

1. CSOPORT: AGGREGÁTUMOK FOGADÁSA ÉS SZÁLLÍTÁSA

1.1	1	Fogadósiló betongödörhöz A siló bruttó térfogata 25 m ³ , betonból készült, részben földfelszín alatti gödörben, amelyben az acél silókúpok vannak elhelyezve. A betonozási munkák nem szerepelnek a SKAKO szállítási terjedelmében. A silót hátrafelé billentő teherautóval történő feltöltésre tervezték. Az acél siló lekerekített sarkokkal, silóvibrátor szerelvényekkel és a rézsútos felületeken 9 mm-es kopógumival van felszerelve. <u>Az acél silókúp műszaki adatai:</u> Kapacitás: 11,3 m ³ bruttó térfogat Méretek: 3650 x 3650 x 1961 mm (Szé x Ho x Ma) Bevonat: Horganyzott
	1	Siló vibrátor Silókúpra szerelt motoros vibrátor a siló jobb ürítése érdekében. <u>Műszaki adatok:</u> Vibrátor 0,16 kW
	1	A fogadósiló mozgó rostély Háromrészes rostély ellenőrzőnyílással, amelyet az egyik szelvényben a fogadósiló tetején helyeztek el. A rostély megakadályozza, hogy személyek essenek, vagy nagyméretű részecskék kerüljenek a silóba. A teherautót rávezetik a rostélyra a hátsó billentéshez. Azt a területet, ahova a teherautó kerekai ráhajthatnak, lemezek határolják be. <u>Műszaki adatok:</u> Méretek: 3650 x 3650 mm A rés szélessége: 97 mm Tengelyterhelés: 200 kN Bevonat: Horganyzott
	1	Horganyzott tartóoszlop a vezérlőszekrényhez A töltésvezérlő irányítószekrényének védelme az időjárás hatásaival szemben.
	1	A fogadósiló billenő fedele A fedelet vázszerkezetként alakítják ki, amely a siló felett 60 mm vastag habszivacs szigetelést kap az ejtőgaratba helyezett lemezekre rögzítve. A nyitás és zárás a szállítási terjedelem részét képező hidraulikus rendszer segítségével történik. Ezenkívül a fedél gumifüggönyökkel van felszerelve, amelyek csökkentik a hó és a csapóeső bejutását a fogadósilóba. <u>Műszaki adatok:</u> Méretek: 3650 x 3650 mm Hidraulikus egység: 0,7 kW Bevonat: Horganyzott acél burkolólemezek Festett vázszerkezet
AZ 1.1. POZÍCIÓ ÁRA:		EUR 63 558

1.2 1

SB 1000 típusú rézsútos hevederes szállítószalag

A hevederes szállítószalag meghajtóállomással van ellátva, amely 2 db hajtóműves motort tartalmaz. A hajtódob gumiból készült súrlódó burkolattal van ellátva, a szállítószalag pedig úgy van kialakítva, hogy nagy fesztávot tegyen lehetővé, valamint vályús szállítószalaggal és a következő szállítószalagra vezető gumi átmenettel is el van látva. A meghajtóállomás vibrációs tisztítót tartalmaz, amely a szállítószalagon lévő anyagmaradványok nagy részét eltávolítja. **A tisztítás érdekében a szállítószalag alatt komplett mosórendszer található.**

Műszaki adatok:

Dőlésszög:	30°
Szík hosszúsága:	22 m
Szík szélessége:	1000 mm
Szík sebessége:	1,5 m/s
Kapacitás:	134 kg/s, 1,5 t/m ³ anyagsűrűség esetén
Hajtómotor:	Kb. 22 kW
Bevonat:	Horganyzott

Ezen felül a hevederes szállítószalag még a következőkkel van felszerelve:

A gumi szállítószalag tartókkal van ellátva.

- 1 Gumi borítású töltőtölcsér.
- 18 m Horganyzott acél burkolat.
- 15 m Horganyzott fémhálórács az öv alsó oldalán a személyi biztonság érdekében.
- 1 Fordulatszám-mérő a dob hátsó részére szerelve.
- 1 Vészleállító. A hevederes szállítószalag megáll, ha megnyomják a gombot, vagy ha a hevederes szállítószalag oldalán lévő huzalt meghúzzák.
- 22 m A felső fedél és az oldalsó elemek közötti burkolat. Biztosítja, hogy az anyag ne essen le a szállítószalagról.
- 1 Porképződést korlátozó átvezetés a vibrációs homokrostára.
- 1 Tartószerkezet a dob hátsó részénél.
- 1 Tartószerkezet a silógödörnél.
- 1 3–5 m magasságú tartószerkezet

AZ 1.2. POZÍCIÓ ÁRA:

EUR 68 895

1.3 1

Függesztett állandó mágnes

SMP1000-250 függesztett mágnes 4 db emelőfüllel A bejövő homokból eltávolítja az összes fémtárgyat (a vibrációs rosta előtt). Függesztőkerettel és hevederes szállítószalaggal a fémrészekék automatikus eltávolításához.

AZ 1.3. POZÍCIÓ ÁRA:

EUR

12 191

1.4 1

Vibrációs rosta az aggregátumfogadó rendszerben

Feladat:	Aggregátum szűrése a fogadórendszerben
Betöltési eljárás:	Az SB1000 típusú hevederes szállítószalaggal folyamatosan
Előírás:	Nyitott kivitel, a lehető legjobb.
Rostálási pontosság %:	A lehető legjobb.
Anyag:	Aggregátumok
Részecskék mérete:	8–16 mm.
Térfogatsűrűség:	1,5 t/m ³
Nedvességtartalom %:	Természetes nedvesség legfeljebb 5-7 %
Anyag hőmérséklete:	-30 és +40 Celsius fok között
Környezeti hőmérséklet:	-30 és +40 Celsius fok között
A motorok fűtettek Kapacitás:	Akár 250 t/h
Tápellátás:	400 V - 50 Hz.

A fent említett alkalmazáshoz ajánljuk/szállítjuk a következőt:

S2U100/0250M1OI TÍPUSÚ SKAKO VIBRÁCIÓS ROSTA

Nyitott kivitelezésű a JJP130904-01 számú rajznak megfelelően.

Rostafedél, kettő nyitható, méretek: Sz x Ho = 1000 mm x 2500 mm.

A vibrációs rostát a rostatest oldalain elhelyezett 2 db motoros vibrátor hajtja.

Hajtóegység: 1 db motor, vibrátor típusa 230/400 V - 50Hz kW
IP66 védelmi osztály F szigetelési osztály

A rostaszekrény lágyacélból készül, a megtámasztáshoz rugókkal együtt szállítjuk.

A fenti berendezés rostája a következőkkel van tervezve/felszerelve:

Háló, 1 db nyitható, 40 x 40 mm nyílással

Felületkezelés: horganyzott, vagy RAL 1007 színűre festett.

Nettó tömeg: 700 kg

A fenti S2U100/0250M1OI TÍPUSÚ VIBRÁCIÓS ROSTA állványának adatai

Lágyacélból készült, magassága kb. 2 m.

Felületkezelés: horganyzott, vagy RAL 1007 színűre festett.

Nettó tömeg: 400 kg

AZ 1.4. POZÍCIÓ ÁRA:

EUR

27 950

1.5

1

SB 1000 típusú rézsútos hevederes szállítószalag

A hevederes szállítószalag meghajtóállomással van ellátva, amely 2 db hajtóműves motort tartalmaz. A hajtódob gumiból készült súrlódó burkolattal van ellátva, a szállítószalag pedig úgy van kialakítva, hogy nagy fesztávot tegyen lehetővé, valamint vályús szállítószalaggal és a következő szállítószalagra vezető gumi átmenettel is el van látva. A meghajtóállomás vibrációs tisztítót tartalmaz, amely a szállítószalagon lévő anyagmaradványok nagy részét eltávolítja. **A tisztítás érdekében a szállítószalag alatt komplett mosórendszer található.**

Műszaki adatok:

Dőlésszög:	30°
Szík hosszúsága:	51 m
Szík szélessége:	1000 mm
Szík sebessége:	1,5 m/s
Kapacitás:	134 kg/s, 1,5-ös anyagsűrűség esetén
Hajtómotor:	2 x 22 kW
Bevonat:	Horganyzott

Ezen felül a hevederes szállítószalag még a következőkkel van felszerelve:

A gumi szállítószalag tartókkal van ellátva.

- 1 Gumi borítású töltőtölcsér.
- 47 m Horganyzott acél burkolat.
- 5 m Horganyzott fémhálórács az öv alsó oldalán a személyi biztonság érdekében.
- 1 Fordulatszám-mérő a dob hátsó részére szerelve.
- 1 Vészleállító. A hevederes szállítószalag megáll, ha megnyomják a gombot, vagy ha a hevederes szállítószalag oldalán lévő huzalt meghúzzák.
- 47 m A felső fedél és az oldalsó elemek közötti burkolat. Biztosítja, hogy az anyag ne essen le a szállítószalagról.
- 1 Tartószerkezet a dob hátsó részénél.
- 1 6–9 m magasságú tartószerkezet.
- 1 15–18 m magasságú tartószerkezet.
- 1 Tartószerkezet a meghajtóállomásnál.

86 m Kezelőjárdák és lépcsők. A hevederes szállítoszalag **MINDKÉT** oldalára felszerelve. Feljutást biztosít az alsó szintről a siló tetejére, és lehetővé teszi a közlekedést a hevederes szállítoszalag mentén. Korlátokkal együtt.

AZ 1.5. POZÍCIÓ ÁRA:

EUR 184 887

1.6

1

SB 650 típusú forgatható hevederes elosztószalag

A hevederes szállítoszalag meghajtóállomással van ellátva, amelyet közvetlenül a hajtódob tengelyére szerelnek fel. A hajtódob gumiból készült súrlódó burkolatot kapott.

A hevederes szállítoszalag vályús és sima szalagos szállítoszalaggal, valamint töltőtölcsérrel van felszerelve. A forgó funkció a hevederes szállítoszalag szerves része, ami a siló felső szélén lévő körsínen haladó elektromosan hajtott kerékblokk révén valósul meg.

A meghajtóállomás szalagkaparóval van felszerelve, amely az anyagmaradványok kb. 95%-át eltávolítja a szállítoszalagról. A szállítoszalag fordulatszám-mérővel, mindkét oldalon vészleállítóval, kapacitástöbblet-érzékelővel, valamint pozicionálási kódolóval van felszerelve.

Műszaki adatok:

Szík hosszúsága:	2950 mm
Szík szélessége:	650 mm
Kapacitás:	137 kg/s, 1,5 anyagsűrűség esetén
Szík sebessége:	2 m/s
Hajtómotor:	5,5 kW
Forgatómotor:	0,37 kW
Bevonat:	Horganyzott

AZ 1.6. POZÍCIÓ ÁRA:

EUR 19 420

1. ÁRCSOPORT:

EUR 376 901

2. CSOPORT: SILÓ- ÉS ADAGOLÓBERENDEZÉSEK AZ AGGREGÁTUMOKHOZ

2.1

1

525/8 típusú magas siló

A siló 1–64 mm szemcseméretű, max. 1600 kg/m³ sűrűségű aggregátumok tárolására szolgál. A magas siló moduláris felépítésű, csavarkötésekkel szerelhető össze. A siló henger alakú, tetején és alján kúpos, így biztosítva a teljes térfogat hatékony kihasználását. A válaszfalak a siló középső oszlopára szerelt trapéz alakú elemekből állnak. Az alsó kúp lapos fenékben végződik, amely alá az adagolóberendezés van felszerelve. A siló teteje a rézsútos szállítoszalagon lévő lépcsőn érhető el. Az egyes silórekesszek a siló fedelén lévő ellenőrzőnyíláson és a siló falán körbemenő létrán érhetők el. A siló kúpos teteje a hevederes szállítoszalaghoz egy tisztítónyílással és egy kezelőjárdával van felszerelve, az aggregátumoknak a berendezésbe történő betöltéséhez.

Műszaki adatok:

A siló bruttó térfogata:	529,6 m ³ bruttó térfogat (6 válaszfal)
Siló átmérője:	8 m
Siló rekeszek:	4 db 45°-ban nyitható, 66,2 m ³ bruttó térfogat 2 db 90°-ban nyitható, 132,4 m ³ bruttó térfogat
A műszaki pontosítás során véglegesítendő	

Ezen felül a magas siló még a következőkkel van felszerelve:

Négy darab, „A” alakú keretből álló tartó. Tartóba integrált kezelőjárda, amely szerkezeti padlóból áll, az ellenőrzőtábla fedele nem vízálló.

A kezelőjárda négyszögletes, mérete 64 m².

A kezelőjárdát függőleges lábak támasztják alá, hogy a járda alatti tér optimálisan szabad maradjon.

1 A keverőmű tisztítónyílása.

5 m 800 mm széles horganyzott acél lépcsők

Horganyzott kezelőjárda korláttal a garatmérlegeknél.

3 m Horganyzott létra.

A 2.1. POZÍCIÓ ÁRA: EUR 803 775

2.3 Szigetelt burkolat. Az aggregátumsiló külső oldalát bevonatos, profilozott, 80 mm-es ásványgyapot szigeteléssel ellátott szendvicslemezekkel burkolták be.
A keverőmű kezelőjárdájának burkolata a gyárépület burkolatával egybeépítve

A 2.3. POZÍCIÓ ÁRA: EUR 62 275

2.4 8 **FCE 056/0071 M3NL típusú vibrációs adagoló**
Vibrációs adagoló elektromágneses vibrátorral, amely hatékony és pontos adagolást biztosít. A vibrációs adagoló kialakítása és működési elve biztosítja a vibrációs vályú minimális kopását és csökkenti az esetleges hídképződést a siló kimenete felé.
Az adagolót nedvesség-érzékelő csatlakoztatására alkalmas szerelvénnel látták el.

Műszaki adatok:

Kapacitás: 41 kg/s, 6° vályúszög esetén
Anyagsűrűség 1,6, nedvesség 3%

Vibrátor: „20D”

Bevonat: Horganyzott

A 2.4. POZÍCIÓ ÁRA:

EUR 49 848

2.5 1

TW 750 típusú aggregátum garatmérleg

Szegélyezett garat alsó kúppal, felfüggesztő hevederrel a kalibrációs súlyokhoz, szerelvény motoros vibrátorhoz, hárompontos láncfelfüggesztés és alsó karima. A garat a belső oldalán 7 mm-es SH 62 kopógumival van felszerelve.

Műszaki adatok:

Keverőmű:

Min. 750 l.

Mérési tartomány:

a maximális tartalom 5–100%-a.

1

TW 2250 típusú aggregátum garatmérleg

Szegélyezett garat alsó kúppal, felfüggesztő hevederrel a kalibrációs súlyokhoz, szerelvény motoros vibrátorhoz, hárompontos láncfelfüggesztés és alsó karima. A garat a belső oldalán 7 mm-es SH 62 kopógumival van felszerelve.

Műszaki adatok:

Keverőmű:

Min. 2250 l.

Mérési tartomány:

a maximális tartalom 5–100%-a.

A garatok a következőképpen vannak felszerelve:

Pneumatikus kapuegység 2 kimenettel, gumibevonatú kopófelületekkel, valamint rugalmas átmenetekkel a keverőbemenetekhez.

Elosztó a kilépő kapuhoz belső gumibevonattal, a kapu és a keverő bemenete közé történő felszereléshez.

Garatba szerelt motoros vibrátor a jobb ürítés érdekében.

A 2.5. POZÍCIÓ ÁRA:

EUR 42 857

2. ÁRCSOPORT:

EUR 958 755

3. CSOPORT: SILÓ- ÉS ADAGOLÓBERENDEZÉSEK CEMENTHEZ, PERNYÉHEZ ÉS SZILÍCIUM-DIOXIDHOZ

3.1 3

75 T típusú porsiló

Henger alakú siló cement, pernye és szilícium-dioxid tárolásához.

A siló fel van szerelve felső korláttal, Ø 100 befecskendező csővel, karimákkal a szűrőhöz és érzékelőkhöz, kézi működtetésű blokk-kapuvál a kimenetnél, valamint nyomáscsökkentő szelepekkel / szívószelepekkel. **Az egyik cementsilóba további kivezetést kell beépíteni, hogy a szétosztás mindkét keverőhöz lehetővé váljon.**

Műszaki adatok:

Térfogat:

Bruttó

60,2 m³

Nettó

52,2 m³

Fő méretek:

Átmérő

3180 mm

A henger
magassága 6700 mm

A kúp magassága 2600 mm

A tárolt anyag maximális
térfogatsűrűsége: 1,45 t/m³

A siló a következőkkel van felszerelve:

Silónként 4 m-es silótartó, amely 4 átlósan összekötött csőoszlopból áll.

Kezelőjárda, a siló kimenete alá helyezve.

Horganyzott létra biztonsági hevederrel és a szükséges pihenőkkel. A létra a kezelőjárdától hozzáférést biztosít a siló tetejéhez.

Figyelem: Csak 1 db siló van létrával felszerelve.

Horganyzott létra biztonsági hevederrel és a szükséges pihenőkkel. A létra feljutást biztosít az alsó szintről a kezelőjárdára.

800 mm széles híd korlátokkal a siló teteje és a legközelebbi siló teteje közötti közlekedéshez.

- 2 1000 mm széles híd korlátokkal a siló kezelőjárdája és a legközelebbi siló kezelőjárdája közötti közlekedéshez.

további 12 m befecskendező cső a közös befecskendezési helyre.

A 3.1. POZÍCIÓ ÁRA: EUR 163 740

- 3.2 12 Porsiló mérőcella az állomány ellenőrzéséhez

C1 osztályú mérőcella, PTB jóváhagyással, 50 000 kg.

- 3 Beckhoff típusú mérőerősítő

A 3.2. POZÍCIÓ ÁRA: EUR 16 875

- 3.3 Levegőztetőrendszer 6 fúvókával és szelepekkel. Biztosítja az anyag kimenethez történő áramlását.

- 3 Szűrő az RO3 típusú porsilóhoz
A siló tetejére szerelhető. Az injektálásból származó túlnyomás a szűrőn keresztül távozik, ahol a porszemcsék lerakódnak. A szűrőegység tisztítása sűrített levegő segítségével automatikusan történik.

Műszaki adatok:

A szűrő felülete: 24,5 m²

A szűrő anyaga: Poliészter

Levegőkapacitás: 42 m³/min

Maradék por: Kevesebb, mint 10 mg/m³

Bevonat: Rozsdamentes acél

Automatikus túlterhelési rendszer maximumérzékelővel, nyomáskapcsolóval, valamint membránszeleppel. Biztosítja, hogy a silót ne lehessen túltölteni, mert ez porkibocsátást okozna a környezetbe.

3 A befecskendező csövön lévő túlfolyásérzékelő vezérlése.

3 Riasztódoboz porsilókhoz, a befecskendezés helyén kell elhelyezni. A doboz IP 55 védelmi osztályú, nyomógombokat, jelzőlámpákat, valamint riasztó szirénát tartalmaz túltöltés esetére.

3 Sziréna csatlakoztatása.

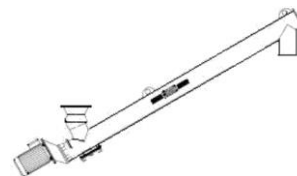
3 Szűrő porsilóhoz, riasztódobozról és PC-ről is indítható.

A 3.3. POZÍCIÓ ÁRA:

EUR 16 427

3.4 4 ST 193 típusú szállítócsiga por szállítására

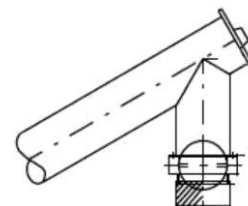
A por szállítására alkalmas szállítócsigát erős karimás hajtóművel, kémlelőablakos burkolatokkal és a túltöltés megakadályozására a bemenetnél speciális menetekkel szállítjuk. A láncfelfüggesztés és a gumihüvelyek a szállítócsiga és a garatmérleg közötti átmenetnél találhatók.



Műszaki adatok:

Hosszúság:	9 m	
Átmérő:	193 mm	
Motor:	Kb. 7,5 kW	
Köztes csapágy:	2	
Kapacitás 30° dőlésszög esetén:	Cement	10,0 kg/s
	Pernye	6,8 kg/s
	Szilícium-dioxid granulátum	1,36 kg/s
	Szilícium-dioxid por	0,68 kg/s
Bevonat:	RAL 9010 fehér	

4 A por szállítására alkalmas szállítócsiga kimenete pneumatikus blokk-kapuvál van ellátva, amely az adagolás befejezése után záródik. Ez megakadályozza az ellenőrizetlen zagyelfolyást a szállítócsigáról, ami jelentős többlet-porfelhasználást eredményezhetne.



A 3.4. POZÍCIÓ ÁRA:

EUR 20 692

3.5 1

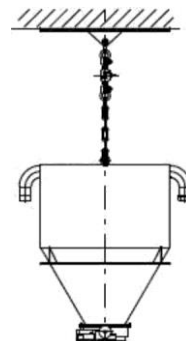
CW 900 típusú por garatmérleg - AM2250 keverőmű

Hengeres garatmérleg alsó kúppal, felfüggesztő hevederrel az ellenőrző súlyokhoz, valamint légkalapács a teljes kiürítés biztosításához. A garatmérleg könnyen leszerelhető 400 mm átmérőjű, állítóművel működtetett kimeneti kapuval, valamint a keverőműhöz rugalmas átmenettel van ellátva.

Műszaki adatok:

Tartalom:	Cement	900 kg
	Pernye	610 kg
	Szilícium-dioxid granulátum	312 kg
	Szilícium-dioxid por	162 kg

Mérési tartomány: a maximális tartalom 5–100%-a.



1

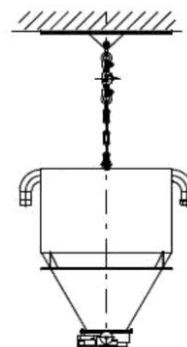
CW 450 típusú por garatmérleg - AM750 keverőmű

Hengeres garatmérleg alsó kúppal, felfüggesztő hevederrel az ellenőrző súlyokhoz, valamint légkalapács a teljes kiürítés biztosításához. A garatmérleg könnyen leszerelhető 300 mm átmérőjű, állítóművel működtetett kimeneti kapuval, valamint a keverőműhöz rugalmas átmenettel van ellátva.

Műszaki adatok:

Tartalom:	Cement	450 kg
	Pernye	305 kg
	Szilícium-dioxid granulátum	156 kg
	Szilícium-dioxid por	80 kg

Mérési tartomány: a maximális tartalom 5–100%-a.



A 3.5. POZÍCIÓ ÁRA:

EUR 14 254

3. ÁRCSOPORT:EUR **231 988****4. CSOPORT: ADAGOLÓBERENDEZÉSEK VÍZHEZ, ADALÉKOKHOZ ÉS FESTÉKEKHEZ**

4.1 1

WW 450 típusú víz garatmérleg - AM2250 keverőmű

Kúpos garatmérleg, felfüggesztő hevederrel az ellenőrző súlyokhoz. A garatmérleg 4"-os ürítőszeleppel, valamint a keverőműbe való rugalmas átmenettel rendelkező csővezetékkel van felszerelve.

