

BAZALT FIBRABETONLARNI XUSUSIYATLARI VA QO‘LLANILISHI

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Annotatsiya

Ushbu maqolada, bazalt, shisha, uglerod va poliamid tolalari odatda beton uchun armatura sifatida qo‘llanilishi keltirilgan. Fibra ishlab chiqarish texnologiyasining so‘nggi rivojlanishi bazalt toshidan tayyorlangan bazalt tolalarini tayyorlash imkonini berishi ko‘rsatilgan. Bazalt tolasi yaxshi issiqlik ko‘rsatkichlari, tebranish va zarba yukiga qarshilik ko‘rsatishi aytib o‘tilgan.

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Hozirgi vaqtda dunyoda turli xil xususiyatlarga ega bo‘lgan turli maqsadlar uchun betonlarning keng assortimenti ishlab chiqarilmoqda. Zamonaviy shaharsozlik rivojlanishi va ob‘ektlar turlarining kengayishi bilan (ko‘priklar, tunnellar, himoya inshootlari, ko‘p qavatli yo‘llar, tezyurar temir yo‘llar, uchish-qo‘nish yo‘laklari) yangi takomillashtirilgan ishlash xususiyatlariga ega maxsus betonlarga ehtiyoj paydo bo‘lmoqdi va tez sur‘atlar bilan o‘sib bormoqda. Betonni qurilishda qo‘llash sohalari undan yasalgan konstruksiyalar uchun ish sharoitlarini kuchaytirish uning fizik-mexanik xususiyatlarini doimiy ravishda yaxshilashni talab qiladi - egilish, siqilish, yorilishga chidamliligi, zarba va dinamik ta’sirlarga chidamliligi va boshqalar. Hozirgi vaqtda bazalt tolalari qo‘shilgan betondan foydalanish orqali beton konstruksiyalarning ishlashi va xizmat muddatini sezilarli darajada oshirish usullari tobora ko‘proq qo‘llanilmoqda.

Bazalt tolalari betonning butun hajmi bo‘ylab tartibsiz joylashgan kompozitsion material. Bunday beton yuqori ishlash xususiyatlari bilan ajralib turadi, ayniqsa, egiluvchanlik va tortishish kuchi, zarba kuchi va yorilishga chidamliligi.

Bazalt tolasiining metall, shisha va polipropilen tolalaridan afzalliklari:

- Metall toladan foydalanish konstruksiyalarning xavfsizligi bilan bog‘liq, chunki eroziya paytida tolalar chiqib ketishi mumkin, bundan tashqari, metall tolalar salbiy katod ta’siriga ega, korroziyaga moyil, betonda aralashtirish muammolari mavjud, sifat jihatidan ham juda katta farq bor.

- Shisha tolaning ishqorga chidamliligi pastligi sababli foydalanish cheklangan. Natijada, mustahkamlovchi tolalar kuchining pasayishi butun kompozitsiyaning mustahkamligining pasayishiga olib keladi;
- Polipropilen tolasi yuqoridagi kamchiliklarga ega emas, lekin bazalt tolasi bilan solishtirganda bog'lovchiga nisbatan pastroq yopishish darajasiga ega.

Zamonaviy qurilishda materiallarning yong'inga chidamliligiga yuqori talablar qo'yiladi va polipropilen tolasining erish nuqtasi bazalt tolasiga qaraganda ancha past. Betonning mustahkamligiga ta'sir qiluvchi muhim ko'rsatkichlardan biri bu tolaning chiziqli cho'zilish koeffitsienti bo'lib, uning ko'rsatkichi propilen tolasi uchun bazalt tolasidan bir necha baravar past (propilen tolasi uchun nisbiy cho'zilish 150-200%, va bazalt tolasi uchun 3,1% ni tashkil etadi, shuningdek va kuchlanish quvvati ko'rsatkichlari (0,77 ga qarshi 2,85 MPa * 103), valentlik moduli (0,8 ga qarshi 21,0 MPa * 103).

Bazalt tolasi paydo bo'lishi bilan dispers mustahkamlashga ishonchsizlik asta-sekin yo'qolib bormoqda.

