1 \qquad (2.2)$$

bu yerda f_1-zagatovka-tayanch tutashuvidagi ishqalanish koeffitsienti



a- rasm

1-dorna. 2-namuna. 3-prizma a



rasm 2.1.b

2.1rasm. Asbobni tepadan pastga ishchi yurishida zagatovkani tik joylashtirib bazalashtirish va uning konusidagi kuchlar sxemasi.

(2.1) va (2.2) larni hisobga olgan xolda

$$\frac{\cos\alpha - f\sin\alpha}{\sin\alpha + f\cos\alpha} = k \quad (2.3)$$

turg'unlik tenglamasidan

$$P_o = \frac{Gf_1}{k - f_1} \quad (2.4)$$

$$P_r = \frac{Gf_1 \cdot k}{k - f_1} \quad (2.5)$$

(2.3) va (2.5) lardan ko'rinib turibdiki, bazalashtirishda zagatovkaga (asbobga) ta'sir etuvchi kuchlarni qiymati uncha katta emas. Misol uchun, $\alpha = 5°$, $f = f_1 = 0{,}2$, radial kuch P_r taxminan 0,2 Gga, o'q bo'yicha ta'sir etuvchi P_0 kuch 0,06 G ni tashkil etadi.

Radial kuch katta og'irilikdagi zagatovkalarni kichik anchagina katta bo'lishi mumkin. Bu xolatda mustahkam o'rnatilgan xarakatsiz zagatovkalar teshigi bo'yicha asbobni bazalashtirish muhim axamiyatga ega.

Bazalashtirish jarayonida zagatovkani o'z-o'zini o'rnatish xolatini aniqlaymiz. Buning uchun A nuqtaga nisbatan kuch momentlarini tenglamasini tuzamiz

$$P_O\left(\frac{D-d}{2}\right) + G\frac{D}{2} - P_r\lambda = 0$$

Zagatovkani og'darilishi bo'lmaydigan xolat

$$P_r\lambda \le P_O\left[\frac{D-d}{2}\right)+G\frac{D}{2}$$

bunga (2.4) va (2.5) ni qo'ysak

$$\lambda=\frac{D-d}{2k}+\frac{D(k-f_1)}{2f_1k} \quad (2.6)$$

(2.6) dan ko'rinib turibdiki, zagatovkani ruxsat etilgan balandligi uning tashqi diametrini ortishi bilan kattalashadi va tayanch bilan zagatovkani tutashuvida ishqalanish koeffitsienti kamayadi.

Zagatovkani ruxsat etilgan balandligi teshik diametri va koeffitsient K ni ta'siri past bo'ladi. Misol uchun, $\alpha=5°,\ f=0{,}2,$ koeffitsient $K=3{,}42$, $\alpha=3°$, $f=0{,}1$ da $K=6{,}53$ bo'ladi. Zagatovkani $d=10мм$, $D=30мм$, $f_1=0{,}13$ bo'lsa $K=3{,}42$, $\lambda\le 48{,}5мм$ bo'ladi.

Agarda (2.6) tenglik bajarilmasa bazalashtirish davrida zagatovka ag'darilib ketadi.