Műszaki adatok:

Kapacitás:	450 l.
Mérési tartomány:	a maximális kapacitás 5–100%-a
Bevonat:	Horganyzott.

- 1 **WW 150 típusú víz garatmérleg - AM750 keverőmű**
 Kúpos garatmérleg, felfüggesztő hevederrel az ellenőrző súlyokhoz.
 A garatmérleg 3"-os ürítőszeleppel, valamint a keverőműbe való rugalmas átmenettel rendelkező csővezetékekkel van felszerelve.

Műszaki adatok:

Kapacitás:	150 l.
Mérési tartomány:	a maximális kapacitás 5–100%-a
Bevonat:	Horganyzott.

A garatmérlegek a következőkkel vannak felszerelve:

Adagoló egység hideg vízhez durva/finom adagolószeleppel, valamint kézi működtetésű szelep a teljesítményszabályozáshoz.

Adagoló egység újrahasznosított vízhez durva adagolószeleppel, finom adagolószelep a tiszta vízhez, valamint kézi működtetésű szelep a teljesítményszabályozáshoz. Maximális tartalom az újrahasznosított vízben: Részecskék mérete 0,25 mm, valamint szilárd anyag tartalom 14%.

- 1 **Áramlásmérő 750 literes keverőműhöz**
 Az adagolt víz regisztrálásához keverőműben.

Műszaki adatok:

Mérési elv:	Mágneses
Cső átmérője:	25 mm
Pontosság:	0,5%
Legkisebb térfogatáram:	0,15 l/s
Legnagyobb térfogatáram:	5 l/s
Anyag:	Rozsdamentes acél / alumínium

- 1 **Áramlásmérő 2250 literes keverőműhöz**
 Az adagolt víz regisztrálásához keverőműben.

Műszaki adatok:

Mérési elv:	Mágneses
Cső átmérője:	50 mm
Pontosság:	0,5%
Legkisebb térfogatáram:	0,6 l/s
Legnagyobb térfogatáram:	18 l/s
Anyag:	Rozsdamentes acél / alumínium

A 4.1. POZÍCIÓ ÁRA: EUR 19 798

4.2 8

Hydro-Probe 04 típusú nedvességmérő szonda

A Hydro-Probe II-t egy elsődleges folyamatirányító számítógéphez kell csatlakoztatni. A rendszer az adalékanyagok nedvességtartalmát az adagolás során mikrohullámokkal méri.

Műszaki adatok:

Interfész a folyamatirányító	RS 485
számítógéphez:	0–20/4–20 mA analóg jel

A rendszert nem szabad 8 mm-nél nagyobb szemcseméretű anyagokhoz alkalmazni.

2

Hydromix 08 típusú nedvességmérő szonda - keverőmű padlója

A Hydromix 08 szondát egy elsődleges folyamatirányító számítógéphez kell csatlakoztatni. A rendszer mikrohullámmal méri az aggregátok nedvességtartalmát a keverőműben. A szondát a keverőmű aljához rögzítő gyűrűvel együtt szállítjuk.

Műszaki adatok:

Interfész a folyamatirányító	RS 485
számítógéphez:	0–20/4–20 mA analóg jel

A 4.2. POZÍCIÓ ÁRA: EUR 31 466

4.3 1

Figyelem Az adalékrendszerhez keverőművenként 2 vegyszer alkalmazását tételeztük fel – kérjük, vegye figyelembe, hogy ezeket nem szállítjuk a tartályokkal, mert feltételezzük, hogy a helyi vegyszerszállító adja

2

ZD 12 V típusú adalékanyag szivattyú

Automata szívó szivattyúhajtás a keverékek adagolásához.
A szivattyút a beépítéshez szükséges szerelvényekkel, valamint a változó kapacitáshoz bypass szeleppel szállítjuk.

Műszaki adatok:

Kapacitás:	0,2 l/s . (bypass szabályozással 0,1–0,2 l/s állítható).
Motor:	0,75 kW.
Szívómagasság:	2 m.
Nyomómagasság:	40 m.

2 **SW 15-P típusú adalékanyag garatmérleg**

Vegyszerálló akrilüveg hengerből, szemrevételezéshez használt skálával. A henger visszacsapó szeleppel és ürítőszeleppel van felszerelve. Minden henger mosási célú permetező fúvókával van ellátva. A mérőrendszer porálló szekrénybe van beépítve, amelyen a könnyű ellenőrzés érdekében akrilüveg ajtó van. A elektromos rendszer egyszerű kapocsdobozra van csatlakoztatva.



Műszaki adatok:

Az adalékanyagok száma: 2

Tartalom: 15 l

Alkalmazási tartomány: a maximális tartalom 5–100%-a.

A szekrény méretei Szé x Mé x Ma: 1050 x 500 x 1350 mm

2 3-utas elosztószelep az adalékanyag hengerhez

A 4.3. POZÍCIÓ ÁRA:

EUR 9 549

4.4 2 **WURSCUM komplett súlymérő/szállító egység, FLEX 50**



FLEX 50 2 x 4 KOMPLETT ADAGOLÓ- ÉS SZÁLLÍTÓRENDSZER mindegyik

1 mérő/szállító edénnyel kombinálva

A KÖVETKEZŐKET TARTALMAZZA:

1 elektronikus mérleg nyomásmérő garattal

rozsdamentes acélból készült, 70 l térfogatú

Erőmérő cella 200 kg, mérési tartomány 0,5–25* kg,

3000 egység, minimum egység 20 g, pontosság +/- 50** g

(*a max. mennyiség a térfogatsűrűségtől függ)

(** optimális mérési feltételek esetén,

színtulajdonságoktól és szabályozástól függően).

Mágnesszelep nyomás továbbításához, nyomásszabályozáshoz.

Adagolás szállítócsigával.

1 db NA 300 pneumatikus pillangószelep a töltéshez,
0–2 bar méréstartományú manométer elektromos érintkezővel, 2 kapcsolási ponttal,
Túlnyomáslevezető biztonsági szelep, 3 bar.
Tehermentesítés G 2" pneumatikus présszeleppel
vezérlőszeleppel és légsugárral

A teljes egység porálló szekrénybe van beszerelve. Vezérlőszelepek, pneumatikus elemek és sorkapocs egy dobozban.

Szállítócsigák:

PB 120 TÍPUSÚ 2 x 4 SZÁLLÍTÓCSIGÁK pigmentpor Big-Bag zsákokban

történő szállítására, hosszúsága 2–3 m,
kétsebességes motor, kb. 2,6/3,1 kW, 400 V 50 Hz,
15 vagy 30 l/min szállítóteljesítmény durva és finom adagoláshoz

Tartókeret

2 MEREV ACÉL TARTÓKERET - mind a 4 színpozícióhoz

a szállítócsigák a keretbe vannak helyezve.

2x4 TÁROLÓGARATTAL a szállítócsiga felett,

mindegyik 1 db pneumatikus vibrátorral

mindegyik 1 alacsony szintű szondával piros lámpával a garaton

fedéllel és bemenettel a Big-Bag zsákokban (500 mm) lévő por számára

Tartozékok a két keverőmű ellátására

NA 50 8 x 20 m SPECIÁLIS NAGYNYOMÁSÚ TÖMLŐ

antisztatikus, tömlőbilincsekkel együtt

8 BEHEGESZTHETŐ CSATLAKOZÓ-KEVERŐ FEDÉL, NA 50

tömlőrgőzítő bilincsel

8 KIEGÉSZÍTŐ SZÁLLÍTÓVONAL - LEVEGŐBEFÚVÁS

(Szükséges a keverőbe szállítás elősegítésére)

20 kábeltálca (horganyzott) A SZÁLLÍTÓTÖMLŐK SZERELÉSÉHEZ

3000 x 200 mm, a kábelkötegelőkkel együtt

BIG BAG ZSÁKÜRÍTŐ ÁLLOMÁSOK

GE 1070 típusú 2 x 4 Super Sack tartóállvány

Big Bag zsákok részére, 1,3 x 1,3 x 2,7 m

Állítható magasságú függesztősinék bármilyen Big-Bag zsák mérethez.

A szuperzsákos állványt a tartókeret minden adagolóhelyére targoncával helyezik el.

2 x 4 felfüggesztő szerkezet targoncához

1 tonna kapacitású Big Bag zsákhöz

A 4.4. POZÍCIÓ ÁRA:

EUR 345 235

4. ÁRCSOPORT:

EUR **406 048**

Wienerberger Ltd.
New rooftile factory
TBC
Hungary

QUOTATION
Quotation No.: GHU 0403
Date: 03-10-2022
Page: 1 of 37
Customer No.:

P.O. No.:
Your ref.: Thomas Mandl
Our ref.: Gareth Hulcup
E-mail: ghu@skako.com
Phone: +44 7585 055568

Dear Thomas.

Please find attached the amended offer which includes a summary table below of the items that have been removed from the technical specification. The recirculation system has been moved to the options list at the end of the quotation.

Item	Price EUR
Removal of ground hopper feeder unit	7,800
Hot air distributors	80,205
Recirculation system (priced as option)	88,663
Removal of hot water valves	1,000
Removal of electrical manpower (customer to supply)	40,344
Removal of mechanical manpower (customer to supply)	134,000
6 aggregate storage compartments (8 compartments priced as option)	41,728

We believe the omission of the above items will not have a fundamental impact on the operation of the plant and will ensure that the output and quality of the plant as we have agreed will not be compromised. These cost reductions will enable the plant to align closer to your budget whilst giving you the quality product and specification you require.

Regarding the offer, due to the unsecure situation in the world, prices are fluctuating almost on a daily basis. Prices indicated in this quotation, and/or order, are therefore only indicative estimates and SKAKO are forced to reserve the right to change the price at any given time when met by changes from our suppliers, even after order has been signed. As freight is also included in the quotation/order, it must be also be considered as an estimate only. Any increase in the freight cost and/or taxes or fees will be invoiced separately. I appreciate this is far from ideal, but given the current situation we find ourselves in, we have little choice. I hope you are understanding of this given that Wienerberger will almost certainly have experienced price increases of their own akin to ours.

We trust the below shall meet with your requirements, however should you require any additional information, or should we be able to assist you in any other matter, please do not hesitate to contact us.

Yours sincerely
SKAKO Concrete A/S



Gareth Hulcup
Sales Manager

Enclosures

[ORGALIME SI14-GB](#)

[SKAKO Concrete A/S's sales and delivery terms - March 2020](#)

We are pleased to quote the following equipment and services according to our standard sales and delivery terms and ORGALIME SI 14:

GROUP 1: RECEIVING AND TRANSPORT OF AGGREGATES

- 1.1 1 of **Receiving silo for concrete pit**
 The silo capacity is 25 m³ gross volume and constructed in concrete as a partly underground pit in which the steel silo cones are placed. The concrete work is not included in SKAKO's scope of supply. The silo is intended for charging by means of rear truck. The steel silo is equipped with round corners and fittings for silo vibrator and 9 mm wear rubber on the inclined surfaces.
Technical data for steel silo cone:
 Capacity: 11.3 m³ gross volume
 Dimensions: 3650 x 3650 x 1961 mm (W x L x H)
 Coating: Galvanized
- 1 of **Silo vibrator**
 Motor vibrator mounted on silo cone for better discharge of silo.
Technical data:
 Vibrator 0.16 kW
- 1 of **Travel grate for receiving silo**
 Three-part grate with manhole in one section placed on top of receiving silo. The grate prevents persons from falling into the silo and large particles from entering the silo. The truck is driven onto the grate for rear tipping. Guide plates delimit the area where the wheels of the truck are allowed.
Technical data:
 Dimensions: 3650 x 3650 mm
 Gap width: 97 mm
 Axle load: 200 kN
 Coating: Galvanized
- 1 of **Galvanized post for control box**
 To protect the operating box for loading control against weather impacts.
- 1 of **Tipping cover for receiving silo**
 The cover is made as a frame construction with 60 mm foam insulation fixed above the silo on plates embedded in the dump hopper. Opening and closing take place by means of a hydraulic system included in the delivery. In addition, the cover is equipped with rubber curtains reducing the penetration of snow and driving rain into the receiving silo.
Technical data:
 Dimensions: 3650 x 3650 mm
 Hydraulic unit: 0.7 kW
 Coating: Galvanized panel plates
 Painted frame construction

PRICE POSITION 1.1:

EUR

63,558

1.2 1 of **Inclined belt conveyor type SB 1000**

The belt conveyor is equipped with a drive station with 2 off gear motors. The driving drum is equipped with friction lining of rubber, and the belt conveyor is so constructed permitting a large span and equipped with a troughed belt conveyor as well as a rubber transition to the subsequent belt conveyor. The drive station is equipped with a vibration cleaner which removes most of the material residue on the belt conveyor. **Complete with washing system underneath belt conveyor for cleaning.**

Technical data:

Incline:	30°
Belt length:	22 m
Belt width:	1000 mm
Belt speed:	1.5 m/sec.
Capacity:	134 kg/sec. at a material density of 1.5 ton/m ³
Drive motor:	Approx. 22 kW
Coating:	Galvanized

In addition the belt conveyor is equipped with:

The rubber conveyor belt is equipped with carriers.

- 1 of Rubber-clad charging funnel.
- 18 m Galvanized covering.
- 15 m Galvanized wire grating on the underside of the belt for personal safety.
- 1 of Revolution indicator installed at the tail drum.
- 1 of Emergency stop. Stops the belt conveyor when the button is pushed or when the wire along the side of the belt conveyor is pulled.
- 22 m Covering between top cover and side members. Ensures that the material does not fall off the belt.
- 1 of Dust limiting transition to vibrating sand screen.
- 1 of Supporting structure at tail drum.
- 1 of Supporting structure at silo pit.
- 1 of Supporting structure with a height of 3-5 m

PRICE POSITION 1.2: EUR 68,895

1.3 1 of

Permanent Suspension Magnet

Suspension Magnet SMP1000-250 with 4 lifting eyes. To remove all metallic objects from incoming sand supply (before vibrating screen). Complete with suspension frame **and belt conveyor for automatic removal of metal particles.**

PRICE POSITION 1.3:

EUR

12,191

1.4 1 of

Vibrating Screen in the Aggregate receiving system

Job: Screening of aggregate in receiving system
 Loading method: Continuously via belt conveyor SB1000
 Requirement: Open design, cheapest possible.
 Screening accuracy %: Best as possible.
 Material: Aggregates
 Particle size: 8-16 mm.
 Bulk density: 1,5 t/h³
 Moisture content %: Natural moist up to 5 – 7 %
 Temp. material: -30 til +40 degree Celsius
 Temp. ambient: -30 til +40 graders Celsius
 Motors are heated
 Capacity: Up to 250 t/h
 Power supply: 400V -50 Hz.

For the a.m. application we are pleased to recommend/deliver:

SKAKO VIBRATORY SCREEN TYPE S2U100/0250M1OI

Open execution according to drawing no. JJP130904-01.

Screen deck, two off, with dimension W x L = 1000 mm x 2500 mm.

The vibratory screen is driven by 2 off motor vibrators placed at sides on the screen body.

Drive unit: 1 off motor vibrators type 230/400-50Hz kW
 Protection class IP66. Insulation class F

The screening cabinet is executed in mild steel and delivered complete with springs for support.

The screen for the a.m. used designed/equipped with:

Net, 1 off, with aperture 40 x 40 mm

Surface Treat.: Galvanized or painted RAL 1007.

Net weight: 700 kg

Stand for above VIBRATORY SCREEN TYPE S2U100/0250M1OI

Executed in mild steel, apr height 2 m.

Surface Treat.: Galvanized or painted RAL 1007.

Net weight: 400 kg

PRICE POSITION 1.4:

EUR

27,950

1.5 1 of **Inclined belt conveyor type SB 1000**

The belt conveyor is equipped with a drive station with 2 off gear motors. The driving drum is equipped with friction lining of rubber, and the belt conveyor is so constructed permitting a large span and equipped with a troughed belt conveyor as well as a rubber transition to the subsequent belt conveyor. The drive station is equipped with a vibration cleaner which removes most of the material residue on the belt conveyor. **Complete with washing system underneath belt conveyor for cleaning.**

Technical data:

Incline:	30°
Belt length:	51 m
Belt width:	1000 mm
Belt speed:	1.5 m/sec.
Capacity:	134 kg/sec. at a material density of 1.5
Drive motor:	2 x 22 kW
Coating:	Galvanized

In addition the belt conveyor is equipped with:

The rubber conveyor belt is equipped with carriers.

- 1 of Rubber-clad charging funnel.
- 47 m Galvanized covering.
- 5 m Galvanized wire grating on the underside of the belt for personal safety.
- 1 of Revolution indicator installed at the tail drum.
- 1 of Emergency stop. Stops the belt conveyor when the button is pushed or when the wire along the side of the belt conveyor is pulled.
- 47 m Covering between top cover and side members. Ensures that the material does not fall off the belt.
- 1 of Supporting structure at tail drum.
- 1 of Supporting structure with a height of 6-9 m.
- 1 of Supporting structure with a height of 15-18 m.
- 1 of Supporting structure at drive station.

86 m Gangway and stairs. Installed on **BOTH** sides of the belt conveyor. Provides access from ground level to the silo top and makes service along the belt conveyor possible. Incl. railing.

PRICE POSITION 1.5: EUR 184,887

1.6 1 of **Turnable distribution belt conveyor type SB 650**

The belt conveyor is equipped with a drive station mounted directly on the shaft of the driving drum. The driving drum is equipped with friction lining of rubber.

The belt conveyor is equipped with a troughed, smooth belt conveyor as well as a charging funnel. The rotating function is an integrated part of the belt conveyor and consists of an electrically driven wheel block travelling on a circular rail on the upper edge of the silo.

The drive station is equipped with a belt scraper which removes approx. 95% of the material residue on the belt conveyor. The belt conveyor is equipped with a revolution indicator, emergency stop on both sides, capacity overflow sensor as well as encoder for positioning.

Technical data:

Belt length:	2950 mm
Belt width:	650 mm
Capacity:	137 kg/sec. at a material density of 1.5
Belt speed:	2 m/sec.
Drive motor:	5.5 kW
Rotary motor:	0.37 kW
Coating:	Galvanized

PRICE POSITION 1.6: EUR 19,420

PRICE GROUP 1: EUR 376,901

GROUP 2: SILO AND PROPORTIONING PLANTS FOR AGGREGATES

2.1 1 of **High silo type 525/8**

The silo is designed for storage of aggregates with a particle size of 1-64 mm with a density of max. 1600 kg/m³. The high silo is built as a modular construction to be installed by means of bolted joints. The silo is designed as a cylinder with cones at the top and bottom ensuring an effective utilization of the total volume. The partition walls consist of trapezoidal elements mounted on the centre column of the silo. The bottom cone ends in a flat bottom under which the proportioning equipment is mounted. The silo top is accessed through stairs on the inclined belt conveyor. The individual silo compartments are accessed through a manhole in the silo deck and by means of rounds of a ladder on the silo wall. The conical silo top is equipped with an access door and a service platform for the belt conveyor loading aggregates into the plant.

Technical data:

Silo volume, gross: 529.6 m³ gross volume (6 partition walls)

Silo diameter: 8 m

Silo compartment: 4 off of 45°, 66.2 m³ gross volume

2 off of 90°, 132.4 m³ gross volume

To be finalised during technical clarification

In addition, the high silo is equipped with:

Support consisting of four A-shaped frames. Platform integrated in the support and consisting of a structural floor with deck of checker plate that is not waterproof.

The platform is quadratic of a size of 64 m².

Support under platform level is made as vertical legs to ensure optimum free space underneath the platform.

1 of Access door to the mixing plant.

5 m Galvanized stairs with width of 800 mm

Galvanized service gangway with railing at weigh hoppers.

3 m Galvanized ladder.

PRICE POSITION 2.1: EUR 803,775

2.3 Insulated cladding. The outside of the aggregate silo is clad with coated, profiled sandwich plates, insulated with 80 mm mineral wool.

Cladding of mixer platform to be incorporated into factory building cladding.

PRICE POSITION 2.3: EUR 62,275

2.4 8 of **Vibratory feeder type FCE 056/0071 M3NL**
Vibratory feeder with electromagnetic vibrator which ensures an efficient and accurate proportioning. The design and operating principles of the vibratory feeder ensure minimum wear on the vibratory trough and reduce possible bridge building in the silo outlet.

The feeder is equipped with an installation fitting for moisture probe.

Technical data:

Capacity: 41 kg/sec. with a trough angle of 6°

Material density 1.6, moisture 3 %

Vibrator: 20D

Coating: Galvanized

PRICE POSITION 2.4: EUR 49,848

- 2.5 1 of **Aggregate weigh hopper type TW 750**
Edged hopper with bottom cone, suspension hoop for calibration weights, fitting for motor vibrator, three-point chain suspension and bottom flange. The hopper is equipped with 7 mm SH 62 wear rubber on the inside.

Technical data:

For mixer: Min. 750 l.
Weighing area: 5-100% of max. content.

- 1 of **Aggregate weigh hopper type TW 2250**
Edged hopper with bottom cone, suspension hoop for calibration weights, fitting for motor vibrator, three-point chain suspension and bottom flange. The hopper is equipped with 7 mm SH 62 wear rubber on the inside.

Technical data:

For mixer: Min. 2250 l.
Weighing area: 5-100% of max. content.

The hoppers are equipped as follows:

Pneumatic gates unit with 2 outlets, rubber-coated wear surfaces as well as flexible transitions to mixer inlets.

Manifold for outlet gate with inside rubber coating for installation between gate and mixer inlet.

Motor vibrator installed on the hopper for better discharge.

PRICE POSITION 2.5: EUR 42,857

PRICE GROUP 2: EUR **958,755**

GROUP 3: SILO AND PROPORTIONING PLANT FOR CEMENT, FLY ASH AND SILICA

- 3.1 3 of **Powder silo type 75 T**
Cylindrical silo for storage of cement, fly ash or silica.
The silo is equipped with top railing, Ø 100 injection pipe, flanges for filter and sensors, manually operated block gate at the outlet, as well as pressure relief valves / suction relief valves. **Additional outlet to be included in one of the cement silos to enable proportioning to both mixers.**

Technical data:

Volume:	Gross	60.2 m ³
	Net	52.2 m ³
Principal dimensions:	Diameter	3180 mm
	Cylinder height	6700 mm

	Cone height	2600 mm
Max. bulk density of the stored material:		1.45 t/m ³

The silo is equipped with the following:

4m silo support per silo, consisting of 4 tubular columns connected with diagonals.

Service platform, placed under silo outlet.

Galvanized ladder with safety hoop and necessary landings. The ladder provides access to the silo top from service platform.

NB: Only 1 off silo is equipped with a ladder.

Galvanized ladder with safety hoop and necessary landings. The ladder provides access from ground level to service platform.

800 mm wide catwalk with railings for connection between the silo top and the top of the nearest silo.