Fibraning mustahkamlovchi xususiyatlariga uning quruq va foydalanishga tayyor bo'lgan qurilish aralashmalarini ishlab chiqarishda qo'llanilishi ham asoslanadi. Turli xil qurilish ishlarini (gidrozolyatsiya, pardozlash) ishlab chiqarishdagi asosiy muammolardan biri bu ohaklarning poydevorga past yopishishi va quritish va qotish paytida ularning yorilishi. Bazalt tolalari bo'lgan yuqori mustahkamlovchi kuchga ega mustahkamlovchi qo'shimchalarni kiritish bu muammoni hal qilishi mumkin.

Bazaltfibrobetonning afzalliklari:

Betonning qattiqlashishi jarayonida mikroplastik qisqarish va yorilishni kamaytiradi:

Betonning kritik davrda buzilmasdan deformatsiya qilish qobiliyatini oshiradi-qisqarishdan keyin 2-6 soat, shu bilan yoriqlar hajmi va sonini kamaytiradi, bu esa betonning ichki mustahkamligini saqlashga yordam beradi. Keyingi bosqichda, beton qattiqlashganda va qisqarishni boshlaganda, bazalt tolasi uni ishonchli tarzda mustahkamlaydi va sinish xavfini kamaytiradi. Gidratsiyani samarali nazorat qilish orqali suv chiqarilishini kamaytiradi va shu bilan ichki yuklarni kamaytiradi. Suvning yuzaga chiqishini nazorat qilish tufayli plastik cho'kma paytida yoriqlar paydo bo'lishi kamayadi. Aralashmaning delaminatsiyasini oldini oladi.

Betonning muzlash va erishga chidamliligi:

Fibra betonga oz miqdordagi havoni kiritadi, bu esa muzlash va erish davrida erkin suvning kengayishiga va qisqarishiga imkon beradi. Fibra betondagi suv kanallari sonini kamaytiradi va o'tkazuvchanlikning pasayishi natijasida muzlashga ko'proq qarshilik ko'rsatadi. Bazalt tolasi betonda suvning harakatini boshqaradi, sementning yanada samarali namlanishini ta'minlaydi va birinchi kuni bosim kuchini oshiradi. Sement va qumning yuzasiga ko'tarilishining oldini oladi, betonning past va chuqur o'tkazuvchanligini hisobga olgan holda muzlashga qarshi tuzlarning ta'siriga chidamliligini oshiradi.

Betonning zarbaga chidamliligi:

Bazalt tolasini o'z ichiga olgan beton an'anaviy betonga nisbatan sezilarli darajada ko'proq zarba qarshiligi va bo'linish qarshiligiga ega, sinovlar ushbu omil bo'yicha 5 baravar oshganligini ko'rsatadi.

Bazalt tolasi po'lat to'rga iqtisodiy alternativ hisoblanadi:

Bazalt tolasi yoriqlar hosil bo'lishini nazorat qiluvchi po'lat to'rga iqtisodiy alternativa sifatida qaralishi mumkin. Fibra betonning egilish kuchini oshiradi. Metall to'r cho'zilib ketadi va faqat beton yorilib ketganidan keyin qandaydir qiymatga ega bo'ladi. Shu bilan bir qatorda, fibra plastik holatda betonda hosil bo'lgan mikro yoriqlarning oldini olishga yordam beradi. Loyiha xususiyatlarini saqlab, beton konstruktsiyaning hajmini 20% gacha kamaytirishga imkon beradi .

Qo'llash sohalari:

- Fuqarolik qurilishi obektlarini qurish;
- Omborlar va bank seyflarini rekonstruksiya qilish;
- Ko'priklar, aerodromlarning uchish-qo'nish yo'laklari, gidrotexnik inshootlar (qirg'oq to'g'onlari, qulflar va daryo kanallari)qurilishi;
- Atom elektr stantsiyalarining reaktor bo'linmalarini, radioaktiv chiqindilarni yo'q qilish uchun konteynerlarni ishlab chiqarish;
- Har xil turdagi yo'l qoplamalari, prefabrik va monolit plitalar, chegaralar, ajratuvchi chiziqlar va yulka plitalarini yaratish.

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