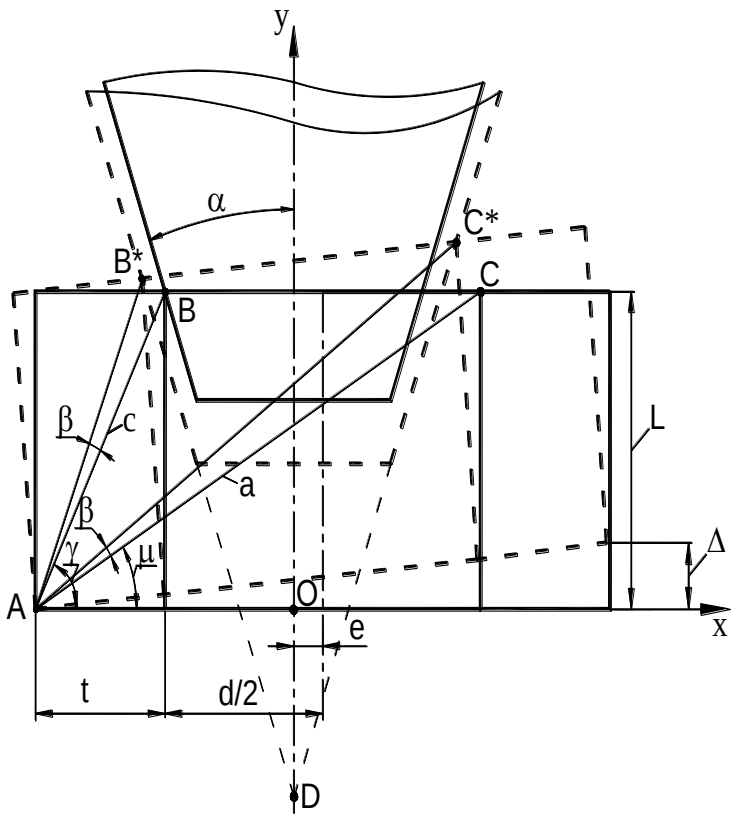
Zagatovkani og'ish burchagi β ni topish uchun (2.2 rasm) sxemasi ko'rib chiqamiz. To'g'ri burchakli koordinatali tizimini boshlanish nuqtasi O desak, zagatovkani A nuqtaga nisbatan β burchakga og'sa nuqta V esa endi V* xolatini egallaydi. Nuqta S esa S* xolatiga o'tadi. V* va S* koordinatalar

$$B*\left[e-\frac{d}{2}-t+C\cos(\gamma+\beta);C\sin(\gamma+\beta)\right]$$

$$C*\left[a\cos(\mu+\beta)+e-t-\frac{d}{2};a\sin(\mu+\beta)\right]$$

Abtsissa o'qi (90°+α) ga burchak ostida V* nuqtadan o'tuvchi to'g'ri tenglama quyidagi ko'rinishga ega bo'ladi.(2.2 rasm)

$$y = -x(tg(90-\lambda)) + (e - \frac{d}{2} - t + C\cos(\gamma+\beta)tg(90-\lambda) + C\sin(\gamma+\beta)$$



Rasm 2.2.

$C*$ nuqtadan abtsissa o'qiga nisbatan burchak ostida o'tuvchi to'g'ri tenglama

$$y = x(tg(90-\lambda)) + (e - \frac{d}{2} - t + C\cos(\gamma+\beta)tg(90-\lambda) + C\sin(\gamma+\beta) \quad (2.7)$$

(2.7) tenglamaga $C*$ni koordinatorlarini qo'yib chiqsak

$$a\sin(\mu+\beta) = (a\cos(\mu+\beta) + e - t - \frac{d}{2})tg(90-\lambda) + \left(e - \frac{d}{2} - t + C\cos(\gamma+\beta)tg(90-\alpha) + C\cos(\gamma+\beta\right.$$

(2.8)

(2.8) ni qayta ishlab chiqilsa

$$t+\frac{d}{2}-e=\left(t+\frac{d}{2}\right)\cos\beta-\left(\frac{d}{2}tg\alpha+\lambda\right)\sin\beta \quad (2.9)$$

Bu tenglamaga asoslanib

$$B\cos\beta-A\sin\beta=C \quad (2.10)$$

$$A=\left(\frac{d}{2}tg\alpha+\lambda\right)\phi\ 0 \quad (2.11)$$

$$B=\left(t+\frac{d}{2}\right)\phi\ 0 \quad (2.12)$$

(2.10) tenglamani yechsak

$$\cos(\beta+\varphi)=\frac{c}{\sqrt{A^2+B^2}} \quad (2.13)$$

Bu yerda $\varphi=arctg\frac{A}{B},.....0\le\varphi\le\frac{\pi}{2}$ (2.14)

V uravnenie (2.9)

$$\frac{C}{\sqrt{A^2+B^2}}=\frac{t+\frac{d}{2}-e}{\sqrt{\left(t+\frac{d}{2}\right)^2+\left(\frac{d}{2}tg\alpha+\lambda\right)^2}}\pi\,1 \quad (2.15)$$

Demak (2.9) tenglamani doimiy yechimi mavjud

(2.10 ..... 2.15) larni inobatga olib, zagotovkani og'ish burchagini topishimiz mumkin