2 of 1000 mm wide catwalk with railings for connection between the service platform of the silo and the service platform of the nearest silo.

12 m additional injection pipe to common injection place.

PRICE POSITION 3.1: EUR 163,740

3.2 12 of Powder silo weigh cells for stock control

Load cell class C1, PTB approved, 50,000 kg.

3 of Weighing amplifier type Beckhoff

PRICE POSITION 3.2: EUR 16,875

3.3 Airing system with 6 off nozzles as well as valves. Ensures material flow to the outlet.

3 of Filter for powder silo type RO3
To be mounted on the silo top. The excess pressure from the injection is removed through the filter where the dust particles are deposited. Cleaning of the filter unit takes place automatically by means of compressed air.

Technical data:

Filer area: 24.5 m²

Filter material:	Polyester
Air capacity:	42 m ³ /min.
Residual dust:	Less than 10 mg/ m ³
Coating:	Stainless steel

Automatic overload system with max. sensor, pressure switch as well as membrane valve. Ensures that the silo is not overfilled, which would cause dust emission to the surroundings.

- 3 of Control of overflow sensor on injection pipe.
- 3 of Alarm box for powder silos for placement at the injection place. The box has protection class IP 55 and contains push buttons, indication lamps as well as an alarm siren for overfilling.
- 3 of Connection of siren.
- 3 of Filter for powder silo, can be started from alarm box as well as PC.

PRICE POSITION 3.3: EUR 16,427

3.4 4 of **Powder screw conveyor type ST 193**

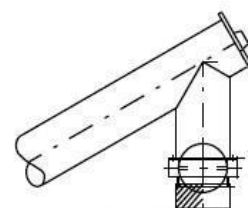
The powder screw conveyor is supplied with a strong flange gearbox, inspection covers and special threads at inlet to prevent overfilling. Chain suspension and rubber sleeves at transition between screw conveyor and weigh hopper are included.



Technical data:

Length:	9 m	
Diameter:	193 mm	
Motor:	Ca. 7.5 kW	
Intermediate bearing:	2 off	
Capacity at 30° incline:	Cement	10.0 kg/sec.
	Fly ash	6.8 kg/sec.
	Silica granulate	1,36 kg/sec.
	Silica powder	0,68 kg/sec.
	Coating:	White RAL 9010

- 4 of The outlet of the powder screw conveyor is supplied with a pneumatic block gate that closes after completed proportioning. This prevents uncontrolled tailings/flow from the screw conveyor which can result in a considerable additional powder consumption.



PRICE POSITION 3.4: EUR 20,692

3.5 1 of

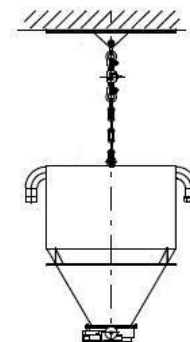
Powder weigh hopper type CW 900 - AM2250 mixer

Cylindrical weigh hopper with bottom cone, suspension hoop for control weights, as well as air hammer ensuring complete discharge. The weigh hopper is equipped with an easily demountable Ø 400 mm actuator-operated outlet gate, as well as a flexible transition to the mixer.

Technical data:

Content:	Cement	900 kg
	Fly ash	610 kg
	Silica granulate	312 kg
	Silica powder	162 kg

Weighing area: 5-100% of max content.



1 of

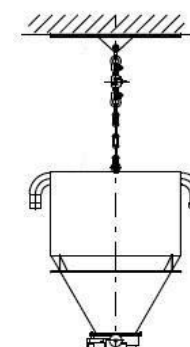
Powder weigh hopper type CW 450 – AM750 mixer

Cylindrical weigh hopper with bottom cone, suspension hoop for control weights, as well as air hammer ensuring complete discharge. The weigh hopper is equipped with an easily demountable Ø 300 mm actuator-operated outlet gate, as well as a flexible transition to the mixer.

Technical data:

Content:	Cement	450 kg
	Fly ash	305 kg
	Silica granulate	156 kg
	Silica powder	80 kg

Weighing area: 5-100% of max content.



PRICE POSITION 3.5:

EUR 14,254

PRICE GROUP 3:

EUR **231,988**

GROUP 4: PROPORTIONING PLANTS FOR WATER, ADMIXTURE AND COLOUR

4.1 1 of

Water weigh hopper type WW 450 – AM2250 mixer

Conical weigh hopper with suspension hoop for control weights. The weigh hopper is equipped with a 4" discharge valve as well as piping with flexible transition to mixer.

Technical data:

Capacity:	450 l.
Weighing area:	5-100 % of max. capacity.
Coating:	Galvanized.

1 of

Water weigh hopper type WW 150 – AM750 mixer

Conical weigh hopper with suspension hoop for control weights.

The weigh hopper is equipped with a 3" discharge valve as well as piping with flexible transition to mixer.

Technical data:

Capacity:	150 l.
Weighing area:	5-100 % of max. capacity.
Coating:	Galvanized.

The weigh hoppers are equipped with:

Proportioning unit for cold water with coarse/fine proportioning valve as well as manually operated valve for capacity regulation.

Proportioning unit for recycled water with coarse proportioning valve, fine proportioning valve for clean water as well as manually operated valves for capacity regulation. Max. content in recycled water: Particle size 0.25 mm as well as solids content 14%.

1 of

Flowmeter for 750 l mixer

For registration of proportioned water in mixer.

Technical data:

Measuring principle:	Magnetic
Pipe diameter:	25 mm
Accuracy:	0.5 %
Minimum flow:	0.15 l/sec.
Maximum flow:	5 l/sec.
Material:	Stainless steel/Aluminium

1 of

Flowmeter for 2250 l mixer

For registration of proportioned water in mixer.

Technical data:

Measuring principle:	Magnetic
Pipe diameter:	50 mm
Accuracy:	0.5 %
Minimum flow:	0.6 l/sec.
Maximum flow:	18 l/sec.
Material:	Stainless steel/Aluminium

PRICE POSITION 4.1:

EUR

19,798

4.2

8 of

Moisture measuring probe type Hydro-Probe 04

Hydro-Probe II must be connected to a primary process computer. The system measures the moisture in the aggregates during proportioning by means of microwaves.

Technical data:

Interface to process computer: RS 485

Analog signal 0-20/4-20 mA

The system should not be applied in materials with a particle size of over 8 mm.

2 of

Moisture measuring probe type Hydromix 08 – mixer floor

The Hydromix 08 probe to be connected to a primary process computer. The probe measures the moisture in the aggregates in the mixer by means of microwaves. The probe will be delivered with mounting ring for mixer bottom.

Technical data:

Interface to process computer: RS 485

Analog signal 0-20/4-20 mA

PRICE POSITION 4.2:

EUR

31,466

4.3

1 of

NB. For the additiv system, we have assumed 2 of chemicals per mixer – please note, we have not included for the tanks assuming these to be supplied locally by the supplier of the chemicals

2 of

Admix pump type ZD 12 V

Automatic suction gear pump for proportioning of admixtures.

The pump is supplied with fittings for installation and bypass valve for variable capacity.

Technical data:

Capacity: 0.2 l/s . (adjustable 0.1-0.2 l/sec. by means of bypass regulation).

Motor: 0.75 kW.

Suction height: 2 m.

Pressure height: 40 m.

2 of

Admix weigh hopper type SW 15-P

Consists of chemical-resistant acrylic glass cylinder including scale for visual inspection. Cylinder is equipped with non-return valve and discharge valve. Each cylinder is equipped with a spray nozzle for washing purposes. The weighing system is built into a dust proof cabinet with one acrylic glass door for easy inspection. Electrical installation has been connected to a common terminal box.



Technical data:

Number of admixtures: 2 of

Content: 15 l

Application area: 5 –100 % of max. content

Cabinet dimensions W x D x H: 1050 x 500 x 1350 mm

2 of 3-way distribution valve for admix cylinder

PRICE POSITION 4.3:

EUR

9,549

4.4

2 of

WURSCUM Complete Weighing/Conveying Unit FLEX 50



2 x 4 COMPLETE METERING AND CONVEYING SYSTEM TYPE FLEX 50

each with 1 combined weighbin/conveying vessel

COMPRISING:

1 Electronic scale with weighing pressure hopper

made of stainless steel, capacity 70 l

Load cell 200 kg, weighing range 0,5-25* kg,

3000 units, minimum unit 20 g, accuracy +/- 50** g

(*max. quantity depends on bulk density)

(** with optimal metering conditions,

depending on colour properties and control).

Solenoid valve for pressure conveying, pressure regulator.

Dosing with screw conveyors.

1 pneumatic butterfly valves NW 300 for filling,

Manometer 0-2 bar with electric contact with 2 switch points,

overpressure security valve 3 bar.

Discharge by pneumatic squeeze valve G 2"

with pilot valve and air jet.

The complete unit is completely installed in a dust proof cabinet.

Pilot valves, pneumatic elements and terminal board in a box.

Screw conveyors:

2 x 4 SCREW CONVEYORS TYPE PB 120 for Big-Bags of powder pigment
length 2-3m,
two speed motor, approx. 2,6/3,1 KW, 400V 50Hz,
conveying capacity 15 or 30 l/min for coarse and fine metering

Support frame

2 RIGID STEEL SUPPORT FRAME – each for 4 colour positions
the screw conveyors are put into the frame.
including 2x4 STORAGE HOPPERS above screw conveyors,
each 1 pneum. vibrator
each 1 Low level probe with red lamp on the hopper
with cover and inlet for powder Big-Bag (500mm)

Accessories to supply in two mixers

8 x 20 m SPECIAL PRESSURE HOSE NW 50

antistatic, incl. Hose clips

8 WELD-IN CONNECTOR-MIXER COVER, NW 50

with hose attachment clamp

8 ADDITIONAL CONVEYING LINE – AIR INJECTION

(Required to assist conveying to mixer)

20 CABLE TRAY (galvanized) FOR CONVEYING HOSE INSTALLATION

3000 x 200 mm, including cable ties

BIG BAG DISCHARGE STATIONS

2 x 4 Super Sack support racks TYPE GE 1070

For Big-Bags, 1.3 x 1.3 x 2.7 m

Height-adjustable suspending rails for any Big-Bag size.

The super sack rack is placed onto each feed position on the support frame by forklift.

2 x 4 suspending device for fork-lift

For Big-Bags cap. 1 ton.

PRICE POSITION 4.4:	EUR	345,235
---------------------	-----	---------

PRICE GROUP 4:	EUR	<u>406,048</u>
----------------	-----	-----------------------

GROUP 5: MIXERS AND MIXER EQUIPMENT

5.1 1 of **SKAKO ATLANTIS counter-current mixer type AM 750**

ATLANTIS, the latest SKAKO mixer series, has been developed in due consideration of operation reliability, operation optimization, sturdiness and with a completely unique design placing operation friendliness, cleaning and service in focus.

The inside of the mixer is designed to ensure that the daily cleaning is performed quickly and easily, either manually through the large, operation friendly service hatches, ensuring easy access to the mixer, or fully automatically by means of a high-pressure cleaning system, which can be chosen as an option.



A lockable main switch for the mixer motor for installation near the mixer is included. All inlets are led through the top of the mixer, and an inspection gate makes it possible to look into the mixer during the mixing process, without compromising on safety. The wear plates are equipped with stud-welded threaded pins ensuring fast and safe installation and dismantling. This also increases the effective thickness of the wear plates by approx. 20-25% as it is not the wear of the pins that decides the time of replacement.

The counter-current mixer is driven by a planetary gear that moves a fast rotating set of shovels in the mixer pan in a repeated movement against the current ensuring that the materials are both lifted and set in a multi-dimensional motion. This results in an efficient and fast mixing of the concrete. The design of motor and gear allows the mixer to start under full load after an unintended stop. The mixer is supplied with complete electrical installation for sensors and valves lead to a common contact box.

The mixer gear boxes are covered by an eight-year warranty (max. 1800 hours of operation a year) provided that a service contract has been concluded with SKAKO Concrete.

Technical data:

Charging volume:	750 l
Mixed quantity:	500 l/1200 kg compacted concrete
Mixer stars:	1 off
Rubber shovels:	2 off
Top shovels:	1 off

Side scrapers of	1 off
Manganese steel 500HB:	
Corner scrapers of	1 off with exchangeable tip made of carbide
Manganese steel 500HB:	
Drive motor:	18.5 kW – with frequency inverter
Hydraulic motor:	4 kW – with frequency inverter
Coating:	Yellow RAL 1007
	Grey RAL 7000

In addition the mixer is equipped with the following equipment:

- 3 sets Service doors. Three set double doors with oilproof remathan sealing strips are mounted on the sides of the mixer.
- 2 sets Hydraulically operated discharge gates. Discharge of the concrete takes place through 2 off discharge gates, incorporated in the bottom of the mixer pan. The gate is driven by a separate, hydraulic station equipped with a hand pump, making discharge of the mixer possible in connection with power failures. The hydraulic station is included in the delivery. Gate size: 850 mm x 576 mm.
- 1 of Safety system. All service doors and discharge gates are equipped with a locking system. The keys for the locking system cannot be released until the main switch has been cut out, ensuring that the mixer cannot start.
- 1 set Bottom wear plates made of Nihard.
- 1 set Side wear plates made of Hardox 600 or equivalent.
- 1 of Loose inlet for aggregates.
- 2 of Outlet funnel type 1 (for hoppers and belt conveyors). RAL7000
- 1 of Distribution pipe with 2 fixed nozzles. For water proportioning directly into the mixer. The water is evenly distributed over the entire surface of the concrete and accurately proportioned by means of valves for coarse/fine proportioning.
- 1 of Sampler. Hydraulically operated sampler for laboratory samples. The samples will be taken during production without any safety risks for the personnel. The concrete mix design and the time of sampling being unknown to us, we cannot guarantee that the sample will always be representative of the total quantity of concrete in the mixer.



Automatic hatch for camera installed on AM750 mixer.
The camera is mounted on a turnable plate inside a box.
The camera allows for visual inspection of the mixing process and emptying of the mixer. This makes it possible to perform visual consistency control from the control room.
The box protects the camera from dirt as the camera is only inside the mixer at specific moments. The camera box is mounted with lighting, safety function and inspection hatch for easy cleaning and service of the camera.



1 of

SKAKO ATLANTIS counter-current mixer type AM 2250

ATLANTIS, the latest SKAKO mixer series, has been developed in due consideration of operation reliability, operation optimization, sturdiness and with a completely unique design placing operation friendliness, cleaning and service in focus.

The inside of the mixer is designed to ensure that the daily cleaning is performed quickly and easily, either manually through the large, operation friendly service hatches, ensuring easy access to the mixer, or fully automatically by means of a high-pressure cleaning system, which can be chosen as an option.



A lockable main switch for the mixer motors for installation near the mixer is included.

All inlets are led through the top of the mixer, and an inspection gate makes it possible to look into the mixer during the mixing process, without compromising on safety.



The wear plates are equipped with stud-welded threaded pins ensuring fast and safe installation and dismantling. This also increases the effective thickness of the wear plates by approx. 20-25% as it is not the wear of the pins that decides the time of replacement. Manual turning of the mixer star is possible. The counter-current mixer is driven by a planetary gear that moves a fast rotating set of shovels in the mixer pan in a repeated movement against the current ensuring

that the materials are both lifted and set in a multi-dimensional motion. This results in an efficient and fast mixing of the concrete.

The design of motors and gear allows the mixer to start under full load after an unintended stop. The mixer is supplied with complete electrical installation for sensors and valves lead to a common contact box.

The mixer gear boxes are covered by an eight-year warranty (max. 1800 hours of operation a year) provided that a service contract has been concluded with SKAKO Concrete.

Technical data:

Charging volume:	2250 l
Mixed quantity:	1500 l/3600 kg compacted concrete
Mixer stars:	2 off
Rubber shovels:	4 off
Top shovels:	2 off
Side scrapers of Manganese steel 500HB:	1 off
Corner scrapers of Manganese steel 500HB:	2 off with exchangeable tip made of carbide
Drive motor:	2 x 30 kW – with frequency inverter
Hydraulic motor:	4 kW – with frequency inverter
Coating:	Yellow RAL 1007 Grey RAL 7000

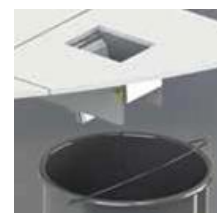
Note:

- **The power consumption is approx. 15-20% lower** than for similar mixers on the market.
- The two drive motors ensure a continued production also in case of breakdown of one motor. Production with one motor will supply approx. 60% of a full batch. In this way **production integrity** is ensured.

In addition the mixer is equipped with the following equipment:

- | | |
|--------|---|
| 3 sets | Service doors. Three set double doors with oilproof remathan sealing strips are mounted on the sides of the mixer. |
| 2 sets | Hydraulically operated discharge gates. Discharge of the concrete takes place through 2 off discharge gates, incorporated in the bottom of the mixer pan. The gate is driven by a separate, hydraulic station equipped with a hand pump, making discharge of the mixer possible in connection with power failures. The hydraulic station is included in the delivery. Gate size: 885 mm x 850 mm. |
| 1 of | Safety system.
All service doors and discharge gates are equipped with a locking system. The keys for the locking system cannot be released until the main switch has been cut out, ensuring that the mixer cannot start. |

- 1 set Bottom and side wear plates made of Ni-Hard 2.
- 1 of Loose inlet funnel for aggregates.
- 2 of Outlet funnel type 1 (for hoppers and belt conveyors). For large outlet gate.
- 1 of Distribution pipe with 4 fixed nozzles. For water proportioning directly into the mixer. The water is evenly distributed over the entire surface of the concrete and accurately proportioned by means of valves for coarse/fine proportioning.
- 1 of Sampler. Hydraulically operated sampler for laboratory samples. The samples will be taken during production without any safety risks for the personnel. The concrete mix design and the time of sampling being unknown to us, we cannot guarantee that the sample will always be representative of the total quantity of concrete in the mixer.



Automatic hatch for camera installed on AM2250 mixer. The camera is mounted on a turnable plate inside a box. The camera allows for visual inspection of the mixing process and emptying of the mixer. This makes it possible to perform visual consistency control from the control room. The box protects the camera from dirt as the camera is only inside the mixer at specific moments. The camera box is mounted with lighting, safety function and inspection hatch for easy cleaning and service of the camera.



PRICE POSITION 5.1:

EUR

200,597

- 5.2 1 of **Fully automatic high-pressure cleaning unit AM750 mixer**
The rotating washing head is automatically lowered into the mixer during cleaning. The head washes the inside of the mixer in a 360° rotation with a high-pressure water jet of 170 bar loosening residual concrete, if any. The system saves up to 80 % of the manual cleaning time.
- 1 of **Fully automatic high-pressure cleaning unit AM2250 mixer**
The rotating washing head is automatically lowered into the mixer during cleaning. The head washes the inside of the mixer in a 360° rotation with a high-pressure water jet of 170 bar loosening residual concrete, if any. The system saves up to 80 % of the manual cleaning time.
- 1 of **High-pressure washing pump**
High-pressure pump with frame, switch for failing water supply, thermostat, manual washing handle as well as automatic water valve for 2 off consumption places.

Technical data:

Pump output: 75 l/min.

Pressure: 170 bar

Pump motor: 30 kW

1 of Control of wash pump unit.

2 of Control of mixer wash system.

PRICE POSITION 5.2: EUR 33,051

5.3 2 of **Filter system type FJS 6**

To be placed directly above the mixer.

The intercepted particles are automatically led back into the mixer in the same cycle so that manual discharge of the system is avoided.

Technical data:

Fan motor: 1.1 kW

2 of **Filter connection to mixer**

The connection unit consists of flexible transition from the fixed pipe connection, manual gate for regulation of air quantity and automatic three-way valve that closes during water proportioning to avoid moisture from penetrating the filter system.

PRICE POSITION 5.3: EUR 26,788

5.4 1 of **Concrete intermediate hopper type CH 2250 – AM2250 mixer**

The hopper is made with round corners and equipped with a service gate in order to facilitate discharge and cleaning. Fittings for suspension of the hopper under the mixer platform are included in the delivery.

Net volume: 1.5m³ for concrete with an angle of slide of 60° from horizontal level.

1 of **Concrete intermediate hopper type CH 1500 – AM750 mixer**

The hopper is made with round corners and equipped with a service gate in order to facilitate discharge and cleaning. Fittings for suspension of the hopper under the mixer platform are included in the delivery.

Net volume: 1m³ for concrete with an angle of slide of 60° from horizontal level.

Further the hoppers are equipped with:

2 of Transition member to concrete belt conveyor with rubber sealings, manually adjustable gate at each end for layer height adjustment as well as suspension fittings for the belt conveyor.

2 of **Level indicator type FDU 9 X for concrete intermediate hopper**
Signal is transferred to main control system to display the level in the silo in %.
The system consists of an electronic part for installation in silo.
Measuring principle: Ultrasound.

2 of Connection of silo indicator type 6.

Associated pipework for removal of wash water from mixer

PRICE POSITION 5.4: EUR 28,202

5.5 1 of **Belt conveyor for concrete type SB1000 – AM750 mixer**
The belt conveyor is equipped with a drive station with electric motor. The driving drum is equipped with friction lining of rubber, and the belt conveyor is constructed of C- profile side members and equipped with a troughed belt conveyor. Belt scraper which removes most of the material residue from the belt conveyor. The belt conveyor can transport concrete with a maximum slump of 50 mm. **Belt conveyor fitted with additional drive station for reversing function.**

Technical data:

Incline:	Max 5°
Belt length:	21 m
Belt width:	1000 mm
Belt speed:	1 m/sec.
Coating:	Galvanized

In addition the belt conveyor is equipped with:

17 m Galvanized covering.

21 m Galvanized wire grating on the underside of the belt for personal safety.

1 of Revolution indicator installed at the tail drum.

1 of Emergency stop. Stops the belt conveyor when the button is pushed or when the wire along the side of the belt conveyor is pulled.

1 of Material sensor indicating if there is material on the belt conveyor.

17 m Covering between top cover and side members. Ensures that the material does not fall off the belt.

1 of Dust limiting transition to extruder hopper

3 of Supporting structure with a height of 3-5m.

PRICE POSITION 5.5: EUR 67,388

5.6 1 of **Belt conveyor for concrete type SB1000 – AM2250 mixer**

The belt conveyor is equipped with a drive station with electric motor. The driving drum is equipped with friction lining of rubber, and the belt conveyor is constructed of C- profile side members and equipped with a troughed belt conveyor. Belt scraper which removes most of the material residue from the belt conveyor. The belt conveyor can transport concrete with a maximum slump of 50 mm. **Belt conveyor fitted with additional drive station for reversing function.**

Technical data:

Incline:	Max 5°
Belt length:	25 m
Belt width:	1000 mm
Belt speed:	1 m/sec.
Coating:	Galvanized

In addition the belt conveyor is equipped with:

20 m	Galvanized covering.
25 m	Galvanized wire grating on the underside of the belt for personal safety.
1 of	Revolution indicator installed at the tail drum.
1 of	Emergency stop. Stops the belt conveyor when the button is pushed or when the wire along the side of the belt conveyor is pulled.
1 of	Material sensor indicating if there is material on the belt conveyor.
20 m	Covering between top cover and side members. Ensures that the material does not fall off the belt.
1 of	Dust limiting transition to extruder hopper.
3 of	Supporting structure with a height of 3-5 m

PRICE POSITION 5.6: EUR 73,148

PRICE GROUP 5: EUR 429,174

GROUP 6: COMPRESSED AIR SYSTEM

6.1 1 of **Air compressor type LE 15-10 E 475**

Complete unit with piston compressor, tank, filter, reduction valve as well as electric control.

Technical data:

Tank size:	475 l.
Output at 100% load:	67 Nm ³ /hour, 1110 l/min.

Motor: 11 KW.

- 1 of **Cooling drier type FD 40**
Reduces the dew point of the compressed air to + 3°C and thereby improves the function of the aftercooler, which results in a further reduction of the water content in compressed air.
- 2 of **Air treatment unit**
Combined lubricating and water separator unit for installation in the compressed air installation.
- 1 of **Pressure switch**
Gives alarm when the pressure in the compressed air system is too low.
- 5 of **Safety valve**
Bleeds the compressed air system so that it becomes pressureless when an emergency stop is activated. This ensures that the individual components are without function. The safety valve is therefore a part of the safety system of the complete plant.

PRICE GROUP 6: EUR **13,409**

GROUP 7: CONTROL CABIN

- 7.1 1 of **Control cabin**
20 ft. office container with 100 mm insulation.

The cabin is delivered with the following:

1 off window with PVC shutters.
1 off door with lock.
Electrical installation with light fittings and power sockets.
1 off electric heater.
Colour: Blue RAL 5010.



- 1 of Air-condition unit installed in container.

PRICE GROUP 7: EUR **7,767**

GROUP 8: CONTROL SYSTEM FOR PROPORTIONING, MIXING AND TRANSPORTATION PLANT

8.1 1 of **SKAKOMAT 600 SQL process control computer**

SKAKOMAT 600 is a computer system for the concrete production with graphic user interface for process monitoring.



SKAKOMAT 600 is of a modular design and individually adjusted to each plant and the functions required in order to obtain the very best concrete production for the plant in question as far as capacity and quality is concerned. SKAKOMAT 600 includes a Microsoft SQL database system for registration of production data and generation of statistics and via interface it is possible to exchange data with other systems.

Windows 10 is used as control system. All data are stored locally and automatically protected by a password. SKAKOMAT 600 can meet all requirements related to mix designs and defined in the European Norm EN206-1 as well as national legal requirements.

The functions of the plant can be monitored on the screen and the various operation modes set. The operator will always have a full view of the operation of the plant. All manual functions are operated by means of keyboard and mouse.

Technical data for PC:

Industrial computer built into a pressure control cabinet including a dust filter

Processor:	Intel Core i5, min 2,5 GHz
Hard disk:	1 TB
RAM:	2 GB
Ports:	1 off RS 232 6 off USB
Network card:	1 off for network/ADSL 1 off for PLC I/O modules
Other equipment:	1 off 22" wide screen 1 off keyboard and mouse 1 off laser printer Integrated video display card
Norms:	Meet the EMC directive for industrial application EN 61000-6-2 EN 61000 –6-4 FCC class A

1 of **Router with VPN server**

Hotline support by means of internet access. Connects the SKAKOMAT with the SKAKO hotline service. Global IP address must be available at the installation place of the process control system.

- 1 of **UPS system for PC**
The system is supplied with integrated battery to maintain voltage supply to the PC during short voltage failure and ensure against damaging overvoltage. If the voltage failure lasts more than 5-10 min., a controlled shutdown of the PC will take place.
- 1 of **2-screen system**
1 off extra 22" wide screen to be placed next to the SKAKOMAT screen. The two screens function as one large screen and are operated by means of the same keyboard and mouse. The SKAKOMAT is displayed and operated from one screen and the plant graphics is shown and operated from the second screen.
- 1 of **Extra hard disk and USB key.**
Extra hard disk for replacement of the hard disk of the PC if it becomes defective. In connection with the visit by a service technician the hard disk of the PC is copied to the extra hard disk so that data are as actual as possible. USB key for entering of the latest backup files after breakdown of the hard disk as well as manual relocation of production data for filing on another PC.
- 1 of **System software for SKAKOMAT 600**
The below standard system software is used:
- Windows 10 control system
Microsoft MSDE SQL-database
I-FIX graphics software
Online support program
Anti-virus program (F-Secure)
The program protects against extraneous virus, spyware and hacking and is supplied with 1 year free online update.
Twincat OPC server
Twincat soft PLC
- 1 of **Software basic module for SKAKOMAT 600 SQL**
The basic module includes all calculation and operation software for 100 mix designs.

SKAKO Performance Manager:

The SKAKO Performance Manager program is a strong management tool for maximum plant utilization. The SKAKO Performance Manager program is an open system which means that data easily can be exported to other programs. SKAKO Performance Manager includes the two modules below and they help the production management to ensure that the plant can always produce with maximum capacity.

OEE (overall equipment efficiency) module:

The OEE module observes the efficiency of the plant operation regarding production time, speed and quality. The efficiency is presented as an OEE number which is calculated as follows: Availability x Performance x Quality

Maintenance module:

The module automatically collects data for the necessary maintenance work i.e. operation hours and other counting values and further the module offers the possibility of manually entering calendar based maintenance work.

Above functions offer new possibilities of optimum maintenance for the plant at the lowest possible price.

1 of **Software extension module 1 for SKAKOMAT 600**

The extension module includes the below functions:

SQL-model:

Grain size curves

Set of requirements for setup of EN 206-1

Extended register of material correction

Proportioning order register

Hot-water module

1 of **Software precast module for SKAKOMAT 600**

The precast module includes the below functions:

SQL-model:

Station register

Project register

1 of **Software for HYDROMIX water proportioning system**

The HYDROMIX system automatically measures the moisture of the concrete mix by means of electrodes placed in the mixer bottom for automatic water proportioning until the required moisture of the concrete mix has been reached. The measuring principle is based on microwaves and is primarily used for earth-moist concretes. Fine adjustments will be necessary when different parameters change like e.g. composition of the grain curve, absorbed moisture, mixing time, temperature, etc.

1 of **Software for WEBAPP**

WEBAPP enables access to the SKAKOMAT from an external network.

1 of **Software for XML-interface**

XML-interface enables sharing of data with other databases, such as those in ERP-software.

PRICE POSITION 8.1:

EUR

23,818

8.2 1 of **Contactor board**

Modular built board containing main switch, overcurrent and short circuit protection as well as contactors for motors, PLC modules, control relays, transformers, emergency stop and safety relays as well as terminal strips. All PLC input and output terminals are equipped with indication lamps to assist in connection with possible troubleshooting.

Technical data:

Board cabinet:	Rittal	
Standard main dimensions:	Height:	1905 mm
	Depth:	400 mm
	Length:	Depends on the equipment
Protection class:	IP 55	
Norm:	EN 60204-1	

The contactor board contains the following controls/components:

Protection against transients in the electrical supply network.

Weighing systems

- 2 of Connection module for weighing amplifiers.
- 8 of Weighing amplifier type Beckhoff
- 16 of Load cell class C3, PTB approved, 250/500/1,000 or 2,000 kg.
- 10 of Control of discharge valves on weigh hoppers.

Loading of aggregates

- 1 of Basic module for aggregate loading system.
- 1 of **Operation box for aggregate loading system to be placed at the dump hopper**
The box is in protection class IP 55 and contains push buttons as well as indication lamps for remote control.
- 1 of Control of vibratory feeder type FCU.
- 1 of Control of silo vibrator.
- 1 of Control of tipping door on receiving silo.
- 2 of Control of 30° inclined belt conveyor.
- 1 of Control of double deck sand screen
- 1 of Control of turnable distribution belt conveyor.
- 1 of Control of safety door on silo top.

Belt conveyors

- 3 of Control of belt conveyor, max. 15 kW.
- 5 of Control of revolution indicator on belt conveyor.
- 2 of Control of sensor.

Aggregate proportioning

- 1 of Basic module for the control of vibratory feeder type FCE.
Incl. control of 1 vibratory feeder.
- 7 of Control of vibratory feeder type FCE.
- 2 of Control of vibrator on weigh hopper.

Powder proportioning

- 3 of Control of powder screw conveyor, 1 speed, max. 18.5 kW.
- 3 of Control of block gate on powder screw conveyor.
- 3 of Control of airing system on powder silo.
- 3 of Control of powder silo filter cleaned by means of compressed air.

Water proportioning

- 2 of Connecting module for flowmeter.
- 1 of Connecting modules for moisture probes.
- 2 of Connection of moisture probe.
- 6 of Control of water valve.

Admix proportioning

- 2 of Control of admix pump.

Flowmeter for wash water

- 2 of For registration of the quantity of wash water in the weigh hopper.

Technical data:

Measuring principle:	Measuring disc
Pipe diameter:	3/4"
Accuracy:	1.5 %
Maximum flow:	1 l/sec.
Material:	Synthetic material

- 2 of Connecting module for flowmeter.
- 8 of Control of valve on admix weigh hopper.

Proportioning of colour

- 2 of **Interface to Wurschum colour system**
Incl. voltage supply to control box on the proportioning plant.

8 of Weighing amplifier type Beckhoff

2 of Control of filter on mixer.

8 of Control of valve of colour system.

Mixers

1 of Control of mixer type AM 750 with 2 gates.

1 of Control of mixer type AM 2250 with 2 gates.

1 of **Service box for 2 mixers**

Operation box of protection class IP 55 to be used in connection with cleaning including pushbuttons for start/stop/discharge mixer, water proportioning into mixer as well as emergency stop.

2 of Control of gate on concrete intermediate hopper.

Compressed-air system

1 of Control of aftercooler on compressor.

1 of Control of pressostat.

5 of Control of safety air escape valve.

PRICE POSITION 8.2:

EUR

130,633

8.3 8 of **Level sensor type FTI 56 for max. measuring in aggregate silos**
Signal is transferred to main control system when the preset level has been reached. The system consists of a wire probe with an electronic part for installation in silo. Measuring principle: Capacitive.

8 of Control of level indicator.

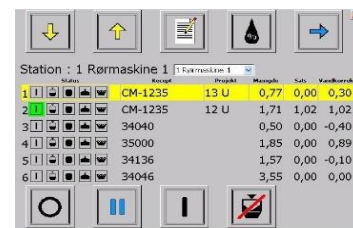
PRICE POSITION 8.3:

EUR

8,368

8.4 2 of **SKAKOLINK order terminal – order boxes for factory**

Terminal of protection class IP 55 for ordering of concrete at the production place includes microcomputer with touch display with the following main functions:
Concrete ordering/reset with 6 registers.
Selection of mix design.
Selection of quantity.
Water correction.
Alarm reset.
5 x function keys for optional functions.



Display of plant status.

2 of Connection of SKAKOLINK order terminal.

PRICE POSITION 8.4: EUR 3,497

PRICE GROUP 8: EUR **166,316**

GROUP 9: PROJECT HANDLING AND DOCUMENTATION

9.1

Project handling

Main dates (as per email 19/08/22):

Signed order confirmation:	Week: 39/2022
Received prepayment:	Week: 40/2022
Completion of technical clarification, design and production of equipment:	Week: 25/2023 (4 weeks before UK plant)
Delivery to site:	Week: 26/2023
Production of first concrete:	Week: 50/2023
Handing over of the delivery:	Week: 52/2023

The stated delivery times are subject to the goods being unsold. The above times of delivery are conditioned by the order confirmation being received duly signed and the agreed terms of payment as mentioned above being observed. After entering into the contract SKAKO selects a project manager, who will be your future contact person throughout the project. The project manager will attend to the execution and coordination of the project in cooperation with you. All commercial and technical questions in connection with the project must be directed to the project manager. Project related documents will be supplied currently, as e.g. freight documents, installation instructions, start-up check list, method statements I/O check list, capacity test, as well as handover letter. Project variations will be handled according to the SKAKO A/S standard modification form.

Documentation

Content:

User manual:	English
User manual SKAKOMAT 600:	English
SKAKOMAT user interface:	English

Service manual and all other documentation will be supplied in English. All documentation will be supplied electronically. Printed version can be supplied at an additional price. Static calculations of steel constructions can be supplied at an additional price.

9.2

BUDGET COSTINGS FOR EQUIPMENT DELIVERY AT TODAY'S PRICES NB – FREIGHT COSTS WILL BE RE-EVALUATED AT TIME OF ORDER

Delivery and insurance DAP Incoterms 2010

The equipment is supplied carriage-paid including insurance to xxxxxxxx excluding unloading. The Purchaser is obliged to keep the consignment fully

insured from delivery until transition of ownership. Until transition of ownership to the Purchaser, the Supplier is entitled to the insurance sum in case of loss or damage of the consignment.

PRICE POSITION 9.2: EUR 60,278

9.3

**BUDGET COSTING FOR INSTALLATION ASSUMING TURN-KEY
EXCLUDING CRANAGE; PERSONEL LIFTS AND/OR SCAFFOLDING ETC:**

Installation and commissioning

Complete installation and commissioning includes the following performances.

Mechanical installation

The price includes necessary travel costs (incl. travel time), accommodation, allowances and local transport. The price includes hire of welding equipment, automatic bolt tighteners and additional hand tools.

***CUSTOMER TO SUPPLY MECHANICAL MANPOWER.**

SKAKO TO PROVIDE SUPERVISORS

6 MECHANICAL FITTERS FOR 8 WEEKS

Complete electrical installation

The electrical installation includes all cables, junction boxes, safety switches, routings, etc. necessary for a complete installation from the contactor board to the supplied/agreed equipment, as well as personnel to perform the electrical installation. Cable ladders are used as main cable routings. Small cable routings will, depending on the circumstances and requirement, be made in a cable tray or a steel or plastic pipe. The cable routings are covered with a lid or the like where it is clearly necessary in order to protect the cables against damage.

The cables are protected against mechanical overload when the routings are performed on platforms or other access roads. Supports and similar fittings are fastened to the building or plant parts by anchoring, welding or by means of HILTI bolts. Cables are fastened to the routing by means of strips; cables are laid in bundles and with a separator between the circuits according to the valid norms.

Junction boxes and isolator switches are fastened on the side of the cable routing on installation plates. In connection with short distances the lead-in-wires to motors and other components are laid directly from the contact box/isolator switch to the component. In connection with longer distances the lead-in-wires are laid in pipes or fastened to the plant parts by means of strips.

Isolator switches and operation boxes, necessary for the daily operation of the plant, will be installed on parts of the plant or the building at a suitable height and distance from the associated components. It is assumed that the Purchaser lays the pipes according to the specifications stated on the foundation drawing. The pipes must be laid before the electrical installation can be started.

The electrical installation does not comprise the main supply cables to the contactor boards nor to a control cabin, if any, nor the installation of these items. The Purchaser must bear the expenses in connection with these installations. The main supply cables must be dimensioned to convey the power stated by SKAKO. In the quotation it is assumed that the contactor board is placed max. 20 m from the mixer platform.

***CUSTOMER TO SUPPLY ELECTRICAL MANPOWER.
SKAKO TO PROVIDE SUPERVISOR AND 1 ELECTRICIAN
*4 ELECTRICIANS FOR 4 WEEKS***

Complete compressed-air installation

The compressed-air installation includes all pipes, fittings, hoses and supports necessary for a complete installation from the supply terminal, as well as personnel to perform the installation. All pipes will be laid in the most suitable duct considering function and other installations. Pipe supports are fastened either with bolts or by welding.

It is the responsibility of the Purchaser to perform the connection from the supply terminal to e.g. the dump hopper or silo battery, which can be done as underground PEL pipes. The Purchaser bears the expenses for this work. These pipes must be laid before the compressed-air installation can be started.

It is the responsibility of the Purchaser to install the supply terminal in the building according to the instructions given by SKAKO A/S. The supply terminal must be ended by a main stop valve which opens the possibility of connecting a Whitworth pipe thread. The supply terminal must be equipped to supply quantity and pressure according to the information given by SKAKO A/S.

Complete water installation

The water installation includes all pipes, fittings, hoses and supports necessary for a complete installation from the supply terminal, as well as personnel to perform the installation. All pipes will be laid in the most suitable duct considering function and other installations. Pipe supports are fastened either with bolts or by welding. It is the responsibility of the Purchaser to perform the connection from the supply terminal to e.g. the dump hopper or silo battery, which can be done as underground PEL pipes. The Purchaser bears the expenses for this work. These pipes must be laid before the water installation can be started.

It is the responsibility of the Purchaser to install the supply terminal in the building according to the instructions given by SKAKO A/S. The supply terminal must be ended by a main stop valve which opens the possibility of connecting a Whitworth pipe thread or flange according to DIN norm 2566/2633. The supply terminal must be equipped to supply quantity and pressure according to the information given by SKAKO A/S. The quotation does not include possible insulation and heating of pipes.

Test and commissioning

Test of the cable connections to the contactor board, calibration, adjustment and commissioning. Excl. training of operating personnel. The price includes necessary travel costs, accommodation, allowances and local transport. In order

to commission and adjust the plant optimally a minimum production of about 50 % of the plant capacity for minimum 5 days is required.

Hire of crane, lift and scaffolding (*indicative price included as an option*)

The price does not include hire of crane, lift, scaffolding etc. as we are convinced the client can rent this equipment at a much more competitive price. Our estimations of the number of cranes, lifts and scaffoldings as well as the period of hire will be informed during the preparations of the installation, based on our best experiences of this type of plants/equipment installation under normal conditions. Should problems, with cranes or lifts etc., not caused by SKAKO and for reasons not known during the preparation of the installation, complicate or obstruct the performance of the job, SKAKO reserves the right to reinvoice the additional costs arising due to the changed conditions.

PRICE POSITION 9.3: EUR 407,746

9.4

Payment terms

30 % by receipt of order and bank guarantee
 40 % at delivery of the majority of the delivery or when goods are ready for dispatch if the agreed time of delivery is postponed by Purchaser.
 10% at completion of mechanical installation
 10 % at completion of electrical and pipework installation
 10 % at completion of performance test with submission of bank guarantee.

Delivery terms

The enclosed sales and delivery terms for plants and installation of plants from SKAKO as well as ORGALIME SI 14 apply for this delivery. Any options are quoted ex works and without installation unless otherwise specified.

Validity

The quotation is valid 2 weeks from the date of quotation.

PRICE GROUP 9: EUR **468,024**

TOTAL PRICE: EUR **3,058,382**

- **SPECIAL DISCOUNT FOR ORDERING BOTH PLANTS** EUR **217,574**

FINAL TOTAL PRICE EUR **2,840,808**

OPTIONAL EQUIPMENT**GROUP 10: INDICATIVE CRANAGE COSTS (AUG 2022 PRICES)**

10.1

Hire of crane, lift and scaffolding

The price includes hire according to the below estimated conditions:

Activity	Equipment	Duration
High silo	2 of HIAB's	2 weeks
	1 of 60t crane	2 days
BIG lift	1 of 500t crane	1 day
Cement silos	1 of 100t crane	3 days
	1 of HIAB	1 week
Belt conveyors	1 of HIAB	2 weeks
	1 of 100t crane	2 days
Telehandler (Manitou)	1 of Telehandler 5t	7 weeks
MEWP	2 of boom lift 16 m	5 weeks
	1 of boom lift 40 m	1 week

Our estimations of the number of cranes, lifts and scaffoldings as well as the period of hire are based on our best experiences as regards installation of this type of plants/equipment under normal conditions.

Should problems with access for cranes due to new-built constructions or the like arise, not known during the preparation of the quotation, complicating the performance of the job, SKAKO Concrete A/S reserves the right to reinvoice the additional costs arising due to the changed conditions.

PRICE GROUP 10:**EUR****115,920****GROUP 11: RECIRCULATION SYSTEM**

11.1 1 of

Inclined belt conveyor type SB 650 - circulation of moist sand to the top of the aggregate silo

The belt conveyor is equipped with a drive station with 2 off gear motors. The driving drum is equipped with friction lining of rubber, and the belt conveyor is so constructed permitting a large span and equipped with a troughed belt conveyor as well as a rubber transition to the subsequent belt conveyor. The drive station is equipped with a belt scraper which removes approx. 95% of the material residue on the belt conveyor.

Technical data:

Incline:	10°
Belt length:	31 m
Belt width:	650 mm
Belt speed:	1.5 m/sec.
Capacity:	59 kg/sec. at a material density of 1.5
Drive motor:	2 x 5,5 kW

Coating: Galvanized

In addition the belt conveyor is equipped with:

- 2 of Rubber-clad charging funnel.
- 27 m Galvanized covering.
- 6 of Galvanized wire grating on the underside of the belt for personal safety.
- 1 of Revolution indicator installed at the tail drum.
- 1 of Emergency stop. Stops the belt conveyor when the button is pushed or when the wire along the side of the belt conveyor is pulled.
- 1 of Supporting structure at tail drum.
- 1 of Supporting structure with a height of up to 3 m.
- 1 of Supporting structure with a height of 9-12 m.
- 1 of Wash system for waste material tray. Wash pipe and water valve for cleaning of the waste material tray.
- 4 m Galvanized waste material tray.
- 1 of Funnel and downpipe for collection of drainage water from the bins via the aggregate weigh hoppers bypass.
- Galvanized service gangway with railing at belt conveyor drive unit.
- 4 m Galvanized ladder.

PRICE GROUP 11: EUR 88,663

GROUP 12: 8 AGGREGATE STORAGE COMPARTMENTS (TOTAL)

- 12.1 2 of Additional dividing wall sections to allow 8 aggregate storage compartments rather than 6.