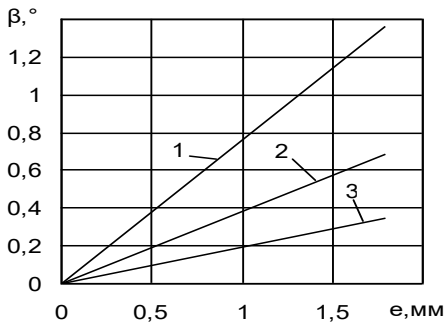
$$\beta = \arccos\left\{\frac{\frac{D}{2} - e}{\sqrt{\left(\frac{D}{2}\right)^2 + \left(\frac{d}{2}tg\alpha + \lambda\right)^2}}\right\} - arctg\frac{dtg\alpha + 2\lambda}{D}, \qquad (2.16)$$

Bu yerda ye – ishchi korpus va zagotovka teshigini boshlang'ich o'qdoshligi

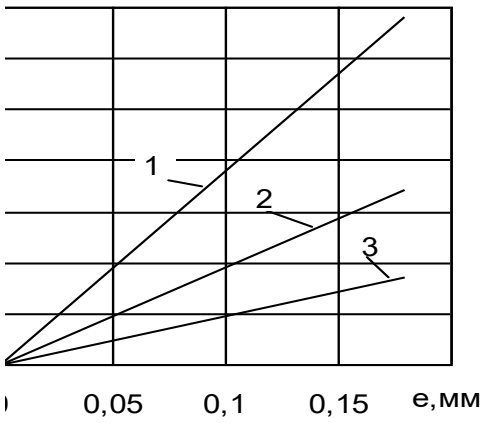
(2.16) formulani taxlili shuni ko'rsatadiki burchak β ta'sir etuvchilar ye va φ bo'lib ye ni o'sishi bilan β kattalashadi.

λ ni ortishi natijasida kamayadi.

(2.3 rasm)



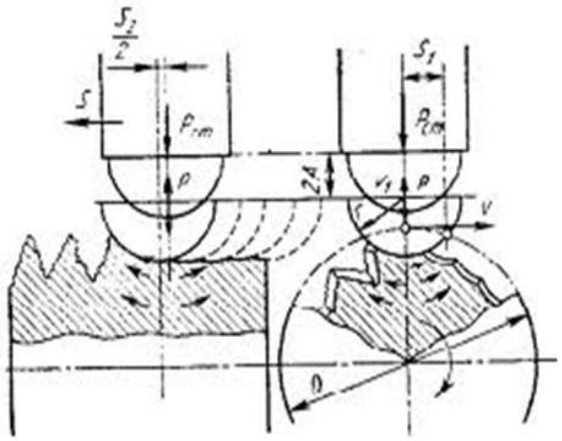
A



1 – *L*=75 mm, *2* – *L*=150 mm, *3* – *L*=300 mm; *b* – *d*=1 mm, *D*=3 mm, *1* – *L*=7,5 mm, *2* –

L=15 mm,

3 – *L*=30 mm



2.4. rasmda dorna xalqasi o’tuvchi teshikni proshivka qilinganda yangi xosil bo’lgan yuzani sxemasi ko’rsatilgan. Dornalash asosan oldindan parmalash, zinkerlash, yo’nib kengaytirish, razvertkalash sidirish va boshqa jarayonlardan keyin bajariladi. Boshlang’ich yuzadagi g’adir-budirliklarni mikroprofili ko’ndalang xolatda bo’lganda dornalash jarayoni bajarilgan uncha yuqori bo’lmagan tozalikdagi yuza xosil bo’ladi.

O’tuvchi teshiklarda pardozlovchi – mustahkamlovchi jarayonlarni bajarilishida dornalash texnologiyasidan foydalaniladi.

O’tuvchi teshiklar tekislovchi sidirgichlar, tekislovchi proshivkava sharlar yordamida proshivka qilish bilan ishlov beriladi.

Xulosa:

Dornlash texnologik jarayoni qo`llash tufayli foydali ish koiffitsenti yaxshilash. shu bilan bir qatorda yuza tozaligini ortishi, chiqindining kam chiqishi, ish unumdorligini ortirish mumkin. Dornovka jarayonini mashinasozlik samalyotsozlik hamda harbiy qurol aslahalar ishlab chiqarishda keng qo`llanilish bu maxsulotlarimizning standartlarga mos kelishini taminlaydi.

Manbalar ro`yxati.

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7.