PRICE GROUP 12: EUR 41,728

Vortex Hydra srl

Via Argine Volano, 355
44034 Fossalta di Copparo (FE) / Italia
Telefono +39 0532.879411
Telefax +39 0532.866766
Email: vh.sales@vortexhydra.com
Web page: www.vortexhydra.com
Issued by: MG
Reviewed by: MG

WIENERBERGER AG

Wienerbergstrasse 11
A-1100 Wien (Austria)
To the kind attention of:
Mr. Thomas Mandl

Fossalta di Copparo FE, Tuesday 25 October 2022

PROPOSAL N. 235 /19 rev. N

"VORTEX MATRIX 140"



MAIN TECHNICAL DATA (indicative for standard configuration)

MAXIMUM VELOCITY	Up to 140 tiles per minute
PRODUCTION OUTPUT	Multiple curing chambers of 6.300 tiles/each for interlocking tiles. Any arrangement being multiple of 6.300 is possible; in particular we've given the initial configuration for 17 chambers (housing 107.100 pallets). Different profiles can be handled as multiple of 6.300.
RACKS CIRCULATION	The racks circulation is based on a <u>First In - First Out</u> logic: a rack with fresh tiles enters a pre-heating chamber installed on the indexing conveyor after the wet racker (pre-heating time is approx. 40 mins) and then is entering a big curing room with multiple lanes where racks go from one side and exits at the other end of each lane when the curing cycle has been completed. The desired curing condition can be easily achieved by using heat exchangers and humidity probes controlled by a dedicated PLC.
MINIMUM BUILDING SIZE	As per Lay – Out Annexed dwg. N. 21063 rev.7
INSTALLED POWER	~ 500 kW(Mixer & BATCHING excluded)

VORTEX HYDRA GROUP:



- 55 years of evolution and experience generated solutions for developing products, machines, plants
- Vortex Hydra Company size and turnover is approx. 2 times bigger than its closest competitor
- The Largest customer basis in this field with 500 clients in 5 continents and 80 countries (see in green on the map)
- The Largest Company in this concrete roof tile equipment field served by 6 technical assistance centres (Italy, UK, China, Malaysia, Australia, Brazil)
- The widest range of machines and automations (over 100 with several combinations) , plants (over 20 with several combinations), final products (over 100 models)
- Supported by ISO 9001 and ISO 14001 certification
- Mission is generating ideas to develop the market together with our old and new Customers, strongly believing that innovation is key to success. Innovation is stimulated by the needs, visions and dreams of our customers with more than 20 patents including technology for fibers

1. DESCRIPTION of OPERATIONS

Batching and Mixing sytem (excluded from this quotation except for part of mix feeding systems):

The fresh concrete for the tile line and for the accessories line is prepared by an automatic batching and mixing plant. A primary hopper receives the sand discharged by a front loader moving sands from storage area. The sand is delivered by a belt conveyor to a piano wire screen system and then, with another belt conveyor, to a shuttle conveyor to distribute up to #4 types of sand inside four sand storage bins.

This will be sized according to Customer's requirements (in this proposal approx 50 tons each bin – 200 tons total).

Each sand is discharged from the 4 storage bins (each one equipped with moisture control for sand quantity compensation) onto a wagon installed on rails and where the material is weighed by means of #3 load cells. The wagon will discharge alternatively on the skip of the two mixers.

Cement, stored in silos, it is fed by a screw conveyors system into a cement weighing unit installed on the mixers (silos and screw conveyor are not included in the list of supply)

Water and coloured mix are supplied into the mixer by an automatic dosing system.

Manufacturing line:

The tiles are formed by extrusion-pressure process of concrete on die-cast aluminum pallets.

The quoted E4/S automatic roof tile extruder has an operational speed of 140 tiles/min, continuous action and it is equipped with Vortex Hydra **state-of-the-art double knife flying cutter electronically driven** capable to precisely cut & trim every tile profile. Furthermore, the extruder and cutting system are synchronized such that the cutting position is automatically adjusted according to the pushing position to prevent from cutting not being precise when the aluminium pallets are dirty or the pushing chain is stretched due to wearing.

The continuous pushing action is performed by pawls matching with the underneath side of the pallets. Pawls are installed on trolleys fixed onto two double chains life-greased before installation. Their life is approx. 10 to 12 million tiles production, depending on the maintenance and pushing stress. As stretching is minimum, the cutting precision is enhanced.

The driving system is powered by an electric self-braking motor controlled by inverters on roller and on pushing mechanism, so that it is possible to tune the acceleration/deceleration ramps and the operational speed at any chosen value.

Tungsten carbide faces internal walls of the extrusion box and pallets tracks on the corresponding bench section.

Provided that suitable moulds are available, the change-over to a second profile production can be made in less than 10 minutes by replacing the extrusion head and the bench section attached to it with another extrusion head equipped for the new profile and previously set off line.

Heavy duty service conveyors are used for tiles and pallets transport line. The frame is formed by two steel plates bolted together by means of suitable spacers. These plates act also as lateral guides for pallets and tiles. All electrical and air wiring as well as junction-boxes are on board. All conveyors motors are driven by self-braking motors controlled by inverters.

Besides that, large adjustment possibilities of every single part are foreseen.

E4/S Extruder machine



After the extruder, wet tiles are conveyed to the racker/deracker, loaded into steel racks and stored into the MATRIX system.

The peculiar MATRIX curing system with automatic circulation of racks is designed to guarantee:

- Maximum production flexibility (several different tile profiles and colours);
- Perfect control of curing conditions;
- Ease of profile change;
- Smooth handling of products for any velocity up to 140 tiles per minute;

The front-rear loaders and rack's dimensions have been studied to allow maximum flexibility when managing different profiles and to minimize shocks undergone by the wet products during automatic handling, keeping into consideration racks speed during their transfer in the whole curing system.

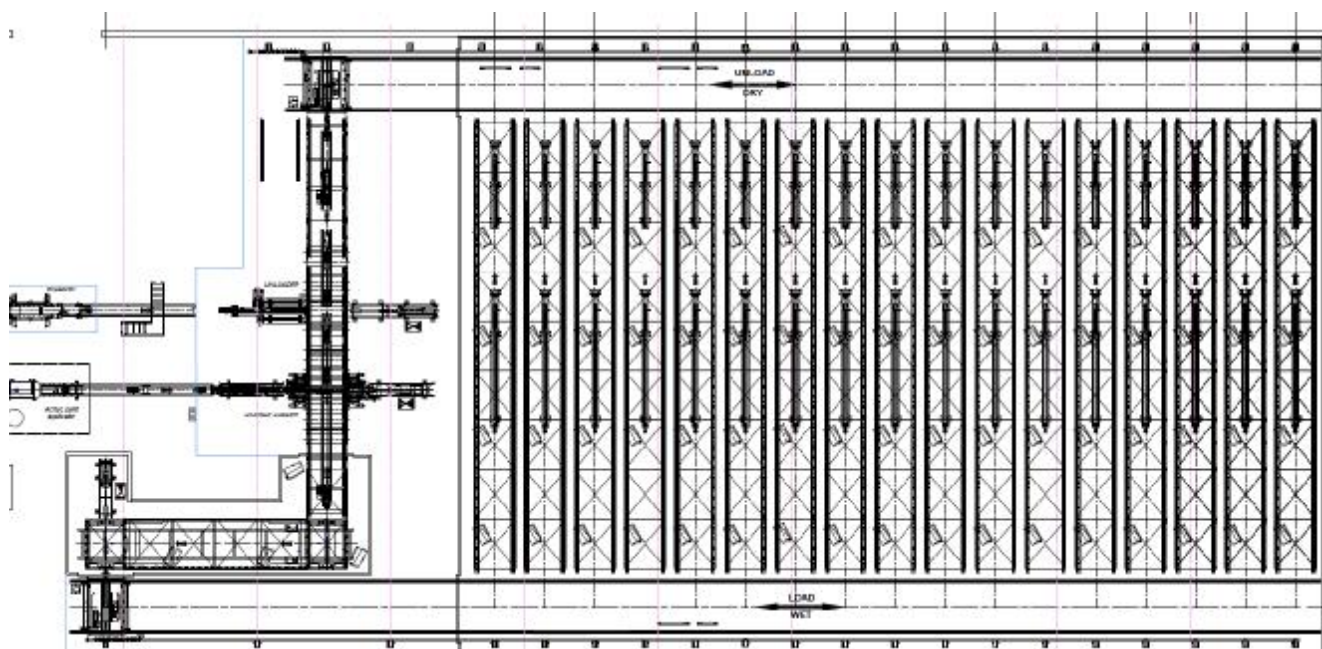
The MATRIX system consists of pre-heated chamber having a capacity of 7 racks + a single curing chamber with 17 lanes for a total curing capacity of 101.700 tiles. Any arrangement being multiple of 6.300 tiles is then possible to increase the curing capacity.

In order to fit the system into an existing building or to meet different requirements, the quantity of racks in each chamber can be changed. The capacity can be easily expanded in the future by adding new tunnels.

The steel racks coming from the curing tunnels are moved along the cross rack-conveyor and pass through the racker-deracker, where the dry tiles are unloaded and fresh tiles are loaded.

When on the cross-rack conveyor, the racks are moved step by step by 4 different indexing systems:

The result of this is maximum flexibility between the wet and the dry line to absorb possible stops of the wet line keeping running with the dry line and vice versa.



Racks Indexing System

Thanks to this feature, during changes of profile, it's not necessary to add or take out moulds from/to the line by hand. Furthermore, if a quantity of moulds is taken out from the circuit during the production shift, because of rejects or for other reasons the system will self balance.

Once the pre-heated rack full of wet tiles is moved on board of the "wet-side" trolley that will then place the racks in front of the selected lane of the large curing chamber.

After the curing process, at the opposite side of each lane, the extraction device takes out of the lane, one at a time, the last 7 racks of dry tiles and pushes them over the “dry-side” transfer trolley, that brings them back to the racking-deracking area, closing in this way the production cycle. In this way the circulation of racks is based on a First In - First Out logic.

Racking/Deracking:

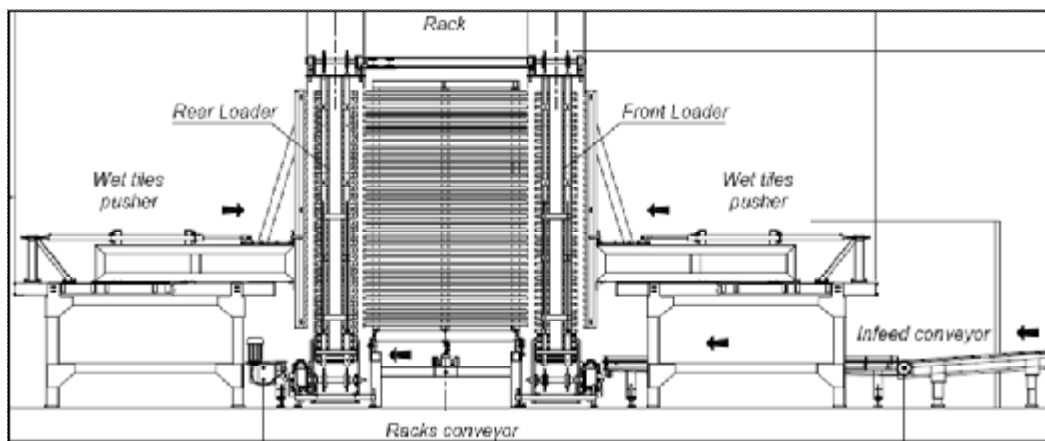
The racking system foresees two rackers, one in front and the other at the rear of the rack which has to be filled with fresh tiles. The fresh tiles are firstly elevated by the front elevator; once this is full, fresh tiles proceed underneath the rack towards the rear elevator while the front hydraulic pusher has time to gently push, without any damage, a vertical row of 35 fresh tiles into the rack.

The elevators include an axe control to get maximum precision in elevating tiles, while are activated by servomotors to optimize acceleration and deceleration ramps.

The two pushers are activated by inverters; this reflecting in very smooth operations, while the accurate design of the pushing bar also prevents from damaging the edges.

Dry tiles are moved by means of a pushing bar from the rack into the descender that, performing accurate downwards indexed steps, discharges at every step a 4 tiles row on the outgoing conveyor. This conveyor is hinged at one end and pneumatically suspended, moving automatically downwards in case of jam.

Maintenance operations of racker/deracker are easy thanks to their easy accessibility.



Curing:

The curing system, including temperature and humidity controls, can achieve a curing cycle of approx. 7 hours. The pre-heated tunnel is equipped with #4 heat exchangers while the large single tunnel is equipped with 4 heat

exchangers with fans per each single lane to perform a vertical circulation of hot air and reduce at minimum the difference of temperature among lower and upper tiles.

Racks dimensions have been studied to allow maximum flexibility when managing different profiles, keeping into consideration racks speed during their transfer in the whole curing system.

Fluting of rack guides facilitate moulds passage.

When unloaded from the racks, the cured tiles (still on pallets) pass through the depalleter, which separates them. Aluminum pallets are returned to the tile machine through an oiler, where releasing oil (approx. 4 gr./tiles) is sprayed on their upper surface, to prevent concrete to stick on aluminum and help depalleting operation after curing.

Packaging:

The proposed system performs the drying of the acrylic paint (up to two layers) sprayed on the dry tiles before stacking and banding them in large packs.

The **system concept** consists in loading the tiles into a single small circular rack that moves step-by-step, in a continuous cycle, to assure the **same drying time** for all loaded tiles.

At the exit of the drying rotary, the tiles are sent to the small packets forming system made of #5 spider-robots capable to handle each single tile ensuring the max possible flexibility in terms of packets formation.

Once packets are formed they are conveyed through the strapping lines where packets are vertically strapped and then doubled, ready to be collected by #2 robots that will form the large pack on an inclined saddle installed on a rotating carousel (#2 rotating carousels are supplied).

The carousel is equipped with two strapping machines to perform the horizontal strapping of the large packs.

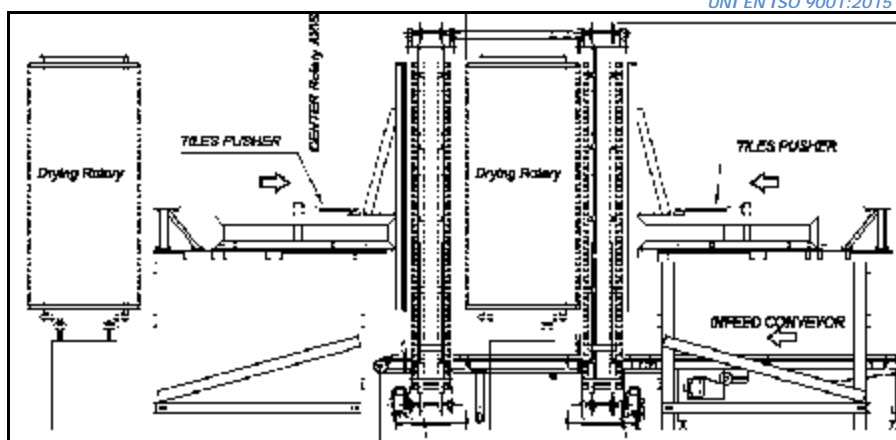
Once the large pack is strapped, a palletizing robot will collect the pack and place it onto the wooden pallets. Finally stretch-hooded cubes of 6 horizontally strapped packs of tiles will be ready to be collected by the fork lift bring tiles to the yard.

Advantages of DRYING ROTARY-rack over traditional packers are:

- Optimal curing of paint;
- No energy required to dry the paint;
- Scratching / scuffing of tile's surface is virtually eliminated;
- Pack presentation is excellent;
- Less machines reflecting in a better efficiency;

Drying of tiles and large packs forming unit

In the proposed standard configuration, the Drying Rotary packaging system is equipped with 2 loaders of tiles (front and rear) into the Drying Rotary rack, that has a net capacity of 3.680 tiles (26 min. drying time at 140 t.p.m).



Front Rear Loader at 140 t.p.m

The loading system consists of two elevators, one in front and the other at the rear of the rack's bay which has to be loaded with tiles. The tiles are firstly elevated by the front elevator; once this is full, tiles proceed underneath the rack towards the rear elevator while the front hydraulic pusher has time to gently push, without any damage, a vertical row of 32-40 painted tiles into the bay.

The elevators include an axe control to get maximum precision in elevating tiles, and are activated by servomotors to optimise acceleration and deceleration ramps.

The two pushers are activated by inverters; this reflecting in very smooth operations, while the accurate design of the pushing bar also prevents from damaging the edges.

Finishing:

Other than in the mass, tiles will be coated with:

- Acrylic paint can be sprayed on wet and/or cured tiles (as per layout) before packaging.

Trims:

The whole set of accessories needed to integrate the production of the field concrete roof tiles are manufactured by a production line running at 20 t.p.m for Ridges, Half Tiles and Vent Cups and 10 t.p.m for Cloak verges with three different extruders installed on a sliding sled for fast profile changeover. After extrusion on the aluminum pallets, the wet accessories are automatically loaded in racks that are stored into a dedicated automatic Matrix chambers system similar to the one used for the main line. After curing ridges are automatically are acrylic painted on the dry side (one acrylic paint application will be made on the wet tiles) and, after paint drying system, all the accessories are strapped in small bundles and finally palletized to be moved to the stock yard.

2. LIST OF SUPPLIES WITH PRICES:

2.1 MIX FEEDING SYSTEM

Item Description

A140.2 ACCESSORIES FOR TILES MIX FEEDING SYSTEM

- **#1 Pivot reversible conveyor** (~ 2.5 mts long) to feed mix from the rear (accomplishing best material flow) and to allow profiles change over.
- **Overband Magnet (Bunting 10 PCB 5 TRI-POLAR model)** with pertinent controls with ladders access system to access also the Metal detector position
- **Metal Detector** Mesutronic METRON 05D with pertinent controls

Item	Description	Q.ty	Price (€)
A140.2	ACCESSORIES FOR TILES MIX FEEDING SYSTEM	1	32.750
	TOTAL EX-WORKS (€Euro)		32.750

2.2 MANUFACTURING LINE & PALLETS

Item Description

B140 MANUFACTURING EQUIPMENT OF ROOF TILES WITH FAST EXTRUSION HEAD CHANGE AND NEW ELECTRONICALLY DRIVEN CUTTING UNIT

- **# 1 automatic extruder E4S:** steel bench with bottom and side guides assembled over two lateral walls, continuous chain drive of pallets, motors with gear-boxes for pushing chain & extrusion head,
- **New Electronically servo driven flying cutting system**
 - Cutting cam with slave encoder
 - Connecting rod with intermediate air cylinder with pre-set pressure which can retract in presence of an obstacle
 - Hinged support of the cutting blade, provided with a safety sensor
 - Servo drive performing the synchronization of every single tile with the knife
 - Servo – driven – cam with master encoder.
 - Tray for cleaning water overspray collection



A stationary frame installed on a side of the extruder is carrying a new concept cutting system with one single blade operated by a cam and a servo motor. This allows fast, accurate and silent cutting. The blade has a rapid connection system with the frame for fast knife change-over.

- Lubricating system of the pallets tracks;
- **# 1 FAST CHANGE extrusion head for any standard Vortex Hydra profile** complete with:
 - Heavy duty frame with removable anti-wearing walls lined Tungsten Carbide insert;
 - Transmission mechanism with chain transmission and tensioning system, stirrer;
 - Shaping tools: roller, small roller, lateral discs, big slipper, small slipper; Roller and small roller are adjustable in height for fast set up and extended rollers life time
 - Knife for the profile in tempered steel;
 - Service trolley for the extrusion box;
- **Instrument for extruder setting-up**

Changeover time is made in maximum 10 minutes time.

The procedure to change the extrusion head will be as follows:

1. Select "profile change" from the touch screen. This will free the extrusion box from the rest of the extruder by disconnecting the holding box screw
2. Disconnect the chain from the extrusion head sprocket
3. The extrusion head & bench are released and lifted off by means of two pneumatic cylinders
4. The extrusion box now is free to be moved out to a dedicated transport trolley
5. Same procedure but reversed will be used to install the new extrusion box



- Ø The extremely fast and accurate movements of the cutting knife are performed thanks to a high precision mechanism, made of light and resistant aluminium alloy.
- Ø The arms of the driving system are hinged with pin-bearing system, life lubricated and protected from dust, water, concrete, etc. in order to avoid any form of adjustment or maintenance (except cleaning)
- Ø The "mass" of the moving parts has been reduced to a few Kg in order to eliminate vibrations, noise and guarantee trouble-free long life

Item	Description
------	-------------

B140.1 ADDITIONAL FAST CHANGE EXTRUSION HEAD for any standard VH profile complete with:

- Heavy duty frame with removable anti-wearing walls lined Tungsten Carbide insert;
- Transmission mechanism with chain transmission and tensioning system, stirrer;
- Shaping tools: roller, small roller, lateral discs, big slipper, small slipper; Roller and small roller are adjustable in height for fast set up and extended rollers life time
- Knife for the profile in tempered steel;
- Service trolley for the extrusion box;
- **Instrument for extruder setting-up**

B140.1b BENCH SECTION FOR ADDITIONAL EXTRUSION HEAD suitable for set up of the extrusion head out of the line and faster profile change:
1 removable bench section complete of all Tungsten Carbide tracks

C140 TRANSPORT LINE OF TILES AND MOULDS

- **Conveying line for wet tiles, dry tiles and pallets**
Total length ca. 85 m, with exclusion of the conveyors forming part of individual machines. All conveyors are: with polycord rope 20 mm diam.; continuous guides for the rope; drive with variable speed system and heavy-duty design. Transport line includes the following accessories:
 - Scraping system of aluminium pallets after the extruder
 - Aluminium pallets correct flow & positioning sensor
 - Brush roller to clean the aluminium pallets
 - Low pressure air blower to remove the debris from fresh tiles and before dry side acrylic application

C140.1 FLOW INVERTER

- **Flow Inverter** to return pallets to the extruder;

C140.2 AUTOMATIC DEPALLETER

- **Automatic Depalleter** with idle pre-depalleting system and motorized depalleting discs;



C140.3 AUTOMATIC BRUSH OILER for high speed plants

- **Automatic Oiler** with brush driven by motor;
- Inverter to control the speed of the brush shaft to determinate the quantity of oil sprayed;
- pump and recovery circuit;
- portion of controls of above

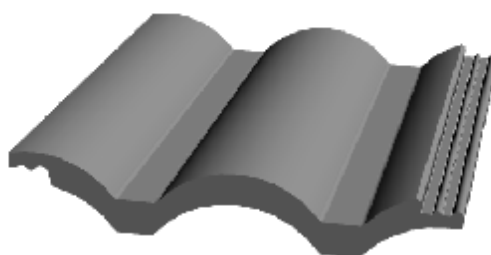
Note: allows the user to save big quantity of oil as the unit can reliably apply smaller quantities then other types of applicators (**up to 50% of saving**)

Item	Description
------	-------------

G10 ALUMINIUM PALLETS – ROUND COPPO profile

Vortex ROUND COPPO profile

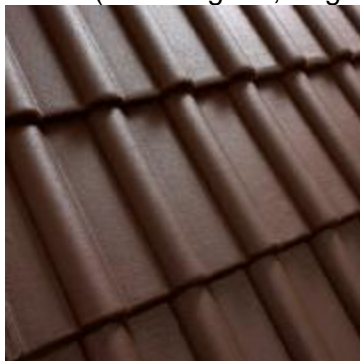
Pallets are pressure die-cast in AISi11Cu2 alloy (EURONORM EN AC 46100), machined on 4 sides and flattened (Net Weight 3,5 Kg/each)



G1 ALUMINIUM PALLETS – DOUBLE ROMAN profile

Vortex DOUBLE ROMAN profile

Pallets are pressure die-cast in AISi11Cu2 alloy (EURONORM EN AC 46100), machined on 4 sides and flattened (Net Weight 2,7 Kg/each)



G3 ALUMINIUM PALLETS – FLAT THIN LEADING EDGE (BIBER) profile

Vortex TLE / BIBER profile

Pallets are pressure die-cast in AISi11Cu2 alloy (EURONORM EN AC 46100), machined on 4 sides and flattened (Net Weight 3,4 Kg/each)



CL CUSTOMER LOGO ON ALUMINIUM PALLETS FOR ROOF TILES


Logo on one side of pallet only.

Item	Description
J1	<p>ACRYLIC PAINT APPLICATOR FOR WATER BASED PAINT <u>on Wet and Dry Tiles</u></p> <ul style="list-style-type: none"> • #3 Frame and conveyor with drive; • #3 Sealed booth; • #6 adjustable spraying nozzles; • #4 support frames for 1.000 lts IBC's • #4 Visco Jet stirrers for IBC's wired to isolators/starters • #3 Acrylic pump c/w filtration system • #4 SMAC mixing and filtration units, wired to panel • #3 Overspray filter recovery units • #1 Control panel
L140.2	<p>CONTROLS FOR MANUFACTURING LINE</p> <ul style="list-style-type: none"> • # 1 distribution electric board (power section) and control panel with SIEMENS PLC, including # 2 inverters to adjust acceleration ramp and speed of the propulsion mechanism drive and roller; • # 1 Local command desk (Touch Screen) • SINEMA Remote Connect for teleservice and remote maintenance
Z2	<p>CODE PRINTER - ZANASI SYSTEM to print date or codes on the tiles</p> <ul style="list-style-type: none"> - Accessories to installation on the main line - Installation and training course - User manual



Item	Description	Q.ty	Price (€)
B140	MANUFACTURING EQUIPMENT OF ROOF TILES	1	162.200
B140.1	ADDITIONAL FAST CHANGE EXTRUSION HEAD	2	47.600
B140.1b	BENCH SECTION	2	15.340
C140	TRANSPORT LINE OF TILES AND MOULD (approx 85 mts)	1	116.500
C140.1	FLOW INVERTER	1	12.100
C140.2	AUTOMATIC DEPALLETER	1	26.500
C140.3	AUTOMATIC OILER	1	21.900
J1.140	ACRYLIC PAINT APPLICATOR including PREPARATION SYSTEM	1	150.300
L140.2	CONTROLS FOR MANUFACTURING LINE	1	89.300
Z2	CODE PRINTER - ZANASI SYSTEM	1	13.700
	TOTAL EX-WORKS MACHINERIES (€Euro)		655.440
G10	ALUMINIUM PALLETS – ROUND COPPO profile	50.400	1.199.520
G1	ALUMINIUM PALLETS – DOUBLE ROMAN profile	31.500	610.730
G3	ALUMINIUM PALLETS – FLAT THIN LEADING EDGE profile	25.200	645.120
CL	CUSTOMER LOGO IN PALLETS	3	8.250
	TOTAL EX-WORKS MACHINERIES & ALU PALLETS (€Euro)		3.119.060

Special features and Advantages versus other suppliers:

- Ø Easy operation for extruder set up and profile change (less than 10 minutes time)
- Ø Special design of propulsion mechanism to reduce maintenance cost of -40% vs competitor
- Ø Special design of oiling system with brush with -40% of oil saving vs competitor 
- Ø Micro-lubrication of the pallets track to guarantee their long-life
- Ø Each extrusion box is supplied with independent bench section for off-line adjustment
- Ø Silent & precise state-of-the-art cutting system
- Ø Cue sensors, inverter on all conveyors, to get consistent flow and higher plant efficiency

2.3 MATRIX CURING SYSTEM

Item	Description
------	-------------

D120.2w AUTOMATIC RACKER-DERACKER,:

- Racker of wet tiles with 2 rackers (front & rear), including:
 - Infeed conveyor with variable speed drive
 - Short infeed spacing conveyor
 - Front elevator of wet tiles, 35 steps at 3" pitch with servo drive
 - Rear elevator of wet tiles, 35 steps at 3" pitch with servo drive
 - Pushers (front & rear) of elevated tiles inside the compartment of the rack in 2 positions controlled by encoders
- Deracker of dry tiles with single unloader, including:
 - Rear pusher of all tiles (# 140) contained in a bay into the descender
 - Descender of 35 rows of 4 tiles each with indexing gear-box
 - Outfeed conveyor with tilting system to clear possible jams
- Racks conveyor:
 - Cross railway approx. 20 m long to suit chambers size
 - Indexing system of racks between racker and deracker
 - Chain pusher of racks to quickly transfer them from deposit to deracking area
 - Chain pusher of racks to quickly transfer them from racking area to pick-up position
 - Hydraulic power unit
 - Centring system of racks on bottom and on top
- Maintenance platform
- Local control panel



E120.1 TRANSFER SYSTEM of RACKS from/to CURING CHAMBERS, Including:

- Trolley of racks on wet side with pushing system of racks
- Trolley of racks on dry side
- Approx #200m burbark rails for trolleys
- Maintenance station

Item	Description
------	-------------

E120.2 EQUIPMENT for PRE-HEATED CURING CHAMBER

To house 7 racks in 1 cell:

- # 1 Transfer system of wet tiles racks from the indexing conveyor to the pre-heating lane
- # 1 Pre-Heating conveyor (approx. 12 mts long) to move racks through the pre-heating chamber for a total pre-heating time of approx. 40 minutes
- # 1 deviation system to transfer the racks from preheating lane onto the wet trolley

S120.1 HEATING SYSTEM for # 1 PRE-HEATED CURING CHAMBER

- # 1 set of equipment including:
 - # 4 Activation fans with incorporated 10,000/40,000 kcal/h heat exchanger
 - # 1 temperature probe + # 1 humidity probe # 1 extraction fan
- Control panel with display of temperature and humidity

E120.3 EQUIPMENT for LARGE CURING CHAMBER

To house 9 racks in 1 lane, for a total of 153 racks inside the large curing chamber:

- # 1 Extraction systems of last 7 racks out of each curing chamber
- # 1 Wheeled binaries to be fixed to supports made by the customer

H120 STEEL RACK 700 TILES/EACH

Sized to contain 700 tiles/pallets in 5 bays, 35 high and 4 deep with a 3" pitch, with dimensions of 2.220 mm x 1.850 mm and 2.590 mm high.

Vortex to supply the rack elements to be assembled on site.

The supply includes also # 1 assembling jig.

S120.2 HEATING SYSTEM for # 1 LARGE CURING CHAMBER

- # 1 set of equipment including:
 - # 3 Activation fans per lane (total #51 units) with incorporated 10,000/40,000 kcal/h heat exchanger
 - # 7 temperature probe + # 7 humidity probe # 7 extraction fan (3+2+2 according to profile partition)
- Control panel with display of temperature and humidity

T7 PREFABRICATED TUNNEL FOR #17 CURING CHAMBERS

FOR INTERNAL USE FOR A TOTAL CAPACITY OF 107.100 PCS, including

- All external and internal walls with 100 mm thick ISOBOX sandwich panels
- #8 automatic doors (#6 for the large curing chamber and #2 for the pre-heating chamber)
- #1 manual door for inspection and rack maintenance purposes.

Item Description

L120.3 CONTROLS for MATRIX CURING SYSTEM

- Control panel for Racker/Deracker and Racks circulation with SIEMENS PLC
- Local command desk – Touch Screen type
- SINEMA Remote Connect for teleservice and remote maintenance

Item	Description	Q.ty	Price (€)
D120.2w	AUTOMATIC RACKER-DERACKER	1	396.600
E120.1	TRANSFER SYSTEM of RACKS from/to CURING CHAMBERS	1	158.900
E120.2	EQUIPMENT for # 1 PRE-HEATED CURING CHAMBER	1	78.400
S120.1	HEATING SYSTEM for # 1 PRE-HEATED CURING CHAMBER	1	6.800
E120.3	EQUIPMENT for # 1 LARGE CURING CHAMBER	17	242.500
H120	STEEL RACKS 700 TILES/EACH	155	1.093.950
S120.2	HEATING SYSTEM for # 1 LARGE CURING CHAMBER	1	72.900
T7	PREFABRICATED TUNNEL FOR 17 CURING LANES	1 set	250.000
L120.3	CONTROLS for MATRIX CURING SYSTEM	1	124.200
	TOTAL EX-WORKS (€Euro)		2.424.250

Special features and Advantages versus other suppliers:

- Ø Maximum production flexibility (several different tile profiles and colours);
- Ø Perfect control of curing conditions
- Ø Ease of profile change with no removal by hand of aluminium pallets from the tile circuit with relevant increase of efficiency);
- Ø Smooth handling of products for 140 tpm velocity due to big racks size (700 tiles/each);
- Ø Low maintenance and wearing using special rollway bearings
- Ø Ready for future capacity and “single-chamber system” expansion

2.4 PACKAGING and PALLETISING LINE for 140 t.p.m.

Item	Description
------	-------------

D.I 130 RACKER & DERACKER with LARGE PACK FORMATION including:

Loading system of tiles with wet paint:

- # 1 Inlet conveyor line to feed front/rear elevators
- #1 Automatic hot melt applicator to apply glue under the tiles to prevent from scratching when over posed.
- # 2 Chain Elevators of wet tiles, 40 steps at 3" pitch, with servo-drive
- # 2 Pushers of elevated tiles inside the compartment in 2 positions with hydraulic cylinder and power pack unit

Unloading of dry tiles with single unloader:

- # 1 Rear pusher of 40 x 2 tiles including: drive and hydraulic power unit;
- # 1 Lowerator of tiles onto outgoing conveyor;
- # 1 Outgoing conveyors and turn table to small packets former
- # 1 Small packets (max 10 tiles) former with infeed conveyor;

HD.38tp DRYING ROTARY-rack total capacity of 3,840 tiles composed of:

- # 48 steel racks each one 40 high x 2 deep with a pitch of 3"
- # 1 Upper frame to close the whole carousel
- # 1 Base Ring
- # 12 wheel supports adjustable in height
- # 2 Side wheel guides
- # 1 indexing system of the rack

Note: steel basements underneath Rotary support wheels are on customer care (VH will supply drawings and specifications)

I140.Bs AUTOMATIC SMALL PACKETS STRAPPING LINE

To strap vertically the small packets of 5-tiles:

- outgoing conveyor line from the Drying Rotary to the spider robots
- # 5 Spider-Robots equipped with pertinent clamps to collect each single tile from the outgoing conveyor and group them in packets of 5 tiles on the strapping indexing conveyors
- # 5 Indexing Conveyors of small packets through the strapping machines including buffering line after the strapping cycle
- # 5 chute vertical strapping machines to strap the small bundles of 5 tiles;
- #2 additional back-up strapping heads for Plain tile/ Duo small packets strapping
- # 5 doublers of packets of 5-tiles to form packets of 10 tiles ready to be collected by the robots feeding the strapping carousel
- Jib crane to quickly move strapping heads in/out from the strapping lines

**NOTE: Quoted strapping machine is for PP polypropylene strap with size:12mm(width) x 0,8mm(thickness)
In case of different strap the price may change and will be confirmed under request.**



Item Description

I140.Bv AUTOMATIC LARGE PACK STRAPPING LINE with #2 strappers

To strap horizontally the large bundles:

- #2 6-axys robot with pertinent hand gripper to collect 10-tiles packets and form the large packs on the rotating carousel
- # 2 Carousel system for large pack forming and horizontal strapping with #8 positions (#1 for strapping with possibility of future installation of back up strapping units)
- #2 horizontal strapping machines (one per each carousel) to strap the big bundle preventing tiles edges to be damaged when they are squeezed together on the timber pallet and during transport;

NOTE: Quoted strapping machine is for PP polypropylene strap with size: 12mm(width) x 0,8mm(thickness)

In case of different strap the price my change and will be confirmed under request.

I140.1 AUTOMATIC PALLETISING LINE Including:

- #1 6-axys Robot equipped with pertinent clamps to collect packets of 40 tiles from the large pack forming units and to palletize them
- Automatic squeezer of packs
- Indexed chain palletising conveyor with 6 pallet positions including Spin Wrapping Unit
- Storage chain palletising conveyor with 8 pallet positions (#6 pick up positions).
- Automatic feeding line of timber pallets to the automatic dispenser system
- Automatic timber pallet dispenser and magazine
- Automatic Stretch Wrapping Unit + lifting system to cover the wooden pallet

L4.140 CONTROLS FOR THE DRYING ROTARY & PALLETISING LINE

- # 1 Control panel with SIEMENS PLC including power section
- # 1 Local command desk for manual operations with touch screen
- SINEMA Remote Connect for teleservice and remote assistance

Item	Description	Q.ty	Price (€)
D.I 140	RACKER & DERACKER	1	1.623.800
HD.38	DRYING ROTARY-rack	1	
I140.Bs	AUTOMATIC SMALL PACKETS STRAPPING LINE	1	
I140.B	AUTOMATIC STRAPPING LINE with #2 Strappers	1	
I140.1	AUTOMATIC PALLETISING LINE	1	
I140.1	AUTOMATIC FEEDING LINE OF TIMBER PALLETS	1	94.600
LI.140	CONTROLS FOR DRYING ROTARY & PALLETISING	1	133.400
	TOTAL EX-WORKS (€Euro)	€Euro	1.851.800

Special features and Advantages versus other suppliers:


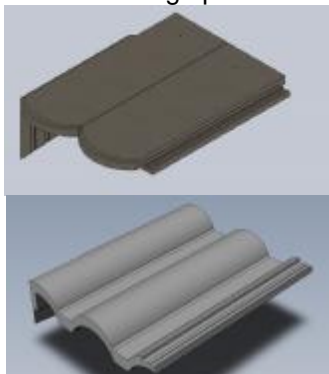
- Ø Easy and fast change of profile
- Ø Handling of each single tile to form packets of selected amount of tiles

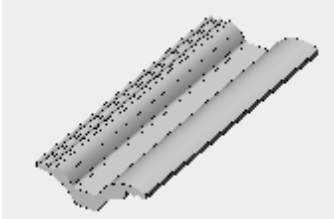





- Ø Redundancy of the system in order not to lose efficiency and capacity in case of stop of one of the strapping lines
- Ø Fast changing system of strapping band and stretch hooding film

2.5 AUTOMATIC MANUFACTURING LINE FOR TRIMS

MAIN TECHNICAL DATA *(indicative for standard configuration)*

MAXIMUM VELOCITY	20 tiles per minute (t.p.m) for Ridges 20 tiles per minute (t.p.m) for Half Tiles & Ventilation Cups 10 tiles per minute (t.p.m.) for Cloak Verges
QUOTED RIDGES PROFILES	STANDARD TAPERED RIDGE
QUOTED ACCESSORIES PROFILES	CLOAK VERGES FOR ALL PROFILES (RH & LH) HALF TILES FOR ALL PROFILES, VENTILATION CUPS FOR ALL PROFILES
MAIN FEATURES	Multiprofile; Automatic mixing; Automatic production; Automatic Matrix curing system; Automatic packaging and palletizing line.

PRODUCT	OUTPUT (based on 49.000 main tiles/shift)	NOTES
Standard Tapered Ridge 	2.700 pcs/ shift	Designed for Eastern Europe market and suitable to be installed with all the profiles quoted in this proposal. General dimension: 420 x 250 mm Est. Weight: 4,5 kg
Cloak Verge profiles 	350 Right Hand + 350 Left Hand pcs/ shift <i>per each profile</i>	Designed for Eastern Europe market General dimension: 420 x 330 mm Est. Weight: 7 kg/each

PRODUCT	OUTPUT (based on 49.000 main tiles/shift)	NOTES
Half Tile Round Coppo profile 	500 pcs/ shift <i>per each profile</i>	General dimension: 420 x 180 mm Est. Weight: 3 kg
Half Tile Double Roman profile 		
Half Tile TLE profile 		
Ventilation Cups 	350 pcs/shift	Two ventilation cups are produced on the same aluminium pallet
End Ridge 	70 pcs/ shift	General dimension: 420 x 250 mm Est. Weight: 6 kg
3-way-apex Ridge 	35 pcs/ shift	General dimension: 420 x 250 mm Est. Weight: 6 kg

MANUFACTURING LINE

Item	Description
A15	ACCESSORIES FOR MIX FEEDING BELT CONVEYOR - Overband Magnet (Bunting 10 PCB 5 TRI-POLAR model) with pertinent controls with ladders access system to access also the Metal detector position - Metal Detector Mesutronic METRON 05D with pertinent controls
F15	TRIMS PRODUCTION SYSTEM Automatic Extruder R20 (at 20 tpm): <ul style="list-style-type: none"> - Steel bench with heavy duty steel frame and hardened steel guides - Hydraulic power unit with oil cooler with Inverter - # 1 Automatic vertical hydraulic knife cutter - # 2 Automatic lateral sides hydraulic knife cutter - Instrument for extruder setting-up Extrusion head with shaping tools, gear-box for <u>head (profile changeover time approx. 10 minutes):</u> - STANDARD VORTEX TAPERED RIDGE profile
FG1	ALUMINIUM PALLETS – Stnd. TAPERED RIDGES (# 5.760) Vortex Stnd Tapered profile. Pallets are die-cast in AlSi11Cu2 alloy (EURONORM EN AC 46100), machined on 4 sides and flattened
F15.H	HALF TILE & VENTILATION CUPS PRODUCTION SYSTEM Automatic Extruder R20 (at 20 tpm): <ul style="list-style-type: none"> - Steel bench with heavy duty steel frame and hardened steel guides - Hydraulic power unit with oil cooler with Inverter - # 1 Automatic vertical hydraulic knife cutter for half tiles & ventilation cups - Instrument for extruder setting-up Extrusion heads with shaping tools, gear-box for <u>head (profile changeover time approx. 10 minutes):</u> <ul style="list-style-type: none"> - #3 Extrusion heads for all half tiles profile, - #3 Extrusion head for Ventilation cups production
FG2	PALLETS FOR HALF TILE (# 4.320): <u>ALL</u> profiles pallets are gravity die-cast in AlSi12 alloy (UNI 5076 or ASTM A383), machined on 4 sides and flattened
FG3	PALLETS FOR VENTILATION CUPS (# 1.440) Pallets are gravity die-cast in AlSi12 alloy (UNI 5076 or ASTM A383), machined on 4 sides and flattened

Item	Description
BCK2	<p>VORTEX UNO CLV: Max Output Capacity:10 cloak verges tiles / minute including:</p> <ul style="list-style-type: none"> - extruder vortex cloak verge to manufacture cloak verge tile - bench guides heavy duty steel bench 45 mm thick 3500 mm long - tools for maintenance, instrument for extruder set-up; - cutting system: vertical pneumatic cutting lateral edge pneumatic cutting pocket pneumatic cutting - local control panel with power section; - pushing system with trolley on rails and pusher pawls with hydraulic power unit; <p><u>Note: Profile changeover can be done in approx. 10 minutes</u></p>
BCK2.R	<p>CLOAK VERGE MANUFACTURING EQUIPMENT - <u>RIGHT HAND</u></p> <p>extrusion head to be installed on BCK2 for <u>all CLV profiles</u> profile</p> <ul style="list-style-type: none"> - roller, lateral roller, slipper - hydraulic drive for roller - knife for vertical cutting - pocket knife
G10.R	<p>PALLETS FOR CLOAK VERGE- <u>RIGHT HAND</u>:</p> <p><u>Any type</u> cloak verge profile pallets are gravity die-cast in AISi11Cu2 alloy (EURONORM EN AC 46100), machined on 4 sides and on the bottom;</p>
BCK2.L	<p>CLOAK VERGE MANUFACTURING EQUIPMENT -<u>LEFT HAND</u></p> <p>extrusion head to be installed on BCK2 for <u>all CLV profiles</u> profile</p> <ul style="list-style-type: none"> - roller, lateral roller, slipper - hydraulic drive for roller - knife for vertical cutting - pocket knife
G10.L	<p>PALLETS FOR CLOAK VERGE- <u>LEFT HAND</u>:</p> <p><u>Any type</u> of cloak verge profile pallets are gravity die-cast in AISi11Cu2 alloy (approx. 7 kg) (EURONORM EN AC 46100), machined on 4 sides and on the bottom2.7</p>
C15.1	<p>TRANSPORT LINE OF TRIMS AND MOULDS including:</p> <ul style="list-style-type: none"> - All conveyors are flat belt type with a total length of approx. 120 m; continuous guides for the rope; drive with variable speed system and heavy-duty design, - oiling system suitable for all profiles - sled system for fast extruders changeover, - #1 depalleting systems for ridges and half tiles with automatic profile changeover - vibrating table and demoulding robot for cloak verges - #1 turn table

Item	Description
J1	ACRYLIC PAINT APPLICATOR FOR WATER BASED PAINT <u>on Wet and Dry Tiles</u> <ul style="list-style-type: none"> • #3 Frame and conveyor with drive; • #3 Sealed booth; • #6 adjustable spraying nozzles; • #4 support frames for 1.000 lts IBC's • #4 Visco Jet stirrers for IBC's wired to isolators/starters • #3 Acrylic pump c/w filtration system • #4 SMAC mixing and filtration units, wired to panel • #3 Overspray filter recovery units • #1 Control panel
FP	VORTEX UNIVERSAL PRESS for STANDARD fittings production
FP.S	STANDARD FITTINGS PRODUCTION TOOLS To be installed on VORTEX UNIVERSAL PRESS (item FP), including: <ul style="list-style-type: none"> • 3 WAY APEX production kit: master die + 35 aluminium pallets • END RIDGE production kit: master die + 70 aluminium pallets
L15.r	CONTROLS FOR MANUFACTURING LINE <ul style="list-style-type: none"> • Control panel with SIEMENS PLC and local command desk • SINEMA Remote Connect for teleservice and remote maintenance
Z2	CODE PRINTER - ZANASI SYSTEM to print date or codes on the tiles <ul style="list-style-type: none"> - Accessories to installation on the main line - Installation and training course - User manual



PRICES for MANUFACTURING LINE for TRIMS

Item	Description	Q.ty	Price (€)
A15	ACCESSORIES MIX FEEDING BELT CONVEYOR	1	32.750
F15	TRIM PRODUCTION SYSTEM – STND TAPERED RIDGES	1	59.150
FG1	ALUMINIUM PALLETS – Stnd. TAPERED RIDGES	5.760	101.952
F15.H	TRIM PRODUCTION SYSTEM – HALF TILES & VENT CUPS including #6 EXTRUSION BOXES	1	162.600
FG2	ALUMINIUM PALLETS – HALF TILES (all profiles)	4.320	173.664
FG3	ALUMINIUM PALLETS – VENTILATION CUPS	1.440	66.240
BCK2	VORTEX UNO CLV MANUFACTURING EQUIPMENT	1	44.300
BCK2.R	CLOAK VERGE MANUFACTURING EQUIPMENT - <u>RIGHT HAND</u>	3	64.950
G10.R	PALLETS FOR CLOAK VERGE- <u>RIGHT HAND</u> : All profiles	2.160	218.592
BCK2.L	CLOAK VERGE MANUFACTURING EQUIPMENT - <u>LEFT HAND</u>	3	64.950
G10.L	PALLETS FOR CLOAK VERGE- <u>LEFT HAND</u> : All profiles	2.160	218.592
C15.1	TRANSPORT LINE OF TRIMS AND MOULDS	1	345.000
J1.U1	ACRYLIC PAINT APPLICATOR	3	150.300
J1.UP	ACRYLIC PAINT PREPARATION		
FP	VORTEX UNIVERSAL PRESS	1	4.410
FP.S	STANDARD FITTINGS PRODUCTION TOOLS	1	8.250
L15.r	CONTROL SYSTEM FOR RIDGE MANUFACTURING LINE	1	89.800
Z2	CODE PRINTER - ZANASI SYSTEM	1	13.700
TOTAL EX-WORKS (€Euro)			1.819.200

NOTE: Number of aluminium pallets is calculated to cover a two shifts production allowing an efficient production configuration to minimize the profile changeover time. Change of configuration according to different customer needs is always possible.

MATRIX CURING SYSTEM

Item	Description
D20.w	AUTOMATIC RACKING-DERACKING SYSTEM including: <ul style="list-style-type: none"> - Front chain elevator 15 high with 8" pitch including infeed conveyor - Front pusher of elevated wet tiles 4 positions hydraulically operated - Unloader of dry tiles with descender 14 high - 4 pallets deep, pusher of a whole rack bay (15x4 pallets) into the descender, outfeed conveyor - Cross wheel conveyor for racks with separated indexing systems for loader and unloader and chain transfer system of filled racks from dry side deposit and to wet side deposit
E20.1	EQUIPMENT for PRE-HEATED CURING CHAMBER To house 3 racks in 1 cell: <ul style="list-style-type: none"> - # 1 Transfer system of last from the indexing conveyor to the pre-heating lane - # 1 Pre-Heating conveyor (approx. 9 mts long) to move racks through the pre-heating chamber for a total pre-heating time of approx. 60 minutes - # 1 deviation system to transfer the racks from preheating lane onto the wet
S120.1	HEATING SYSTEM for # 1 PRE-HEATED CURING CHAMBER <ul style="list-style-type: none"> • # 1 set of equipment including: <ul style="list-style-type: none"> • # 2 Activation fans with incorporated 10,000/40,000 kcal/h heat exchanger • # 1 temperature probe + # 1 humidity probe # 1 extraction fan
H360	STEEL RACKS 360 TILES/EA FOR EXISTING CURING CHAMBERS Sized to contain 360 tiles/pallets in 6 bays, 15 high and 4 deep with a 8" pitch Supplied in elements to be bolted together at work-site <ul style="list-style-type: none"> • # 45 Complete sets of above • # 1 Jig for racks assembly on site;
E20	TRANSFER SYSTEM OF RACKS FROM/TO CURING CHAMBERS <ul style="list-style-type: none"> • # 2 Transfer trolleys of racks with drive on board and laser positioning system; • Festoon system including steel columns and cables; • # 1 Pushing and extraction system of racks on board of the trolley; • Heavy duty service "Burbak" rails including future expansion (approx. 180 m) • Maintenance station
E20.2	EQUIPMENT for # 1 CURING CHAMBER to be used for #1 curing chambers To house 4 racks in 1 cell: <ul style="list-style-type: none"> • # 1 Extraction systems of last 2 racks out of each curing chamber • # 1 Wheeled binaries to be fixed to supports made by the customer
S20.1	HEATING SYSTEM for #1 LARGE CURING CHAMBER <ul style="list-style-type: none"> - #11 Activation fans with incorporated 10,000/40,000 kcal/h heat exchanger - # 2 temperature probe; # 2 humidity probe - # 2 extraction fan - Control panel with display of temperature and humidity <p><i>Note: Main manifolds, pumps, boiler and burner, valves are not included in this price</i></p>

Item Description

L20.3 CONTROLS FOR RACKER/DERACKER & RACKS CIRCULATION

including:

- # 1 control panel with Siemens PLC;
- # 1 local control desk with touch screen

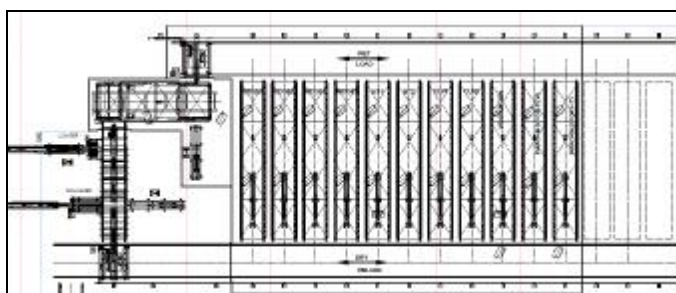
T7 PREFABRICATED TUNNEL FOR 11 CURING CHAMBERS and FOR PRE-HEATING CHAMBER FOR INTERNAL USE, including:

- All external and internal walls with 100 mm ISOBOX sandwich panels
- #3 automatic doors
- #1 manual door for inspection and maintenance purposes.

PRICES FOR: CURING SYSTEM

Item	Description	Q.ty	Price (€)
D20.2w	AUTOMATIC RACKING-DERACKING SYSTEM	1	198.500
E20.1	EQUIPMENT for PRE-HEATED CURING CHAMBER	1	64.100
S120.1	HEATING SYSTEM for # 1 PRE-HEATED CURING CHAMBER	1	3.800
H360	STEEL RACKS 360 TILES/EACH	45	192.000
E20	TRANSFER SYSTEM OF RACKS FROM/TO CURING CHAMBERS	1	142.900
E20.2	EQUIPMENT FOR CURING CHAMBERS	11	115.800
S20.1	HEATING SYSTEM + CONTROLS	1 set	31.500
L20.3	CONTROLS FOR CURING SYSTEM	1	121.600
T7	PREFABRICATED CURING TUNNEL	1 set	122.500
TOTAL EX-WORKS (€Euro)			992.700

NOTE: Number of curing chambers is calculated to cover a two shifts production allowing an efficient production configuration to minimize the profile changeover time. Change of configuration according to different customer needs. Please note that a single type of rack (having a capacity of 360 tiles/each) is used such that profile changeover time is almost zero in the curing area



PACKAGING & PALLETIZING LINE

Item Description

DE.60 ACRYLIC PAINT DRYING SYSTEM

Capable to hold 105 tiles (more than 5 minutes production at 20 ridges per minute), including:

- Feeding conveyor to elevator
- Continuous chain elevator – total capacity 15 tiles (15 floors at 8" each)
- Transfer system for tiles from elevator to descender with indexing system installed at the top of the system itself
- Continuous chain descender – total capacity 90 pallets (15 floors at 8" each one of 6 ridges or accessories)
- Out feed conveyor

I40.PK AUTOMATIC STRAPPING, PACKAGING AND PALLETIZING LINE

- Stacking system of ridges and half tiles with a spider-robot system
- Stacking system of Cloak Verges with dedicated robot
- Strapping systems of small packets of ridges, Half tiles and Cloak Verges
- FANUC robot with double head for clamping of packs of all profiles
- Automatic feeding line of timber pallets to the automatic dispenser system
- Timber pallets magazine
- Palletizing conveyor with 5 positions
- Storage conveyors with 6 pick-up positions
- Stretch hooding unit + lifting equipment to cover the wooden pallet

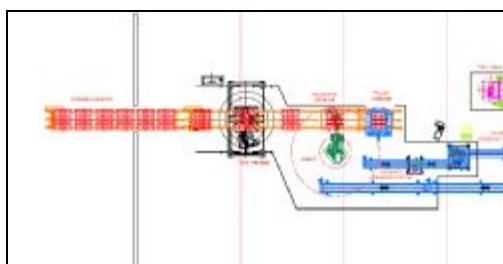
LF40.I CONTROLS FOR PACKAGING AND PALLETIZING LINE

including:

- # 1 control panel with Siemens PLC;
- # 1 local control desk with touch screen

PRICES FOR: PACKAGING AND PALLETIZING LINE

Item	Description	Q.ty	Price (€)
DE60	ACRYLIC PAINT DRYING SYSTEM	1	150.000
I140.1	AUTOMATIC FEEDING LINE OF TIMBER PALLETS	1	94.600
D120.2w	AUTOMATIC PACKER	1	559.000
L120.3	CONTROLS FOR PACKAGING & PALLETIZING	1	
TOTAL EX-WORKS (€Euro)			803.600



2.6 ADDITIONAL EQUIPMENT FOR BOTH TILE AND ACCESSORIES LINES

Item	Description
------	-------------

SSF ELECTRICAL CABLES, including:

- Electrical cables Lapp type as follows:
 - Cables from MCC room control panels to all the junction boxes on board of each single piece of equipment
 - Cable ladders and cable trays

SFT120 SAFETY EQUIPMENT– Compulsory for CE countries

Ø Fences for both Main and accessories line

- Manufacturing line
- Racking deracking system
- Packaging and palletizing line

FTT120 FORTRESS Trapped Key Interlock Switches:

Trapped Key Interlock Switches are used for electrical isolation of machinery to improve safe access and also as teach boxes in robot cells. Once the power has been turned off, the key can be withdrawn and used in the next sequence of operation such as unlocking an access hatch or allowing valves to be operated.



PB.2 ELECTRIC HOIST to move the extrusion head for maintenance (800 kg) only for the ridge + accessories line

A PLATFORMS, WALKWAYS AND LADDERS for ease of access through the production line

Item	Description	Q.ty	Price (€)
SSF	ELECTRICAL CABLES and TRAYS for both lines	1	335.900
SF120	SAFETY FENCING CE STANDARD	1 set	30.000
FTT120	FORTRESS SAFETY SYSTEM	1 set	18.000
PB.2	ELECTRIC HOIST FOR ACCESSORIES LINE	1	9.800
A	PLATFORMS, WALKWAYS AND LADDER for both lines	1 set	89.500
	TOTAL EX-WORKS	€Euro	483.200

OPTIONAL EQUIPMENT FOR BOTH TILE AND ACCESSORIES LINES

Item Description

VS VISUAL SYSTEM TO DETECT BAD TILES AND AUTOMATIC REJECTING SYSTEM, including:

- Keyence Cameras to be installed before painting units to control quality of the tiles prior to painting section
- Automatic rejecting system of bad quality tiles

C140.N TRANSPORT LINE OF TILES AND MOULDS – NOISE ISOLATION CABINS

- Cabins with Sandwich panels for noise insulation where necessary to keep the noise level below 85 dB

SF.1 “SMART FACTORY” SYSTEM Including:

- Industrial PC for software handling and implementation
- Customization of data collection as per customer requirements
- Device for remote connection
- Software to be installed on mobile devices to monitor the production
- Cameras along the line to have visual access to several parts of the plant (display included)

Item	Description	Q.ty	Price (€)
VS	VISUAL SYSTEM AND AUTOMATIC REJECTING SYSTEM	4	296.600
C140.N	TRANSPORT LINE – NOISE ISOLATION CABINS	1 set	140.300
SF.1	“SMART FACTORY” SYSTEM	1 set	86.000

SUMMARY of PRICES

(2.1) MIX FEEDING SYSTEM	32.750
(2.2) MANUFACTURING LINE & 107.100 ALUMINIUM PALLETS	3.119.060
(2.3) MATRIX INCLUDING PREFABRICATED CHAMBERS	2.424.250
(2.4) PACKAGING & PALLETIZING LINE	1.851.800
DISCOUNT on MAIN TILE LINE EQUIPMENT	- 540.100
A) TOTAL PRICE for MAIN TILE LINE EX WORKS FERRARA, ITALY (2.1 to 2.4)	€ 6.887.760
(2.5) AUTOMATIC MANUFACTURING LINE FOR TRIMS	
MANUFACTURING LINE & ALUMINIUM PALLETS	1.819.200
MATRIX CURING SYSTEM INCLUDING PREFABRICATED CHAMBERS	992.700
PACKAGING & PALLETIZING LINE	803.600
DISCOUNT on ACCESSORIES EQUIPMENT	- 224.060
B) TOTAL PRICE FOR TRIMS LINE EX WORKS FERRARA, ITALY (2.5)	€ 3.391.440
(2.6) ADDITIONAL EQUIPMENT	483.200
(3) ASSISTANCE TO INSTALLATION AND START-UP	436.000
GRAND TOTAL NET PRICE EX WORKS FERRARA, ITALY	€ 11.198.400
ESTIMATION FOR TRANSPORT	230.000

3. ASSISTANCE TO INSTALLATION & COMMISSIONING

Assistance to installation:

Means the expertise provided by Vortex Hydra's Installation Engineer/s (with mechanical and/or electrical qualification) to install (assembly, wire, test) the equipment supplied by VH, with the support of a local team of mechanics, electricians and general hands, in the quantity indicated by VH, provided by the customer at their cost and expenses and supervised by VH engineer/s.

Assistance to Commissioning:

Means the expertise provided by Vortex Hydra's Commissioning Engineer (technologist and system expert) to start-up and commission the installed equipment supplied by VH until ready to operate efficiently.

During this period VH commissioning engineer will be supported by customer's plant manager and/or any skilful operator, including when foreseen maintenance operator and production crew to get trained.

With respect to the quoted standard configuration, we estimate that a total of 500 man's days will be necessary, which are calculated as follows:

- 300 man's days @ 850 Euro for Installation Engineer's working day (not exceeding 8 working hours).
- 100 man's days @ 850 Euro for Commissioning Engineer's working day (not exceeding 8 working hours).

Item	Description	Q.ty	Price (€)
AI	INSTALLATION ENGINEER'S WORKING DAYS	300 days	255.000
AC	COMMISSIONING ENGINEER'S WORKING DAYS	100 days	85.000
BL	BOARD & LODGING (estimation)	400 days	72.000
FL	TRAVEL COST (estimation)	1 set	24.000
	ASSISTANCE TO INSTALLATION & START-UP		436.000

~~The expenses for local and airport transfers, board and lodging and economy class flight tickets are excluded and are on customer charge and will be paid upon presentation of expenses list unless differently agreed.~~

- All hours exceeding the 8 hours per day will be priced at 120 Euro/hour for Installation Engineer and for Commissioning Engineer.

- In case of customer's request of work on Saturday and Sunday, all hours will be priced at 160 Euro/hour.

- Travelling days and all days not worked for reasons beyond Vortex Hydra responsibility will be charged at 850 Euro/day. Anyhow no more than 2 travelling days every 3 weeks are considered.

- For further information, please read carefully exclusions from our supply in the last page of "CONDITIONS" paragraph.

In case Vortex Hydra will be awarded for this project, Vortex Hydra is ready to provide included the consultancy of one of our senior engineers after the commissioning of the plant made of two weeks of continuous stay on-site interspersed with two weeks of remote assistance guaranteeing a total period of 6 months of post-commissioning assistance to make sure that customer's learning curve will be the best possible one and production will run consistently since the first day.

3.1 OPTION FOR TURNKEY INSTALLATION

Assistance to Turn-Key:

Means the expertise provided by Vortex Hydra's Senior Engineer/s (with mechanical and/or electrical qualification) to support of a team of mechanics, electricians and general hands sourced and paid by VH.

Turn-Key

Includes the personnel and equipment to perform the turn-key installation of the equipment included in this proposal (Compressed air and water net are excluded and needs to be provided by the customer)

Item	Description	Q.ty	Price (€)
AC	TURN-KEY ENGINEER'S WORKING DAYS (estimation)	1300 days	700.000
BL	BOARD & LODGING	1300 days	
FL	TRAVEL COST	1 set	
	TURN-KEY INSTALLATION <i>Estimation only, to be confirmed when ready for order</i>		700.000

The following equipment will be needed during the installation:

- #1 25tons Crane for approx. 4 months
- #2 3,5tons Fork Lifts for approx. 8 months
- #1 Cherry Picker for approx. 6 months
- #1 Container / workshop with pertinent tools for approx. 8 months
- #1 Container / Toilet with relevant cleaning system for approx. 8 months
- #1 Container / locker room for approx. 10 months
- #1 Container to be used as office for approx. 10 months

Estimation for work power distribution Installation and commissioning – MAIN LINE			
	VH Supervisor Installation & commissioning (man/days)	Mechanical crew (man/days)	Electrical crew (man/days)
Manufacturing line installation	50	70	110
Curing system installation	120	225	225
Packaging line installation	70	110	160
Commissioning	60	-	-
TOTAL	300	405	495

Estimation for work power distribution Installation and commissioning – ACCESSORIES LINE			
	VH Supervisor Installation & commissioning (man/days)	Mechanical crew (man/days)	Electrical crew (man/days)
Manufacturing line installation	15	30	50
Curing system installation	40	100	100
Packaging line installation	25	50	70
Commissioning	20	-	-
	100	180	220

4. CONDITIONS

DELIVERY: delivery dates as per Gantt chart file "WB PROJECT - GANTT CHART_rev2", subject to variation due to raw material and components availability.

PRICE: the listed prices are expressed in € (Euro). Due to extremely high volatility of raw materials & electrical components costs, price of machineries (aluminium pallets, installation and transport cost are excluded) are subject to a maximum variation of **+/- 3%** based on INDUSTRIAL PRODUCER PRICES (NACE 2007code: 2899) variation as per values reported at the following link: <http://dati.istat.it/Index.aspx?lang=en&SubSessionId=cbe1456f-3771-43d3-b69c-e91f3d8>

Reference month - value: August 2022 – 119 (Euro zone – except Italy)

Aluminium pallets price to be readjusted according to aluminium alloy and to energy value fluctuation as per "Alu pallets price scheme" file attached to this quotation.

Current quotation is based on aluminium alloy August 2022 value

(<https://www.assomet.it/rilevazioni/mensili/>) and energy cost in July 2022.

(<https://www.a2aenergia.eu/assistenza/tutela-cliente/indici/indice-psv>)

Max allowed aluminium pallets price variation is +/- 15% of the prices shown in this quotation.

TERMS OF PAYMENT

As per contract N...

- In case shipment can't be done for reasons not imputable to Vortex, the last 70% will be paid anyhow within 3 months fm Note of Ready for Shipment and storage fee of 5 Euro/m² per week will be charged after 2nd one
- In case installation and commissioning can't be achieved for reasons not imputable to Vortex, the last 5% will be paid anyhow within 3 months from delivery date ex works
- Commissioned Certificate will be released as soon as the plant will reach an Efficiency such that the Production Output stated in the Quote is achieved (or the number of aluminium pallets available if less) within an Actual production time of 8 hours. (Actual production time is the difference between the total working time less all the downtimes not imputable to Vortex machinery faults like: profile changeover time, the colour change time and all general downtimes like stop for lunch and similar breaks, stop for lack of maintenance of the equipment according Vortex instruction, lack of proper raw material or material not complying the test specification like sand, cement, water, oil, paint,....., lack of skilled workers, lack of energy,.. . If less, the Production Output will be recalculated accordingly).
- Any delays in payment or L/Credit opening will affect delivery and installation, while in case of delays over 6 month Vortex is authorised to re-negotiate the Contract and invoice pertinent costs already sustained.

TRANSPORT: If not clearly specified the Transport shall be intended as excluded, in case Cost of transport is given and included in the quotation, the shipping company and consequently Vortex can't guarantee its validity for more than 2 months. So Vortex is authorised to charge to the customer any increase of this transport costs after showing Invoices of it. This difference has to be paid before starting the installation. As a budgetary figure the transport cost can be estimated in approx. 2% of the contract value (i.e approx. 230.000 Euro) but this value is subject to variation and Vortex suggest to use "open book price +10%" policy to handle the transport matter.

VORTEX ENGINEERS PRICES AND CONDITIONS:

@ 850 Euro for Installation Engineer's working day (not exceeding 8 working hours).

@ 850 Euro for Commissioning Engineer's working day (not exceeding 8 working hours).

- All hours exceeding the 8 hours per day will be priced at 140 Euro/hour for Installation Engineer and for Commissioning Engineer

- In case of Saturday and Sunday working hours, the all hours will be priced at 160 Euro/hour.

~~Travelling days and all days not worked for reasons beyond Vortex Hydra responsibility will be charged at 850 Euro/day. The same amount will be charged for all the days not worked for reasons beyond Vortex Hydra responsibility.~~

~~The expenses for local and airport transfers, board and lodging (of tourist class single room) and flight tickets (economy class) are on customer charge and will be paid upon presentation of expenses list unless differently agreed. This offer is not valid in case Italian Foreign Office deem unsafe the travel of our Engineer into the customer country.~~

The normal working hours are 8 hrs a day however we allow our engineers to extend this time for no longer than 10 hrs a day. Seller 's engineers will issue a daily report stating the working hours done that the Buyer is due to sign in order to maintain a common accounting of the Installation schedule. The return is normally scheduled every third week, while it could be every second week inside Europe Anyhow no more than 2 travelling days every 3 weeks are considered

Seller engineers must have access to the various parts of the equipment supplied to provide the necessary remedies and settings at any moment they deem necessary to make so. Buyer will provide the necessary qualified personnel to assist in order even to be trained and perform daily maintenance in accordance with Seller's project engineer instructions. Maintenance operations, mix formulas must be reported and agreed. Variations to mix formula can be proposed by our engineer to match the best extruder box setting and general plant specifications. Once the Production Output is achieved the installation period will be considered terminated and, under request, our engineer can start a Training period or an Assistance to Installation period.

WARRANTY: Seller hereby warrants that upon Final Payment, Seller will transfer to Buyer good and assignable title to the Equipment free and clear of all liens, charges or encumbrances.

Warranty consist in the free Replacement of all defective parts for bad design or defective construction, for a period of 12 months from the loading date of first Bill of Lading (except for all the wearing parts). Loading date means the date when the goods are loaded on truck / vessel / container for the time by the Seller. Seller's obligations shall be limited solely to the reparation or replacement of the defective parts and is not covering the loss of profit, production or reputation or any punitive or exemplary damages.

These defective parts have to be sent back to us for inspection. In case of commercial components, we confirm also the complete guarantee granted to us by our Sub-suppliers. Transport and installation cost are excluded from the guarantee. Seller responsibility and Guarantee is valid only if original wear parts are used and user manual is diligently followed by the Buyer, if the Equipment and its Software is not modified by Buyer without Seller approval and if all due payments are fulfilled.

In case Curing racks are supplied by Vortex, due the high humidity environment inside the chambers, racks have to be considered subject to wearing both of coating and steel with an estimated lifetime of approx 8 years unless a preventive maintenance programme is implemented.

With the purchase of machinery and pallets the buyer has the free right to use Vortex design its tile profiles (that has to be signed for approval) that remains of Vortex property and that can not be patented without Vortex permission, it's Customer duty to verify that the tile design selected will be suitable for its market rules and local specifications.

In case of development of new tile/products or new finishing is made on customer request it's intended that, once the phase of testing and approval of these is terminated in Vortex factory and accepted by the customer, it will be customer care to control that it fulfils its market rules and local specifications.

So being customer care to control the production criteria like raw materials type and ratios, curing conditions and finishing, machinery set-up and maintenance... Vortex can not be considered responsible of any production or quality problem once the Customer decide to enter in the market with these new products.

Aluminium pallets lifespan can be estimated in approx. 2.200 – 2.500 passages under the extrusion box, this value depending on correct utilization of aluminium pallets and on type of raw materials used.

INVENTORY: With the initially suggested stock of spare and wear parts, it's covered the risk of downtimes due to lack of the necessary parts. The inventory must be kept under daily control, in order to issue periodical orders and keep the store level within reasonable limits of fluctuations. If the suggested stock is not ordered Vortex don't accept any responsibility in delays of replacement. Upon finalization of the design phase, Vortex Hydra will prepare a detailed spare & wear parts list with indication about parts to be kept at stock during the commissioning test phase.

NOTE: other conditions are contained in our "TERMS AND CONDITIONS OF SALES AND INSTALLATION" (T.C.S.I.). that in the event of discrepancy shall prevail.

REF. BANKS: to be notified in due time

ELECTRIC SUPPLY: 380V 3phases 50Hz (any difference has to be notified by customer before order)

TECHNICAL DOCUMENTATION, SAFETY CERTIFICATE, COMPONENTS, COLOURS

- #1 Soft-copy of Documentation in English is included, if requested in a different language it will be released by Vortex Hydra srl under request or upon agreement by parties.
- Documentation included: General layout; civil works; electric, water and compressed air utility points; heating system and piping; cable list, user manual; spare part manual. All these for Vortex Hydra supplied machinery only, while it's customer duty to supply reliable drawing of the existing building and equipment before engineering start. Only once final Layout is accepted/signed by buyer, Vortex can start the manufacturing of equipment, after that any additional change in the layout may reflect in extra cost of engineering/equipment that will be charged.
- If the supply there is the design of a new tile, if not differently specified, are included in the price up to 2 revisions after the first and will be charged at cost all additional ones requested by Buyer.
- CE declaration is released by Vortex Hydra Srl for CE member countries. For other countries the buyer has to specify which Safety rules has to be applied. Total price for this item can be given as soon as the final layout is agreed. If customer will not specify nor provide the necessary information about these binding Safety rules is intended that the necessary provisions, if any, will be taken by the customer. In case any different safety rules has to be required before the order.
- Safety Perimeter Guarding Devices:
 - CE standard safety net (h=2000 mm): Euro 150/m,- Electrical Interlocked door: Euro 400 each unit
 Total price for this item can be given as soon as the final layout is agreed
- Different Electrical and Mechanical brand components from the standard vortex one have to be specify and discussed before the order to understand variation of price and delivery
- Colours for Vortex machinery is RED RAL 3020, GREY RAL 7031, curing racks colour according with surface treatment (any different one have to be discussed before the order)

CUSTOMS CODES: equipments 84791000; aluminium pallets 84806000; spare parts 84799080.

EXCLUSIONS FROM OUR SUPPLY:

- Civil works (building, accesses, foundations, fences platforms and ladders where not specified etc.),
- ~~—Cement silo and screw conveyor~~
- ~~—Cables laying from panels to junction boxes of machines & from Main Power board to panels~~
- air compressor and network, water network to utility points, Power supply.
- heat generator (spec will be supplied for) and chimney, piping, all circulation pumps, valves, manifolds and expansion tank (except what it's not listed in the quotation)
- ~~—walkways platform, and ladders~~
- ~~—travel, board and lodging of our fitters~~
- local crew of mechanical, electrician, workers and lifting means during installation and discharging operations, to be provided in the quantity and times that our engineers will specify. Installation can't start before all the civil works are completed, the power is there, the tools (as per list) are available.
- all taxes, custom duties, demurrage costs,... (if any) resulting from importation are on Customer charge (all cost resulting from exportation from Italy, in Italy, are on Vortex charge).
- pallet treatment
- what else not detailed here

This quotation shall be governed by and construed in accordance with the laws of Italy and place of jurisdiction is Italy

VORTEX HYDRA S.R.L.

1. A MŰKÖDÉS LEÍRÁSA

Adagoló- és keverőrendszer (a keverékadagoló rendszerre vonatkozó részt kivéve nem része az árajánlatnak):

A friss betont a tetőcserép szállítószalagjához és a kiegészítőelemek szállítószalagjához egy automata adagoló- és keverőberendezés készíti elő. A tárolóterületről érkező, előző rakodó által szállított homokot az elsődleges töltőgarat fogadja. A homokot hevederes szállítószalag viszi a hárfaszita osztályozórendszerhez, majd onnan egy szállítószalag egy másik szállítószalaghoz a legfeljebb 4 típusú homok négy tárolótartályba történő elosztása céljából.

A szemcsenagyság szerinti osztályozás az ügyfél követelményei szerint történik (ebben a javaslatban kb. 50 tonna tartályonként – összesen 200 tonna).

A 4 tárolótartályból az összes homokot a síneken várakozó vagonokba ürítik (a homok mennyiségének kompenzálása céljából mindegyik tárolótartály nedvességérzékelővel van felszerelve), amelyekben az anyag tömegét 3 mérőcella segítségével mérik meg. A vagon felváltva ürítik ki a két keverőgép csilléjébe.

A silókban tárolt cementet szállítócsiga-rendszerrel juttatják a keverőgépre szerelt cementmérleg egységhez (a silók és a szállítócsiga nem része a szállítási terjedelemnek)

A vizet és a színes keveréket egy automatikus adagolórendszer juttatja a keverőgépbe.

Gyártósor:

A tetőcserepeket a betonból sajtoló-nyomósos eljárással alakítják ki, présöntésű alumínium sablonokon.

Az említett E4/S automata tetőcserép-extruder működési sebessége 140 cserép/perc, működése folyamatos, és Vortex Hydra **csúcstechnológiás, elektronikus vezérlésű kétképes repülővágóval** van felszerelve, amely minden cserépprofil precízen darabol. Az extruder és a vágórendszer továbbá úgy van szinkronizálva, hogy a vágási pozíció automatikusan a toló pozícióhoz igazodik, így megakadályozva az alumínium sablonok szennyezettségéből vagy a tolólánc megnyúlásából adódó pontatlanságokat.

A folyamatos tolást a sablonok alsó oldalához illeszkedő rögzítőhorgok végzik. A rögzítőhorgokat két darab kettős láncra rögzített kocskra szerelik fel, amelyeket beszerelés előtt élethosszig tartó kenéssel látnak el. Élettartamuk a karbantartástól és a tolóerőtől függően nagyjából 10-12 millió darab tetőcserép legyártásáig tart. Mivel a megnyúlás minimális, a vágási pontosság kiemelkedő.

A hajtásrendszert a görgőkön és tolószerkezeten lévő, inverterekkel ellátott elektromos önfékező motor működteti, így lehetőség van a gyorsító-/lassítórámpák és a működési sebesség bármilyen kiválasztott értékre történő behangolására.

A volfrámkarbid az extrudáló doboz belső falai felé néz, és a megfelelő húzópad részen sablonpályákat helyez el.

Feltéve, hogy a megfelelő formák rendelkezésre állnak, az extrudálófej cseréjével kevesebb mint 10 perc alatt át lehet állni egy második profil gyártására a hozzáerősített húzópadszakasz egy másik, az új profilhoz felszerelt és korábban beállított extrudálófejjel.

A tetőcserepek és sablonok szállítását nagy teherbírású szállítószalagok végzik. A keretet két acéllemez alkotja, amelyeket megfelelő távtartókkal csavaroznak egymáshoz. Ezek a lemezek a sablonok és tetőcserepek oldalsó vezetőjeként is szolgálnak. Minden elektromos és sűrített levegős vezeték, valamint kötődoboz megtalálható a kapcsolótáblán. Minden szállítószalag-motort inverter-vezérelt önfékező motorok működtetnek. Emellett minden egyes alkatrész széleskörű beállítási lehetőségekkel rendelkezik.

E4/S Extrudergép



Az extrudergép után a nedves tetőcserepeket az állványra helyező/állványról levevő egységhez szállítják, felhelyezik az acél állványokra és MATRIX rendszerben tárolják.

A különleges MATRIX kikeményítőrendszer célja, hogy az állványok automatikus körbe járatásával garantálja:

- a maximális gyártási rugalmasságot (többféle tetőcserep szín és profil);
- a kikeményítés körülményeinek tökéletes kontrollálását;
- az egyszerű profilváltást;
- a termékek zökkenőmentes kezelését 140 tetőcserep per percig bármilyen sebességen.

Az első-hátsó rakodók és az állvány méretei úgy vannak meghatározva, hogy maximális rugalmasságot biztosítsanak a különböző profilok kezelésekor és minimalizálják azokat az ütéseket, amelyekkel a nedves termékek az automatikus kezelés során a teljes kikeményítőrendszerre hatnak, figyelembe véve az állványok szállítási sebességét is.

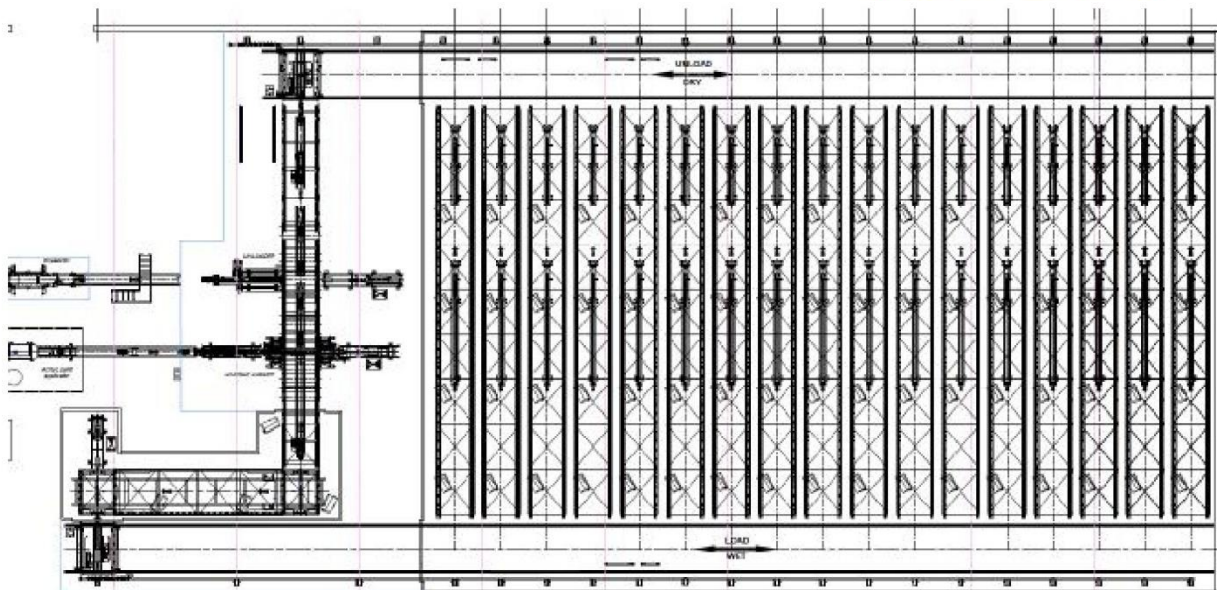
A MATRIX rendszer egy előfűtött kamrából áll, amelynek kapacitása 7 állvány + egy 17 sávú kikeményítő kamra, ami összesen 101.700 tetőcserep kikeményítésére teszi alkalmassá. A kikeményítési kapacitás bármilyen, a 6300 darab tetőcserep többszörösének megfelelő elrendezéssel növelhető.

Annak érdekében, hogy a rendszer adott épületbe beilleszthető legyen, ill. hogy a különböző követelményeknek megfeleljen, az egyes kamrákban lévő állványok mennyisége változtatható. A kapacitás később új alagutak hozzáadásával egyszerűen bővíthető.

A kikeményítő alagutakból érkező acél állványok a keresztirányú állvány-szállítószalag mentén mozognak, és áthaladnak az állványra helyező, állványról levevő egységen, ahol a száraz tetőcserepeket kirakodják és friss tetőcserepeket raknak be.

A keresztirányú állvány-szállítószalagon az állványokat 4 különböző indexálórendszer mozgatja lépcsőről lépésre:

Ennek eredménye a maximális rugalmasság a nedves és a száraz szállítási útvonal között, azaz hogy a nedves árut szállító szalag esetleges leállásakor a száraz árut szállító szalag tovább fut, és fordítva.



Polcindexáló rendszer

Ennek a funkciónak köszönhetően a profilváltások során nem szükséges a formákat kézzel hozzáadni, vagy levenni a szállítószalagról. Továbbá, ha a gyártási műszak során selejtes darabok vagy egyéb okok miatt bizonyos mennyiségű formát kivesznek a körforgásból, a rendszer kiegyensúlyozza önmagát.

Miután az előmelegített, nedves tetőcserepekkel teli állvány a „nedves oldali” kocsira kerül, az a nagy kikeményítő kamra kiválasztott sávja elé helyezi az állványokat.

A kikeményedés után a kiemelő berendezés minden sáv ellenkező oldalán egyesével kiveszi a sávból az utolsó 7 állványon lévő száraz tetőcserepet, áttolja azokat a „száraz oldali” szállítókocsra, ami visszaviszi őket az állványra helyező/állványról levető területre, ezzel lezárva a gyártási ciklust. Ilyen módon az állványok körforgása a FIFO logikán alapul.

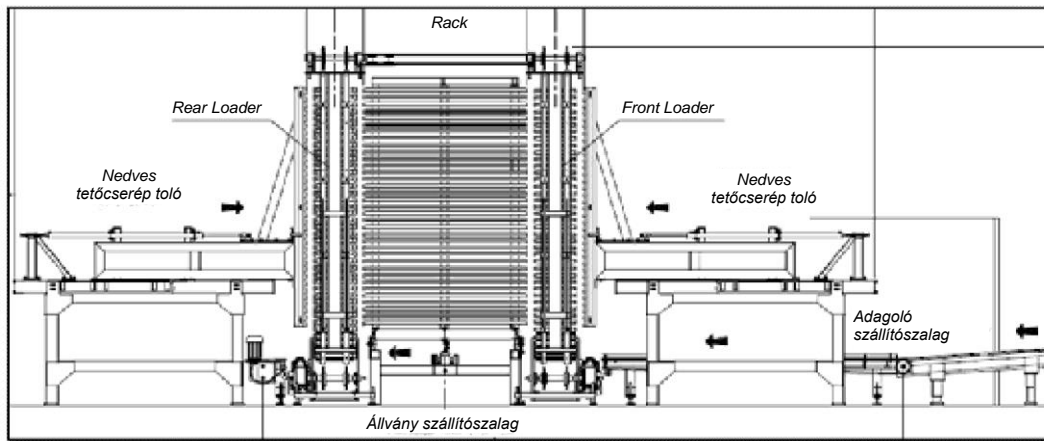
Állványra helyezés / állványról levétel:

Az állványrendszer két állványt tartalmaz, az egyik elől van, a másik pedig, amelyet friss tetőcserepekkel kell megtölteni, hátul. A friss tetőcserepeket először az elülső emelőszerkezet emeli fel; amikor ez megtelik, a friss tetőcserepek az állvány alatt haladnak a hátsó emelőszerkezet felé, miközben az elülső hidraulikus tolószerkezetnek elég ideje van finoman, sérülés nélkül betolni egy függőleges, 35 friss tetőcserepből álló sort az állványba.

A felvonók tengelyvezérléssel rendelkeznek, így maximális pontosságot érnek el a tetőcserepek emelésében, miközben a gyorsítási és lassítási rámpák optimalizálása érdekében szervomotorok mozgatják őket. A két tolószerkezetet inverteres meghajtók mozgatják; ez megmutatkozik a rendkívül gördülékeny műveletekben is, miközben a tolórúd pontos kialakítása az élek sérülését is megakadályozza.

A száraz tetőcserepeket tolórúd mozgatja az állványról lefelé, amely, pontosan indexált lépéseket végrehajtva, minden lépésnél 4 tetőcserepsort ürít ki a kivezető szállítószalagra. Ez a szállítószalag az egyik végén csuklósan van rögzítve és pneumatikus felfüggesztésű, elakadás esetén automatikusan lefelé mozog.

Könnyű hozzáférhetőségüknek köszönhetően az állványra helyező/állványról levető szerkezetek karbantartása egyszerű.



Kikeményítés:

A kikeményítési folyamat, beleértve a hőmérséklet- és páratartalom-szabályozást is, nagyjából 7 órát vesz igénybe. Az előfűtő alagút 4 hőcserélővel van ellátva, a nagyméretű külön alagút pedig 4 darab ventilátoros hőcserélővel van felszerelve minden egyes sávban, így biztosítva a meleg levegő függőleges cirkulációját és minimalizálva az alul és felül lévő tetőcserepek hőmérséklete közötti különbséget.

Az állványok úgy vannak méretezve, hogy maximális rugalmasságot biztosítsanak a különböző profilok kezelésekor, figyelembe véve az állványok szállítási sebességét is a teljes kikeményítési rendszerben.

Az állványvezetők bordázata megkönnyíti a formák áthaladását.

Az állványokból történő kirakodáskor a még sablonokon lévő kikeményedett tetőcserepek áthaladnak a sablonleválasztón, amely különválasztja őket. Az alumínium sablonokat olajozón keresztül juttatják vissza a tetőcserepkészítő gépbe, ahol megközelítőleg 4 g/tetőcserep mennyiségű olajpermetet juttatnak azok felületére, ami megakadályozza, hogy a beton ráragadjon az alumíniumra, és ezzel segíti a kikeményedés után a sablon eltávolítását.

Csomagolás:

A javasolt rendszer megszárítja a száraz tetőcserepekre (legfeljebb két rétegben) szórt akrilfestéket, mielőtt nagy csomagokban egymásra rakná és kötegelné azokat.

A **rendszer koncepciójának része**, hogy a tetőcserepeket kis, kör alakú állványra rakja, amely lépcsőről lépcsőre mozog, folyamatos ciklusban, hogy minden behelyezett tetőcserepnek **azonos száradási időt** biztosítson.

A forgó-szártó kijáratánál a cserepek egy minden egyes tetőcserepet kezelni képes, 5 pókrobotokból álló kis csomagképző rendszerbe kerülnek, amely a csomagképzésben a lehető legnagyobb rugalmasságot biztosítja. Miután a csomagok elkészültek, a pántoló útvonalakon keresztül továbbítják őket, ahol a csomagokat függőlegesen pántolják, majd megduplázzák, és így készen állnak arra, hogy a 2 robot nagy csomagot alkotva a forgó szerkezetre szerelt rézsútos, nyereg alakú támfelületre gyűjtse őket (2 forgó szerkezet része a szállítási terjedelemben).

A forgó szerkezet a nagyméretű csomagok vízszintes pántolásához két pántológéppel van felszerelve.

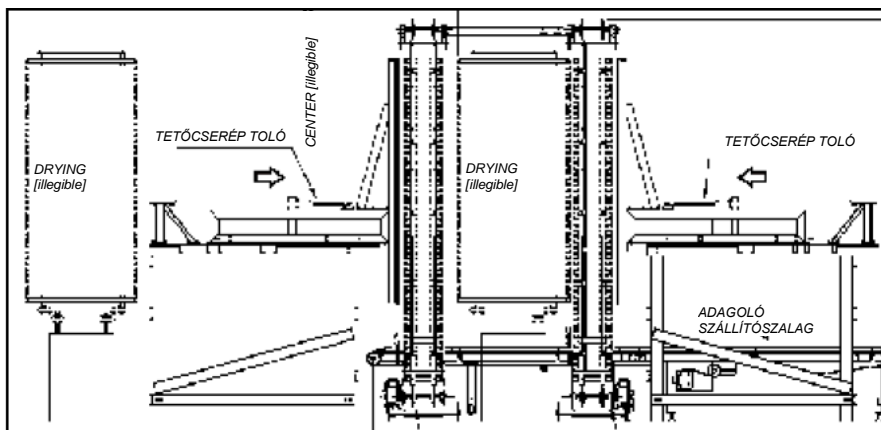
Miután a nagyméretű csomagok pántolása megtörtént, a raklapozó robot összegyűjti és fa raklapokra helyezi a csomagot. Végül a tetőcserepek 6 darab vízszintes pántolású, zsugorborítású, kocka alakú csomagja készen áll arra, hogy villás targoncával felvegyék és kivigyék az udvarra.

A **FORGÓ-SZÁRÍTÓ polc előnye** a hagyományos csomagolókkal szemben:

- a festék optimális kikeményedése;
- a festék szárításához nincs szükség energiára;
- a tetőcserep felülete gyakorlatilag nem karcosodik, nem kopik;
- a csomag megjelenése tökéletes;
- kevesebb gép, jobb hatékonyság.

Tetőcserepek szárítására és nagyméretű csomagok kialakítására szolgáló egység

A javasolt szabványos konfigurációban a forgó-száritó csomagolórendszer 2 állványra rakodó tetőcserep-adagolóval van ellátva (elől és hátul), amelynek nettó kapacitása 3680 tetőcserep (26 perc száradási idő 140 ford./perc fordulatszám esetén).



Első-hátsó rakodó 140 ford./perc fordulatszám esetén

A rakodórendszer két felvonóból áll, az egyik az állvány előtt, a másik pedig mögötte található, amelyet tetőcserepekkel kell megtölteni. A tetőcserepeket először az elülső emelőszerkezet emeli fel; amikor ez megtelik, a tetőcserepek az állvány alatt haladnak a hátsó emelőszerkezet felé, miközben az elülső hidraulikus toló szerkezetnek elég ideje van finoman, sérülés nélkül betolni egy függőleges, 32-40 festett tetőcserepből álló sort a rekeszbe.

A felvonók tengelyvezérléssel rendelkeznek, így maximális pontosságot érnek el a tetőcserepek emelésében, miközben a gyorsítási és lassítási rámpák optimalizálása érdekében szervomotorok mozgatják őket.

A két toló szerkezetet inverteres meghajtók mozgatják; ez megmutatkozik a rendkívül gördülékeny műveletekben is, miközben a tolórúd pontos kialakítása az élek sérülését is megakadályozza.

Bevonatolás:

Csomagolás előtt a tetőcserepeket a következőkkel vonják be:

- Az akrilfestéket a nedves és/vagy kikeményedett tetőcserepekre (az elrendezésnek megfelelően) csomagolás előtt lehet felszórni.

Kiegészítők:

A beton tetőcserepek termékkészletének teljességéhez szükséges kúpcserepeket, félcsepepeket és szellőzőnyílásokat 20 ford./perc, a szegélycserepeket pedig 10 ford./perc fordulatszámú gyártósoron állítják elő, a gyors profilváltás érdekében csúszószárnra szerelt három különböző extruderrel. Az alumínium sablonokon történő extrudálás után a nedves tartozékok automatikusan olyan állványokba kerülnek, amelyeket a fő gyártósoron használthoz hasonló, kifejezett erre a célra szolgáló automatikus mátrixkamra-rendszerben



UNI EN ISO 9001:2015 / 14000 :2015

tárolnak. A kikeményedés után a bordák a száraz oldalon automatikusan akrilfestést kapnak (egy akrilfesték réteget kell felvinni a nedves tetőcserépre) és a festékszárító rendszer után az összes tartozékot kis kötegekben rögzítik, végül raklapra helyezik, és a raktárudvarban helyezik el.